George Cockburn?

THE

HISTORY

OF THE

ROYAL SOCIETY of LONDON,

FOR IMPROVING OF

NATURAL KNOWLEDGE,

FROM ITS FIRST RISE.

IN WHICH

The moſt conſiderable of thoſe Papers communicated to the SOCIETY, which have hitherto not been publiſhed, are inſerted in their proper order.

AS A SUPPLEMENT TO

THE PHILOSOPHICAL TRANSACTIONS.

By THOMAS BIRCH, D.D.

SECRETARY to the ROYAL SOCIETY.

VOL. IV.

Talem intelligo PHILOSOPHIAM NATURALEM, *quæ non abeat in fumos ſpeculationum ſubtilium aut ſublimium, ſed quæ efficaciter operetur ad ſublevanda humanæ vitæ incommoda.* BACON de Augm. Societat. L. ii. c. 2.

LONDON:

Printed for A. MILLAR in the Strand.

MDCCLVII.

THE HISTORY OF THE ROYAL SOCIETY of LONDON, FROM ITS FIRST RISE.

JANUARY 8, $167\frac{9}{10}$. Sir CHRISTOPHER WREN vice-preſident in the chair.

The minutes of December 18, 1679, were read.

Mr. HOOKE read another letter of his to Mr. NEWTON concerning ſome farther account of his theory of circular motion and attraction; as alſo ſeveral obſervations and deductions from that theory; as 1. That pendulum clocks muſt vary their velocity in ſeveral climates. 2. That this variation muſt alſo happen at different hights in the ſame climate: Which laſt remark he confirmed by an obſervation of Mr. HALLEY at St. Helena; and 3. as a conſequence of theſe, that a pendulum was unfit for an univerſal ſtandard of meaſure.

Dr. PAPIN being preſent at the reading of this letter related, that a perſon employed by the Royal Academy of Sciences at Paris to try pendulum clocks in places near the line found them to go much too ſlow; and that the ſaid Academy doubted the truth of this fact, but ſuppoſed, that he had been ſome way miſtaken, though he with much confidence affirmed the matter of fact to be true, but knew no reaſon of it.

Mr. HOOKE read alſo a letter of Mr. BALLE's, giving an account of his thoughts concerning the hypotheſis of Monſ. MALLEMONT.

Dr. TYSON read the first part of his observations made upon the porpoise; the remaining part being referred to another meeting; and his discourse was ordered to be registered [a].

Mr. HOOKE shewed an experiment of the putting of camphire into aquafortis, whereby that gum is presently converted into oil, and swims in that form upon the aquafortis.

He was desired to make his trials as soon as possible of Mr. NEWTON's experiment concerning the earth's diurnal motion.

The experiment to try the comparative weight of tin, lead, and the mixture of tin and lead was prepared; but it being late it was referred to the next meeting.

January 14, at a meeting of the COUNCIL at the president's house were present,

Sir JOSEPH WILLIAMSON, presid[t]	Dr. HOLDER
Sir ROBERT SOUTHWELL	Dr. KING
Mr. COLWALL	Dr. GALE,
Mr. HILL	Mr. HOOKE.

Mr. HILL and Dr. GALE having spoken with Mr. POVEY concerning Monsr. FAUBERT's treaty about Chelsea College, reported, that Mr. POVEY was yet in hopes, that Monsr. FAUBERT would go on with his design; and that he would speak with Monsr. FAUBERT, and return his positive resolution on that affair.

Sir CHRISTOPHER WREN, Dr. CROUNE, Mr. HILL, Dr. GALE, Mr. HOOKE, or any three of them, were impowered to treat with Mr. ROSSINGTON concerning Chelsea College. And, if he should accept of the same conditions, that were proposed by Monsr. FAUBERT, to agree with him; otherwise to report their proceedings to the Council.

Mr. HUNT was called in, and demanded, what he would expect for employing all his time in the service of the Society: Whereupon he said, that he would refer himself for his reward to the Council, but that he had been informed, that Mr. SHORTGRAVE had sometimes been allowed 50*l. p.r ann.* Whereupon 40 *l. per. ann.* being proposed to him in full for all business done for the Society, the ten pounds already allowed him being part thereof, he readily accepted thereof.

January 15, at a meeting of the SOCIETY, Mr. HENSHAW vice-president in the chair.

[a] It was not entered in the Register, but it was printed at London 1680, under the title of *Phocæna*: or, The Anatomy of a Porpoise dissected at Gresham College, with a preliminary discourse concerning anatomy, and a natural history of animals.

The minutes of January 8th were read; which gave occaſion to diſcourſe about the experiments made at the laſt meeting with camphire and aquafortis.

Mr. HENSHAW related, that camphire ſo liquified had been found a certain and ſpeedy remedy for the tooth-ach, ariſing from hollow teeth.

Dr. GREW ſuppoſed, that it might be from the acidity given it by the aquafortis; for that all acids very much contribute to the faſtening and ſtrengthening of the teeth. Mr. HOOKE ſuppoſed, that a moderate acid might ſerve to cleanſe the teeth, if foul; but that the acidity of aquafortis was much too violent; and he conceived, that it would rather damage the tooth itſelf, and ſo leave it more ſubject to external injuries from acids or other noxious qualities; and that it is a general obſervation, that after eating ſharp and acid juices the teeth will for ſome time be very ſenſible and tender, and be much more affected with ſharp or ſweet juices, or with hot or cold ſubſtances, than at other times.

Mr. POVEY related from his own experience upon his own teeth, that the filing of a long and ſlender tooth had made it grow thick, and fill the place between the other teeth.

Mr. HENSHAW related an experiment of ſetting an artificial tooth into the place of another tooth newly drawn out; whereby it proved, that the artificial tooth being ſo put into the ſocket of the jaw, the gum was obſerved to cloſe and grow about it, and fix it, as if it had been the natural tooth.

Mr. POVEY related, that he had known a great part of the jaw-bone on one ſide taken out, and that yet the perſon was able to chew and grind his meat.

Mention was made alſo of others, who had loſt all their teeth, and were notwithſtanding able to chew their food, their gums growing callous.

Mr. HOOKE produced the tranſlation of a long letter, which he had received from Mr. LEEWENHOECK, written in Low Dutch; together with ſeveral curious draughts of ſmall pieces of wood obſerved in the microſcope; as alſo the letter itſelf. A part of this tranſlation was read, and the delineations examined, wherein were explained the ſeveral veſſels and curious contexture of the parts of wood. The remaining part was referred to the next meeting.

The experiment ſhewed was the examination of the ſpecific weights of tin, and a mixture of equal parts of lead and tin; which was done by weighing them firſt in the air, and then in the water, and taking notice of their particular gravities. The weights of them were as follow:

	before melting	in air	in water	the difference		
Tin	3840	3536	3044	492	$7\frac{92}{491}$	$7\frac{2}{11}$
Lead	3840	3628	3266	362	$10\frac{4}{181}$	$10\frac{1}{2\frac{1}{2}}$
Tin and lead	7680	7096	6120	976	$7\frac{33}{122}$	$7\frac{3}{11}$ $8\frac{23}{61}$

January 21, at a meeting of the COUNCIL at the preſident's houſe were preſent,

Sir JOSEPH WILLIAMSON, preſid^{t}
Sir ROBERT SOUTHWELL
Dr. HOLDER
Mr. HILL
Dr. CROUNE
Dr. GALE
Mr. HOOKE.

The buſineſs of the *New Atlas* undertaken by Mr. PITT, was debated; and it was reſolved, that Mr. PITT ſhould be deſired to give a meeting to thoſe members of the council, who were concerned and named in that deſign, and to take an account of the preſent ſtate and progreſs of that work.

Dr. CROUNE made the following propoſal, as from Mr. ROSSINGTON, concerning Chelſea college; that the ſaid Mr. ROSSINGTON was willing to take a leaſe of that college and the ground belonging to it, being about ſix acres, for 61 years; at 30 *l. per ann.* and to be obliged to lay out in ſubſtantial building upon the premiſes the ſum of * *. Whereupon it was propoſed, that Mr. ROSSINGTON ſhould be farther treated withal, to ſee, if he could be prevailed with to give 35 *l. per ann.* rent for 61 years: but rather than break off with him, to comply with his propoſal of 30 *l. per ann.* &c. only that it be inſiſted on, that he lay out upon the premiſes in ſubſtantial building 2000 *l.* at the leaſt within two years at fartheſt, and to give good ſecurity for the performance of the ſame. And it was recommended to Sir CHRISTOPHER WREN, Mr. HILL, and Dr. CROUNE, Mr. COLWALL, Dr. GALE, and Mr. HOOKE, or any three of them, to treat and agree with Mr. ROSSINGTON accordingly.

Dr. CROUNE propoſing from Mr. COLLINS, that the latter was ready to print two volumes of algebra, written by Dr. WALLIS, Mr. BAKER, Mr. NEWTON, &c. provided the ſociety would engage to take off 60 copies after the rate of 1 *d* $\frac{1}{2}$ a ſheet; it was ordered, that Mr. COLLINS ſhould be deſired to make his propoſal in writing, and that the ſociety would farther conſider of encouraging the propoſal.

January 22, at a meeting of the SOCIETY, Mr. HENSHAW vice-preſident in the chair.

The minutes of January 15th were read, which gave occaſion of diſcourſing farther concerning camphire.

Sir WILLIAM PETTY related, that the powder of camphire, though mixed with ſnow, would burn when kindled.

Mr. HENSHAW related, that the king of Achim had great quantities of it, which he kept in cheſts, which, when he had a mind to burn ſhips in his harbour, he would pour out upon the ſea; part of which ſwimming powder being fired, would give fire to all the reſt, that ſwam upon the water, and thereby ſet fire to the outſide of any ſhip being at anchor in his harbours.

Dr.

Dr. CROUNE mentioned, that the ſociety had a glaſs of oil of champhire ſent from Mr. VERNATTI, which he conceived to be extracted from the camphire-tree.

Others ſuppoſed, that it was the wood of cinnamon, that yielded the camphire gum, and conſequently, that the cinnamon and the camphire came both from the ſame tree, the cinnamon (called *cannello*) being the bark ſhrunk up into a pipe, and the wood of the tree being that, which is called camphire-wood.

Mr. HENSHAW was of opinion, that a cauſtic often ſtops the pain of the teeth by deſtroying the worms, and alſo making the part ſenſeleſs.

Mr. HOOKE read a letter, which he had received from Mr. LEEWENHOECK, giving account of ſome further diſcoveries of an exceeding ſmall ſort of worms found in ginger-water; as alſo the reaſons, why he conceived, that the parts of water cannot be made viſible by a microſcope.

Mr. HOOKE produced a phoſphorus given him by Dr. SLARE, which was examined by Mr. HENSHAW, Sir CYRIL WYCHE, and ſeveral others, and was found to be very receptive of light.

Mr. HOOKE ſhewed the ball, that had been let fall from the hight of 27 feet, and fell into a box full of tobacco pipe-clay, ſticking in the clay, upon the ſurface of which were made lines croſſing each other: which ſhewed the true perpendicular point indicated by the ball, when it hung ſuſpended by a thread from the top, and how much the ball had varied from that perpendicular in its deſcent towards the South and Eaſt: and he explained the manner, how the ſame was performed in all particulars. It was deſired, that this experiment might be made before a number of the ſociety, who might be witneſſes of it before the next meeting. The time appointed was the Monday following at three in the afternoon.

The experiment of weighing the mixture of copper and lead was tried by examining its weight both in air and water; and thereby it was found, that the ſaid mixture in the air weighed 4188 grains; in the water 3746 grains; whence the weight of it to that of water was as $9\frac{105}{221}$, to one, or $9\frac{21}{44}$ to one.

Dr. CHRISTIAN HEUSCH, principal phyciſian to the elector Palatine, who was preſent at this meeting, was propoſed candidate by Mr. HOOKE; as were alſo Mr. THOMAS FIRMIN and Mr. JOHN HOUGHTON.

January 25, the preſident in the chair.

The minutes of the 22d inſtant were read; and upon diſcourſing about the ſmall creatures diſcovered by Mr. LEEWENHOECK in ginger-water mixed with pepper-water, it was ordered, that ſome ſhould be prepared againſt the next meeting.

Mr.

Mr. COLWALL moved, that a magnetical needle might be made for the ſociety, and lent to Mr. FLAMSTEAD to make obſervations at Greenwich of the variation of the needle; and it was ordered, that ſuch a needle ſhould be made, and that Mr. FLAMSTEAD might take care to have it well made.

Dr. HEUSCH, Mr. FIRMIN and Mr. HOUGHTON were elected; as was alſo Mr. LEEWENHOECK upon the motion of Dr. CROUNE, and Dr. GALE was deſired to draw up a diploma to be ſent to him.

Mr. HOOKE read an account of the experiments, which had been ſhewn to the ſociety of the comparative weight of two mixed metals with the weight of the ſeveral metals, out of which they were compounded; from which he deduced, that the invention of ARCHIMEDES to find the cheat of the goldſmith in making HIERO's crown, though in itſelf very ingenious, might not be ſufficient to perform what he deſigned by it; for that ſome two metals compounded made a heavier, and ſome other two a much lighter, than they really ought.

Sir WILLIAM PETTY explained the experiment, whereby the two metals ſeemed to penetrate each other, by the filling a veſſel firſt with large bullets or ſhot, as of culverines; then by putting into the ſame muſket-bullets, which would run into the cavities between the culverine-ſhot; and when no more of thoſe could be put in, then by pouring in ſmall bird-ſhot, then ſand, and laſt of all water; in every one of which fillings the veſſel might be ſaid to be as full of theſe bodies, as it could be; and yet by reaſon of the interſtices left between them could receive bodies of ſmaller parts.

He farther diſcourſed concerning what things were convenient to be obſerved in other compoſitions for the future, as colour, malleableneſs, hardneſs, brittleneſs, &c. together with the ſpecific gravity: and he mentioned, that there were other qualities alſo obſervable in ſome metals, as that ſmiths generally obſerve, that if any lead were ſpilt in their fire, the coals would not burn; nor will iron weld well till all thoſe were thrown out.

He ſuppoſed, that the reaſon, why tin put into lead makes it brittle and unfit for ſome uſes, might be the diſordering the parts of the lead, as by making thoſe parts lie acroſs, which before lay ſide by ſide; and that tin might be a kind of ferment of metals.

Upon this it was diſcourſed what was the beſt method of proſecuting experiments; and it was propounded by the preſident, that the beſt way was to proceed ſynthetically by firſt making the propoſition what was deſigned to be proved, and then proceeding with the experiments to make the proof.

Sir THEODORE DE VAUX queried, whether it would be agreeable to the ſociety to bring in ſome accounts, which he had of experiments made by Sir THEODORE MAYERNE, that the ſociety might examine, which of them were conſiderable and fit to be again examined. Upon which the ſociety deſired, that he would produce ſuch papers, and ſpoke of appointing ſome perſons to examine them. The

The preſident moved, that all experiments might be examined by a committee choſen for that purpoſe.

Sir WILLIAM PETTY deſired, that the operator might be employed for making the apparatus, and in the trial of ſome experiments: to which the preſident and ſociety agreed, and Mr. HUNT was ordered to attend accordingly.

Sir WILLIAM PETTY likewiſe mentioned it as a very deſirable thing, that every member of the ſociety would have ſome aim or deſign for promoting the ends of the ſociety; and that he would do ſomething in order to proſecute ſuch deſign: and he wiſhed, that the members would principally aim at ſuch experiments or obſervations, as might prove of great and immediate uſe.

The preſident acquainted the ſociety, that the council had met ſeveral times to conſider of the beſt ways of carrying on the deſign of the ſociety; and had made ſome orders concerning it, which he cauſed to be read; and it was ordered, that the amanuenſis ſhould write them in a fair hand to lie on the table of the ſociety.

The buſineſs of the philoſophical gazettes was then diſcourſed of; and it was deſired, that the matter ſhould be conſidered againſt the next meeting of the ſociety; that the ſociety ſhould not be intitled to it: that the form ſhould be half a ſheet in folio, and not to be more than 2 *d.* price. This method, it was ſuppoſed, would much propagate natural philoſophy and the Engliſh language.

It was farther mentioned, that the printer ſhould be diſcourſed with as to the number to be printed, and the paper and letter.

It was deſired, that it might be recommended to the council to ſettle this matter.

The experiment to be tried at the next meeting was the examination of the mixture of gold and ſilver; and Mr. HILL, Dr. BROWN, Mr. BERRY, and Dr. CROUNE were appointed a committee to ſee the examination of it on the Monday following at three in the afternoon in the operator's lodgings.

February 5, the preſident in the chair.

Dr. HEUSCH and Mr. HOUGHTON ſubſcribed and were admitted.

Mr. PETER PERKINS was choſen and admitted.

The minutes of January 29th were read, and ſeveral matters were diſcourſed of about the melting of metals.

Mr. HENSHAW remarked, that ſulphur was very deſtructive to moſt metals, as that it would melt iron, and make it drop; that it would calcine ſilver ſo as to make it hard to be reduced.

The method of making experiments was alſo farther diſcourſed of; that they ſhould be made in order to prove a theory propounded: but Sir WILLIAM PETTY was of opinion, that they would be more faithfully made and delivered, if they were not made to help out a theory, becauſe that might prepoſſeſs and biaſs the experimenter.

Mr. HOOKE gave an account of ſome other qualities, which he had taken notice of in the mixture of tin and copper, as 1. That the colour of the copper was quite deſtroyed, it appearing much of the colour of iron, when poliſhed. 2. That the compoſition, which was made of two very malleable metals, when mixt, became friable and brittle. 3. That it bore a pretty good poliſh and reflection. 4. That though copper is exceedingly hard to be melted, yet this mixture melted very eaſily. 5. That viewing the poliſhed ſurface of it with a glaſs, he found it very full of extremely ſmall holes or blebs in the metal.

Sir THEODORE DE VAUX was deſired to bring in ſuch papers, as he ſhould think fit, and order ſhould be taken to have them fairly copied into a book by themſelves, that they might be peruſed; and that the papers, after having been copied, ſhould be ſafely delivered to him again.

There being a diſcourſe about the neceſſity of having ſome conveniences for making the experiments of mixtures of metals, Mr. HENSHAW promiſed to give a ſmall pair of ſmiths bellows, which he had by him.

The experiment of tin and copper was deſired to be made at the next meeting.

Mr. HOOKE read an account of the experiment, which was made the Monday before by Mr. HILL, Dr. CROUNE and Mr. HOOKE, which was ordered to be entered into the regiſter, as follows: [b]

" *February* the 2, $16\frac{7\,9}{8\,0}$; the ſeveral weights of lead and tin, and a mixture " made of equal parts of lead and tin melted together, were examined; and the " proportions taken as followeth:

" Lead, weighed in the air, was	3450 grains.
" Tin, weighed in the air, was	3450 grains.
" Lead, weighed in water, was	3138 grains.
" Tin, weighed in water, was	2988 grains.

" The aforeſaid equal parts of lead and tin, being melted into one maſs in a " crucible, and being then examined, we found that,

" This mixture weighed in air	6876 grains.
" The ſame weighed in water was	6078 grains.

" Whence the ſpecific weight of the metal compared with water, was $8\frac{8\,2}{1\,1\,3}$.

[b] Vol. 5, p. 216.

" The

" The ſpecific weight of lead, as above — — — — $11\frac{6}{104}$.
of tin — — — — — $7\frac{31}{66}$.

" Whence the ſpecific weight of this mixture ſhould have been — $9\frac{1810}{6864}$."

It was deſired, that trials ſhould be made, between that and the next meeting, with mixture of tin and copper, tin and ſilver, ſilver and lead, and ſilver and copper: and that the time of making ſome of them ſhould be on the Monday following at three in the afternoon; and that any member of the ſociety, who pleaſed, might be preſent.

Mr. HOOKE produced a letter from monſ. JUSTEL, which he had received that afternoon, though dated at Paris 23 December, 1679[c]. It was read by the preſident. It contained an account of an artificial man and an artificial horſe, and of a machine for tranſporting earth. Dr. GALE was deſired to ſend an anſwer to it, with directions to him how to convey his letters.

Upon this it was diſcourſed what kind of information Dr. GALE ſhould ſend to the correſpondents, and it was reſolved, that he ſhould receive directions at the next meeting.

The two ſecretaries were appointed to have keys of the preſs, in which the ſociety's books and papers were kept, and no perſon elſe.

Dr. HOOKE ſhewed an Indian fig or prickly pear from Bermudas, which was opened, and the deep red juice thereof taſted by ſeveral of the members.

Dr. PAPIN ſhewed an experiment in the exhauſting engine, whereby, he affirmed, that a liquor incloſed in the exhauſted receiver, extracted a tincture from red wood much ſooner and ſtronger than the ſame liquor in another glaſs in the open air would do in the ſame time.

February 12. Mr. HENSHAW Vice-preſident in the chair.

A letter from Mr. HYDE of Oxford to Dr. CHARLETON was produced by Mr. COLWALL and read, giving an account of ſome obſervations of his about moths, &c. as alſo concerning the generation of oiſters; which letter was as follows:[d]

" In the firſt place I preſent to you the little incloſed paper, which contains
" three or four embrios of moths: for every one of thoſe little things hath a
" worm in it. If you obſerve upon hangings in chambers, you ſhall ſee in ſome
" places the nap or wool ſheared off, that the place is left bare the breadth of about
" half a crown piece; and very near that bare place you ſhall ſee one of theſe
" things ſticking upon the cloth, like a little roll of lint or flock, which is always
" of the ſame colour with the cloth or hangings, from whence it was ſheared off.

[c] Letter book, vol. 8. p. 88.
[d] Letter book, vol. 8, p. 89.

" Theſe, which I have ſent, are partly red and blue, becauſe I took them off " from a Turky carpet, which had ſuch colours in it. I ſuppoſe, that at the end " of ſummer the old moth lays her worm or ſeed, and gives it this artificial " covering to preſerve it againſt the cold winter. As alſo the green beetle, which " we call a roſe-fly (becauſe they love to be upon roſes) doth not only earth itſelf " half a foot deep in the ſpongy ground of beds in gardens, but thoſe, which do " not happen upon that convenience, do find out another ſhift: for example, of " the houſe of a man, who made baſkets and other things of twigs, the floor of his " houſe being hard earth, was covered with the ſheeds and refuſe matter of ſmall " twigs as if it had been ſtrewed with ruſhes, under which lay many of theſe roſe- " flies, each of them being incloſed in a caſe of earth, which covered his whole bo- " dy totally. Theſe caſes, when broken, are perfectly ſmooth within, but the out- " ſide was rugged. My wonder is, by what art the fly could cement this earth ſo " as to make it ſtick together, and ſecondly how it could cloſe itſelf within, ſo that " the caſe ſhould be perfectly ſhut up on all parts. Theſe things I did, ſome years " agon, preſent to Dr. COMPTON, biſhop of London, for his friend Mr. MAR- " SHAL of Wincheſter, who hath been the moſt curious obſervator of inſects, and " hath often ſpoke of printing a large volume about them.

" Concerning the generation of oiſters, I lately obſerved ſticking upon ſome of " their ſhells little knobs of matter between white and yellow, which, if you mark " it well, are ſo many knots or cluſters of young oiſters, which I have viewed in " a magnifying glaſs, and found one ſide convex and rugged, and the other in- " clining to concave, as is the figure of an oiſter. Within each little particle of " the cluſter was water mixed, with ſome more fat and unctuous matter. I ſup- " poſe, that about December the oiſter ſpawns, and that by the ſides of her ſhell " iſſues out the matter, which is for generatien of the young brood: which being " iſſued out ſticks upon her ſhell, and is there nouriſhed up for a time, till either " nature or the toſſing of the ſea ſeparate them. I ſuppoſe them to begin breeding " about December, becauſe at the beginning of this preſent January I found theſe " cluſters ſo far grown, as to be perfectly formed to their ſhape outwardly, with " fluid matter within them without form; there being alſo ſticking to the ſame " ſhell ſome of perhaps the former year's breed, as big as ſix-pences, whoſe ſhells " were perfectly hard, and ſome pretty little meat within them, whoſe ſhape " was perfect within, in all points. If you pleaſe to mind it, doubtleſs you may " find many of them in any parcel of oiſters.

" Thoſe things, which we call crabs-eyes (which, for want of true ones, the apo- " thecaries ſometimes make into that form out of powder of egg-ſhells) are found " in the little prauns or craſiſh at the time of ſpawning: for I found them when " they had the little round particles of their ſeed or young ones ſticking in their " poſteriors. But thoſe things called crabs-eyes are only in the male fiſh, ſuch " whereof hath two of them in his head, ſtanding on the edge, like a couple of " millſtones or wheels. Hitherto you have my own experience. But I have " been informed concerning the little fiſhes called bleaks, that the reaſon, why they " leap above water at Midſummer, is not to catch flies, but becauſe they are at " that time of the year troubled with a little worm in their guts: which may be " inquired into better at ſummer. I have been alſo told, that the butter-flies

" are bred of the caterpillar, which in ſummer is green upon the leaves, and " at winter grows hairy and hirſute, bodying themſelves (as I have ſeen) all " the winter in a ſtrong cobweb of their ſpinning, hanging within a bush in any " hedge: but whether at ſpring theſe hirſute creatures come to be butter-flies, " may be eaſily found: for my part I doubt it, &c."

But Mr. HENSHAW was of opinion, that mr. HYDE was miſtaken in his notion, that the oiſter by ſome means conveys it young ſo, as to make them ſtick on the outſide of its ſhell; for that thoſe young ſhell-fiſh, that ſtick upon the backs of oiſters, were for the moſt part of another kind, as the couter-fiſhes and the auris-marina, &c. and that when many oiſters chance to cleave to the ſhell, he conceived them to be caſt there from ſome other ſpawning oiſter.

A letter from Mr. LEEWENHOECK to Mr. HOOKE, tranſlated by Mr. ASTON, and dated at Delft 13 February, 1680, N. S. was read, acknowledging the receit of the laſt letters and books ſent him, and expreſſing his deſire to be choſen a member of the ſociety; and mentioning, that he was buſy in making two obſervations, which he promiſed to tranſmit to the ſociety.

Dr. GALE was called upon for the diploma directed at the meeting of January 29 to be ſent to Mr. LEEWENHOECK; and it was ordered, that the ſociety's ſeal ſhould be affixed to it, and that a ſilver box ſhould be provided for it.

Mr. HOUGHTON preſented the ſociety with ſeveral prints of the line of the Norfolk family, as alſo the copper plate itſelf, whereon it was ingraven, and a pane of glaſs, on which the picture of the firſt duke of Norfolk was drawn; all which Mr. HOUGHTON had procured from his uncle, Mr. SILVANUS MORGAN.

Mr. HOOKE read his account of the experiment, which had been made on the Monday preceding, of melting ſilver and tin together [e]:

" Monday February 9, 1679/80, half an ounce of refined ſilver (the ſpecific " gravity whereof, to water, was found to be as 9½ to 1) was melted in a crucible " in a charcoal fire, in about half a quarter of an hour; and then an equal weight " of block-tin was thrown into it, which immediately melted like butter, but " cooled the ſilver. Blowing the coals again, the whole maſs melted and incor- " porated, but there ſeemed a great deal of droſs at the top. Then we took out " the crucible, and ſuffered it to ſtand till it was almoſt cold: then turning up the " crucible upon a ſheet of paper, a great deal of powder and ſcoria and ſome pieces " of metal, which though it were ſo cold as not to burn the paper, yet was it ſo " ſoft, as to temper and ſpread with the point of a knife like an amalgama of mer- " cury and tin: but breaking the crucible, we found a pretty quantity of metal " at the bottom. We picked out as much as we could of the mettle, and to make " it in a lump, we melted them in another crucible, which it preſently did, and " poured it into water: this lump of mettle we weighed, and found it to weigh in " the air 173 grains, and in the water 157 grains; whence the ſpecific gravity

[e] Regiſter, vol. 5, p. 217.

" thereof

" thereof is $10\frac{13}{16}$, ſomewhat more than $10\frac{3}{4}$. So that by the mixture of an equal " weight of tin, whoſe ſpecific gravity to water is but as 7 to 1, the ſilver is made " above the tenth part heavier."

The metal being ſhewn to the ſociety, and by a blow of a hammer broken before them, it was obſerved to be very heavy, cloſe, hard and brittle.

The experiments of gold and ſilver, and lead and ſilver, were deſired to be made on Monday following at two in the afternoon in the repoſitory.

Mr. HENSHAW read a paper of Dr. PAPIN, being propoſals of ſome experiments, which he could ſhew with ſpirit of wine mixed, both with freſh water, and ſalt-water, and then put into the exhauſting engine, where ſometimes the mixture with freſh-water would yield moſt bubbles, and ſometimes the mixture with ſalt-water. The paper was as follows[f]:

" Ardent ſpirits and particles of ſalt being two of the moſt active ſubſtances in " our bodies, I thought it would be good to try ſomething about them, in order " to the diſcovery of the effects they can produce, when they are mixed in our " veins and arteries. Therefore I took firſt common water in one bottle, and ſalt-" water in another bottle, and having put them both together *in vacuo*, I found, " that common water would bubble more than ſalt-water. So it ſeemed, that " pouring equal parts of brandy into each bottle, there ſhould not follow ſo much " ebullition in the bottle with ſalt, as in the bottle without ſalt. Nevertheleſs, when " I came to try that, I found, contrary to my expectation, that the ebullition be-" gan ſooner, and was greater in the bottle with ſalt, than in the other; which I " thought to proceed from the mutual working of the particles of ſalt and ardent " ſpirits upon one another. And this might be the reaſon, why drunkards love ſalt " meat, becauſe ſome particles of ſalt remaining in the organs of the taſte, when they " are wrought upon by the wine in drinking, they make a tickling motion, which " cauſeth the ſenſation of a pleaſing taſte.

" Now becauſe acids and alcalis, after they have done working, are mortified " and deprived of ſome qualities they had before, I would try, whether ſpirit of " wine would be mortified too, by the particles of ſalt, and deprived of the quality it " hath to boil *in vacuo*, which hath been diſcovered many years ago by Mr. BOYLE. " Therefore I poured two equal parts of brandy into two bottles, and I mixed with " one twice as much ſalt-water, and with the other twice as much common water: " theſe having been well ſtirred and kept ſeven hours together, I put them " both *in vacuo*, at the ſame time; but I found, that then the working of the parti-" cles of the ſalt with the ardent ſpirits was ſtronger than when they are newly " mingled; the mixture with ſalt bubbling up a great deal ſooner than the other. " Therefore I took out both the bottles, and having kept them ſeven or eight hours " more, I put them again *in vacuo*; and then I found at laſt, that the ſpirits were " much mortified by the ſalt; becauſe this time the mixture without ſalt bubbled " up much ſooner than the other did.

[f] Regiſter, vol. 5, p. 218.

" From

" From this I gueſs, that ſalt and ardent ſpirits are antidotes againſt one another; " and that ſalt meats may be good to thoſe, that drink ſuch liquors, as are apt to " give many ardent ſpirits.

" The working of thoſe ſubſtances may be haſtened in our bodies, by reaſon of " the heat: it might be haſtened too, by uſing ſpirits of ſalt inſtead of ſalt it- " ſelf: for I remember, that by an experiment made at Mr. HUYGENS's, and print- " ed in the year 1674, we found, that aquafortis doth preſently mortify ſpirit of " wine.

" By proſecuting ſuch experiments, I think ſeveral other ſubſtances could be " found to be antidotes againſt one another; but I ſubmit all to the judgment of " the Royal Society."

Dr. GALE produced his draught of a diploma for Mr. LEEWENHOECK.

The ſociety, it being late, would not ſtay to ſee the experiment, which was ready; but the minutes of the laſt meeting being read, adjourned.

February 19. The preſident in the chair.

The minutes of the 12th inſtant were read, wherein mention being made of Mr. HYDE's letter, it was deſired, that Dr. GALE would take this opportunity to write to him on the ſubject thereof.

Upon mention of Mr. LEEWENHOECK's diploma, it was ordered, that the arms of the ſociety be ingraved on the ſilver box to be provided for the diploma.

The preſident deſiring to ſee the things preſented at the laſt meeting by Mr. HOUGHTON, the prints were brought in and diſtributed one to each member; and Mr. HUNT was ordered to paint upon the frame of the painting on glaſs the name of the donor, Mr. MORGAN.

Mr. HOOKE read an account of ſome experiments made on the Monday precede- ing upon a mixture of ſilver and lead; which account was ordered to be entered in the regiſter-book[s], and was as follows:

" Monday February 1679/80. We found by trial, that the ſpecific weight of ſilver " was $9\frac{2}{7}$, and that the ſpecific weight of lead, examined by water, was $11\frac{2}{3}$; and " by melting half an ounce of ſilver and half an ounce of lead together, and weigh- " ing the mixture firſt in air, then in water, we found the weight of it in the air to " be $439\frac{5}{10}$, and the weight of the ſame in the water to be $397\frac{4}{10}$: whence we " deduced, that the ſpecific gravity thereof was $10\frac{3}{7}$: and by comparing it with " what it would have been, ſuppoſing an equal mixture without penetration, we " found it ſhould have been $10\frac{2}{7}$, ſo that it was found ſomewhat lighter than " the medium of their two ſpecific gravities, which we ſuppoſed to be cauſed by

[s] Vol. 5, p. 219.

" the

" the waſting of ſome part of the lead into litharge. So that it ſeems in this com-
" poſition the metals do not work upon and penetrate each other, as in ſome of
" the other mixtures.

" Then with a hammer and anvil we beat this mixture very flat, to ſee if by the
" ſtrokes of the hammer they could be made to penetrate each other, or to lie in
" a cloſer texture: but weighing the piece ſo hammered, firſt in air, and
" then in the water, we found the weight thereof in both caſes the ſame with the
" former weight. It was very malleable, and ſeemed of a middle nature, as to
" hardneſs and mallcableneſs, as it did alſo as to its colour between ſilver and
" lead.

" After this we put the ſame lump into the ſame crucible, and ſuffered it to
" ſtand in the fire melted, till all the lead was thrown out of the ſilver into a li-
" tharge, which remained melted at the top, and was converted into a glaſs, ſome-
" what yellowiſh but tranſparent, and which was very brittle. But it was obſerv-
" able, that ſo long as there remained any lead with the ſilver, it kept the ſame in
" fuſion, though the fire was not very ſtrong: but ſo ſoon as it was all boiled
" out into litharge, the ſilver grew hard, though the litharge remained melted in-
" to a glaſs; which we poured out into a cake.

" Examining the comparative weight of this glaſs of litharge to water, we
" found the ſpecific gravity thereof to be $6\frac{3}{25}$, that is near $6\frac{1}{8}$. So that lead
" reduced into glaſs hath acquired a texture twice as much rarefied, as it was
" whilſt a metal.

" Examining the ſpecific gravity of a lump of glaſs between white and green,
" we found it to be to water as $2\frac{1}{2} + \frac{1}{3\frac{1}{2}}$: ſo that this glaſs of lead is almoſt three
" times as heavy as common glaſs."

The experiments to be tried on the Monday following at three in the afternoon were appointed, viz. 1. With ſilver and gold. 2. With ſilver and copper; and 3. with braſs and lead.

Mr. PACKER gave an account of the way of converting lead into litharge, by ſkimming the melted lead with a ſkimmer.

The glaſs, which had been made out the lead boiled out of the ſilver, was ſhewn, and the weight of it given, compared both to lead, common glaſs, water, &c.

Mr. HENSHAW gave an account of the way of making putty of tin and lead calcined.

Two books brought by Mr. AUBREY from Mr. WILLIAMS were preſented to the Society. They were ſent by JOHN BRUMSTEIN, M. D. ſecond phyſician to their highneſſes the prince and princeſs of Orange, and had been ſent him by Mr. J. SWAMMERDAM for this purpoſe, as appeared by a note incloſed.

Dr. PAPIN

Dr. PAPIN ſhewed an experiment with the exhauſting engine, the account whereof he delivered to the preſident, which was ordered to be regiſtered [b].

Dr. CROUNE related that the fetid flegm remaining after the ſpirit of Canary had been extracted by diſtillation, could not be ſweetened by any method ſo well as by pouring on it freſh Canary, which did it immediately.

Dr. KING ſhewed a pair of microſcopes conveniently contrived to ſcrew together, which, he affirmed, would do as well as any larger microſcope.

Dr. GALE was deſired, that he would in his letter to Monſ. JUSTEL requeſt to be informed, as much as might be, of what was known concerning the effects of the poiſon ſo much ſpoken of in France.

Mr. HILL gave ſome accounts of the poiſoning, that was ſo much practiſed in Rome and Italy in the year 1656.

Mr. HENSHAW added, that the report of that Italian poiſon was, that it was not diſcernible by ſmell or taſte, when it was mixt either with meat or drink: That it was ſaid to be ſome preparation of lettice: That the ſymptoms of it were, that the perſon ſoon after taking it grew drowſy: That after ſleeping he awaked with a ſhivering like an ague, with a great dejection of ſpirits: That if he were let blood, he died preſently: If he took cordials, he fell into a high burning fever, that carried him off in two or three days: And that the antidote againſt this poiſon was vinegar or juice of lemon.

Dr. CROUNE mentioned, that the grand duke of Tuſcany being ſent to by the king, to know what that poiſon was, which was reputed ſo very mortal, returned a bottle of the fetid oil of tobacco, and ſaid, that he knew no poiſon greater than that.

Mr. PERKINS gave ſome account of ſome obſervations, which he had made about the variation of the magnetical needle; of which a more full account was expected at the next meeting.

February 23, at a meeting of the COUNCIL were preſent

The Preſident,

Sir WILLIAM PETTY	Dr. HOLDER
Mr. HENSHAW	Dr. GREW
Mr. COLWALL	Dr. GALE
Mr. HILL	Mr. HOOKE.

It was ordered, that the treaſurer do pay to Dr. POPE for the uſe of his lodgings ſo much rent, as ſhould be found due ſince the laſt payment to the time, when they were delivered back to him: And,

[b] It is not entered in the regiſter.

That

That Mr. HUNT prepare a ſilver box for the diploma to be ſent to Mr. LEEWENHOECK.

Dr. GALE was deſired to get a table fairly written with the inſcription now produced by him, acknowledging the noble bounty of the duke of Norfolk in beſtowing the Norfolcian library on the Society; the ſaid table to be hung up in the gallery, where the ſaid library is placed.

It was moved, that the duke of Norfolk ſhould be ſolicited to beſtow his picture to be preſerved in the library.

Mr. COLWALL was at the ſame time deſired to beſtow his picture upon the Society, to be kept conſtantly in the repoſitory; which he, though with much modeſt reluctancy, promiſed to do.

It was ordered, that there ſhall be proviſion made for all the manuſcripts of the Norfolcian library.

Dr. GREW read a propoſal of his about procuring ſubſcriptions for encouragement of his undertaking to print a catalogue of the natural and artificial curioſities of the Society; and he was encouraged to bring in his propoſals on the Thurſday following for ſubſcriptions.

The matter of the new diurnal to be printed in half a ſheet of paper was debated: And it was reſolved to meet upon this matter on the Saturday following, February 28, at ten in the morning.

Mr. BATES's bill for the partition in the gallery was paſt.

Frebruary 26, at a meeting of the SOCIETY, the preſident in the chair.

Mr. FIRMIN was admitted fellow.

Mr. HOOKE preſented from Mr. BOYLE his *Sceptical Chemiſt*, lately reprinted by him with many additions; which treatiſe the committee for experiments were deſired to peruſe, and to give an account of to the Society, and to ſee what experiments contained therein were proper to be ſhewn at the meetings of the Society.

The committee of experiments were Mr. HILL, Mr. COLWALL, Mr. HENSHAW, Mr. EVELYN, Mr. ASTON, Dr. GALE, Dr. CROUNE, Dr. BROWN, Mr. HOOKE, and Mr. PERKINS. They were deſired by Mr. HOOKE to meet upon the Monday following in the afternoon, when he deſigned to try ſome experiments of weighing.

The preſident preſented from Dr. BECKERUS a book of his lately publiſhed, and dedicated to the Society, intitled, *J. J. Beckeri de novâ temporis dimetiendi ratione & accuratâ horologiorum conſtructione, theoriâ, & experientiâ, ad Societatem Regiam Anglicanam in Collegio Greſhamenſi Londini.*

Mr. FLAMSTEAD gave an account, that he had peruſed the book, and conceived, that there was very little in it, that was ſignificant for the deſign, which it was intended for; that the alteration by rarefaction and condenſation would do more harm than good: And that he thought, that if the author had applied the barometer, it would have been more ſignificant.

Mr. HOOKE mentioned, that one part of the deſign, viz. the taking off all inequality of force from the pendulum, had been long ſince completed and ſhewn by himſelf before the Society, when they met at Arundel-houſe, as would appear from their regiſters: That this author had only aſſerted, that there was ſuch a way, but had not ſhewn what his way was: and that ſome other of the ways, which he had there propoſed, appeared to be much inferior to thoſe already practiſed.

Mr. FLAMSTEAD was deſired to bring in an account of his obſervations about a ſtrange tide, that had lately happened; which he promiſed to do.

He gave an account in writing of an obſervation, which he had made with the Society's needle at the obſervatory at Greenwich, viz. that it varied about 4 or $4\frac{1}{2}$ degrees at moſt to the weſt.

Mr. HOOKE gave an account of the trials made upon the Monday preceding; as likewiſe of the method, which he had made uſe of to adjuſt the weights for ſucceeding experiments by dividing extended wires, &c. into grains, half grains, quarters, and eighths: And he mentioned, that he would by thoſe examine the weight of gold, ſilver, copper, tin, lead, &c. and on the Monday following make the trials.

Hereupon ſeveral diſcourſes were occaſioned about the nature and temperature of ſimple and mixt metals; and particularly of the metal, of which the holes, through which wire is drawn, are made; which, Mr. HOOKE ſaid, he had been informed, was made by one man only, and not known to any other perſon.

It was deſired, that one of thoſe plates with holes ſhould be procured againſt the next meeting.

Mr, HENSHAW mentioned, that the way of hardening and tempering tools for cutting porphyry was by quenching them in the diſtilled water of branca urſina.

Mr. HAAK produced an extract of a letter from a learned gentleman at Nuremburg, dated 24 January $16\frac{79}{80}$, containing an account of a ſtrange obſervation made on a dead corps, which appeared covered with red hair. He was deſired to inquire farther concerning it; and the extract was ordered to be regiſtered, [1] as follows:

"We have nothing curious here now worth imparting, unleſs you will permit "a late accident in this town to ſupply the defect; viz. That there being an occa-

[1] Regiſter, Vol. v, p. 224.

" ſion to enlarge a burial-vault in one of our church-yards, the workmen lighted " upon a corps buried there twenty and odd years ago; which, the coffin being " opened, did appear to be all over from top to toe (or from the head to the " ſoles of the feet) thick overgrown with hair, of a red colour, and to the touch, " at firſt ſoft and ſmooth, but after it was a little while expoſed to the air, much " harder and rougher than briſtles."

Upon mentioning the obſervation, that the hair was firſt very ſoft, and afterwards hardened in the air, Mr. HOOKE remarked, that the of ſilk-worms, ſpiders, caterpillars, &c. which in the body were ſoft, ſo ſoon as they were drawn into the air, hardened into a thread.

Dr. TYSON upon this occaſion mentioned a ſtrange obſervation of his, of hair found in the ovarium of a woman, who lately died; which hair he alſo ſhewed. He remarked alſo, that he had found ſomething like it in the ovary of a bitch. He was deſired to bring in an account thereof in writing.

Mr. PERKINS read an account of ſome obſervations, which he had made on the variation of the magnetical needle, which he ſaid varied in ſeveral inclinations, inſomuch that he could make it ſtand due eaſt and weſt. This account was ordered to be regiſtered, [k] as follows:

" The ſouth end of the horizontal needle or compaſs being made to dip (in this " northern hemiſphere) will cauſe the needle to vary, and that more or leſs accord- " ing to the dipping; ſo that when made to incline about as much as is the com- " plement of the natural inclination of the place, it will ſtand eaſt and weſt; and " if dipt a certain number of degrees more, the ſouth end will wholly turn and " ſtand north, and the north end ſouth.

" The variation is either natural or accidental: the natural is conſtantly regular " and uniform.

" The accidental is either from the guns and iron work of the ſhip, according as " it lies nearer or further off, higher or lower, in greater or leſſer quantities; and " that either caſt or hammered, clean or ruſty and foul, &c. and according to the " tack or ſet of the ſhip: So that the compaſs upon one tack may have four degrees " variation, on another 3°, &c. according as the north or ſouth end comes to be " inclined towards ſuch and ſuch a maſs of iron, and that lying aloft or below, &c. " Alſo according to the warping of the card or needle, and ſtrength of the virtue " now on the wire, or that was given by the touch at firſt, and truth of its " horizontal ſet: alſo ſomewhat acuity or bluntneſs of the pin that bears the " card, &c.

" To which may be added the faults in obſervation and computation, as the not " regarding of refraction, and the true centre of the ſun or ſtar, and erroneouſneſs " of the tables of declination.

[k] Regiſter, Vol. v. p. 221.

" The natural variation is from the natural inclination or dipping, and the acci-
" dental variation from the accidental dipping.

" Hence, the natural inclination being greater and greater, as nearer and nearer
" the pole, the leſs deviation from horizontality cauſeth a great variation: So that
" when as 2 or 3 degrees dipping under or near the æquinoctial may cauſe but 1
" degree variation; as much dipping in 50 degrees latitude may cauſe 5 or 6 de-
" grees variation."

Mr. PERKINS ſhewed alſo an experiment with a dipping needle, whereby he endeavoured to prove his theory, viz. by making the dipping needle incline in a line in a north and ſouth poſition.

Mr. HOOKE objected, that though a dipping needle would vary from the meridian, according to various inclinations in ſeveral azymuths, as he had long ſince found, and reduced to a theory; yet he conceived, that the leading or poiſing a horizontal needle to ſuch an inclination would not have the ſame effect; and therefore he doubted, whether that would ſucceed. But Mr. PERKINS and Mr. FLAMSTEAD both affirmed, that the variation would be much the ſame. Mr. PERKINS deſired to be informed of as many variations of the magnet, as could be procured, that he might make a theory of the variation. He ſaid, that he had found by obſervation, that there were ſix meridians, in which the needle did not vary, three in the north, and three in the ſouth; and that one of theſe went now through St. Helena.

Dr. HOLDER acquainted the Society, that the preſent governor of Newfoundland was well known to him; and that if the Society had any commands or inquiries for that country, he would recommend them to that governor's care.

Mr. HOOKE produced a large diſcourſe about inſects, being a tranſlation of the principal things contained in Dr. SWAMMERDAM's book. But it being now eight o'clock at night, the Society roſe.

February 28, at a meeting of the COUNCIL were preſent

The Preſident,

Sir CHRISTOPHER WREN	Mr. COLWALL
Sir WILLIAM PETTY	Dr. GALE
Dr. HOLDER	Mr. HOOKE.
Mr. HILL	

The heads of the Philoſophical Gazette were diſcourſed of, and ſome of them ſet down.

Mr. HOOKE was deſired to make a trial of one.

March 4, at a meeting of the SOCIETY, the preſident in the chair.

The preſident read the rules (now fairly ingroſſed in a ſheet of paſteboard) which were ordered by the council for the method of proceeding at every meeting of the Society for the future; and which were ordered to lie always upon the table at the ſaid meetings; and the perſon in the chair was deſired to ſee, that they be obſerved.

The ſaid rules were alſo to be produced at the next meeting of the committee of experiments; at which meeting the ſaid committee were deſired to conſider, what authors, who had written of matters pertinent to the buſineſs of the Society, ſhall be firſt conſidered, and of the perſons proper and at leiſure for peruſing the ſaid authors, and making extracts of them; and to recommend the ſaid authors to the perſons ſo fixed upon.

The time of the meeting of this committee was appointed to be the Tueſday following in the afternoon in the repoſitory; and Mr. HUNT was ordered to give notice to ſuch of them, as were not then preſent.

The minutes of February 26 were read; whereupon the matter of Dr. BECKER's book was diſcourſed of; and becauſe it was thought, that all that Mr. FLAMSTEAD had ſaid concerning that book was not entered in the journal, he was deſired to bring in his account of it in writing at the next meeting.

Mr. PERKINS ſuppoſed, that the drineſs and moiſture of the air was a greater cauſe of the variation of the pendulum clocks than the heat and cold.

Mr. HENSHAW was of opinion, that the heat and cold might alter them conſiderably, ſince the air itſelf in cold countries ſeems to freeze and cover all things with a froſt.

Mr. PERKINS ſuppoſed, that the ſtanding of the Dutchman's clock in Nova Zembla might proceed from the foulneſs or ruſt thereof.

Mr. COLWALL gave an account, that Mr. HYDE was well pleaſed, that the Society had the peruſal of his letter; offering to aſſiſt them by communicating any thing, that he ſhould meet with proper for their deſign.

Mr. HOUGHTON produced a plate for drawing of wire, not yet drilled; as alſo a broken piece of another wire-drawing plate, which had been uſed; and a piece of mixed metal of the colour of gold, which would not coſt above 5 *s.* a pound; which, it was deſired, might be examined by weighing to find the ſpecific gravity on the Tueſday following, and then returned to Mr. HOUGHTON.

He gave likewiſe an account of the weighing of two bullets, the one of lead, the other of tin, caſt in the ſame mould, and of the difference of their gravity in air and water; and produced the bullets to the Society. He farther gave an account from a ſilverſmith of his obſervations on the wire-drawing plate, which was to this effect; that this metal breaks whiter than ſteel: That it is believed, that there is

is ſome ſilver in it, and no iron; perhaps ſome ſteel: That it is made at Lyons in France, and no where elſe: That it is prohibited upon the ſevereſt penalties to * * * * *: That being heated quite red hot makes no variation in its temper: That there is no way to ſoften it but by working: and that prince Rupert had tried to make it, but without ſucceſs. Mr. HOUGHTON was deſired to inform himſelf farther concerning it, and to bring in a large account thereof in writing. Mr. PERKINS deſired to be informed how it ruſted.

Mr. HOOKE gave an account of the ſame metal; that it could be both hardened and ſoftened by heating and quenching: That it was ſuppoſed to be ſome preparation of ſteel: That the great uſe of it was for drawing gold, ſilver, and copper wire, &c. That ſteel wire could be drawn through plates made in England of ſteel not hardened; but that theſe plates were apt to fret the wire of ſofter metal: That he would make ſome trial of this metal, by which he hoped he might give ſome more certain account what the metal was; which he was deſired to do.

Hereupon ſome diſcourſe was occaſioned about finding out ſome cheap metal, that might be hard and tough, and not ruſt; which would be of good uſe as well for ſheathing ſhips, as for other occaſions.

Mr. HILL related, that a ſhip was ſent to Muſcovy about 130 years before, which was ſheathed with lead; but from the ruſting of the nails it was left off: And that the inconvenience of the ruſting of the copper nails was the cauſe of the preſent diſuſe of it in the navy.

The preſident remarked, that it was very deſirable, that the journals of all voyages made by ſea ſhould be procured by the Society to be peruſed, and what was conſiderable extracted for uſe, as from the Eaſt-India Company, Trinity-houſe, &c.

Mr. HOOKE inquired, whether any perſon preſent could give any information concerning a certain Engliſh earth very effectual for ſcouring copper, braſs, &c. but none having before heard of it, the members were deſired to inform themſelves farther concerning it: And Mr. HOUGHTON promiſed to inquire of ſome, who, he thought, could inform him.

It was moved by the preſident, that Mr. PITT ſhould be deſired to attend the next meeting about giving ſecurity.

The trial on the Tueſday following, promiſed by Mr. HOOKE, was of copper and ſilver.

The preſident took with him the diploma for Mr. LEEWENHOECK, and preſented the Society with a ſcrew-preſs for ſealing ſuch diploma's.

Upon the objections made by Mr. HOOKE to the inferences made at the laſt meeting by Mr. PERKINS from his experiments ſhewed with a dipping needle va-

riouſly inclined in the north and ſouth azymuths, that the compaſs needle would alſo vary, if the ſouth end thereof were made to dip; Mr. PERKINS explained what he meant by the north end of the dipping needles pointing ſouthwards beyond the equator.

Mr. HOOKE alſo explained thoſe experiments, and ſhewed, that there was nothing in them, which varied from the known magnetical rules; and ſhewed the reaſon of the directing of the dipping needle towards other places than it would naturally do, if it were not limited and reſtrained: and that in this reſtraint it did, as near as it could, place itſelf in its moſt natural poſture: That this had no manner of influence upon the common compaſs needle, whether it hung horizontal, or whether the ſouth or north end dipped below it. And becauſe there were ſome miſunderſtandings about the names of the north and ſouth ends of the needle, Mr. HOOKE explained what he meant by pointing northwards and ſouthwards, viz. towards any point of an hemiſphere, or the north or ſouth ſide of the eaſt and weſt azymuth; which he made more intelligible by a draught, whereby he ſhewed alſo the manner of the dipping of the needle below the horizon.

Mr. PERKINS brought in the magnetical needle made by the direction of the Society, and at their charge; and the latter part of the inſcription ingraven on it by Mr. WYNNE was ordered to be taken out, ſince that needle was only made for the uſe of the ſociety, where-ever they pleaſed, and to be kept always in the repoſitory.

Dr. GALE moved, that the Society's inſtruments at the obſervatory at Greenwich might be brought back to their repoſitory.

Mr. JONAS MOORE was propoſed candidate by Mr. HOOKE.

Rarities procured by Mr. HOOKE from ——— WHISTLER, Eſq; and preſented to the Society for their repoſitory, and delivered this day to Mr. HUNT.

1. The ſkin of an orbis-ritunatus.
2. The ſnout of a priſtis or ſaw-fiſh.
3. The core of a gazell's horn.
4. A large turtle's head.
5. A very large Molucca crab.
6. Two tropic birds.
7. The head of a ſeal or ſea-calf.
8. The pizzle of a ſea-horſe.
9. The fin of a ſhark.
10. A ſhark's jaw.
11. The tail of a dolphin.
12. A dried gurnet.
13. Several pieces of coarſe white coral or petrified ſubſtances.
14. A ſea-fan.
15. A decayed bird of Paradiſe.

16. Some

16. Some ſhells.
17. An helmet-ſtone.
18. A Weſt-Indian feather-cap.
19. An Eaſt-Indian ſhield made of canes.
20. An Eaſt-Indian fan.
21. A pair of China ſtiliards in a caſe.

On this day, there was read and entered into the regiſter[l] the following account of an experiment of the weight of gold and ſilver melted together, by Mr. HOOKE:

"Monday March 1, 1676. The weights having been before, with very great "care and curioſity, adjuſted, ſo as to be all in a true proportion to one another, "and every thing being well adjuſted and fitted for the trials; we examined the "weight of the gold (which was of the beſt refined water-gold) and found the "ſame in the air to be counterpoiſed by —— —— —— 109¼ grains.
"In the water 'twas counterpoiſed by —— —— —— —— 103½ grains.
"The ſpecific gravity as to water was as 19 to 1.

"We examined the weight alſo of refined ſilver by the ſame weights, and found "it in air to be —— —— —— —— —— 109¼.
"And in water —— —— —— —— —— 98¾.
"Whence the ſpecific gravity to water is as 10 17/42 to 1.

"Then we melted them together and let them cool, and weighing the "maſs in air, we found it —— —— —— —— 215½ grains.
"And in water —— —— —— —— —— 199½ grains.
"whence the ſpecific gravity to water was as 13 13/23 to 1. But the medium of the "ſpecific gravities of the gold and the ſilver was to water as 14¾ to 1. Therefore "the mixture was lighter than it ought to have been, according to the ſuppoſition "of ARCHIMEDES by 2/23, that is ſomewhat more than a twelfth part.

"Then with a chiſſel we cut the lump in two, and found the middle part of it "look pretty yellow like gold, as if the gold had not been all perfectly mixt "with the ſilver, though the ſilver incompaſſed it. We melted it therefore again "in the ſame crucible, and when cool, weighed it and found its weight in the "air 215¾ grains, and in the water 199¼ grains; whence its ſpecific gravity was "much the ſame as before, viz. 13 20/64 to 1.

"Then we cut the lump in ſunder with a chiſſel as before, and found, that the "mixture was perfect, and the colour of the gold wholly loſt."

There was likewiſe entered the following paper.[m]

"*December* 19, 1676, hor. 8 hours, 9 min. 0 ſec. in the morning, the ſun's fol-"lowing limb was in the ſame azimuth with Eltham ſteeple.

[l] Vol. 5. p. 222. [m] Vol. 5. p. 223.

"His

" His true azimuth from the meridian at this time by calculation found 51 deg. " 15 min. Eaſt = to the angle EOM.

" The angle ſubtended betwixt Eltham ſteeple and the windmill at Bromley at " the obſervatory on Saturday laſt 48 deg. 15 min. $\frac{3}{4}$ = EOB.

" Therefore the azimuth of Bromley windmill B from the meridiam Eaſtward " BOM 3 deg. 0 min.

" But the azimuth of Bromley windmill from the magnetical meridian taken " yeſterday was one degree, or at moſt $1\frac{1}{4}$ to the Weſtward BOM.

" Therefore the variation MOm 4 deg. 00 min. or at moſt $4\frac{1}{4}$ degrees Weſterly " in the North, to the Eaſt, in the South point of the compaſſes, by the equili- " brated needle, one foot long.

" February 25, $16\frac{7}{8}\frac{8}{0}$, in the obſervatory at Greenwich."

March 11, the preſident in the chair.

The minutes of March 4th were read, which gave occaſion to diſcourſe farther concerning uſeful mixtures of metals, and particularly of ſuch, as would not ſuffer ruſt from the air or ſalt water: and it was propounded to be tried, whether iron, copper, or braſs nails being dipped in tin or lead, and well covered therewith, would not ſecure them from being ruſted and eaten by the ſea-water; which would be of great uſe for ſheathing of ſhips; ſince the nails now made uſe of were obſerved to be much conſumed by the ſalt-water, and ſo to occaſion the leaving off or not uſing of the new way of ſheathing ſhips with melted or rolled lead.

Hereupon it was queried, whether experiments of this kind could be well made here, in England, ſince the ſea-water in hotter countries might be more powerful for that effect than here: but it was ſuppoſed, that a ſtrong brine kept warm might be made more powerful here than the ſea-water in hotter countries.

The preſident mentioned again the uſefulneſs of collecting all the journals of voyages, that had been made, and had not yet been publiſhed; and urged, that ſome care might be taken to make ſuch a collection.

Mr. HILL moved, that a catalogue might be made of all the relations, that have been hitherto printed, and particularly of ſuch, as have appeared ſince PURCHAS publiſhed his collection.

The preſident deſired Mr PERKINS to make that collection, which he undertook to do.

Mr. HOOKE gave an account, that upon his farther inquiring concerning the material uſed for ſcouring and poliſhing metals, as braſs, copper, &c. he had been informed

informed, that it was called rotten ſtone; and that it was brought out of Lancaſhire, Derbyſhire or Cheſhire, or that way; but the particular place he could not yet be informed of. Some of it was produced, and ſeemed to be a light hard and gritty earth.

The account of the experiments tried on the Tueſday preceding was brought in by Mr. HOOKE and read, being examinations of the weight of a mixture of ſilver and copper, as alſo of a crown-piece; which account was ordered to be regiſtered [a], as follows:

" *March* 10, 1675. The weight of refined ſilver was examined, firſt in the air, " and then in water; and it was found { in air — 136 / in water 122½ } grains, whence the " gravity to water, as 10$\frac{2}{27}$ to one. Then an equal weight of copper was ex- " amined and found { in air — 136 / in water 118¼ }, whence its ſpecific gravity to water as " 7$\frac{27}{35}$ to one. Then they were put together and melted in a crucible, and being " weighed again when mixed, the maſs weighed { in air — 268$\frac{2}{10}$ / in water 238$\frac{1}{10}$ }, whence " the weight to water as 8$\frac{458}{779}$ to one. But ſuppoſing a perfect mixture without " penetration, it ſhould have been 9 and ſomewhat more than a third. We ham- " mered it, and found it very hard and tough, and cutting of it with a chiſſel, we " perceived, that the mixture was not ſo perfectly made, but that ſome parts were " more brown than the others: therefore we melted it again and found its weight " { in air — 264$\frac{2}{8}$ / in water 236$\frac{3}{8}$ }, whence its ſpecific gravity to water was as 9$\frac{107}{243}$, which " is ſomewhat heavier than it ought to be without penetration.

" We tried alſo a crown-piece, and found its weight in air 471¼, in water 425¼, " whence its weight to water was as 10$\frac{45}{154}$. So that it ſeemed to have ſome lead " or tin mixed with it rather than copper; it being heavier than refined ſilver, " whereas copper makes it lighter."

Upon the mention of the ſpecific gravity of a crown-piece, Mr. COLLINS affirmed, that there was no mixture of tin or lead in the ſilver minted in the tower; but that the ſtandard ſilver was a mixture of 222 parts of fine ſilver and 18 of copper; that is, 37 ſilver and 3 copper, or almoſt a twelfth part of copper.

Mr. POVEY moved, that Mr. SLINGESBY, the maſter of the mint, might be deſired to inform the Society more particularly of this matter: and it was deſired, that Mr. POVEY would ſpeak to him for that purpoſe; and that Mr. HOARE, comptroller of the mint, might alſo be ſpoken to on the ſame account.

The experiments for the Tueſday following propounded by Mr. HOOKE were appointed to be on the mixtures of iron and tin, and iron and lead.

[a] Vol. 5, p. 224.

Mr. HOOKE gave an account, that he had lately written to Mr. WILLIAM BALLE, to inquire concerning the preſent variation of the needle in Devonſhire: and he was deſired, when he wrote next to Mr. BALLE, to requeſt an account of what experiments of that kind he had formerly made.

Dr. GALE ſhewed an inſcription for the library to be printed in letters of gold upon a blue ground; which was approved of and ordered to be done.

Dr. TYSON read his account of the anatomical obſervations made by him concerning hair, &c. found in the ovary of a woman; and he preſented the ſubſtancees in a box, which were delivered to Mr. HUNT for the repoſitory; and the account was ordered to be regiſtered [o].

It was deſired, that Mr. LEEWENHOECK's long letter, tranſlated by Mr. HOOKE, might be read at the next meeting.

JONAS MOORE Eſq; was elected.

March 18, the preſident in the chair.

Mr. MOXON preſented his fourteen *Mechanical exerciſes*, bound in a volume; and was encouraged to proceed in his undertaking.

Captain WOOD [p] was propoſed candidate by Mr. MOXON.

Mr. BRIDGEMAN was admitted a fellow.

Mr. PERKINS being called upon for an account of what he had been able to do about the collection of voyages, anſwered, that upon inquiry he found, that the greateſt number of journals of voyages were in the navy-office; and very few, or none, either in the Eaſt-India or trinity-houſe. He alſo delivered in a paper containing the titles of ſome voyages, which had been printed, but were ſcarce. He was deſired to proceed with his inquiry, and to bring in an account of his progreſs from time to time; which he promiſed to do.

Sir ROBERT REDDING moved, that Mr. BLATHWAYTE might be conſulted with concerning this affair, to ſee, what aſſiſtance he could give in this matter of voyages.

Mr. PERKINS ſhewed ſome nails caſt by a founder in New-ſtreet in Shoe-lane pnrpoſely for the ſheathing of ſhips. They were ſuppoſed to be a mixture of braſs and lead. Some trials were ordered to be made with iron nails covered with lead and tin, to ſee whether that would preſerve them from that inconvenience.

Mr. BRIDGEMAN ſuppoſed, that the journals of the Eaſt-India company of Holland might be procured, if care were taken to inquire after them.

The

[o] It does not appear in the regiſter.

[p] In the printed catalogue he is called JOHN WOOD, Eſq;

The preſident moved, that Sir JOHN NARBOROUGH and captain WOOD might be ſpoken to for procuring of their voyages; the one to the ſtraits of Magellan, and the other to the North Eaſt.

Mr. HILL related, that in an old map of the ſtraits of MAGELLAN made in the time of queen ELIZABETH, the paſſage to the Southward of the ſtraits was deſcribed long before LE MAIRE was ſaid to have found it. It was deſired, that this map ſhould be farther inquired after, to ſee whether they were the ſame ſtraits, and who made that map, and the firſt diſcovery of thoſe ſtraits.

Mr. HOOKE mentioned the deſcription of the South Sea coaſts made for the king of Spain; and preſented to his majeſty, in the poſſeſſion of the earl of Briſtol [q] at the time of his death, as he had been informed; but not heard of ſince that time.

Mr. MOXON ſaid, that he had had it in his cuſtody for ſome time, but had returned it to the earl of Briſtol; that captain WOOD might likewiſe have had it in his cuſtody for ſome time, and might probably now be able to give ſome account of it. Mr. MOXON therefore undertook to make ſome farther inquiry after it.

A letter in latin from JOHN CHRISTOPHER STURMIUS to Mr. HOOKE, dated at Altorf 10 February, 1680 [r], was read, containing an account of the variation of the needle lately obſerved there by himſelf and ſome other curious men; as alſo concerning the new phoſphorus or ſhining pills, &c. Dr. GALE was deſired to return to him the thanks of the Society, and to deſire him to ſend ſome of thoſe pills, &c.

A letter from Monſ. JUSTEL to Mr. HOOKE, dated at Paris 9 March, 1680, N. S. [s] was likewiſe read, giving an account of the diſſection of fiſhes by monſ. DU VERNEY, and of his curioſity in having them exactly drawn by monſ. DE LA HIRE: as alſo an account of the poiſoners at Paris, and of a new invention in Germany of printing without a preſs; and of a German, who had travelled over land to China. Dr. GALE was deſired to return an anſwer to monſ. JUSTEL, and to encourage him continue his correſpondence.

Dr. GALE read an account of the numbing eel given to him by Mr. FLAMSTEAD: which account was ordered to be regiſtered [t]. It was as follows:

" Since I promiſed you an account of what I heard from Mr. Bateman, who was " for more than twenty years an inhabitant and planter in Surinam in the Weſt- " Indies, concerning the numb-eel of the place, that it might be the more perfect, " I have taken occaſion to inquire of his acquaintance, the beſt merchants in this " place, what report he had made them of it, and find them all agree in the

[q] GEORGE DIGBY, Earl of Briſtol.
[r] Letter book, vol. 8. p. 98. An extract of it is printed in Mr. HOOKE's Philoſoph. Collections, N°. 2. p. 8.
[s] Ibid. vol. 8. p. 105.
[t] Ibid. vol. 8. p. 91.

" following particulars, moſt of which I heard him tell his majeſty and ſeve-
" ral of the nobility before he went hence for Guinea, where the laſt ſhips thence
" tell us he is dead.

" That as ſoon as the fiſh ſeizes the bait, the party holding the line finds his
" hand ſtruck with a numbneſs, which ſuddenly pierces to his ſhoulder, and ex-
" cept he quit his hold immediately, thence to his heart, ſo that he falls down dead.
" That ſome unexperienced or forgetful perſons have by this means loſt their
" lives. But if as ſoon as they perceive it, they quit their hold, they recover again
" in a few hours.

" That himſelf had been ſtruck with one in 60 fathom water, and when he had
" ſo much line out of the boat; but being forewarned of it, and quitting his line,
" he received no great hurt by it.

" That whatever it be, that cauſes this numbneſs, 'tis of that active ſubtil na-
" ture, that when ſome perſons being ſtruck with it have fallen, their friends, who
" haſted to raiſe them, have for their officiouſneſs been rewarded with a ſenſe
" of the ſame, though they have touched no part of the line, but only the body
" affected.

" Enquiring concerning the eel itſelf, they tell me he informed them it was
" about three or four feet long and of proportionable thickneſs, not unlike our
" eels here: that it hath this benumming faculty only whilſt alive. That when dead,
" it may be handled and eat too without any inconvenience. That it is very good
" food and commonly eaten, both by the Indians and planters, from the former of
" which the latter have learnt the following way of taking both it and other fiſh.

" The ſhore hath many creeks: in theſe, where they open into the ſea, with
" poles and ſticks they make wears, ſuch as are ſometimes ſeen made in other ri-
" vers, to keep the fiſh from getting out of the creek into the ſea. Then going to
" the upper end of the creek in their boats or canoes, they make a faggot of a cer-
" tain ſort of wood they call poiſon-wood, and tying it up with a with-tow to the
" ware, this wood is of that nature, that though it be not noxious to any other crea-
" ture that he knew of, yet it operates ſo on the fiſh, that all ſoon after riſe as it were
" intoxicated, and float on the top of the water, ſo that they can eaſily take up
" what they pleaſe: but the numb-eel is not to be touched, though ſhe float amongſt
" the reſt. Here therefore the Indian companion or ſervant ſhoots with an arrow,
" and when ſhe is dead, they hand her up without hurt, and feed as boldly on her
" as on any of the other fiſh. He added, that the intoxicated fiſh ſink themſelves
" again; and that they do not eſteem what they take thus intoxicated any leſs than
" if it were taken by any other artifice.

" This is all I can learn or remember at preſent; but I have ſome hopes of a far-
" ther account from an inquiſitive perſon, who copied ſeveral things from his mouth,
" and got ſomething under his hand concerning that country and its rarities; but
" not much, by reaſon that he was no ſcholar, and as I underſtand wrote but ill,
" &c. Greenwich, Wedneſday, March 10, 167$\frac{3}{4}$." There

There were likewiſe produced ſome letters of Dr. BEAL, which with the tranſlation of Dr. SWAMMERDAM's deſcription of the inſect hemerobius, and the long letter of Mr. LEEWENHOECK, were reſerved to the next meeting.

The trials on the Tueſday following were appointed to be made on iron, lead, braſs, &c.

On this day, though there is no entry of it in the journal, there was given in by Mr. HOOKE the following account of the weight of ſeveral metals[u].

" Tueſday, March 16, 1679. We firſt examined the weight of regulus of antimony in air and water, and found the weight to be in air $135\frac{1}{2}$, in water $115\frac{1}{4}$: whence the ſpecific gravity is $6\frac{68}{79}$.

" We found alſo the weight of common iron in air 697, in water $606\frac{1}{2}$, whence the ſpecific gravity $7\frac{127}{185}$.

" The weight of the wiredrawing-plate was in air $465\frac{3}{8}$, in water $399\frac{1}{8}$, whence its ſpecific gravity is $7\frac{13}{130}$ or $7\frac{1}{41}$.

" The weight of the gold-coloured mixture, ſuppoſed to be made of ſpelter and copper, was found in air 1317, in water 1166: its ſpecific gravity $8\frac{109}{151}$ or $8\frac{2}{3}$. Another piece examined, was found in air 1296, in water $1146\frac{1}{2}$: therefore its ſpecific gravity $8\frac{800}{2299}$ or $\frac{2}{3}$.

" The mixture of antimony and iron did not ſucceed."

1680, *March* 25. Mr. HENSHAW Vice-preſident in the chair.

JONAS MOORE, Eſq; was admitted a fellow.

ANDREW CLENCH, M. D. [w] fellow of the college of phyſicians of London, was propoſed candidate by Mr. HOOKE: as was alſo ROBERT NELSON, Eſq; by Mr. LANE.

The minutes of the 18th inſtant were read.

Upon the mention of ſheathing of ſhips with lead, Mr. Hunt gave an account, that he had tinned ſome iron nails; but that it would not wholly preſerve them from ruſt. He was ordered to make trials of them and of the other ſheathing nails with urine, brine, vinegar, &c. againſt the next meeting.

Upon the mention of the maps of the ſtraits of Magellan, it was related, that ſir JOHN NARBOROUGH's map thereof was printing; wherein ſome remarks of his

[u] Regiſter, vol. 5. p. 225.

[w] Afterwards ſtrangled in a hackney-coach, 4 January 1691, for which one HENRY HARRISON was executed. See State Trials, vol. 4. p. 488. 2d edit.

were inſerted, but not all; for Mr. HOOKE remarked, that he had been informed by captain WOOD, that upon ſounding in ſome parts of thoſe ſtraits with 1000 fathom of line, he could find no bottom.

The preſident then came in, and took the chair.

Dr. CROUNE introduced monſ. CHARRAS, who preſented the Society with a printed account of the obſervations of Dr. JOHN BAPTISTA ALPRUNUS, phyſician to the empreſs ELEONORA, intitled, *De Contagione Viennenſi Experimentum medicum*, &c. together with a paper of his own, contaning his thoughts and animadverſions thereupon [x].

Dr. CROUNE diſcourſed concerning the ferment of the ſtomach, and ſaid, that it contained a ferment and menſtruum quite different from any other ferment whatſoever.

Mr. HOOKE was of opinion, that a great cauſe of the diſſolution by the ſtomach was a continual motion of the ſtomach, whereby the food therein contained was continually ſqueezed and churned; by which means concoctions, diſſolutions, or digeſtions were cauſed, which without that motion could not be effected, either by the heat or menſtruum of the ſtomach.

Dr. CROUNE objected much againſt this ſuppoſition, and ſaid, that it did not appear, that the ſtomach had any motion; and that he conceived, that it was rather cauſed by the glandules of the ſtomach and guts.

The account of the experiments made on the Tueſday before by the committee for that purpoſe, was brought in by Mr. HOOKE, and read as follows [y]:

" Tueſday, March 23 $16\frac{7}{8}\frac{9}{0}$. we made a regulus of equal parts of antimony " and iron, and found it to weigh in the air 533 grains, and in the water $457\frac{1}{4}$: " whence the ſpecific gravity is $7\frac{1}{1}\frac{1}{0}\frac{1}{3}$. This we found to be very hard, but yet " brittle and not at all malleable. It broke with a ſhort grain and black, or little " reflective: it ſeemed not very likely to take any poliſh. It had no manner of " operation on the magnetic needle.

" This part we melted with equal parts of tin, and found a mixture, that looked " pretty white: it continued melted with a ſmall heat, little more than red-hot. " It broke into ſeveral pieces with two or three blows of a hammer; the grain of " which was exceeding fine, cloſe and ſmooth; and whiter than bell-metal. We " poliſhed it, and found it held a very good poliſh, which gave a ſtrong reflection. " Its weight in air was $859\frac{1}{2}$, in water, $738\frac{1}{4}$, whence its ſpecific gravity is as " $7\frac{4}{4}\frac{3}{8}\frac{1}{5}$. We conceive it may be very uſeful for making ſpeculative glaſſes for " Mr. NEWTON's experiment.

" Then, with another part of the regulus of antimony, we mixed an equal " weight of lead, which ſoon incorporated together: the reſult was, that it made

[x] See Mr. HOOKE's Philoſ. Collect. N°. 2. p. 17. [y] Regiſter, Vol. v. p. 225.

" a com-

" a compoſitum very hard and very brittle. Its weight in air was $422\frac{6}{8}$ in the " water $365\frac{5}{8}$: whence its ſpecific gravity muſt be as $7\frac{182}{257}$."

The preſident moved, that againſt the next meeting Mr. HOOKE ſhould make a table of all the experiments of this kind, that he had already tried and deſigned farther to try, that ſo that ſubject might be brought to a concluſion, and another be pitched upon.

Mr. HOUGHTON gave ſome farther account of his inquiries about wire-drawing, and promiſed to digeſt them, and bring them in to be regiſtered.

Dr. CROUNE remarked, that he had ſeen the wire-drawing at E * *, and that the motion thereof through the the hole was extremely ſwift.

The experiments appointed to be tried on the Tueſday following were mixtures of tin, lead, and regulus martis with braſs.

Dr. GALE preſented two papers from Mr. EVELYN, the one a letter of Mr. WILSON [a] to the earl of LEICESTER [b], dated 12 Auguſt, 1568, giving ſome account of an unicorn's horn, and a peculiar purging China root, called macknaquam, probably mechoacan: the other was an account of the bezoar ſtone in Portugueſe. Both theſe papers were referred to the next meeting, together with the letters and diſcourſes not read at the laſt meeting.

April 1. Mr. HENSHAW vice-preſident in the chair.

The minutes the laſt meeting were read, which gave occaſion of ſome farther diſcourſe about the way of preſerving iron from ruſt.

Mr. HUNT produced the braſs and iron nails, which were covered with tin, that had lain all the preceding week in brine, and ſeemed to be little altered thereby. However, it being conceived, that theſe nails were not ſo well covered with tin as they might be, Mr. HENSHAW directed, that they ſhould be filed before they were dipped in tin, becauſe thereby the tin would more intirely join to them, and cover them.

Upon diſcourſing of the great depth of ſome parts of the ſea near the ſhoar, Mr. HILL related, that in the faro of Meſſina not far from the ſhore, no bottom could be found by ſounding.

Mr. HOOKE being aſked ſome reaſon, why he ſuppoſed the ſtomach to promote digeſtion by its motion, alledged the muſcular compoſition and make of the ſtomach, eſpecially remarkable in the gizzard of fowls; and the motion, which he had obſerved of it in divers inſects, which are tranſparent; as alſo the periſtaltic motion of the guts.

[a] Probably Dr. THOMAS WILSON, maſter of the requeſts, and afterwards ſecretary of ſtate.

[b] ROBERT DUDLEY.

Mr. HENSHAW conceived, that the gizzards of fowls were a ſupplement for teeth to grind and bruiſe their food; and that chickens and other fowls would die, if they wanted gravel in their gizzards to grind their food.

The letter concerning the unicorn's horn and macquequam root, and the paper concerning bezoar, which was tranſlated by Dr. WHISTLER, were read.

This gave occaſion to diſcourſe concerning the unicorn; and Mr. HENSHAW obſerved, that no mention was made of it in any Latin author to have been known to the Romans.

Mr. LEEWENHOECK's letter to Mr. HOOKE, who had tranſlated the ſenſe of it into Engliſh, was read, giving an account of ſome farther diſcoveries of his about the eel-like worms in the ſeed of a rat; as alſo of the motion of the gills of muſcles, oiſters, &c.

It was ordered, that theſe ſhould be examined at the next meeting; in order to which Mr. HUNT was directed to procure ſome oiſters and muſcles.

Dr. GALE read a Latin letter to himſelf from Dr. JOHN BOHN, procured by Mr. HAAK, and dated at Leipſic, 12 *February*, 1680, [c] containing ſome new anatomical obſervations.

Dr. GALE was deſired to anſwer his letter, and to encourage him to continue his correſpondence: And Dr. TYSON was deſired to peruſe the letter, and to communicate to Dr. GALE ſome of his obſervations to be ſent in his anſwer to Dr. BOHN.

Mr. HENSHAW read part of a letter from Sir PETER WYCHE, in which he deſired to be informed, whether CRAFT, who had been in England ſome time before, in order to ſell his receit of the phoſphorus fulgurans, had received any reward for it. Several of the members were of opinion, that he had not received any at all.

Sir CHRISTOPHER WREN then took the chair.

Dr. GALE related, that Dr. WALLIS had a deſign to print PTOLEMY's muſic.

Mr. HOOKE produced an account of the experiments made at the laſt day; as alſo a table of all the mixtures of metals, that were at firſt deſigned to be tried; but no farther trials for the next meeting were fixed upon.

Mr. NELSON, Dr. CLENCH, and capt. WOOD were elected.

April 8, the Society did not meet.

April 15, being Eaſter week very few members met; but Sir CHRISTOPHER WREN, vice-preſident, taking the chair, ſeveral letters from correſpondents were read.

[c] Letter Book, Vol. 8. p. 101.

The

The first was a letter from Monſ. LEIBNITZ to Mr. HOOKE dated in February $16\frac{7}{8}\frac{2}{0}$, at Hanover, giving an account of his prince's deſign of making a ſurvey of his own country; inquiring concerning the undertakings of Dr. PELL, and eſpecially his way of reſolving equations by a table of ſigns; anſwering ſome propoſitions made to him by Mr. HOOKE, as particularly about his arithmetical inſtrument and the late biſhop of Cheſter's univerſal character and language; hinting an invention of his, which he ſuppoſed much more uſeful for the improving reaſon; mentioning, that he had by him VAS ARCANUM LUMINIS PERPETUI different from all other ſhining bodies; and inquiring concerning Mr. BERNARD, and whether our manuſcripts contain more of APOLLONIUS than what BORETTUS had printed.

Upon diſcourſing concerning Monſ. LEIBNITZ's new invention, Mr. HOOKE remarked, that he had an invention of that kind in ſeveral other ſubjects beſides geometry and arithmetic.

The ſecond letter was likewiſe from Monſ. LEIBNITZ to Dr. GREW, dated at Hanover March $16\frac{7}{8}\frac{9}{0}$, deſiring ſeveral things to be ſent to him; mentioning Dr. VOLCAMER's making obſervations of the declination of the needle; and a book publiſhed by JOHN HALLEUS, intitled, *Introitus ad novam & inauditam phyſicam*; which writer he ſuppoſes to be one, who affects myſteries; taking notice of a maſs of amber found near Hanover; of a great number of ſmall animals found in the ſnow of a mountain; of one BEATRIDGE, who promiſed a powder, that at a certain time would take fire; of a diſcovery of his, that the thermometer ought to be divided in a muſical progreſſion: That he had almoſt perfected his arithmetical engine: and that TABOR's febrifuge was made of Jeſuit's bark. He inquired in this letter about dying and tinging glaſs red; and mentioned, that he had ſeen Sir SAMUEL MORLAND's but doubted his concluſion; and deſired to be informed what the Royal Society was doing.

Hereupon ſome diſcourſes were occaſioned about dying and tinging of glaſs, and of the excellency of the flint-glaſs now made in England; as alſo about the hardneſs of precious ſtones, and the way of ſlitting them, ſome by the blow of a hammer, others by a wire dipped in vinegar and ſprinkled with diamond powder, of which Dr. CROUNE undertook to bring in a more full account.

The third letter was from Mr. JOB LUDOLFUS to Mr. HOOKE, dated at Francfort 31 December, 1679, giving an account, that Dr. CLAUDER's invention of preſerving dead bodies was in the preſs; and that himſelf would for the future gladly continue his correſpondence, and communicate what he ſhould meet with conſiderable with regard to geography.

April 22. Mr. HENSHAW vice-preſident in the chair.

He produced a Latin letter to the Society from Dr. WULFER dated at Nuremberg, April 1, 1680[4], in anſwer to one of Mr. HAAK to him, and giving a more full

[4] Ibid. p. 108. An abſtract of this letter is printed in Mr. HOOKE's Philoſoph. Collect. No. 2. p. 10.

account concerning a body, which was there found to be converted into hair, as he had received it from the ſexton himſelf, who had dug it up; viz. that it was the body of a woman buried about forty-three years before in a black wooden coffin in a dry yellowiſh earth: That it lay the loweſt of three bodies: That the cover being removed, the ſhape of the whole body appeared perfect, but all covered with hair, long, thick and curled: That the ſexton going to feel the head, the whole ſhape of the body fell to duſt; ſo that nothing remained but a part of the heel-bone: And that the hair, which covered the whole body, was at firſt very ſoft, but being expoſed to the air grew very hard. A paper of which hair was incloſed in the letter, and was found to be ſtiff, red and rotten.

Dr. CLENCH was admitted fellow.

Dr. TYSON produced three teeth ſet or growing in a natural ſocket, together with a paper of curious white hair, both which were upon diſſection taken out of the ovary of a woman lately dead. This was the more remarkable, as it was much of the ſame kind with what he had formerly found himſelf upon the diſſecting of another woman. He was deſired to draw up an account thereof in writing [e] againſt the next meeting, that it might be regiſtered before he returned the ſubſtances themſelves to the perſon, that communicated them, who was Dr. WELMAN.

A paper of Mr. HOUGHTON in anſwer to ſeveral queries about wire-drawing was read; and he was deſired to inform himſelf yet more fully concerning that manufacture, and to bring in a farther account thereof.

He produced a blue bead much eſteemed by thoſe of Guinea; as alſo ſome glaſs beads, that had been made to counterfeit the colour: but they were in no reſpect ſo beautiful and clear of colour as thoſe of Guinea. One of the latter was tried to be melted in the flame of a lamp, but without ſucceſs; but it flamed and cracked like a ſtone. The counterfeit one melted very readily.

Mr. HOOKE conceived, that he could make glaſs beads as beautiful for colour, but could not imitate the hardneſs and fixedneſs of them. He was deſired to make ſome trials about it.

Some of Dr. BEAL's letters to the [f] ſecretary were read, and the reſt reſerved to the next meeting.

Mr. HOOKE produced and ſhewed a new kind of level invented by himſelf, it being the moſt convenient and exact way of any, that hath yet been made uſe of. The inſtrument not being quite perfected, the deſcription thereof is omitted till the next meeting.

[e] This account is publiſhed in Mr. HOOKE's Philoſoph. Collect. No. 2. p. 11.

[f] In the letter-book, Vol. 8. p. 95 and 107, are three letters of Dr. BEAL to Mr. HOOKE, one dated February 18, 167$\frac{7}{8}$, about grapes thriving in England; another dated March 13, on the ſame ſubject; and the other 31 March, 1680, concerning the improvement of land by rain, and about cherries and cider.

April 29, Mr. HENSHAW, vice-preſident, in the chair.

The minutes of the 22d inſtant were read.

After which Dr. TYSON produced a draught of the three teeth ſet in a ſocket mentioned at the laſt meeting; as alſo of a ſtone taken out of the kidney of the ſame perſon. He promiſed to draw up a large account thereof in writing.

Dr. WALLIS read part of a large diſcourſe of his about the paſchal tables, ſhewing the reaſon of many miſtakes and diverſities of opinions among authors about aſſigning the true time of Eaſter; and alſo ſhewing a way how the ſame is to be rectified.

Dr. JACOBUS PIGHIUS of Verona, phyſician to the emperor, and profeſſor of anatomy at Padua, formerly propoſed candidate by Dr. BROWN, was now at his deſire put to the ballot, and elected fellow of the Society.

Captain WOOD was admitted fellow.

A letter of WILLIAM BALLE, Eſq; to Mr. HOOKE, dated at Mainhead in Devonſhire, 24 April 1680, was read, giving an account of ſome magnetical obſervations, which he had already made, and of his intentions of making divers other inſtruments and trials; as particularly of making a magnetical needle of 10 feet in length, and another of 20 feet in length, in order to examine the variation of the directive virtue. Mention was likewiſe made in this letter of an obſervation of the variation near the Sound.

Hereupon Dr. WALLIS mentioned ſome opinions about the variation of the latitude of places. And Mr. HOOKE remarked, that Monſ. PETER PETIT had written a diſcourſe on that ſubject, endeavouring to make it probable. It was conceived, that the cauſe of this opinion might be imperfect obſervations made of the latitude of places by different authors; and that till there was more certainty of the accurateneſs of inſtruments and obſervations, nothing could be concluded about that controverſy.

Dr. WALLIS ſaid, that they had found the latitude of Oxford now not to be more than 51 deg. 46 min; whereas divers had made it near 10 minutes more.

Mr. SMITH [h] ſaid, that Conſtantinople was now found to be 40 deg. 57 min.; whereas in many maps it was placed in 43 degrees.

A letter of Monſ. JUSTEL to Mr. HOOKE, dated at Paris 10 April 1680 [g], giving an account of a German phyſician, who diſtilled the matter of a plague ſore; of Monſ. VILLETTE's making a burning glaſs of three feet ſeven inches diameter, the focus being $3\frac{1}{2}$ feet diſtant; with ſome other articles of literary intelligence.

[g] THOMAS SMITH, afterwards D. D. [h] Letter-Book, Vol. viii. p. 110.

Some diſcourſe was occaſioned about the variation of the magnetical needle, and the beſt form of dipping and variation needles.

Capt. Wood ſaid, that his needle was ſo ordered, as to ſet itſelf in the meridian, and ſo to find its own dipping; which was concluded to be the beſt way.

He affirmed, that the iſland of Iluas, which was almoſt all magnetical, did notwithſtanding not at all cauſe any variation of the compaſs at ſea very near it.

He remarked likewiſe, that he had found the variation of the needle at Flores and Coruo, which had formerly been nothing, to be now 9 degrees weſtward.

Mr. Hooke produced his new level, and explained it; and ſhewed wherein he conceived it to be ſuperior to any kind of level yet made for plainneſs, certainty, and exactneſs.

May 8, Mr. Henshaw, vice-preſident, in the chair.

Dr. Wallis read the remainder of his diſcourſe about the account of time, and the method of the paſchal tables.

A preſent was made the Society, from Mr. John Shorter ſenior of London, of the following particulars:

Chemnitius's *Examen Concilii Tridentini*, in fol.

A book for ordering all the officers of the king's chambers; the order of the king's going to chapel, and ordering of affairs on feſtival days, and the college of Windſor for St. George's feaſts; the creation of a prince of the banquet at Greenwich on St. Thomas's day; and the order of ſitting at the tables, with many other orders and things belonging to the management of affairs at court: a manuſcript in folio.

Another manuſcript in folio, being the manner of placing all eſtates and degrees according to their degrees at funerals or elſewhere; of all the officers at court, and their ſtanding fees: the names of all the towns of war, caſtles, and bulwarks in all the counties of England and Wales, and the fees due to the commanders of them: the names of the ſhips of war, and a general muſter throughout the whole realm of England and Wales: the number of churches in every ſhire; with other curioſities.

A Practice of Piety in the Poliſh language, in octavo.

A Siam drum.

A prickle fiſh like a hedgehog.

A Pintado bird.

A Tropic bird, with one long feather in the tail.

May 13, before the Society ſat, Mr. Mellin, who had long made it his pleaſure and buſineſs to make ſmall lens's for microſcopes, ſhewed ſeveral members of the Society ſome of his own making, which were extremely ſmall, and yet very good; one whereof being a double convex, was no bigger than about a twen-

a twentieth part of an inch. It magnified the object exceedingly, and yet was very clear. He promiſed to preſent a ſet of ſuch lens's at the next meeting.

After this Mr. HOOKE giving an account, that he had ſeen ſeveral ſmall animals in the water, wherein mint grew, the water was examined with a microſcope, and ſeveral of thoſe ſmall long creatures were diſcovered by the vice-preſident and divers of the members.

The vice-preſident, Mr. HENSHAW, then took the chair.

The minutes of the meeting of May 6th were read.

The vice-preſident moved, that ſome of the ſmall microſcopes might be ſent to Signor MALPIGHI as a preſent from the Society; which was well approved of by the Society.

Mr. HOOKE produced three letters from Mr. LEEWENHOECK; one to the preſident and fellows of the Society, containing his thanks for the honour, which they had done him in chooſing him a member. A ſecond to Mr. HOOKE, acknowledging the receipt of the diploma ſent, and a profeſſion of the great eſteem, which he had of the honour done him, and of his zeal to ſerve the Society in what he was able, for the future as long as he lived. A third to Dr. GALE, containing an anſwer to the doctor's addreſs by the laſt letter, and an account of ſome farther diſcoveries made in the juice of plants, animals, *&c.* Mr. AUSTIN took this letter, and promiſed to tranſlate it into Engliſh againſt the next meeting, it being written in Dutch.

Mr. HOOKE produced three papers delivered to him by Sir THEODORE DE VAUX, being ſome of Sir THEODORE MAYERNE's, containing ſome account of the mixture of metals. They were ordered to be tranſcribed, and the papers to be returned to Sir THEODORE.

Mr. HOOKE produced the two firſt ſheets of a diſcourſe of Mr. JOB LUDOLFUS, counſellor to the emperor and the duke of Saxe-Gotha, being the beginning of a hiſtory of Æthiopia and the kingdom of the Habeſſines: which ſheets were read, and ordered to be kept in the library.

Mr. PERKINS preſented a paper, containing three queries about the mixture of metals.

The firſt was, what way to toughen a piece of gold not malleable, called *eager*, and to make it malleable without aqua fortis.

Mr. HENSHAW conceived, that the beſt way would be to anneal it by degrees, ſince metals and glaſs being ſuddenly quenched, or cooled, will become brittle.

Mr. HOOKE ſaid, that there was a way of making ſome mixtures of metals (as

(as the factitious gold made with ſpelter, which is of itſelf very brittle) very tough and malleable, by cementing it with a vegetable powder. And that there was a way of hardening an amalgama of mercury and iron by a vegetable powder, which would make it almoſt as hard as hardened ſteel. This, he conceived, would be an excellent material for making ſpecular planes for teleſcopes in Mr. NEWTON's way; ſince the form of ſuch plates would be eaſily given by laying the ſaid amalgama, when ſoft, upon the convex ſide of an object glaſs for a teleſcope made very large. The compoſition and manner of making and hardening that amalgama was much deſired.

Mr. HOOKE mentioned, that he had been lately informed of a way to harden and fix mercury; but that he had not yet tried it, to ſee, whether it would ſucceed.

May 20, the Society did not ſit.

May 27, Mr. HENSHAW, vice-preſident, in the chair.

The minutes of the 13th inſtant were read.

There was preſented a new book of Mr. BOYLE, ſent by himſelf to the Society, intitled, *Experimentorum novorum phyſico-mechanicorum continuatio ſecunda: in quâ experimenta varia tum in aere compreſſo tum in factitio inſtituta circa ignea, animalia, &c. unà cum deſcriptione machinarum, continentur.*

It was deſired, that ſome member would peruſe this book, and give an account thereof to the Society.

Mr. HUNT was ordered to deſire Dr. PAPIN to bring his glaſs, which he made uſe of for including bones, harts horns, ivory, &c. to be ſoftened, and to ſhew it at the next meeting.

Dr. TYSON preſented his printed diſcourſe, containing the deſcription of the parts of a porpoiſe diſſected by him in Greſham-College, together with a diſcourſe of the uſefulneſs of ſuch kind of anatomical inquiries. He received the thanks of the Society for this preſent, and was deſired to proſecute his deſigned method.

Upon this occaſion the deſign of getting the bodies of all ſuch exotic animals, as ſhould chance to die in St James's Park, in order to their being anatomiſed and deſcribed, was again mentioned; and Mr. HENSHAW and Sir CHRISTOPHER WREN were deſired to uſe their intereſt with the keeper of them to procure them for the Society's uſe.

Hereupon ſeveral things were mentioned relating to anatomy.

Mr. HOOKE produced a letter to himſelf from ECCARDUS LEICHNERUS, dated at

at Erfort 8 May 1680 [i], mentioning ſomewhat of a deſign, which he had, of ſending over ſome writings of his, to be left with the Society. But upon diſcourſing of the matter, and no perſon preſent being able to give a character of this author or of his writings, they demurred upon giving their poſitive anſwer till by a farther information they could learn, whether they might deſerve to be printed; or at leaſt, whether it were convenient for the Society to be any ways concerned for the publiſhing or not publiſhing of them.

Dr. TYSON gave an account of the trials, which he had made in order to examine the ſerpentine-ſtone of Mr. HOUBLON, which was, that he, together with Dr. BROWN and one other perſon, had tried the biting of a viper on two dogs; but finding, that neither of them died, or grew very ſenſible of the viper's biting, they did not think fit to make any farther trial with it.

Mr. HOOKE mentioned, that he had found the place in Monſ. TAVERNIER's voyage, where he ſpeaks of this kind of ſnake-ſtone; and ſaid, that he had there deſcribed the ſnake by a picture; and that the way of uſing it was by rubbing it againſt another ſtone; by which means a kind of oil was produced, which was made uſe of for the antidote againſt poiſons.

Dr TYSON remarked, that Signor REDI doubted of the effects of the flat ſerpentine-ſtone, ſuppoſing it to be factitious.

Mr. ASTON affirmed, that it was a factitious ſtone.

Dr. TYSON gave an account of his trial of a ſerpentine-ſtone, by applying it to the hand of a ſervant bit by a viper. He alſo affirmed, that this ſtone being applied to an hydropical leg was found to ſtick to it; and that he had known and uſed it in an eryſipelas after a fever.

Mr. HUNT brought in a draught, which he had made of this ſtone; which was ordered to be inſerted in the Regiſter [k], with a deſcription of the ſtone, when it ſhould be brought in.

It was ordered, that ſome trials ſhould be made with the ſtone, to ſee, whether it anſwers in all things Monſ. TAVERNIER's deſcription.

Mr. HOOKE ſhewed an experiment, found out by his highneſs prince RUPERT; which was, that a quantity of rectified ſpirit of wine being put into an æolipile, and by the heat of a chafing-diſh of coals converted into vapours, which iſſued out of the ſmall hole of the æolipile in a ſtream with great violence, would by the flame of a candle held under that ſtream be all fired and turned into a great and hot flame, which readily melted lead, glaſs, &c. and ſo might be of very good uſe for blowing the flame of a lamp for working glaſſes, as his highneſs had at firſt deſigned it.

[i] Letter-Book, Vol. viii. p. 111.

[k] There is no entry of papers in the Regiſters from the end of Vol. v. 25 March 1680, to the beginning of Vol. vi. 12 December 1682.

Mr.

Mr. HOOKE alledged, that he had made uſe of this way for driving out the air of ſmall round glaſſes, in order to make ſeveral experiments with them; of which an account was extant in the Regiſter for the year 1662; and that, if the Society pleaſed, they might ſee the experiment of it upon this æolipile: but it being late, this was referred to ſome other meeting.

June 3, Sir CHRISTOPHER WREN, vice-preſident, in the chair.

The minutes of the laſt meeting were read, which gave occaſion to diſcourſe,

1. Of the new experiments of Mr. BOYLE, mentioned in his *Experimentorum novorum phyſico-mathematicorum continuatio*, of which book Mr. HOOKE gave ſome account: as alſo of Dr. PAPIN's engine for boiling. Mr. HUNT mentioned, that he had ſpoken to Dr. PAPIN about it; but that he was now making ſome alterations in it, and therefore could not yet ſhew it to the Society. It was moved, that ſome of the experiments might be ſhewn at the meeting; but it was anſwered, that they required much time for making them: and that as to the effects of the engines for rarefaction and condenſation, they had been already ſeen by the Society.

2. Of Dr. TYSON's book on the porpoiſe; upon which occaſion it was mentioned, that he had ſeveral other curious anatomical obſervations by him; which he was therefore moved to publiſh.

3. Concerning the ſerpentine or ſnake-ſtone, ſhewn to the Society, of which Dr. CROUNE gave an account, that ſteeping it in water he had found it very brittle, and therefore judged it to be the ſame with the porcupine-ſtone, which is much of that ſhape and taſte: of which that the Society might be ſenſible witneſſes, it was ſteeped in a little water, and then the ſtone being touched by the tongue, it taſted extremely bitter; but the water, in which it was ſteeped, was very little ſo. It was likewiſe rubbed upon a porphyry ſtone, whereby it left a kind of paſte or pap, which taſted very bitter. This being mixed with the water, in which it was ſteeped, was ordered to be given to the dogs, that were ſoon after to be poiſoned, the one with a pill of *nux vomica*, and the other with a quantity of oil of tobacco.

Hereupon diſcourſing about the poiſon of rattle-ſnakes, it was inquired, whether the Society had not had one alive to make experiments with, and what the effects were.

Mr. HENSHAW produced and read a propoſal, which he had received from Sir PETER WYCHE, preſented to him at Hamburgh, about a new way for the quenching of any fire very eaſily and ſuddenly. The propoſal itſelf was this: "Nova et artificioſa inventio, quâ omnia in civitatibus et propugnaculis oriunda "incendia eo momento, quo innotuerint, citiſſimè extingui queant, mediante "commodiſſimo quodam inſtrumento, quod hactenus nullibi in uſu viſum et "repertum, et quod tempore gliſcentis flammæ ubique copiam ſui et applicati-

" onem facile admittit; paucis omninò ſumptibus abſque ullo tumultu per " plateas, et deſtructione vicinarum ædium, tempore obſidionis, incendiorum, " aliorumque infelicium caſuum; ære omni dignius." Together with another paper, wherein the author addreſſed himſelf to the Society for a reward upon his diſcovery of it.

Mr. AUBREY produced a letter from Mr. PASCHAL, giving an account of a monſtrous birth, at Hilbrewers in the county of Somerſet, of two children perfectly joined together into one body about the navel, but ſeparated into two diſtinct bodies both above and below the belly[1]. They eat, ſucked, cried, ſlept, and voided their excrements each apart, and very freely, and were likely to live.

Sir CHRISTOPHER WREN was of opinion, that moſt monſtrous births proceeded from twins.

Mr. HENSHAW related of the Italian monſter, that had been formerly in England, and had his brother growing out of his ſide about the navel, that his brother had the ſmall-pox, and yet he eſcaped them; that his brother a good while after died firſt, and then he himſelf died quickly after.

Dr. CROUNE mentioned, that Dr. KERCHRINGIUS had related, that a woman, upon ſeeing a child fall and beat out its brains, had brought forth a child with a head exceedingly bruiſed.

Hereupon much diſcourſe was occaſioned about monſtrous productions of ſeveral kinds, as thoſe by conceits and frights; and from the mixtures of different ſpecies, as of mules by that of the horſe and aſs. Sir CHRISTOPHER WREN and Mr. AUBREY mentioned a production, which they had ſeen, from a male cat and female rabbit. Others ſpoke of mixtures of partridges and pheaſants with ſome poultry; and of ducks with ſea-fowl: many of which ſpecies, though they were really different, yet varied ſo little from one another, that they often engendered one upon another: but that it was generally obſerved, that all theſe mixt productions were barren, and would not go on to propagate their like.

Hereupon ſeveral members mentioned the great variety, that is to be found in creatures of the ſame ſpecies, as of dogs, goats, ſheep, poultry, *&c.* amongſt which Sir CHRISTOPHER WREN deſcribed a pheaſant of Surinam, and Dr. GALE the partridges of Portugal.

The experiment with the two dogs was tried, by giving to one a quantity of *nux vomica* in butter, and to the other a quantity of the grand duke's oil of tobacco, in order to try the ſerpentine-ſtone and water upon them: but theſe poiſons not working during the ſitting of the Society, Mr. HUNT was ordered to take care of them, and when ſick to give them the preparation abovementioned.

[1] This account is printed in Mr. HOOKE's Philoſ. Collect. No. 2. p. 21.

June 10, the preſident in the chair.

The minutes of June the 3d were read, and ſeveral parts thereof diſcourſed upon.

Mr. HOOKE produced a letter to himſelf from Mr. PULLEYN, dated at Rome 25 May 1680 [m], giving an account of the death of Signor BORELLI, and that his work *De motu animalium* was half printed: that the fathers of the *Scholæ piæ*, who were his executors, were printing the ſecond part of it; which would be publiſhed in September following: that Signor VIVIANI's piece *De locis ſolidis* was not yet publiſhed: that Signor BOCCONE deſigned to ſend 300 plants diſcovered by him, and by none elſe, to the Society; and that his natural hiſtory of Corſica was ready for the preſs: that Signor SCILLA had publiſhed at Naples a tract concerning ſhells and petrified bodies: that Signor VITALE GIORDANO had publiſhed an edition of EUCLID in folio, being the firſt of ſeven volumes of his *Curſus mathematicus* then printing: that a Dutch engineer at Rome, named LE MAIRE, had recovered much ground out of the Tiber, and thereby diſcovered a pyramid ſomewhat like that of CESTIUS, concerning which he had publiſhed a treatiſe, and was about cutting a paſſage to Perugia: that Signor FABRETTI was publiſhing a diſcourſe concerning old Roman aqueducts: that Signor BELLORI and Signor POZZO had finiſhed a deſcription, with a great number of copper-plates, of the monuments of the family of the NASONES, *&c.*

With this letter came incloſed ſome part of BORELLI's book, *viz.* his Proem, and a ſheet of the book, with two cuts; which were all read and peruſed.

Mr. HOOKE read likewiſe a letter to himſelf from Signor NAZZARI, dated at Rome 20 March 1680.

He produced two letters from Mr. LEEWENHOECK, which not being yet tranſlated into Engliſh, were referred to the next meeting.

Mr. HOOKE gave an account of the experiments tried with the æolipile; as alſo of what he, together with Dr. TYSON, had obſerved of * * * at the lord mayor's on the Monday before, while it was yet alive, and while it was cut to pieces by the cook. It was hereupon deſired, that ſome care might be taken to procure ſome other hereafter, either from the lord mayor, to whom any ſtrange fiſhes caught in the Thames are generally brought, or by ſome other means, that ſo they might be diſſected and deſcribed more particularly than they had hitherto been.

Mr. HOOKE was deſired to bring in his account of the trials about metals at the next meeting, and to think of ſome other ſubject to be proſecuted for the future.

June 17. Upon occaſion Dr. CROUNE delivered to the Society a diſcourſe upon

[m] Letter-Book, Vol. viii. p. 116.

the

the ſtructure of a muſcle [n], read by him before the Society in 1674, and grounded on a lecture of his read in chirurgeons hall.

A letter from Mr. LEEWENHOECK was read.

Dr. GALE was deſired to write to Mr. PULLEYN at Rome.

June 24, Dr. PAMAN ſhewed a ſtone of great bulk taken out of an horſe's bladder, concreted of many ſtones, weighing four pounds and a quarter, one ſide rugged, the other ſmooth like pebbles. He was deſired to take a particular account of the horſe, ſtone, *&c.*

Mr. HILL preſented from Mr. LANGERMAN, a merchant, a ſpar, or mixture of ſtone, ſpar and pyrites, ſuch as is uſually found in lead mines.

Mr. CHETWYND preſented a piece of lead-ore taken out of a mine in Staffordſhire, in form octoedral, in which form all the ore in that mine ariſes.

Mr. AUBREY preſented a large fly, the product of a ſcolopendra; the tongue of it coiled up in the mouth. It darteth it out, and from the end of it droppeth a poiſon.

The preſident gave the Society Lord BACON's *Sylva Sylvarum.*

July 1. It was ordered, that an experiment be made, whether ſalt-water will riſe higher than freſh.

A letter from Mr. LIMVILLE concerning a method of ſoftening flints was read.

Dr. PAPIN ſhewed a glaſs, which with a cement was made whole and ſtrong, after it was broken: which cement might be uſeful in porcelane, *&c.*

Sir CHRISTOPHER WREN affirmed, that extreme freezing will ſweeten ſalt water: that the curd, which is then upon the ſurface of the water, will be found ſweet: that this is found in Hudſon's Bay: and that a little hole left in a window in winter, and a little fire in the chimney, will freeze any thing to a great degree.

He was of opinion, that in trees gum is the diſeaſe of them.

Mr. ASTON read an account of the ſtone ſent by the Eaſt-India company to the Society; that it is called *Piedra de Cobra de Mombaza,* as being found at Mombaza, in the province of Zanguebar in Africa, in the head or belly of a ſerpent: that its virtues are the helping of women in childbed, curing the colic, melancholy, or fevers, if given in the fits: that the way of uſing it is to rub it

[n] It is printed in Mr. HOOKE's Philoſ. Collect. N° 2. p. 22.

on a hard ſmooth ſtone, till a cream comes out of it, which is generally diſſolved in water, and adminiſtered to the patient as a counter-poiſon: that they are very rare in Europe, and that in the Eaſt-Indies one of this ſort hath been eſteemed worth an hundred pieces of eight: that it was tried very accurately by FRANCESCO REDI, a virtuoſo of FERDINAND grand duke of Tuſcany (who had one of theſe ſtones preſented to him) but with no ſucceſs: that it was given to dogs poiſoned with vipers and *nux vomica*, but that the dog poiſoned with *nux vomica* died very ſuddenly, notwithſtanding this remedy; but that the vipers were not fit for poiſoning.

July 8, Mr. HENSHAW, vice-preſident, in the chair.

Upon diſcourſing about the ſmall microſcope glaſſes lately made by Mr. MELLIN, Mr. HENSHAW related, that he had newly obſerved a ſort of ſmall animals generated in the water, in which ſliced ginger had been ſteeped, being much the ſame with thoſe of pepper-water of the larger ſize; in which he could plainly perceive a diſtinction of the inner parts of their bodies, which he obſerved to be much the ſame in divers of them: and he was of opinion, that theſe and ſeveral other ſmall animals were ſpontaneouſly generated without any previous ſeminal principles.

Mr. HOOKE related, that upon long keeping of pepper-water, and renewing the water ſeveral times, as it had evaporated and dried away, he had obſerved a ſort of exceedingly ſmall animals ſwimming in it, which were perfectly ſhaped like fiſhes, ſuch as minews, or the like, in which he could plainly ſee the head and belly or bowels more opake, and the tail or ſmalleſt part tranſparent.

Upon a diſcourſe of the poiſonous nature of ſome trees, and particularly of the yew-tree for horſes, *&c.* Mr. HOUGHTON affirmed, that he had notwithſtanding divers times eat the berries of it without harm.

Mr. HENSHAW related, that there was a Frenchman in England, who contradicted the obſervations of Monſ. TAVERNIER in many particulars.

Mr. HOOKE gave an account of a letter to himſelf from Monſ. JUSTEL, dated at Paris 13 June 1680 N. S. [*], containing theſe remarkable particulars:

1. That there was at Paris a man, who pretended to have phoſphorus in much greater perfection, than any yet known, which being put into a glaſs well ſtopped, inlightened a whole room; and that a friend of Monſ. JUSTEL, who ſaw it, ſaid, that it exceeded that of KUNKEL.

2. Of a treatiſe of one, who had been long of the mint of Paris, about the eſſaying of metals; and that he had likewiſe a pair of ſcales, that would turn with the 2500th part of a grain.

[*] Letter-Book, Vol. viii. p. 119.

3. Of

3. Of the diſcovery of an earth and mineral near Dreſden, of a red colour, which ſmelt of violets, and was found to have conſiderable effects in phyſic.

4. That Mr. BALDWIN of Dreſden, who formerly correſponded with Mr. OLDENBURG, was deſirous ſtill to do ſo with the Society, and to communicate his ſecrets: that he had a new way of printing with an inſtrument, that coſt very little, only fifteen livres.

5. That Monſ. CHARDIN was returned from India, and had brought with him a book written in the Malabar language, and ſuppoſed from the curious writing and pictures to be the Bible, but that the language was not underſtood: it was written on the bark of trees and the leaves of the palm.

6. That the king of Poland being deſirous to have an account of the road, by which the Ruſſians travel by land to China, had ſent to his ambaſſador at Moſcow, to inform himſelf thereof, who had ſent the king an intelligent perſon, that had been ſeveral times that journey, and gave him a pertinent deſcription of the manners, ſpeech, wars, and habitations of the people on that road: that the king had called together at Warſaw the Tartars, Calmucs, and Greeks, who had been in Tartary, to underſtand what they knew of thoſe parts, and propounded ſeveral queries to them.

7. That a perſon had written from Poland, that he was informed, that in the fartheſt part of Tartary there was a people, who ſpoke Hebrew.

8. Monſ. JUSTEL inquired, whether the two ſpots in the ſun lately obſerved at Paris had been ſeen at London.

Several parts of this letter were diſcourſed upon; and it was deſired, that it ſhould be anſwered; and that the correſpondence ſhould be renewed with Mr. BALDWIN: and inquiry being made, whether the ſpots in the ſun mentioned in the letter had been ſeen here, it was anſwered in the negative.

Mr. ASTON related, that Mr. MELLIN had made a double convex microſcope glaſs, which having weighed at the Tower, he found to weigh leſs than the 80th part of a grain; and that he had ſince perfected another not a 5th part of that bigneſs.

Several experiments were tried about the riſing of liquors in ſmall pipes. The experiments were made by dipping in a ſmall glaſs pipe to a certain depth into fair water, put into a ſmall glaſs, jar, or diſh, and then marking the weight of the water both within and without the pipe; then taking it out with the marks upon it, and blowing out all the water in its cavity. It was ſunk into brine of water and ſalt, to ſee how high that would riſe; and with the ſame care, the brine being blown out, it was ſunk into ſpirit of wine; and again, upon cleanſing, into aqua fortis. Every one of theſe experiments were ſeveral times repeated; but upon many trials it was found, that the hights of theſe riſings were very

uncertain, and varied every time they were tried, and this so irregularly, that it was not easy to assign the cause thereof. For sometimes the water rose highest, sometimes the brine; sometimes the aqua fortis. But the circumstances, that caused that variety, were not discovered. However, it was desired, that some farther experiments should be made at the next meeting about this matter, and trials made in the exhausting engine, to see what hight it would rise therein, and whether water would run in a syphon.

After this was much discourse about the cause of this effect, whether from pressure, inward motion of the water upon the pipe's touching it, or the like.

Mr. HOOKE explained his thoughts of it, and endeavoured to shew the reason thereof from the congruity of the fluid bodies with the solid: but it was desired, that some farther experiments should clear it.

After this discourse was ended, Mr. HENSHAW read the second section of *Century I.* of Lord BACON's *Natural history*, which related to the internal motion of bodies, intitled, *Of motion of bodies upon pressure:* whereupon the first experiment was debated. Mr. HOOKE related, that he had observed, that the motion of the glass was vibrative perpendicular to the surface of the glass, and that the circular figure changed into an oval one way, and the reciprocation presently changed it into an oval the other way; which he discovered by the motion of undulation or rising of the water in the glass, which he discerned to be in four places of the surface in a square posture. It was moved, that the experiment should now be tried before the Society, which was accordingly done; but that figure was not so plain, but that some doubted it. But Sir CHRISTOPHER WREN coming in said, that the glass would vibrate much stronger, being struck on the edge with a violbow. This was also tried, and then the square undulation was extremely plain. But there was likewise discovered another undulation, by which the water was observed to rise in six places like an hexagon; and upon farther trials, also in eight places like an octagon. Each of these gave their particular and distinct sounds; the 4 and 8 were octaves, and the 6 and 4 were fifths. The farther examination of this was left to the next meeting.

July 15, Mr. HENSHAW, vice-president, in the chair.

The minutes of *July* the 8th were read.

Upon the first paragraph thereof Mr. HENSHAW gave a further description of the parts of those small animals, which he had observed in ginger-water; and supposed those parts, which Mr. COCKS affirmed were protuberant and swelling, to be rather hollow and concave; and mentioned the observation, which had been formerly taken notice of in viewing a guinea through a microscope, that swelling figures often appear hollow, and hollow ones swelling.

He desired, that Mr. MELLIN should be spoken to, to fit one of his glasses like those, which Mr. COCKS made, with a plain glass before it, as being more ready than that, which himself made use of.

The

The account of the experiment of ſound in a glaſs with water was read; and it was deſired, that the experiment ſhould be tried at the next meeting before the Society with ſome other glaſſes, to ſee what farther diſcoveries might be made by it.

Mr. HOOKE's letter to Monſ. LEIBNITZ concerning the farther uſefulneſs of the philoſophical language and character was read.

Dr. ST. JOHN's letter was read.

Then the experiments to be made in the exhauſting engine were tried; but the engine was found to be imperfect, and ſo nothing could be concluded certainly from them; the engine upon being removed into the place, where the Society met, having proved leaky, ſo as that the receiver could not be well exhauſted. It was ordered, that Mr. HUNT ſhould put all things into better order againſt the next meeting.

July 22, Sir CHRISTOPHER WREN, vice-preſident, in the chair.

The minutes of the laſt meeting were read; whereupon Mr. HENSHAW gave an account, that he had obſerved an infinite quantity of other yet ſmaller animals in ginger-water; and that he conceived, that it was much more prolific than pepper-water, and had beſides a greater number of very large animals, which appeared ſo large, that he conceived their legs, fins, or parts for motion would be ſeen, if they had any; and therefore he ſuppoſed, that they had none.

Sir CHRISTOPHER WREN was of opinion, that the reaſon, why thoſe parts were not viſible, was the ſwiftneſs of the motion of the animals.

It was deſired, that theſe ſmall animals might be examined with the beſt microſcopes, that could be made, to ſee, if any farther diſcovery could be made of their way of moving.

Dr. CROUNE acquainted the Society, that Mr. MELLIN had promiſed to fit up one of his beſt microſcopes for that purpoſe.

Dr. KING related, that he had obſerved the motion of theſe animals among the globules of blood, by mixing a little blood with pepper-water.

Sir ROBERT REDDING affirmed, that he had ſeen multitudes of them in water, in which oſiers had been ſteeped.

Dr. GALE read part of a letter from Dr. BOHN, and brought in ſeven little tracts on philoſophical ſubjects ſent by him to the Society, which were as follow:

1. *Diſſertationum chymico-phyſicarum; prima de corporum diſſolutione per D.* J. BOHN *& M.* J. W. PAUL. Lipſ.

2. *Secunda de corporum continuatione ſeu concretione per D.* J. BOHN & ERNEST. GOTFREID. Heyſe Dantiſcanum.

3. JAC. JOH. WENCESLAI DOBRZENSKY *de mipr. pente præſervativum univerſale naturale.* Pragæ 1680.

4. *De contagione Dienenſi experimentum medicum Doctoris* JOH. BAPT. ALPRUNI. Pragæ 1680, 4to. half a ſheet.

5. Idem, 8vo. ibid. half a ſheet.

6. G. BALDWINI *Epiſtola ad Dom.* JOH. HEVELIUM *de machina cœleſti &c.* Ratiſbon 1679.

7. *Subjecti maſculini anatomica publica lecturis denunciat D.* J. BOHN. Lipſiæ 1680.

Dr. GALE was deſired to return the Society's thanks to Dr. BOHN for this preſent, and to ſend him Mr. BOYLE's late book, together with that of Dr. TYSON, both in quires.

Dr. CROUNE gave an account of Mr. WARREN's method of preſerving bodies by a powder; and was deſired to bring Mr. WARREN to the Society, and to prevail with him to ſhew them the experiment: which Dr. CROUNE promiſed to endeavour to do. It was ſuppoſed, that the chief ingredient of that powder was ſomewhat of vitriol.

Sir CHRISTOPHER WREN, with the approbation of the Society, ſigned a bill for the table and inſcription ſet up in the long gallery.

The following experiments were tried:

1. Of the extraordinary ſtrong ſound of a glaſs funnel ſtruck with a viol-bow, which yielded four or five ſeveral and very diſtinct ſounds, *viz.* the loweſt ſound a fifth, a fourth, and an eighth, and twelve higher.

2. Another large glaſs holding about three quarts, almoſt filled with water, was ſtruck on the edge with a viol-bow, and it was very viſible, that, according to the ſound, was the number of the places in the glaſs, where the water played. The places were either 4, 6, 8, 10, 12; and ſome were confounded and broad, which ſeemed to participate of two ſounds.

3. Several experiments were tried with ſmall glaſs-canes in the exhauſted receiver, to ſee, whether the water would riſe in them: but upon trial there could be nothing certainly concluded from them, ſome of them being ſtopped by the melting of the cement on the top of them.

But a ſyphon being tried, it was found, that the water would run through the ſame out of one veſſel into another, as well when the air was exhauſted as before.

Dr. PAPIN made a trial of ſmall pipes cloſed at the top in his exhauſted receiver, affirming, that it would aſcend into ſuch a pipe as well, as if it were an open

open ſmall pipe in common air. But it could not be perceived, that the water aſcended into it till ſome air being let into the receiver, the water went to the top of the ſealed pipe: and by the exhauſting it afterwards, it was made to deſcend again upon the top of the pipe.

July 29, Mr. HENSHAW, vice-preſident, in the chair.

The minutes of the 22d inſtant were read; whereupon the ſubject of filtration and riſing of liquors in ſmall pipes was debated, and an account was given of the experiments made at the laſt meeting, and wherein the difficulty of them appeared; *viz.* firſt, from the imperfect exhauſtion; and ſecondly, from the uncertainty of the riſing of the ſame liquor in the ſame pipes at ſeveral times.

Hereupon Mr. HENSHAW moved, that there might be two experiments farther tried, *viz.* firſt, whether a liquor will riſe in vacuo in theſe ſmall pipes; and ſecondly, whether it would filtrate either through a cloth or a ſmall ſyphon; for that he conceived, if it were found to do either, or both of theſe, it could not be ſaid to receive its motion from the different preſſure of the air.

Dr. KING related, that he had obſerved ſix or ſeven ſorts of animals, a thouſand of any of which were leſs than a globule of blood.

Mr. WARREN's way of preſerving dead bodies being farther diſcourſed of, Mr. HENSHAW conceived, that ſpices were the beſt ingredients of a powder for doing it, as of pepper, cloves, mace, *&c.* adding, that he was ſure, that the child preſented to the king by Dr. WARNER many years before was preſerved in a pickle, and not in ſpirit of wine: that the glaſs was ſtopped with wax, and that no wax-ſtopple would contain vinous ſpirits.

Moſt of the members of the Society being either gone, or going into the country, the Society adjourned their uſual meetings till further ſummons ſhould be ſent by the preſident or vice-preſident.

November 4, the Society upon notice ſent to them met again at Greſham-College, after their receſs during the autumn: but neither the preſident nor vice-preſidents being preſent, Sir ROBERT REDDING was deſired to take the chair.

Dr. CROUNE produced a letter to himſelf from Col. WILLIAM SHARP, dated at Barbados 16 Aug. 1680, together with an account of his obſervations of the weather, and of the mercurial barometer ſent over thither by the Society, and his conjectures about the cauſe of the motions of that inſtrument. The Letter and account were as follow[p]:

" I received your letter in April laſt, together with the barometer, and having " with all exactneſs fitted it, according to your direction, I purſued the account " you deſired, a copy of which in the encloſed ſheet I ſend you; and what you

[p] Letter-Book, Vol. viii. p. 127.

" find of method and order wanting therein, my own ignorance, and not having the converſation of any one man of experience here, will, I hope, move " you to excuſe me.

" I am ſufficiently convinced of the exactneſs of that inſtrument to the purpoſes deſigned it; and being now grown into ſome acquaintance with it, am ſeldom diſappointed in my expectations, and wiſh I could as well vindicate my " reaſon, which ſeems to oppoſe even the neceſſary conſequences of it, as that " the weight of the air ſhould compel the mercury to deſcend; for if the weight " of the air hath any effect, as doubtleſs it hath, it then ſeems to me, that the " ſtagnant mercury in the receiver, at the bottom of the barometer, is the moſt " proper and liable object to receive it; and that being impoſed on by ſuch " weight muſt needs preſs the parts downwards, and conſequently compel the " mercury to riſe in the barometer; and by the ſame conſequence, when the air " is higheſt, the mercury freed from ſuppreſſion ought to yield itſelf, and riſe in " the receiver, and grow low in the barometer. But that proving contrary to all " experience, I am willing to quit thoſe reaſons, and to accommodate myſelf to " ſuch other, as may be better juſtified by the effect, unleſs I could be allowed " to fix upon another notion, from which only the common abſurdity, that is " granted in it, prevents me, which is, that the air, which we apprehend the heavieſt, may perchance be the lighteſt, and being extenuated by exhalations, may " weigh leſs than a clear one; and if ſo, there would remain no wonder, that the " mercury did ſubſide at the approach of it, for the reaſons aforeſaid. But ſtill " having a deſire to enquire after ſome more probable, I would, in order thereunto, " conſider the other end of the glaſs, and aſk, if the air, or that included vacuum " there (I know not what to call it) may not have ſome affinity to the atmoſphere, " and being ſenſible by ſome ſort of ſympathy of what happens there, when " that is ſlackened and loaded with exhalations, that vacuum may not alſo " ſlacken and relax, and loſing its volatile and aſcending quality, ſuſpend itſelf " on the mercury to the ſuppreſſion of it; and on the contrary, when the atmoſphere is diſcharged, that ſpringy nature in that vacuum may not reaſſume " itſelf, and by its riſing, admit the ſame to the mercury.

" Thus far, Sir, you have my weak conjectures; and it will be leſs confidence " to acquaint you with the few obſervations this little time hath furniſhed me " with; and becauſe the notice of a ſtorm's continuance may be as beneficial as " that of its approach, I was ſollicitous to find out ſome marks, that might direct " to it; and having obſerved, upon an unuſual and remarkable depreſſion of the " mercury (not the little dippings, which commonly the latter end of a fair day " does uſually produce), the exact time of that depreſſion, the continuance of the " mercury's deſcending, even to the time of its apparent aſcending, which happens ſome hours before the ſtorm, I have thereupon hitherto found, that the " continuance of the violence of the ſtorm, that happens after, is full as long, as " the time from the deſcending to the aſcending of the mercury. Sir, you may " alſo perceive, by the account I have ſent, that the motions of the mercury are " very minute here; which I attribute to the conſtancy and certainty of the wind " in this climate, where nature hath for the moſt part limited it within few points,

" and

" and alſo to the ſmall, narrow, and broken clouds that fall here, of whoſe weight " the air can be but little ſenſible. And I have delayed the account the longer, " that it might enter into that ſeaſon, whereunto the tempeſtuous weather (if " any in the whole year happen) is generally confined. And now, Sir, I can- " not but conclude, that you may well wonder to ſee a man, ſo totally ignorant " in ſpeculations of this nature, ſo forward to declare it alſo: but it is not through " want of my taking true meaſures of my own inſufficiency, but out of an unruly " deſire to appear, even in the meaneſt circumſtance, ſerviceable to you; upon " which ſcore I hope you will not only conceal, but pardon, *&c.*

" I have inſerted in my Calendar ſome other hours than you appointed, but " have not admitted that; and in ſome places have divided a $\frac{1}{10}$ into four " parts, becauſe I found leſs than $\frac{1}{10}$ denoted a conſiderable alteration. *Barbados*, " *16 Auguſt*, 1680."

		Hour.	Degrees.	Wind.	Weather in Barbados.
April	8	9	$29\frac{5}{10}$	E. N. E.	fair and little wind.
	9	9	$29\frac{4}{10}\ \frac{2}{4}$		ſome ſhowers, the like wind.
	10	9	$29\frac{4}{10}$	E. b. N.	continues in the ſame manner.
	11	9	$29\frac{4}{10}$	E. N. E.	the ſame.
	12	9	$29\frac{4}{10}$		the ſame.
	13	9	$29\frac{4}{10}$		the ſame.
	14	9	$29\frac{4}{10}$	E. b. N.	the ſame.
	15	9	$29\frac{4}{10}$	E.	the ſame, almoſt calm.
	16	9	$29\frac{4}{10}$		fair.
	17	9	$29\frac{3}{10}$	E. b. S.	fair, little wind.
	18	9	$29\frac{3}{10}$		fair, more wind.
	19	9	$29\frac{3}{10}$		the ſame.
	20	9	$29\frac{3}{10}$	E.	ſome ſhowers.
	21	9	$29\frac{3}{10}$		frequent ſhowers, ſtrong wind.
	22	9	$29\frac{3}{10}$		rain, and ſome guſts.
	23	9	$29\frac{3}{10}$	E. S. E.	ſhowers and ſmall winds.
		4	$29\frac{2}{10}$		cloſe weather.
	24	9	$29\frac{3}{10}$		much rain.
	25	9	$29\frac{3}{10}$		clear and gentle wind.
	26	9	$29\frac{3}{10}$		the ſame.
	27	9	$29\frac{3}{10}$		the ſame.
		4	$29\frac{2}{10}\ \frac{2}{4}$	E.	very hot and ſoft wind.
	28	9	$29\frac{3}{10}$		
		4	$29\frac{2}{10}$		thunder, lightning, much rain.
	29	9	$29\frac{3}{10}$		fairer.
	30	9	$29\frac{3}{10}$		ſome ſhowers, little wind.
May	1	9	$29\frac{3}{10}$	E.	fair gentle wind.
	2	9	$29\frac{3}{10}$		ſhowers the ſame.
	3	9	$29\frac{3}{10}$		changable.
	4	9	$29\frac{3}{10}$		the ſame.

		Hour.	Degrees.	Wind.	Weather in Barbados.
May	5	9	29 3/10	E.	fair weather, ſoft wind.
	6	9	29 3/10	E. b. S.	the ſame.
	7	9	29 3/10		the ſame.
	8	9	29 3/10		fair, and ſoft wind.
		4	29 2/10		the ſame.
	9	9	29 2/10 2/4		
		4	29 2/10		rain, thunder, little wind.
	10	9	29 3/10		much rain.
	11	9	29 2/10 2/4	E.	grows fair.
	12	9	29 3/10		changable.
		4	29 2/10 2/4		
	13	9	29 3/10		ſhowers and ſtrong wind.
		4	29 2/10 2/4		fair and windy.
	14	9	29 3/10		the ſame.
	15	9	29 3/10		the ſame.
	16	9	29 3/10	E. b. N.	the ſame.
	17	9	29 3/10		the ſame.
	18	9	29 3/10		the ſame.
	19	9	29 3/10		the ſame.
	20	9	29 3/10		the ſame.
	21	9	29 3/10		the ſame.
	22	9	29 3/10	E.	ſhowers, and windy.
	23	9	29 3/10		ſhowers and ſtrong wind.
	24	9	29 3/10		the ſame.
	25	9	29 3/10		the ſame.
	26	9	29 3/10 2/4	E. b. N.	dry and ſtrong wind.
	27	9	29 3/10 3/4		the ſame.
	28	9	29 3/10		the ſame.
	29	9	29 3/10		the ſame.
	30	9	29 3/10		the ſame.
	31	9	29 3/10		the ſame.
		4	29 2/10 2/4		the ſame.
June	1	9	29 3/10	E. b. N.	great ſhowers, leſs wind.
		4	29 2/10 2/4		ſhowers, more wind.
	2	9	29 3/10		the ſame.
	3	9	29 3/10		fair and windy.
	4	9	29 3/10	E. N. E.	the ſame.
	5	9	29 3/10		the ſame.
	6	9	29 3/10		the ſame.
	7	9	29 3/10		the ſame.
	8	9	29 3/10		the ſame, leſs wind.
		4	29 2/10		cloſe weather.
	9	9	29 2/10 2/4		wind little, with ſhowers.
	10	9	29 2/10 2/4		clear ſtrong wind.
	11	9	29 3/10		the ſame.

June

		Hour.	Degrees.	Wind.	Weather in Barbados.
June	12	9	29 3/10	E.	clear ſtrong wind.
		4	29 2/10 2/4		the ſame.
	13	9	29 2/10 2/4		clowds and rain.
		4	29 2/10	E. b. N.	the ſame.
	14	9	29 2/10		ſhowers and great wind.
	15	9	29 2/10		the ſame.
	16	9	29 2/10 2/4		the ſame.
	17	9	29 2/10 2/4		the ſame.
	18	9	29 2/10	E. N. E.	the ſame.
	19	9	29 2/10		fairer, and ſtrong wind.
	20	9	29 2/10		the ſame.
	21	9	29 2/10		the ſame.
	22	9	29 2/10		the ſame.
	23	9	29 2/10 2/4		the ſame.
	24	9	29 2/10 2/4		the ſame.
	25	9	29 3/10		the ſame.
	26	9	29 2/10 2/4		the ſame.
		4	29 2/10		the ſame.
	27	9	29 2/10		the ſame.
	28	9	29 2/10		the ſame.
	29	9	29 2/10		the ſame.
	30	9	29 2/10		the ſame.
July	1	9	29 2/10 2/4	E. b. N.	clowdy, ſhowers, ſtrong wind.
	2	9	29 2/10	E. N. E.	more dry, and great wind.
	3	9	29 2/10		the ſame.
	4	9	29 2/10 2/4	E. b. N.	many ſhowers, great wind.
	5	9	29 2/10		ſhowers, fogs, like wind.
	6	9	29 2/10	E.	changable, much wind.
	7	9	29 3/10		much rain and wind.
	8	9	29 2/10	E. b. N.	clear and fairer, leſs wind.
	9	9	29 2/10	E.	fairer, and windy.
	10	9	29 2/10		the ſame.
		4	29 1/10 2/4		changable, and very ſtrong wind.
	11	9	29 2/10 2/4	E. b. S.	much rain, thunder and lightning.
	12	9	29 2/10 2/4		a ſtorm about 5 this morn. of 1/2 an
		4	29 1/10 2/4	E.	dry, and pretty fair. [hour.
	13	9	29 2/10		fair, leſs wind.
		4	29 1/10 2/4		the ſame.
	14	9	29 2/10	E. N. E.	cloſe weather, much rain.
		4	29 1/10	E. S. E.	much rain, ſome guſts.
	15	9	29 2/10		the ſame.
	16	9	29 2/10	E. b. N.	clear, and moderate wind.
	17	9	29 2/10 2/4		the ſame.
	18	9	29 2/10		the ſame.
		4	29 1/10 2/4		the ſame.

July

	Hour.	Degrees.	Wind.	Weather in Barbados.
July 19	9	29 2/10	E.	clowdy, many ſhowers, great
	4	29 1/10 2/4		the ſame. [wind.
20	9	29 1/10 1/4		clowdy, guſts, much rain.
	4	29 1/10		much rain, great guſts.
21	9	29 1/10 1/4		the ſame.
22	9	29 1/10 2/4		more fair, wind more moderate.
23	9	29 2/10		the ſame.
24	9	29 2/10	E. b. N.	fair and clear, little wind.
25	9	29 2/10		the ſame.
26	9	29 2/10		clear, and ſtronger wind.
27	9	29 1/10 2/4		ſhowers, and the like wind.
28	9	29 2/10	E.	fair and dry, great wind.
29	9	29 2/10		the ſame.
30	9	29 2/10		the ſame.
31	9	29 2/10		the ſame.
	4	29 1/10		clowdy.
Auguſt 1	9	29 1/10 1/4	E. N. E.	changable.
2	9	29— 2/4	N. E.	clowdy, ſhowers, & guſts of wind.
	12	29	N.	much rain, fierce wind.
	2	28— 3/4	N. W.	ſtorm continues, and encreaſeth.
	3	28— 2/4	W.	the ſame.
	6	29		more violent.
	8	29— 1/4	S. W.	the ſame.
	10	29 1/10		moſt violent, with terrible thun-
	1	29 1/10	S.	der and lightning.
	6	29 1/10	S. E.	moſt violent rain.
3	9	29 2/10		the ſtorm well ceaſed.
4	9	29 2/10	E.	fair, clear, moderate weather.
5	9	29 2/10		the ſame.
6	9	29 2/10		the ſame.
7	9	29 2/10		the ſame.
8	9	29 2/10	E. b. N.	the ſame.
9	9	29 2/10	E. N. E.	hot and dry, little wind.
10	9	29 2/10		the ſame.
11	9	29 2/10		the ſame.
12	9	29 1/10 2/4		clear, and calm.
13	9	29 2/10		the ſame.
14	9	29 1/10	N. E.	ſome ſhowers, little wind.

Dr. CROUNE was deſired to return the Society's thanks to Col. SHARP, and to deſire him to continue to proſecute theſe obſervations, and communicate them to the Society.

Dr. CROUNE deſired, that a copy might be made of theſe obſervations, to be ſent to Mr. TOWNLEY; which was accordingly ordered.

He

He took notice, that the changes of the barometer at Barbados were not ſo great as at Tangier; and thoſe at Tangier very much leſs than thoſe in England.

Mr. HALLEY affirmed, that the changes of the barometer at St. Helena were very little, and much leſs than thoſe at Tangier: and that the greateſt variations in England were cauſed by the north-weſt winds.

Sir ROBERT REDDING ſaid, that he had an account of ſeveral obſervations made at London and in Dublin at the ſame time; which he promiſed to communicate.

A paper of Mr. TOWNLEY's obſervations was produced; and Dr. CROUNE remarked, that he had found by them, that the weather was not the ſame both here and where Mr. TOWNLEY had made thoſe obſervations, though the changes of the barometers were not different.

Mr. HOOKE produced a letter to himſelf from Mr. JUSTEL, dated at Paris 21 Aug. 1680. N. S.[q] giving an account of an aſtronomical inſtrument invented by Monſ. ROEMER for finding the poſitions of the heavens at all times, either paſt, preſent, or to come, performed by clock-work within to be turned with the hand: as alſo ſuch an inſtrument invented by CASSINI, but without wheel-work, and to be ſet by the help of tables. Monſ. JUSTEL mentioned likewiſe, that Monſ. PICART was gone to Bayonne with Meſſrs DE LA HIRE and DU VERNAY, the firſt being employed to obſerve the longitudes of different places in France: that a friend of his had received from Poland an account of a journey of ſome Muſcovites to China in 1674 and 1675; of which Monſ. JUSTEL was promiſed a copy; with ſeveral other articles of literary intelligence.

Dr. CROUNE produced a letter of Mr. PULLEYN, dated at Rome, giving an account of a new phyſico-mathematical academy founded by Signor CHAMPIGNI; and mentioning, that he would correſpond with the Society: that he had ſent ſome tracts as a preſent, and would continue to ſend ſuch pieces, as ſhould be publiſhed, that were curious, as BORELLI's book, when finiſhed. This letter took notice of ſome things printing at Rome: of a balſam made by Signor CHAMPIGNI: of a parcel of rare ſeeds ſent by Mr. UPTON for Oxford from BOCCONE: of the poverty of BOCCONE, and what would be an encouragement to him to make farther ſearch for natural curioſities: and of a ſort of lithanthrax, ſent among other things, and found in a crack of the Apennine mountains. This letter promiſed likewiſe to ſettle a correſpondence with Signor PITTIATTI and Signor TOMASO CORNELIO, two learned men at Naples.

Dr. TYSON produced ſeveral ſorts of hair, which had been taken out of the ovarium by Dr. SAMPSON, of which an account had been printed in the *Philoſophical Collections*[r].

Mr. HOOKE ſhewed a letter of Mr. BOYLE, ſent to him during the late receſs

[q] Letter-Book, Vol. viii. p. 135. [r] N° 2. p. 49.

of the Society, wherein was contained ſome ſecret, which the author deſired might not be opened but by his own permiſſion.

Novemb. 11. Sir JOHN HOSKYNS was deſired to take the chair, on account of the abſence of the preſident and vice-preſidents.

The minutes of the laſt meeting were read: whereupon Dr. CROUNE was deſired to write to Mr. TOWNLEY and Col. SHARP, to make obſervations of the barometer at the ſame time; and he moved, that a thermometer might be ſent to Col. SHARP, to obſerve the changes of heat and cold by that inſtrument: upon which Mr. HUNT was ordered to make one.

Mr. HOOKE preſented from ROBERT SOUTHWELL two books of Signor VIVIANI, *De maximis et minimis*, and *De duplicatione Cubi.*

Mr. AUBREY preſented a book in octavo, intitled, THOMÆ HOBBES *Angli Malmeſburienſis philoſophi vita.*

Mr. HOOKE produced a long letter lately received by him from Mr. LEEWENHOECK. It was written in Low Dutch; but the contents of the ſeveral heads were read by Mr. HOOKE. It was deſired, that the ſaid letter ſhould be tranſlated and anſwered.

Mr. PERRY ſhewed a catalogue of Mr. ENT's books preſented to the Society. It was deſired, that a fair copy of it ſhould be made, in order to lie in the library.

Novemb. 25, at a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN, vice-preſident,

Mr. HENSHAW	Dr. GREW
Mr. HILL	Dr. KING
Mr. COLWALL	Mr. HOOKE.
Mr. PARKER	

It was ordered, that Mr. HENSHAW ſhould have lawful power and authority from the Society to treat and agree with Mr. THOMAS FRANKLIN for the arable ground belonging to Chelſea-College, at the rate of 32 s. an acre *per annum*, for a term of 21 years; and, in order to aſcertain the quantity thereof, Mr. HUNT was deſired forthwith to make an admeaſurement thereof: and Sir JOHN HOSKYNS was deſired to get a leaſe drawn up with neceſſary proviſions, covenants, *&c.*

Mr. HILL brought in the following paper concerning the books of Mr. ENT, delivered to the Society by Mr. EVERARD, *viz.*

" Whereas GEORGE ENT, of the Middle-Temple, Eſq; deceaſed, did give " his books in the catalogue hereunto annexed to the Royal Society of London,

" and made Mr. WILLIAM EVERARD of Middleſex, gentleman, the executor " of his laſt will and teſtament: Theſe are to acknowledge the receit of the ſaid " books by order of the Royal Society; and the ſaid Royal Society doth hereby " promiſe, that if any controverſy ſhall ariſe in law, which may alter the poſ- " ſeſſion of the aforeſaid books, that then they will return the ſaid books to the " ſaid Mr. WILLIAM EVERARD, as he hath now delivered them.
" Dated the day of

It was agreed by the Council, and ordered, that a copy of this paper be delivered to Mr. EVERARD, to be ſigned by the ſecretary.

It was ordered, that the arrears of Mr. AVERY be conſidered, and that for the future the ſaid Mr. AVERY be not charged with the uſual payments.

November 25. Many members of the Society met; but there was none in the chair.

Mr. ASTON took Mr. LEEWENHOECK's laſt letter, and promiſed to tranſlate it into Engliſh.

Mr. HOOKE introduced Mr. MEESTER, who explained his water-level; a print and deſcription whereof were preſented by Mr. HOOKE for the uſe of the Society.

Dr. GALE delivered in from Dr. WALLIS the two laſt lectures, which he had read before the Society concerning the time of Eaſter. Dr. GALE was deſired to return the Society's thanks to Dr. WALLIS, with their earneſt requeſt, that he would publiſh thoſe lectures; of which Sir CYRIL WYCHE deſired the peruſal for a ſhort time, which was granted.

Mr. HOOKE produced and read a letter to himſelf from Mr. PULLEYN, dated at Padua in the month of November.

Dr. GALE was deſired to write to Mr. PULLEYN, when the latter ſhould be arrived at Madrid.

Mr. HOOKE gave an account of the particular obſervations of the innermoſt ſatellite of JUPITER, recommended to him by Monſ. TOINARD, to be obſerved by the Engliſh aſtronomers, who might correſpond with the French aſtronomers; together with an account of ſeveral obſervations made by Mr. FLAMSTEAD at Greenwich; which he deſigned to ſend to Paris.

Mr. HOOKE gave a particular relation concerning his obſervations made on the Monday morning and Tueſday morning before of a new comet appearing in the beginning of the ſign Scorpio a little to the ſouthward of the ecliptic: That its

its motion was eaſtward, and haſted towards the ſun: and that it would not be ſeen either on Wedneſday or Thurſday morning becauſe of the thickneſs of the air.[t]

Hereupon Mr. HILL remarked, that he had been informed by Sir ROBERT MORAY, that monſ. MARIOTTE had in his life time ſeen nine comets; and that of theſe nine he had predicted when ſeven ſhould appear.

Monſ. AUZOUT was ſaid to be the firſt, who had printed ephemerides of the comet in 1664, though upon grounds very improbable. But Sir CHRISTOPHER WREN was the firſt, who found out and demonſtrated the true way of making ephemerides of all the way of the comet from any four obſervations.

November 30. the day of the anniverſary election, of which there is no entry in the journal. But it appears from the council books, that the eleven members of the old council, who were continued of it, were

Mr. COLWALL
Dr. CROUNE
Dr. GALE
Dr. GREW
Mr. HENSAAW
Mr. HILL
Mr. HOOKE
Sir JOHN HOSKYNS
Mr. PERRY
Sir JOSEPH WILLIAMSON
Sir CHRISTOPHER WREN.

And that nine of the ten new members of the COUNCIL were

Mr. ASTON
Mr. BOYLE
Mr. CREED
Sir JOHN LAWRENCE
Dr. KING
Sir JOHN LOWTHER
Dr. PLOT
Sir THEODORE DE VAUX
Sir CYRIL WYCHE.

Mr. BOYLE was choſen preſident;[u] but declining by a letter to Mr. HOOKE, dated Pall-mall 18 Decemb. 1680, to accept of that office, and deſiring the Society to proceed to a new election of a preſident, Sir CHRISTOPHER WREN was elected into that poſt, into which he was ſworn at the council held 12 January, 168$\frac{0}{1}$.

Mr. HILL was rechoſen treaſurer at this anniverſary election, as Dr. GALE and Mr. HOOKE were the two ſecretaries.

Not long before this anniverſary election died an eminent member of the Society,

JOSEPH GLANVILL, B. D. born at Plymouth in Devonſhire about the year 1636,[x] and educated in Exeter College in Oxford, where he became batler, and

[t] See Mr. HOOKE's poſthumous works, p. 153.
[u] See life of the honourable Mr. BOYLE, p. 250, 251.
[x] Mr. WOOD, Athen. Oxon. Vol. ii, Fol 662. ſays, that he was ſixteen years of age in 1652.

entered

entered into commons April 19, 1652, under a very able tutor, SAMUEL CONANT, M. A. He took the degree of batchelor of arts October 11, 1655[y], and in July the year following removed to Lincoln College, where he took the degree of maſter of arts June 29, 1658.[z] Soon after this he was invited to live with FRANCIS ROUS, Eſq; provoſt of Eton college, as his chaplain; which offer he accepted of, and reſided ſomewhat above half a year at Mr. ROUS's houſe[a]: Upon whoſe death on the 7th of January $165\frac{8}{9}$[b] Mr. GLANVILL returned to Oxford, and continued for ſome time at Lincoln college[c]. His firſt work was publiſhed at London in 1661, in 8vo, and intitled, *The vanity of dogmatiſing, or confidence in opinions, manifeſted in a diſcourſe of the ſhortneſs and uncertainty of our knowledge and its cauſes: With ſome reflexions on peripateticiſm, and an apology for philoſophy*; in the dedication to which, dated at Cecil-houſe in the Strand, March 1, 1660, he mentions his having written a diſcourſe *of the ſoul's immortality*, and deſigned a preface to it, *as a corrective to enthuſiaſm*, in a vindication of the uſe of reaſon in matters of religion: But that the latter was rendered leſs neceſſary by the king's much deſired and ſeaſonable arrival, and the former by the maturer undertakings of the accompliſhed Dr. HENRY MORE. At the reſtoration he took orders from Dr. SANDERSON, biſhop of Lincoln.[c] The ſecond piece publiſhed by him was at London 1662, in 8vo, under the title of *Lux Orientalis: or, an enquiry into the opinion of the eaſtern ſages concerning the pre-exiſtence of ſouls, being a key to unlock the grand myſteries of religion.* In the beginning of November 1662 he was preſented by Sir JAMES THYNNE to the vicarage of Frome-Selwood in Somerſetſhire in the room of Mr. JOHN HUMPHREY, deprived for non-conformity. December 14th 1664 he was choſen fellow of the Royal Society, to whom the year following he dedicated his *Scepſis Scientifica, or, confeſt ignorance the way to ſcience: In an eſſay of the vanity of dogmatizing a confident opinion: With a reply to the exceptions of the learned* THOMAS ALBIUS: printed at London in 4to. In June 1666 he became rector of the great church in Bath. The ſame year he publiſhed at London in 4to, *Some philoſophical conſiderations touching the being of witches and witchcraft*: but all, or moſt of the impreſſion being burnt in the fire of London in the beginning of September of that year, it was reprinted in 1667 in 4to, and the fourth edition of it appeared in 1668 in 8vo. Theſe *Philoſophical Conſiderations* were anſwered by Mr. JOHN WEBSTER in his *Diſplay of ſuppoſed witchcraft*, &c. London 1667 in fol. In 1668 Mr. GLANVILL publiſhed at London in 8vo his *Plus ultra: or, the progreſs and advancement of knowledge ſince the days of Ariſtotle*, &c which engaged him in a controverſy with Mr. HENRY STUBBE of Warwick, and occaſioned his *Prefatory Anſwer* to Mr. STUBBE, printed at London 1671 in 8vo, and his *Farther Diſcovery of Mr. Stubbe*, printed the ſame year. In July 1672, he exchanged his vicarage of Frome for the rectory of Streat, with the chapel of Walton annexed, in Somerſetſhire. About this time he was made chaplain to the king, and in June 1678 inſtalled canon of Worceſter, which dignity he obtained by the intereſt of HENRY marquis of Worceſter, to whom Mr. GLANVILL's wife claimed ſome relation. He died at his houſe at Bath October 4, 1680, and was interred in his church there on the 9th of that month, his funeral ſermon being preached by Mr. JOSEPH

[y] Mr. WOOD, Faſti Oxon. Vol. ii. Fol. 107.
[z] Ibid. Fol. 122.
[a] Mr. GLANVILL's Farther diſcovery of Mr. STUBBE, p. 31.
[b] Mr. WOOD, Ath. Oxon. Vol. ii. Fol. 232.
[c] Id. Fol. 662.
[d] Farther diſcovery of Mr. STUBBE, p. 32.

PLEYDELL, archdeacon of Chicheſter. Beſides his works abovementiond, he publiſhed ſeveral others; an account of which may be ſeen in Mr. WOOD's *Athenæ Oxon.* He was a man of very lively genius and extenſive learning, and a zealous advocate for the new againſt the old ſcholaſtic philoſophy, and for religion againſt the extremes of enthuſiaſm and ſcepticiſm.

December 2, Mr. HENSHAW in the chair.

The minutes of the preceding meeting were read; after which Dr. PAMAN produced and ſhowed a very large calculus taken out of a horſe, which at firſt was larger and heavier than it was now; for at its being taken out it weighed four founds four ounces; but being now weighed, it was found to weigh but three pounds nine ounces and a quarter. It was ſomewhat of the faſhion of a turnip, and was twenty one inches about, and five inches and a quarter in thickneſs. It was for the moſt part rough and ſpungy; but ſome few ſpots of it were ſmooth and ſlick like a bezoar. The doctor read a diſcourſe of it, giving an account of the age, uſe, manner of feeding, and death of the horſe; and of the place where it was found, which was not in the bladder; together with various conjectures concerning the cauſe and manner of its production. This diſcourſe was ordered to be entered into the regiſter book[d].

Mr. HOOKE read a letter, which he had ſent by Mr. HALLEY to Monſ JUSTEL at Paris.

Dr. PAPIN produced his boiling engine, and ſhewed the proceſs of boiling gooſeberries therein, which had been preſerved ſince Midſummer preceding; together with the manner of making jelly of hartſhorn the ſame way in his engine.

Decemb. 8, at a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN	Dr. PLOT
Mr. BOYLE	Dr. GALE
Mr. HILL	Mr. PERRY
Mr. COLWALL	Mr. HOOKE.

It was ordered, that a book, intitled, *The Digeſter: or, the deſcription of an engine for ſoftening of bones*, written by DENYS PAPIN, doctor of phyſic, and fellow of the Society, be printed and publiſhed:

That henceforth the weekly meetings of the Society be kept upon Wedneſdays in the afternoon at four o'clock; and that ſummons be ſent out accordingly againſt Wedneſday next:

That the ſecretary ſend Mr. NEWTON an anſwer to his letter, that the Society give their conſent for the Italian[e] to dedicate his book, &c. And

That Dr. GALE write a letter to Sir JOSEPH WILLIAMSON in anſwer to his letter to Sir JOHN LOWTHER.

[d] It does not appear there.

[e] GASPARINI. See the minutes of the Society of Decemb. 16.

Dec.

Decemb. 9. Very few members of the Society meeting, there was nothing read; only Mr. HOOKE brought in a book publiſhed and preſented by Mr. BOYLE, intitled, *The Aerial Noctiluca: or, ſome new phænomena, and a proceſs of a factitious, ſelf-ſhining ſubſtance.*

Decemb. 16. Mr. HENSHAW, vice-preſident, in the chair.

Mr. HOOKE read a letter to himſelf from Mr. NEWTON, dated at Cambridge 3 Decemb. 1680,[f] giving an account, that DOMINICO GASPARINI, doctor of phyſic of Lucca in Italy, had lately written a treatiſe of the method of adminiſtring the *Cortex Peruvianus* in fevers, in which he particularly diſcuſſed, whether it might be adminiſtered in malignant fevers; and alſo whether in any fevers before the fourteenth day of ſickneſs; and that upon the fame of the Royal Society ſpread every where abroad, he was ambitious to ſubmit his diſcourſe to ſo great and authentic a judgment as that of the Society; and thereupon deſired another doctor of phyſic of his acquaintance in Italy to write to his correſpondent an Italian in London, to move, that the Society would give him leave to dedicate his book to them. The ſaid Italian being gone from London to Cambridge before the arrival of the letters, on the receit of them applied himſelf to Mr. NEWTON, who promiſed him, that he would deſire Mr. HOOKE to acquaint the Society with Dr. GASPARINI's requeſt. Mr. NEWTON added in this letter his thanks to Mr. HOOKE for the trials, which the latter had made of an experiment ſuggeſted by the former about falling bodies.

Mr. HOOKE was deſired to anſwer Mr. NEWTON's letter, which he did in one dated 18 Decemb. 1680[g], in which he took notice, that the Society was pleaſed with the ſubject of Dr. GASPARINI's book, the *Cortex Peruvianus* being a ſpecific, which had of late been much diſcourſed of, and concerning which an ingenious phyſician of London, Dr. GOODALL, was then publiſhing a diſcourſe, wherein he would endeavour to give a true account of the production and uſe of the *Cortex*, ſo far as he could be informed from writers, travellers, or his own experience. That as to Dr. GASPARINI's dedication of his book to the Society, he needed no leave, things of that nature being uſually done without aſking a conſent; but that doubtleſs the Society could not but be very well pleaſed with the teſtimonies of reſpect from learned and ingenious perſons, of which nature this was ſuppoſed to be: And therefore though they did not invite or prompt any perſons to ſuch addreſſes, yet the author needed not to doubt of finding ſuch an acceptance and reſentment thereof by the Society, as might anſwer his expectations.

Dr. SLARE was introduced by Mr. HOOKE, and having ſubſcribed the obligation was admitted Fellow of the Society.

Mr. HOOKE produced the firſt ſheets of Mr. DETHLERUS CLUVERUS's Ephemerides preſented by Mr HAAK, containing a ſummary of his whole deſign in that undertaking; which being read was approved of.

[f] Letter-Book, Vol. viii. p. 139. [g] Ibid. p. 140.

A letter to Mr. HAAK from Dr. ARNOLDUS, dated at Leyden $\frac{3}{13}$ Decemb. 1680, was read; wherein, amongſt other conſiderable remarks, an account was given, that there was printing at Amſterdam a body of anatomy illuſtrated with figures of all the parts of the body as big as the life, curiouſly engraved in copper: And that Dr. PAUL HERMANNUS, a German and profeſſor of botany at Leyden, was printing an herbal of all the Zeylon plants, he having lived in that iſland eight years: And that ſome curious naturaliſts at Leyden had found without the walls of that city ſcorpions with wings.

Dr. GALE produced a letter to himſelf from Dr. WALLIS, dated at Oxford 14 Dec. 1680[h], which was read, giving an account of the tail of the comet's having been ſeen there on the Friday, Saturday and Sunday night before, the 10, 11, and 12th inſtant. That the head, as he ſuppoſed from the ſituation of the tail, might be about the head of ſagittarius, or the centaur, but ſo near the ſun, that it ſet before the night was dark enough to ſee it: That the tail was long, ſlender, and pointed, reaching almoſt to the zenith, pointing towards Meduſa's head, or thereabouts: But Dr. WALLIS not having ſeen the head, took no accurate notice of it. He gueſſed, that it might have been ſeen ſome weeks before as a morning comet on the other ſide of the ſun; ſince which time it had been in conjunction with the ſun, and would ſhortly (being then eaſtward of him) come to be ſeen ſoon after ſun-ſet, at leaſt if its motion were any thing quick. That the laſt night beingcloudy, the comet was not ſeen.

Dr. GALE was deſired to requeſt Dr. WALLIS to communicate ſuch further obſervations on the comet, as ſhould be made at Oxford.

Hereupon a diſcourſe was held concerning the comet, and Mr. HOOKE related what obſervations he had made concerning it, and what he conjectured concerning its place, motion, duration, *&c.* none of which could be poſitively determined till ſome farther obſervations had informed him more particularly.

Mention being made of the ſhining of diamonds, Mr. HENSHAW related, that it was conceived, that the ſhining of that diamond, in which this property was firſt obſerved, was conjectured to proceed from the manner of its being ſet in the ring: And though it were very ill ſet as to appearance, whilſt it was in his poſſeſſion, yet after the king had bought it of him for 20 *l.* the jewellers durſt not new ſet it for fear of ſpoiling that ſhining quality.

An experiment was tried for examining the electricity of glaſs after Mr. NEWTON's method, by rubbing one ſide of a glaſs to make the other attract: But it was found, that though at firſt it ſucceeded two or three times, yet afterwards, for what reaſon could not be diſcovered, it did not ſucceed: ſo that the experiments deſigned to be made farther with it could not be tried, which were to examine, whether the air were of any uſe for performing this operation; or whether the air being exauſted from one ſide of the glaſs, the ſame effect would not be produced on the bodies placed nearer it.

[h] Letter-Book, Vol. viii. p. 141.

It

It was therefore ordered to be prepared with thinner glaſſes againſt the next meeting, that ſo the experiment might be more certainly made, for that it was ſuppoſed, that the uncertainty of its operation proceeded from the thickneſs of the glaſs, which was rubbed.

Mr. BOYLE's book on the *Noctiluca* preſented at the laſt meeting was now produced, and ſome parts thereof read and diſcourſed of.

Mr. HOUGHTON propoſed three perſons for candidates, *viz.* Mr. GOODWIN, a Portugal merchant, Mr. BRADDON, a ſtudent of law, and Mr. OLIVER SALISBURY of the Middle Temple.

Decemb. 23, the Society dining together this day had no meeting at the uſual place.

$168\frac{0}{1}$, *January* 12, a meeting of the COUNCIL, were preſent,

Sir CHRISTOPHER WREN, Preſident,

Sir JOHN LOWTHER	Mr. COLWALL
Sir JOHN LAURENCE	Mr. ASTON
Sir JOHN HOSKYNS	Mr. PERRY
Mr. HILL	Mr. HOOKE.

Sir JOHN LOWTHER was ſworn of the Council.

Sir CHRISTOPHER WREN was ſworn preſident, who deputed Sir JOHN HOSKYNS vice-preſident for the year enſuing: upon which Sir JOHN HOSKYNS was ſworn vice-preſident.

At a meeting of the SOCIETY on the ſame day, Sir CHRISTOPHER WREN preſident in the chair.

A letter ſent by mr BOYLE was read, containing an account of a ſtrange hurricane at Hanau in November 1680. It was ſigned WILLIAM BYTHASIA.

A letter to Mr. HOOKE from Mr. PASCALL, dated at Chedſey in Somerſetſhire 4 January $168\frac{0}{1}$ was read, giving an account of an earthquake, which had happened the day before at Chedſey and other contiguous places; and of the comet now appearing.

Hereupon the preſident diſcourſed concerning the cauſe of earthquakes; that he conceived, that many of thoſe, which only ſhook the earth, and did not break the earth, were occaſioned by ſome vaſt ſubterraneous caverns, into which ſome great impending parts of the upper parts might fall into the lower, and thereby make that great dead noiſe and trembling, which is ſenſible in the ſurface of the earth contiguous thereto: And that hence the reaſon might be given, why after ſome earthquakes there have been found divers parts of the ground ſunk,

which are ſometimes alſo filled with water, and ſo make a lake or ſtagnum. And he was of opinion, that there might be ſome general conſtitution of the æther, that might be the cauſe as well of the earthquake as of the ſtorm and comet.

Mr. HOOKE read a letter to himſelf from Monſ. LEIBNITZ, containing ſeveral ingenious conjectures, about the uſe of an univerſal language and character; as alſo of an univerſal algebra, and the great benefit thereof; and that by the help thereof he had been able to perform very many conſiderable things, which the commonly known algebra would no way enable him to do, &c.

Mr. HOOKE was deſired to continue his correſpondence with monſ. LEIBNITZ, and to endeavour to prevail with him ſo far, as to procure from him ſome inſtance or experiment of theſe his new problems.

Mr. HOOKE produced alſo a letter to himſelf from Monſ. JUSTEL, dated at Paris 1 January 1681[1], N. S. wherein he gives the reaſon, why he could not yet ſend the deſcription of a ſmall printing engine newly invented; nor the account of the journey from Moſcow to China; but that Monſ. THEVENOT had tranſlated it from the Ruſſian language into French, and was now printing it: That Monſ. PICART was printing an account of his voyages, and the obſervations made by him at Copenhagen, Montpellier, Bourdeaux and Breſt; to which he would add his treatiſe of the meaſures of the earth: That monſ. ROEMER was returning to Denmark, being recalled thither: That Monſ. MARIOTTE had in the preſs a treatiſe on colours: That the comet had been obſerved but three times at Paris; and that the aſtronomers there judged it to be 62 degrees long, and to move two degrees a day: That it appeared ſmall, and that the cloudy weather prevented it from being obſerved: That CASSINI affirmed, that juſt ſuch a comet had appeared three hundred years before: That Monſ. DU VERNAY had not yet ſhewn his friends the obſervations, which he had made on the diſſection of the fiſhes, which he had met with on the coaſt of Bourdeaux; but that he had not ſeen any whale: That the drawings of what had been diſſected were made by Monſ. DE LA HIRE with the utmoſt exactneſs: That there would be an account of the comet in an almanac printing in Paris, which contained ſeveral curious things, and particularly the longitudes and latitudes of places, as corrected by late obſervations: That Monſ. CHAMARS was buſy in making experiments on the magnet: That KUNKELL, who invented the liquid phoſphorus, had left Saxony, and was gone for Poland.

Mr. ASTON having tranſlated a long letter of Mr. LEEWENHOECK from Low Dutch into Engliſh, part of it was read, containing divers obſervations on the lees of ale and wine; and the remainder was referred to the next meeting.

Mr. HOOKE ſhewed a piece of a talipat leaf, which one Mr. KNOX, who had been nineteen years and an half captive in Ceylon, had brought with him from thence. It was about ſeven feet long and nine feet wide at one end, ſhaped like a woman's fan, cloſing and opening like that. The whole leaf was ſaid to be a circle of twenty feet diameter. Dr.

[1] Letter-Book, Vol. viii. p. 147.

Dr. RUSSEL was propoſed candidate by Mr. HOUGHTON.

January 19, at a meeting of the COUNCIL were preſent

Sir CHRISTOPHER WREN preſident,
Sir JOHN HOSKINS — Mr. CREED
Sir THEODORE DE VAUX — Mr. ASTON
Mr. HILL — Dr. CROUNE
Mr. COLWALL — Mr. HOOKE

The preſident moved, 1. that there might be an anatomical committee: to which Dr. CROUNE objected the college of phyſicians:

2. A georgical committee:

3. A coſmographical committee to regiſter all things, that ſhould be remarkable.

It was reſolved, that theſe three committees ſhould be appointed; and that the preſident ſhould conſider of fit perſons to be of the ſaid committees, and to draw up ſome directions for what they are to conſider.

At a meeting of the Society on the ſame day; the preſident in the chair.

The minutes of the 12th inſtant were read. Whereupon there was occaſioned a diſcourſe about earthquakes; and Mr. HILL related, that he had been certainly informed, that there was an earthquake at Morocco the ſame day that there was one at Malaga; and that it happened at Morocco juſt at eight o'clock in the morning.

Dr. ROBERT WOOD, LL. D. was propounded candidate by the preſident, HUGH CHAMBERLAYNE, M. D. by Mr. HOUGHTON, and JOHN PHILIP JORDIS, M. D. of Francfort by Dr. SLARE.

On occaſion of Monſ. LEIBNITZ's letter, the preſident and Sir John HOSKYNS diſcourſed about the univerſal algebra mentioned by him; and they ſuppoſed, that it might be ſomewhat like the *ars Lulliana*; but did not conceive, that it could be of ſo great uſe, as monſ. LEIBNITZ ſeemed to imagine.

Mr. HILL remarked, that profeſſor STURMIUS had written an *Euclides Univerſalis* ſomewhat to this purpoſe; and that he had the book now by him.

The preſident acquainted the Society with the undertaking of Mr. JOHN ADAMS to ſurvey all England, by meaſuring, taking angles, and alſo the latitudes of places; and in order to this running three ſeveral meridians clear through England: that Mr. NEWTON of Cambridge had promiſed to aſſiſt him; and that he deſigned the next week to wait on the Society, in order to deſire their directions and aſſiſtance.

Some diſcourſe aroſe about the comet; and Mr. HILL obſerved, that CALPHURNIUS the poet, who lived in the time of CARINUS, had mentioned a comet not taken notice of in writers of aſtronomy.

The preſident mentioned, that the fire-ball, which had formerly been ſeen in England, might poſſibly be a ſublunary comet.

A letter of Sir THEODORE DE VAUX was read, giving an account of ſome apparitions, that had been lately ſeen in the air like armies fighting: that the fire was ſeen, and noiſe heard like the diſcharging of guns, and afterwards great groanings were heard.

The preſident ſaid, that he had formerly ſeen a very pretty ſcene upon the opening of the clouds, and flaſhes of lightning running to a fro between them.

Sir THEODORE DE VAUX ſaid, that Sir HERBERT PERROT had lately ſeen three ſuns and two moons at Swanſey in Pembrokeſhire.

Mr. HILL related, that a friend of Mr. MOSES had lately given him an account out of Somerſetſhire, that fighting in the air had been ſeen there.

Mr. THOMAS HILL's paper concerning comets [k] ſent by Dr. TILLOTSON was peruſed, and ordered to be copied.

Mr. CLUVERUS delivered in two printed papers ſent by Signior SAROTTI, printed in Italy, concerning the comet. One of them being in Latin was read, but it conſiſted moſt of predictions; as upon peruſing, the other alſo was found to conſiſt of the ſame, and to contain very little or nothing of conſiderable obſervation.

A large pair of mooſe deer horns were preſented by Mr. BOYLE for the repoſitory.

Mr. HOOKE ſhewed his inſtrument for making experiments in order to find out the attractive power of the load-ſtone at ſeveral diſtances, and to reduce that power to a certain theory.

January 26, Sir JOHN HOSKYNS vice-preſident in the chair.

Mr. JOHN ADAMS of the Inner Temple was introduced by Dr. GREW; his buſineſs being to deſire the advice and directions of the Society in an undertaking, which he was engaged in, a perfect ſurvey of England. He ſaid, that he had already had the advice of the preſident, Mr. HOOKE and Mr. FLAMSTEAD concerning it.

[k] This paper is probably that mentioned in a letter of Dr. TILLOTSON to ROBERT NELSON, Eſq; dated at London 7 March, 1680, in which he incloſed that paper for Mr. HALLEY then with Mr. NELSON at Paris. He ſtiles this Mr. HILL of Canterbury *not a learned, but an induſtrious man.* See the life of Archbiſhop TILLOTSON, p. 82. 2d edit. London 1753, 8vo.

Sir JOHN HOSKYNS adviſed him, beſides the geographical deſcriptions, to make alſo a topographical one of all the principal ſeats and buildings, and to take an account of the bigneſs and currents of rivers, &c.

Mr. ADAMS ſaid, that he would from time to time deſire and follow the directions of the Society in proſecuting this undertaking.

Dr. PAPIN preſented a book of his dedicated to the Society, intitled *A new Digeſter*, &c.

Mr. HOOKE produced the preſent, which he had received from Signor MALPIGHI, being ſeveral books lately printed in Italy, together with his picture very well painted, as big as the life. The books were as follow:

Ragguagli del P. ESCHINARDI.
Redi del Ochiale.
P. BARTOLI del ſuono.
Montalbani & Practica Minerale.
Sangallo della Zanzani.
Dialogo circa il ſiſtema Copernicans.
Rubei Epigrammata.
Lettione academica del Montanari.
Manualletto del Bombeſſi della Steffo.
Acta theſium Bononica.
L'Iride del Barbari.

Mr. ASTON undertook to peruſe Sangallo della Zanzani, and to give an account thereof to the Society at their next meeting.

It was ordered, that a frame ſhould be made for the picture of Signor MALPIGHI: and a motion being made, that it might be engraven, Mr. HOOKE was deſired to ſpeak with Mr. LOGGAN or Mr. FAITHORNE concerning it.

February 2, The preſident in the chair.

The preſident gave an account of an accident of one Mr. HAMPSHIRE, who being very much troubled with a canine appetite, and his wife with a deſign of poiſoning him giving him arſenic, it made him vomit violently, and thereby cleared him of both.

Upon diſcourſing concerning the comet the preſident obſerved, that there were two comets; and that the laſt was different from the firſt: that he had from Mr. FLAMSTEAD's obſervations tried the way of it, and found it to agree with his hypotheſis, that comets move in ſtrait lines equal ſpaces in equal times, but not according to KEPLER's hypotheſis.

Mr. HOOKE gave an account, that he had ſpoken with Mr. LOGGAN concerning

the ingraving of Signor MALPIGHI's picture; and that he had ſeen it, and was willing to undertake it.

Upon this occaſion Dr. GALE moved, that the duke of NORFOLK's picture might be prefixed to the catalogue of the library then printing.

A letter from Mr. JUSTEL to Mr. HOOKE, dated at Paris January $16\frac{80}{81}$, was read; as alſo a ſhort account of the ephemerides of the late comet. It was deſired, that Mr. HOOKE ſhould ſend to Mr. JUSTEL in the name of the Society Mr. BOYLE's *Noctiluca* and Dr. PAPIN's book on the *new Digeſter*.

Mr. ASTON returned *Sangallo della Zanzani*, and gave an account, that there was very little in the book new, but that the author's deſign was only to ſhew, that gnats were not produced of the mud of water, but from eggs: that moſt of the obſervations were the ſame with thoſe publiſhed by Mr. HOOKE in his *Micrographia* and by SWAMMERDAM in his book on inſects.

The books preſented by Signor MALPIGHI being now either ſtitched or bound, ſeveral of them were recommended to ſeveral of the members preſent to peruſe and give an account of to the Society: and according Sir JOHN HOSKYNS took *Practica Minerale*; Dr. GALE RUBEUS's poems; Sir. CHRISTOPHER WREN BARTOLI *del ſuono*, and *Ragguagli del Eſchinardi*, and Mr. ASTON *Redi del Ochiale*.

A paper of Mr. HAAK, giving an account of his experiments about recovering and increaſing the attractive virtue of the magnet, was read.

Mr. HOOKE was deſired to think of ſome fit books to ſend to Signor MALPIGHI for a preſent from the Society.

February 9, Sir JOHN HOSKYNS vice preſident in the chair.

Sir JOHN PERCIVAL was propoſed by Sir ROBERT SOUTHWELL.

Sir ROBERT SOUTHWELL ſhewed a certain white powder, made of the lapis ſmaragdinus, only finely beaten, without any other preparation; which being ſcrewed upon a copper-plate, and the plate being laid over a chafing-diſh of coals till pretty warm in a dark room, the powder would ſhine like a glow-worm, and continue ſo for ſome time; but by degrees the light would diminiſh and diſappear.

This was preſently tried and found to anſwer the relation; and it was farther remarkable, that if the plate was taken off the coals, whilſt the powder yet ſhined, as the plate grew cold, the light would diminiſh,; but being laid on again, it would continue to ſhine as before. It was alſo obſerved, that a little wet ſprinkled on the plate put out the light, where the powder was wet.

Sir ROBERT SOUTHWELL ſhewed likewiſe the true receit of making the phoſphorus of Mr. KUNKELL, being the ſame that Mr. KRAFT had formerly ſhewed

in England and ſeveral other places; the phænomena of which are deſcribed by Mr. BOYLE in one of the *Philoſophical Collections*. Sir ROBERT had none of the ſubſtance then about him, but promiſed to produce it at ſome other meeting of the Society.

He ſhewed likewiſe a very curious piece of yellow tranſparent amber, in which was a large ſpider ſo intirely and exactly preſerved, as if it had been yet alive; as alſo a rare necklace of amber beads, which were made of ſeven ſorts of amber, that reſembled ſpeckled marks of all variety of colours, as black and white, black, white and red, white, yellow, and gray, &c. together with other curious pieces of amber of all varieties of colours, as ſome milk-white, called Carbidge amber, and ſome of brimſtone-colour, and ſo of all varieties of whites and yellows both opake and tranſparent. He related, that he had ſeen ſeveral other varieties exceedingly curious.

He gave a farther account of the phoſphorus of BRANT, which he called *Brande Brant*, becauſe firſt invented by Dr. BRANT, though claimed by KUNKELL and KRAFT. And he ſaid, that Dr. BRANT had affirmed to him, that he knew how to prepare a ſhining ſubſtance as well out of vegetable as out of animal or mineral ſubſtances, particularly wine, urine and mercury; but that he had not diſcovered to Sir ROBERT the ſeveral ways and methods, which he uſed for making them.

Dr. GALE related, that there had lately happened a very ſtrange accident to a river in Yorkſhire called Burr near Maſſam, which was that all the fiſh in the ſaid river for many miles to the entrance into the ſea were poiſoned or killed; the reaſon of which was not known, but ſuppoſed to be the breaking out of the earth of certain mineral waters; and ſo much the rather, becauſe it is well known, that there were many mines of lead and coals not far diſtant from it.

Sir JOHN HOSKYNS obſerved, that quick lime thrown into water would poiſon the water ſo as to kill all the fiſh in a pond.

Mr. HOUGHTON produced and read a letter of Dr. BEAL about earthquakes; as alſo about the phoſphorus propoſed after a way experimented by Mr. BOYLE. Mr. HOUGHTON was deſired to give a copy of this letter to the Society.

A letter of Signor NAZZARI dated at Rome 7 Decemb. 1680. was read; and it was deſired, that Dr. GALE would continue the correſpondence with him.

Dr. GALE gave ſome account of a book lately publiſhed by Mr. BURNET of Cambridge [l] concerning an hypotheſis to ſolve all the phenomena of NOAH's flood conſonant to the ſcriptures, the writings of the antients, and the Carteſian philoſophy; and the doctor was deſired to bring in an account of it to be printed in the *Philoſophical Collections* [m].

[l] Intitled *Telluris Theoria ſacra*, London 1681. in 4to.

[m] An account is given of that book N°. 3 p. 75. Decemb. 10, 1681.

Sir

Sir THEODORE DE VAUX promiſed to communicate a method of ſtaining amber by ſinking in of any colour and with any figure, by which the animals in amber might be curiouſly imitated.

Mr. HOUGHTON produced a paper of the byſſus, or a kind of ſilk-cotton; and deſired, that the Society would conſider of what uſe it might be in trade, ſince great quantities thereof might be had at very reaſonable rates.

Mr. ASTON returned *Redi del Occhiale*, and gave this account of it, that the author's deſign was to prove, that a Florentine about 400 years before had found out the uſe of ſpectacles, upon the hearing, that ſome other perſon had before that had ſuch an invention.

Sir ROBERT SOUTHWELL remarked, that GALILEO invented teleſcopes upon much the like occaſion of hearing, that another perſon had invented them.

February 16, being Aſh-Wedneſday, the Society did not meet.

February 23, Sir. JOHN HOSKYNS vice-preſident in the chair.

The minutes of the 9th inſtant were read.

Upon diſcourſing concerning the ſtaining of amber, wood, and ſeveral other ſubſtances, Dr. CROUNE affirmed, that the black ſtain of wood uſed for coaches was obſerved to rot the wood, and on that account began to be diſuſed in coaches.

Upon the occaſion of diſcourſing about the phoſphorus produced at a former meeting by Sir ROBERT SOUTHWELL, Dr. CROUNE related ſome obſervations of his own about the ſhining of a clean ſhirt, when put on very warm and rubbed with his hand: that he had often tried it, and never found it to fail.

Of all fiſhy ſubſtances, that ſhined, the eggs of a lobſter, that had been boiled, were aſſerted to ſhine the ſtrongeſt.

Upon diſcourſing of REDI's tract about ſpectacles it was conceived, that ROGER BACON might be the firſt inventer of them, ſince he had before the time mentioned by REDI deſcribed them, as appeared from his writings.

A paper ſent in by Sir ROBERT SOUTHWELL from Mr. CRISP at St. CHRISTOPHER's was read, wherein he affirmed, that having followed the directions ſent him from the Society for fitting his barometer, he found, that it had not varied then upon any change of weather. It was hereupon conceived, that he had failed in the making of his trials.

Dr. CROUNE remarked, that the barometer in Barbadoes varied but little.

Mr. HOOKE acquainted the Society with his obſervation on the hight of the mercury

mercury on the 7th of January preceding, when, according to a paper, which he ſhewed, the three ſuns and ſeveral rainbows appeared in Sweden. Mr. HOOKE's obſervation was, that the mercury at that inſtant ſtood higher than ever he had remarked it to do before, though he had conſtantly taken notice of it for near twenty years: that accordingly he had cauſed Mr. HUNT at that time to take notice of it, and meaſured it, though he knew nothing of the phænomenon in Sweden till the laſt week.

Dr. CROUNE brought in the ſeeds ſent from Signor BOCCONE, part of every ſort of which Dr. TYSON was deſired to ſend to Dr. PLOT at Oxford to be ſown in the phyſic garden there.

Mr. HAAK preſented to the Society a book intitled *Electorale Saxonicum: authore Tobia Bentelio*, printed at Dreſden in 1671.

He delivered in a paper of Mr. HEINSIUS, which contained a catalogue of all thoſe perſons and authors, who had written concerning amber. Sir JOHN HOSKYNS took this paper to peruſe, and to return it at the next meeting.

Mr. HOOKE preſented to the Society Dr. PAPIN's engine for boiling bones, &c. which the doctor had left for the uſe of the Society. It was opened, and all the ſeveral parts of it explained by Mr. HOOKE, together with the method of fitting and uſing it for boiling, &c.

It was deſired, that ſome trials ſhould be made with this engine at the next meeting.

ROGER MEREDITH, M. A. profeſſor of civil law in Greſham college, was propoſed candidate by Mr. HOOKE.

March 2, the preſident in the chair.

Sir JOHN HOSKYNS gave an account of the Italian book intitled *Prattica minerale trattato del Marco Antonio della Fratta*, the ſubſtance of which he promiſed to put into writing againſt the next meeting.

The preſident gave an account of REDI's and BARTOLI's books, which account he promiſed to put into writing againſt the next meeting.

He acquainted the Society with an obſervation, that he had formerly made about the motion of the ſuperficies of undulating water, which he had taken notice of by the motion of a cork floating in it; and ſaid, that the cork did not keep exactly riſing in a perpendicular line, but had alſo a lateral motion, the compoſition of which two motions together made the cork move in an ellipſis.

He remarked, that ESCHINARDUS had demonſtrated, that the beſt figure for a ſpecular burning glaſs was a ſpherical concave, which was much better than a parabolical concave. He

He alſo gave an account of ESCHINARDUS's way of graduating and adjuſting thermometers; as Mr. HOOKE likewiſe did of the method of adjuſting thermometers by a ſtandard, according to which all that were made by Mr. RICHARD SHORTGRAVE were adjuſted; a ſhort account of which Mr. HOOKE had formerly publiſhed in his *Micrographia*.

Part of a letter of Dr. PAPIN to Dr. CROUNE dated at Antwerp 1 March 1680/81, N. S. [a] was read, wherein he mentioned his having, before his departure from London, left at Mr. HOOKE's lodgings his engine for ſoftening of bones, &c. to be preſented to the Society; and his deſire and readineſs to ſerve the Society in the places, where he ſhould reſide.

An experiment was made in Dr. PAPIN's engine, wherein were put pieces of ivory, horn, and tortoiſe-ſhell; all which were in about the ſpace of half an hour reduced to ſoftneſs; the tortoiſe-ſhell to the ſoftneſs and pliableneſs of ſhoe-leather or tanned leather, the ivory to the conſiſtence of old Chedder cheeſe, and the horn to the ſoftneſs and pliableneſs of pretty ſtiff tanned leather.

March 9, Dr. HOLDER in the chair.

The minutes of the preceding meeting were read.

Sir JOHN HOSKYNS's account in writing of the *Prattica minerale* was read.

Hereupon were occaſioned ſeveral diſcourſes about authors, who had written concerning mines; and particularly LAZARUS ERKAR, who was ſaid to be very much eſteemed for his knowledge and diſcourſe on that ſubject; but whoſe book being in high Dutch was underſtood by few in England. It was therefore moved, that ſome endeavours ſhould be uſed to get it tranſlated into Engliſh. Mr. HENSHAW ſaid, that he had the book by him, and that he would lend it to any perſon, who ſhould be willing to tranſlate it. Upon which Mr. HOOKE was deſired to peruſe it, and to give what aſſiſtance he could in the tranſlation, which he promiſed to do.

Dr. ALLEN propoſed, that a trial might be made with Dr. PAPIN's engine, whether coral and talc boiled well in it would be reduced to a ſoftneſs; which was accordingly ordered to be done.

Mr. HOOKE delivered in a German book, which he had received from Mr. HENSHAW, being an account of the appearances of the comet before and after its conjunction with the ſun. This was ſent by Sir PETER WYCHE from Hamburgh as a preſent to the Society. It was deſired, that ſome account of this book might be given in to the Society.

Dr. GALE preſented two letters to himſelf, one from profeſſor STURMIUS dated at Altorf 10 Febr. 1680/81, [b] concerning the obſervatory to be ſet at Nuremberg;

[a] Letter book vol. 8. p. 156. [b] Ibid. p. 155.

which

which was read: The other from Mr. HEVELIUS, dated at Dantzick 17 January 1680/81 N. S.[p] concerning a comet, and the occultation of Palilicius or Bull's Eye by the moon, was referred to the next meeting.

The experiments made with Dr. PAPIN's boiling engine were in order to examine the power of it in softening beef-bones and wood: But though the fire was urged so long till a drop of water would evaporate in three seconds of time; yet upon suffering the engine to cool, and then opening it, and examining the substance, it was found, that neither the wood nor bones were considerably altered in their hardness.

March 16, the President in the chair.

The minutes of March 9 were read, and several parts of them discoursed of.

Mr. JOHN ROGERS, chaplain to the earl of Berkley, was proposed candidate by Dr. HOLDER.

Mr. HOOKE presented from ROBERT WOOD, LL.D. one of his almanacks put into a gilt frame for the use of the Society, and another to the president.

Upon discoursing concerning the translation of LAZARUS ERKER into English, Dr. HOLDER remarked, that this was actually done by Sir JOHN PETTUS; but that his translation was not printed, because the booksellers were unwilling to undertake it. It was therefore thought, that the best expedient to have it published would be to print it at the translator's charge, and to procure subscriptions for the taking off a considerable number of copies. Dr. HOLDER was desired to get from Sir JOHN PETTUS, then in the Fleet, a sight of the said translation, and to discourse with him concerning this expedient for publishing it; and to acquaint the Society with the result of it.

Dr. PELL mentioned, that he had translated the greatest part of ERKER's book into English, but had not completed it, finding great difficulty to understand the mineral terms of art. And that for the doing that work, as it ought to be done, great care and skill were requisite, because that in such trials the greatest nicety is often very necessary, since the omitting or varying of some little, and perhaps not otherwise observable, circumstance frequently made desired effects to be produced or not produced; which was sufficiently known to such, as had made experiments in chemical matters. He instanced in the way of making verdigrise of the husks of grapes pressed and bits of copper, affirming, that the bits of copper being mixed with the said husks dry would be turned to verdigrise; but if mixed with the husks wet would produce none at all. This was confirmed by the opinion of Mr. BOYLE in one of his books.

Mr. HOUGHTON proposed, that it might be tried, whether there could not in England be found out the way of making jessamine gloves by the help of the

[p] Letter-Book, Vol. viii. p. 151.

white narciſſus flowers, or daffodils; for that he had been informed, that ſuch a thing had been done.

The preſident mentioned, that he had known oil of jeſſamine made in England with jeſſamine flowers by packing up the gloves firſt oiled with oil of ben or of almonds, and mixing a layer of jeſſamine flowers.

He acquainted the Society, that Mr. MERCATOR had lately ſhewn the king a new way or projection of maps uſeful for ſeamen; but did not mention the particular method of it.

Mr. HOOKE ſaid, that Mr. MERCATOR had been with him to diſcover to him his projection; but that he was not willing to underſtand it from him, in order that when his own, which he already diſcovered to the preſident, ſhould come out, it might not be thought, that he had taken any part of Mr. MERCATOR's invention.

Mr. HOOKE produced a paper, which he had procured from Mr. CLUVERUS, who had taken the pains to peruſe JOHN HENDRICHT VOIGT's book called, *Cometa matutinus et veſpertinus*, and had made an extract of the ſame; which was read.

This gave occaſion to ſeveral diſcourſes about the comet.

Mr. HENSHAW's letter to Dr. GALE was read, and the doctor was deſired to return an anſwer to it.

The experiments tried with Dr. PAPIN's engine were with coral, talc, oiſter-ſhells, lobſter-ſhells, and ſhrimp-ſhells; none of which, though were urged very long with a ſtrong fire, were any way ſoftened by the operation.

March 23, at a meeting of the COUNCIL were preſent,

The Preſident in the chair.

Mr. COLWALL	Mr. PERRY
Mr. HILL	Dr. GALE
Mr. ASTON	Mr. HOOKE
Mr. HENSHAW	

Upon conſideration, that there was a piece of ground at Chelſea-college, lying along the ſide of the Society's field, to the free enjoyment of which ſome interruption had been given, and ſome objections made, as if the tenants had a common right of coming upon that piece of ground to dry their hay; Mr. COLWALL and Mr. HOOKE were deſired to diſcourſe with Mr. CHENEY upon that point, and to find, if there were any reaſonable cauſe for this pretence, and to make report to the Council what Mr. CHENEY's ſenſe was of this affair; upon which, farther advice ſhould be taken by the Council, Mr. HENSHAW having informed

formed them, that clay had been dug in the paſture by permiſſion of Mr. CHENEY, Mr. COLWALL and Mr. HOOKE were likewiſe deſired to diſcourſe with Mr. CHENEY upon that point.

Mr. HENSHAW was deſired to employ ſome perſon in the country to mound the ground before the college with a very ſufficient mound and ditch of earth, and a plain gate and poſt, the charge to be defrayed by the Society; and if he ſhould hear of any tenant, who ſhould offer a reaſonable rent from year to year, till the Society ſhould have any better offers for a longer leaſe, or other uſe of the ground and building, that he would make a report to the Council.

He was farther deſired to ſpeak with the Churchwardens of Chelſea to fill up the pit, in which they had dug gravel, according to law.

Mr. HOOKE and Mr. ASTON were deſired to go to Mr. LANE, and give him a fee to peruſe all the Society's writings, and to make an orderly abſtract, eſpecially of thoſe relating to the title to Chelſea-college and land; and that thoſe writings be then orderly placed, according to the ſtatutes, in the cheſt, together with the other writings in Mr. HILL's hands concerning the fee-farms; and that Mr. LANE be aſked, whether any of the writings be neceſſary to be inrolled; and that it be accordingly done, if he ſhould adviſe it.

Mr. HUNT was ordered to make a good and perfect ſurvey and map in vellum of the lands in Chelſea.

The catalogue of the books of the Society being now finiſhed, it was thought neceſſary to look over all the orders concerning the library, and to regiſter them, in order that a ſtatute might be formed out of them, to be entered in the ſtatute-book: And Mr. PERRY was deſired to take Mr. HUNT, and direct and employ him from day to day to aſſort the books; and Mr. WICKS to write out tables upon card paſt-boards to be affixed to the outſide of the preſſes.

The queſtion being put, whether a printer ſhould be choſen for the Society, and divers objecting, that it was rather prejudicial than otherwiſe to the Society, it was carried in the affirmative; but ſo that the debate might be reſumed, if new reaſon ſhould offer to the contrary. The conſideration of the perſon was deferred to the next Council.

At a meeting of the SOCIETY on the ſame day, the preſident in the chair:

The minutes of March 18 were read, and upon diſcourſing concerning mines, it was affirmed, that the laws of the miners in Derbyſhire were printed long before by one Mr. THOMAS JOHNSON, who was now a clerk of the New River Company; the title of which book is, *The Barmoot Court.*

Upon diſcourſing farther concerning the jeſſamine perfume, Mr. HENSHAW obſerved, that he had the way of making it, which was, that the gloves to be

perfumed were firſt oiled with oil of ben, that had been firſt ſtratified with jeſſamine flowers three times repeated, and then the gloves were ſtratified with jeſſamine flowers.

Mr. HERBERT mentioned, that he had known it done by only ſtratifying the gloves dry (without oiling them) with the jeſſamine flowers.

Dr. CROUNE related, that having had a veſſel of orange flowers pickled brought over hither, he had diſtilled them, and found them to yield a great quantity of ſpirit or oil: And that he had divers times pickled peaſe-leaves, and afterwards diſtilled them, and found them to yield very much ſpirit, and ſome oil.

Mr. HOUGHTON related, that Monſ. CHARRAS's way of extracting the eſſence from jeſſamine flowers was to lay the flowers on a flannel blanket oiled with oil of ben.

Dr. CROUNE ſaid, that the ſame way was in the *Pharmacopœia Auguſtana* of Zwelfer; but that ſome, inſtead of a blanket, made uſe of cotton oiled as before.

Mr. HENSHAW moved, that it might be urged, whether the ſcent of the honey-ſuckle might not be extracted the ſame way, and that of ſeveral other curious-ſmelling flowers.

The preſident obſerved, that honey-ſuckles, violets, and ſeveral other fragrant flowers loſe that fragrance, if any ways bruiſed.

On diſcourſing about the laſting and ſtrength of ſome ſcents, Dr. CROUNE affirmed, that having made uſe of the point of a knife for taking ſome civet, which was very good, out of a box, he found the knife to retain that ſmell above ten years after, though he had made much uſe of the knife, and had often whetted it.

The preſident obſerved, that the Chineſe were ſo ſkillful in perfuming, that he had found a China cabinet to have in every drawer of it a diſtinct perfume, which he conceived to be mingled or incorporated with the hard varniſh, ſince it was varniſhed both within and without.

Dr. CROUNE was of opinion, that they were all made out of one gum by mixture of ſome other ſubſtance with it. But Mr. HENSHAW ſuppoſed, that they might be rather made by the natural ſmell of ſeveral ſorts of wood, for that thoſe countries afford great varieties of ſweet-ſmelling woods.

Sir CHRISTOPHER WREN now ſomewhat explained Mr. MERCATOR's new projection for maps for the uſe of the ſeamen, *viz.* that it was a certain projection of the ſurface of the globe upon a plain parallel to the plane of the æquator: That the pole was the centre; and the parallels concentric circles; the meridians ſtrait lines paſſing through the pole or centre; all which are common with ſe-

veral

veral other polar projections already known and used: But the singularity of this was, that the distances of the parallel circles were proportioned according to the proper spreading of the meridians somewhat of the nature of the chart of Mr. WRIGHT (commonly, but falsly, called MERCATOR's chart) to which he had a certain scale appropriated so, as that he could easily measure distances.

Sir ROBERT SOUTHWELL's present, delivered in at the last meeting by Mr. HOOKE, of a quantity of Dr. KUNKELL's phosphorus (the receit of which Sir ROBERT had communicated to the Society some time before) was now examined, a glass having been prepared for it, according to the order of the last meeting; and by many trials this phosphorus was found to be much the same with that which KRAFT had some years before shewed to Mr BOYLE and several other persons. But it was remarkable, that it wanted some small quantity of fresh air to make it shine; and besides, that shaking and heat were very conducive to that effect; that it emitted a perfect flame and a kind of smoke, but had no manner of sensible heat.

An experiment was tried in Dr. PAPIN's engine with barley covered with water, which after above an hour's boiling was reduced to a very thick pulp, it having very much opened and loosened the body of it, so that the tincture or strength of it might be extracted in water.

1681. *March* 30, the president and vice president being absent, Mr. HENSHAW was desired to take the chair.

The minutes of the preceding meeting being read, several matters were discoursed concerning the sorts of perfumes, and the way of making, compounding, and using them: And Mr. EVELYN and Mr. HENSHAW both said, that they had all Sir RALPH HOPTON's receits for making and using of great variety of very excellent perfumes.

Mr. EVELYN farther affirmed, that the present duke of Norfolk had a very large collection of receits of that kind.

Mr. HENSHAW related, that the way of making jessamine oil was to slit almonds or ben nuts, and then to stratify them three times with fresh jessamine flowers; whereby the oil of the nut would be highly impregnated with the scent of the flowers, and afterwards pressing out this oil, therewith to rub the gloves to be perfumed; and then to stratify them with fresh jessamine flowers, which will increase the smell.

Mr. EVELYN said, that the same might be done by cotton dipt in the oil of ben, and laid within sieves, such as the apothecaries use for their powders, the cotton being laid upon one hair-cloth, and the flowers on another, and the whole included from the air by the two outermost leathern sieves.

With regard to the offence, which perfumes give to some women, Mr. HENSHAW

SHAW was of opinion, that there was ſomewhat peculiar in the air of England in that reſpect; for that it is obſerved, that ladies in Spain and Italy uſe the higheſt perfumes without the leaſt offence; whereas the contrary is very remarkable here. And he added, that he knew a lady, who, when ſhe firſt came to England, uſed the higheſt perfumes with great delight, and wondered with ſome diſdain at the nature of Engliſh women, who ſuffered much prejudice by them: But having lived here ſome time, ſhe began to hate them as much as ſhe had valued them before, as well for the ſmell itſelf as for the effects

Dr. KING relates from his own experience, that roſe leaves beaten to a conſerve, and then dried in an oven, would preſerve the ſcent all the year.

For preſerving them alſo, they are uſually beaten with ſalt like a conſerve, and ſo kept all the year in a China or other earthen pot or jar, which being at any time ſtirred with the finger would perfume a room.

Mr. HENSHAW related a way of immediately making hippocras, by mixing double-refined ſugar with one part of good canary and two of white wine; and then dropping in ſome drops of ſpirit of wine highly impregnated with ſpices.

He alſo affirmed, that the higheſt eſſence of roſes and ſome other flowers was made by highly impregnating rectified ſpirit of wine with the dried leaves of thoſe flowers.

The way of making oil of cinnamon and oil of rhodium was related to be * * *[1].

After the diſcourſe was ended, the experiment was tried for finding the reſiſtance of the air to bodies moved through it; and how much longer a body would continue its motion in an evacuated veſſel than in one filled with air.

To this purpoſe a pendulum was hung or fitted into a large receiver or veſſel of glaſs, ſo as by moving the glaſs it might be put into motion. Then the air was very well exhauſted out of it by the air-pump, and kept out by a ſtop-cock: Then the compariſon was made by the keeping account how long the ſame pendulum continued its motion in the veſſel, when exhauſted, and how long in the ſame veſſel, when filled with air.

April 6, the Society did not meet.

April 13, at a meeting of the COUNCIL, were preſent,

The Preſident,

Sir JOHN LOWTHER	Mr. HENSHAW
Sir CYRIL WYCHE	Mr. HILL
Sir THEODORE DE VAUX	Mr. ASTON
Mr. CREED	Mr. HOOKE.
Mr. PERRY	

[1] This minute was left unfiniſhed in the journal, Vol. vii. p. 9.

Mr.

Mr. HILL reporting, that he had an acquaintance of his, who was a friend of Mr. GREEN, he was desired to speak with his acquaintance to treat with Mr. GREEN about procuring part of the meadow ground lying between Chelsea-college and the Thames, and to report his proceedings to the next meeting of the Council.

It was resolved, that the president, Sir JOHN LOWTHER, Mr. COLWALL, Mr. HENSHAW and Mr. HILL, discourse with Mr. CHENEY about the Society's acre of ground, lying next the meadows on the Thames, the possession of which had given the Society some disturbance.

It was ordered, that the small charter-books of the Society's statutes and charters be carried to Mr. LANE; as also the two following queries;

1. Whether the Society may demolish any part of the building at Chelsea now standing?

2. Whether the Society may sell, dispose, or any ways alienate any part of the said materials?

It was ordered, that Mr. WICKS do make a copy of all the orders, that had been made concernig the library, to be delivered at the next meeting of the Council.

Mr. PERRY presented the council with three printed catalogues of the library of the Society[q]; for which, and his care and great pains in composing the same, he had the thanks of the council.

Dr. GALE was desired to speak to Sir WILLIAM DUGDALE, in order to procure the copy of dooms-day book now in the Herald's-office.

Upon resuming the debate, whether a printer should be chosen for the Society, it was resolved in the affirmative; and Mr. RICHARD CHISWELL was unanimously chosen.

It was ordered, that Mr. CHISWELL's charter be made by Mr. WICKS against the next meeting: And

That some catalogues of the library, well bound at the charge of the Society, be presented as follows;

To the Duke of NORFOLK,
The Earl of ARUNDEL,

[q] This catalogue was printed at London in 4to. under the following title: *Bibliotheca Norfolciana; sive, Catalogus libb. manuscriptorum et impressorum in omni arte et linguâ, quos illustriss. princeps, Henricus Dux Norfolciæ, &c. Regiæ Societati Londinensi pro scientiâ naturali promovendâ donavit.*

The

The Lord THOMAS HOWARD,
Mr. CHARLES HOWARD,
Mr. EDWARD HOWARD.

The ſaid five books to be left with Sir THEODORE DE VAUX.

At a meeting of the SOCIETY, on the ſame day, the preſident in the chair:

The minutes of the laſt meeting were read.

Several debates aroſe about the uſe and abuſe of ſnuff-powder, and ſeveral inſtances mentioned of the bewitching cuſtom of taking ſnuff, tobacco, &c.

Dr. HOLDER related, that having kept ſome roſe leaves ſo long till they were eaten up by the inſects, he found in the veſſel a great quantity of the excrements of thoſe inſects, which having kept in a box, he found them to give a better and ſtronger ſmell of the roſe than the leaves themſelves did.

Mr. HENSHAW delivered in ſome obſervations on the comet made at Boſton in New England, ſent to him from Mr. BRAITHWAYTE; which were read.

Sir THEODORE DE VAUX preſented to the Society, for their library, the works of GALILEO, printed in Italian, and finely bound in three volumes.

Mr. HOUGHTON preſented a large piece of cryſtal fairly cut, being an exact model of the grand duke of Tuſcany's diamond; which model was preſented by the grand duke himſelf to Dr. DU MOULIN. Mr. HOUGHTON had procured this of Mr. SMITH, the writing-maſter of Chriſt's Hoſpital.

There being a very full meeting, the Society proceeded to the election of the ſeveral candidates, who had been formerly propoſed; and the following were elected members;

ROBERT WOOD, LL.D. maſter of the mathematical ſchool founded by the king in Chriſt's Hoſpital.
Sir ANTHONY DEANE, Knt.
HUGH CHAMBERLAYNE, M. D.
Sir JOHN PERCIVAL, Bart.
ROGER MEREDITH, M. A. profeſſor of the civil law in Greſham College.
Mr. ROGERS.
Mr. SALISBURY.
Dr. RUSSELL.

Mr. JODOCUS CRULL was propoſed candidate by Dr. HOLDER; and JEREMY SAMBROOKE, Eſq; by Mr. HOUGHTON.

April 20, Mr. HENSHAW in the chair:

The minutes of the laſt meeting were read and diſcourſed of.

RICHARD WALLER, Eſq; was propoſed candidate by Dr. CROUNE.

Mr. HOOKE read a long diſcourſe about the nature of light and luminous bodies [f].

Mr. AUBREY preſented for the repoſitory a piece of iron ore, of which he promiſed to give an account in writing.

He produced a letter of Mr. JOHN ROGERS, dated at Chippenham March 14, $16\frac{8}{7}\frac{0}{1}$, containing the following paſſage:

" The prodigious fog in the Temple was between three and four of the clock in " the afternoon the 27th of November 1674; and the extreme hot time in Lon- " don was from the 10th of June to the 19th, 1676. Theſe things for my own " curioſity I entered in my book."

The experiment of fire burning in a box was exhibited and explained; and it was ſhewn how it was pertinent for the explanation of the theory of light in the abovementioned diſcourſe of Mr. HOOKE.

April 27, at a meeting of the COUNCIL were preſent,

The PRESIDENT	Dr. KING
Sir JOHN HOSKYNS	Mr. ASTON
Sir JOHN LAURENCE	Mr. PERRY
Mr. HILL	Mr. HOOKE.
Mr. COLWALL	

Mr. HILL communicated a letter of a friend of his, who was deſired to diſcourſe Mr. GREEN, to find, if he would part with his meadow between Chelſea-college and the Thames; and from the letter it appeared, that he ſet it at 600 l. being ten acres. It was thought convenient, that the preſident ſhould try whether Mr. GREEN would part with half an acre, ſo much as would be neceſſary to make a way; and the rather, becauſe there appeared deſigns of other perſons, which would turn to the prejudice of the college.

Sir JOHN HOSKYNS was added to the committee appointed to diſcourſe with Mr. CHENEY concerning the way by the meadows, Mr. CHENEY having offered, that at the next meeting he would give the council fuller ſatisfaction in what he aſſerted, that the ſaid way did not belong to the Society.

Sir JOHN HOSKYNS was deſired to peruſe the ſtatute relating to the printer of the Society, and to draw up another patent for Mr. CHISWELL, in which the

[f] See his life by Mr. WALLER, p. 23. and his *Poſthumous Works*, p. 71. *& ſeqq.*

powers given the printer may be leſs diſadvantageous to the Society, than (as by experience had been found) the patent given formerly to MARTYN and ALLESTREE appeared to be; a copy of which patent Mr. WICKS was directed to carry to Sir JOHN HOSKYNS.

A propoſition being made by one Mr. THOMAS HUTTON to become tenant for Chelſea-college, in order to erect there a manufacture of paper, it was referred to a committee conſiſting of the preſident, Sir JOHN HOSKYNS, Mr. HILL, and Mr. HOOKE, to meet that evening.

Sir JOHN HOSKYNS was added to the committee appointed 23 March, to diſcourſe Mr. LANE about the writings of the Society, and to inquire of him or any learned in the law concerning the right of copies, upon Dr. GALE's mentioning, that Mr. CHISWELL would reprint the *Hiſtory of the Royal Society*, and other works, if he knew where the title to them were.

Dr. GALE having informed the council, that there was an excellent library in the kind, which was one Mr. SMITH's [t]; and which he believed the widow would be willing to depoſit with the Society, or at leaſt upon very eaſy terms; Dr. GALE was deſired to proceed in his inquiry, according to his direction, and to make a farther report.

Dr. GALE having mentioned, that the Earl of BERKLEY's books were probably not yet diſpoſed of; he was deſired to inquire farther, and acquaint the preſident.

The preſident deſired Mr. HILL to give in a paper concerning the ſtate of the income of the Society; how the ſalaries were diſpoſed; and what the other expences had been of late years; and alſo a medium of the payments, how much they had amounted to yearly for the laſt five or ſeven years, in order the better to ſtate and proportion the expences.

At a meeting of the SOCIETY on the ſame day, the preſident in the chair.

The minutes of April 20th were read: whereupon the preſident related, that he had ſeveral times obſerved, that prawns would ſhine in the dark, whilſt they were yet freſh and new, and before they began to decay and taint.

Mr. HOOKE read another diſcourſe concerning the nature, cauſe, and effect of light and luminous bodies, wherein was an enumeration of all ſuch bodies, as afford light, and the manner how they might be made luminous [u].

The experiments of two pendulums, the one incloſed in a long glaſs body, out of which the air was exhauſted; and the other in juſt ſuch another glaſs body with

[t] Mr. RICHARD SMITH, formerly ſecondary of the Poultry Compter, who died at London 26 March, 1675. His library was ſold by auction in May and June 1682.

[u] See his Poſthumous Works, p. 71. *& ſeqq.*

the air included, were tried; and it was obſerved, that though the motion of the pendulum in the exhauſted receiver continued very much longer, and ſo larger than that of the pendulum in the receiver unexhauſted; yet the motion of the pendulum therein alſo did by degrees decay, and was at laſt wholly loſt; ſo that though the air ſeemed to be the only body, that would ſtop the motion of the pendulum moving freely in it, yet there was a neceſſity of ſuppoſing ſome other body to be contained in the receiver exhauſted of air; which muſt produce that effect; unleſs it ſhould be ſuppoſed, that motion without any impediment would ceaſe and be loſt.

Dr. GALE read an account in Latin of Mr. BURNET's book, intitled *Telluris theoria ſacra*, which was diſcourſed of and well approved of as to ſome particulars of the theory, though the proof and management thereof could not be judged of without a peruſal of the diſcourſe itſelf.

It was deſired, that the experiments for the next meeting might be about the explication of light.

Mr. WALLER, Mr. SAMBROOKE, Mr. BRADDOW, Mr. GOODWIN and Dr. JORDIS were elected fellows.

May 4, at a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN preſident,
Sir JOHN LOWTHER
Dr. KING
Mr. HILL
Mr. ASTON
Mr. HOOKE.

Mr. HILL reported from the dean of Canterbury[v], that the books, which, it was hoped, might have been obtained from the Lord BERKLEY[x], were certainly diſpoſed of, and legally ſettled; and of that he had ſpoken to his lordſhip, who ſeemed ſorry, that he had not been ſooner put in mind of it, before he had been engaged.

Mr. HILL brought in an account in general of the income and charges of the Society for ſome late years, as he had been deſired, in order that the council might conſider of new modelling the affairs and expences of the Society. After ſeveral diſcourſes the debate was adjourned till the next meeting of the council, and the preſident was deſired to bring in ſome propoſitions in writing.

Mr. HUNT was ordered without farther delay to ſurvey the land at Chelſea-college (as he had been before ordered on the 23d of November 1680) to the end, that the tenants might have their leaſes ſealed accordingly: and Sir JOHN HOSKYNS, Mr.

[v] Dr. TILLOTSON.

[x] GEORGE Earl of Berkley, who in 1682 gave to the library of the clergy of London in Sion college a very valuable one left to his lordſhip's diſpoſal by the will of Sir ROBERT COOKE, who had collected it. See Mr. READING's State of Sion library, p. 36.

HENSHAW, and Mr. HOOKE were appointed a committee to cauſe draughts to be made of the leaſe to THOMAS FRANKLYN of the arable and meadow, according as Mr. HENSHAW had formerly treated with him, viz. in November preceding; and they were deſired to expreſs truly the names and boundaries, according to the original papers of the Society, in which (after the ſurvey made) they were requeſted to inſpect the words of the grant and other papers neceſſary. And the ſaid committee were to have copies of this order, and make their report thereupon at the next meeting of the Council.

At a meeting of the SOCIETY on the ſame day, Sir CHRISTOPHER WREN preſident in the chair.

The preſident gave leave to Mr. GREGORY, a nephew of Mr. GREGORY the profeſſor of mathematics at Glaſcow, to be preſent at this meeting.

Mr. MERIDITH and Mr. RICHARD WALLER ſubſcribed the obligation, and were admitted fellows.

Mr. JOHN ADAMS preſented his propoſals for making an actual ſurvey of England by meaſuring the bounding line, the diſtances between places both in the road and the ſtrait lines, by taking the latitudes and angles of poſition; deſiring the directions and encouragement of the Society in this undertaking.

It was referred to Sir JOHN HOSKYNS, Dr. PELL, Mr. HILL, and Mr. HOOKE, to conſider of the ſaid propoſals againſt the next meeting.

Mr. HOOKE read another diſcourſe about his theory of light.

The experiment about the motion of the pendulum *in vacuo* and in the common air was diſcourſed of; and it was queried, what ſhould be the cauſe of the ſtay of the motion of the pendulum *in vacuo*, ſince there was no ſenſible body to hinder its free motion. It was ſuppoſed by ſome to be the weight of the ſtring, as had been alſo ſuppoſed by GALILEO; by ſome to be the bending of the ſtring.

Mr. HOOKE ſuppoſed it to be from a body of a middle nature between æther and air, the motion, gravitation, and denſity of which he conceived alſo to be the cauſe of divers of the phænomena, which he ſhould have occaſion to diſcourſe more of in his farther inquiries about light.

This, he affirmed, would be likewiſe uſeful in the explication of the motions of the celeſtial bodies, as the moon and other planets.

Mr. HOOKE explained and demonſtrated a certain property in the projection of the planiſphere not taken notice of by any writer; which was to ſhew the proportion between the ſubſtances of the arches of great circles in the globe and thoſe lines projected in the planiſphere to be the ſame; and how by that means the diſtances of any two places in a map ſo projected on the pole of the world,

or the diſtance between any two ſtars in a projection of the heavens, either on the pole of the equinoctial or ecliptic, might be certainly meaſured by the help of a line of chords on a ſector, which he ſuppoſed would do all that was pretended to be done by a new projection of Mr. MERCATOR, of which, he ſaid, Mr. MERCATOR had not yet diſcovered the ground nor the demonſtration, but alledged it to be upon another principle.

The preſident was ſatisfied with the explanation and demonſtration of Mr. HOOKE; and deſired, that he would bring in his demonſtration in writing; as alſo his method of ſolving by it all ſpherical triangles, more eaſily than by the common ways.

Mr. PERRY preſented a ſmall bottle of natural balſam or balm of Gilead, the leaſt drop of which being poured upon water, he affirmed, would immediately ſpread itſelf, and cover the whole ſurface of the water.

May 18, at a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN preſident,	
Sir JOHN HOSKYNS	Mr. ASTON
Mr. HILL	Mr. PERRY
Mr. COLWALL.	Mr. HOOKE.

It was ordered, that ſeven pair of preſſes more be made to fill up the ſouth ſide of the library; and Mr. PERRY was deſired to contrive (which, it was computed, might be done) that the whole Arundel library may be contained in that ſide, and Mr. ENT's books be placed between the windows, in order to commence the library of philoſophical books on the window ſide:

That Mr. HUNT provide a ſtamp, according to direction, for the new books, and ſuch as are ordered to be bound:

That Mr. HILL, Mr. ASTON, and Mr. PERRY be a committee to inquire what books are lent abroad, and to ſend for them and diſpoſe them in the library; and Mr. PERRY to add them to the catalogue:

That obligations be printed and bound together in a book, one ſort with the penalty of ten pounds for printed books; another ſort of fifty pounds for manuſcripts; which obligations were to remain in the librarian's hands, and to be ſigned and ſealed by the borrower, and cancelled, by the librarian, when the book ſhall be returned: and

That Sir JOHN HOSKYNS, Sir JOHN LOWTHER, Mr. HENSHAW, Mr. HILL, Dr. KING and Mr. HOOKE be a committee to meet on Friday afternoon at half an hour after three, to go to Chelſea, and diſcourſe the neighbourhood there in relation to the Society's intereſt in the public way.

Mr.

Mr. HUNT brought in the map of the land belonging to Chelſea-college, which he was ordered to keep with the charter and other writings of the Society: and to attend the committee at Chelſea on the Friday following with the ſaid map.

It was ordered, that Mr. LANE be added to the committee appointed May 4, for ſealing the writings; and Mr. HOOKE was deſired to procure a meeting of Mr. LANE with Sir JOHN HOSKYNS immediately.

Dr. CROUNE reported, that Mr. ROSSINGTON had no farther deſign of taking Chelſea-college.

Mr. HENSHAW mentioned, that Mr. CLERKE near the Bowling-Alley in Chelſea was willing to become tenant for the college to the Society, and to give twenty pounds *per annum*, if the Society ſhould not agree with Mr. HUTTON.

At a meeting of the SOCIETY on the ſame day, Sir CHRISTOPHER WREN preſident in the chair:

The minutes of the preceding meeting were read.

Mr. HOOKE acquainted the Society, that on the Saturday before he had met Mr. MERCATOR at Mr. BERRY's, where, after Mr. HOOKE had told him, that he had demonſtrated the property of the planiſpherical projection for meaſuring diſtances of places in different longitudes and latitudes by the help of a line of chords on a ſector, who would ſerve indifferently for all magnitudes of that projection; and had alſo ſhewn him the manner of meaſuring thereby, which Mr. MERCATOR deſired to ſee a ſecond time; the latter very often and very poſitively affirmed, that his projection was not like that, but of another nature, and was no optical projection, but done by a certain proportion, which he had found, of dividing the meridian line, ſomewhat of the nature of Mr. WRIGHT's or MERCATOR's projection, as it was called, for the finding the rhomb and diſtance: that his projection was finite, and did not extend by the proportion of the half tangent, but was finiſhed with a circle not very far extended, which repreſented the ſouth pole: with many other expreſſions of the like nature, by which he wholly diſclaimed this projection. But that on the Monday after Mr. MERCATOR came to Mr. HOOKE's lodgings with Mr. AUBREY, where he poſitively ſaid, that his projection was no other than that of the common planiſphere; and that though he had made uſe of another way of meaſuring, yet he underſtood the way of uſing the ſector. To which Mr. HOOKE anſwered, that though he was ſufficiently aſſured of Mr. MERCATOR's ability, yet it did not evidently appear to him, that he, Mr. MERCATOR, had known either that property of the planiſphere or the uſe of the ſector in that particular, before he, Mr. HOOKE, had demonſtrated it; or that the projection, which he had ſhewn the king, was the ſame with the planiſphere, ſince he had informed Sir CHRISTOPHER WREN as well as many others, that it was not that, nor any optical projection.

Mr.

Mr. HOOKE diſſuaded Mr. MERCATOR from taking out a patent for the ſaid invention; ſince, as it could not reſtrain any perſon from making maps in that way, it having been ſo old, common, and practiſed a way of making maps; ſo, though it could, yet he aſſured Mr. MERCATOR, that he himſelf was making maps by another way, the properties of which far exceeded thoſe of the planiſpere; for which nevertheleſs he would not take the benefit of a patent, but deſired, that the uſe and benefit thereof might be free.

A diſcourſe was occaſioned about the pendulums ſtanding ſtill in an artificial vacuum: whereupon ſome conceived, that it was occaſioned by the bending of the ſtring; others from the weight of the ſtring or wire: but Mr. HOOKE anſwered thoſe objections, and demonſtrated, that it could not be either the bending of the ſtring, or the weight of any part thereof, that muſt cauſe that impediment. And upon that occaſion he acquainted the Society with a way of hanging a pendulum by a very broad and thick ſpring, which he had many years ſince invented and explained in one of his lectures in the year 1666. That he had ſince made divers clocks that way: and that he had acquainted Mr. TOMPION with it, who had alſo ſeveral times uſed it.

Mr. ADAMS was again preſent about his propoſals, with a deſign to ſhew the ſmall quadrant, that he had made for making ſhort diſtances with perſpective ſights: But the inſtrument-maker not coming till after the Society was riſen, it was ſhewn to but ſome few members, who ſtayed in Dr. POPE's lodgings.

He declared, that he had made trial by ſetting up four lights at Greenwich, each eight inches aſunder, which were not to be diſtinguiſhed at London one from another: but the four lights ſet up at London ten inches diſtance from one another were diſtinguiſhed at Greenwich by the ſights of his quadrant of fifty inches radius.

Mr. HOOKE read a tranſlation, which he had made of a paper of Sir THEODORE MAYERNE, brought in by Sir THEODORE DE VAUX, about a method of ſtaining agates. Sir THEODORE DE VAUX was deſired to communicate ſome others of his collections of Sir THEODORE MAYERNE's papers: which he promiſed to do.

Some experiments were tried in Dr. PAPIN's engine for diſſolving of ſeveral gums by heat and preſſure; and it was found, that the engine very much promoted the diſſolution, both of watry and oily gums. The trials were made with gum Arabic, gum tragacanth, gum ſanderic, and gum maſtic. The former two were diſſolved in water; the latter two in ſpirit of wine.

May 25, Sir. JOHN HOSKYNS in the chair.

The minutes of the preceding meeting were read; which gave occaſion to diſcourſe about the ways of ſtaining agate mentioned in Sir THEODORE MAYERNE's paper communicated by Sir THEODORE DE VAUX: and it was generally

cluded, that the ways mentioned in that paper were only conjectures, and not the reſult of experiments; and that there were other ways of opening the bodies of ſtones, ſo as that they might imbibe colours, than by means of ſpirit of nitre, which would rather corrode a ſtone than ſink into it. Thereupon Mr. HOOKE related, that he had been lately informed, that a goldſmith in Lombard-ſtreet had an agate by him, that had been ſo ſtained.

Dr. PLOT related, that one Mr. BIRD, a maſon of Oxford, had very much perfected the invention of ſtaining, being able, as was alledged, to ſtain in the colours very defined, without running or ſpreading; but that he could not yet find out a way of ſtaining a perfect black.

Mr. AUBREY remarked, that Sir CHRISTOPHER WREN had ſhewed him a foot-pace of white marble, which by the fall of the drops from a tallow-candle was ſtained black.

It was by ſeveral affirmed, that there were ſome Engliſh flints, which, when poliſhed, would be as beautiful as Eaſt-India ſtones: that Sir ANTHONY COPE had ſome ſuch ſtones, which he took up at Biſhop-ſtortford, which being cut and poliſhed ſeemed in their beauty, hardneſs, and poliſh even to exceed the India ſtones.

Mr. HENSHAW mentioned the ſtones of the ſame nature, which he had formerly brought from St. Alban's, and which were of as great hardneſs and beauty as thoſe of Sir ANTHONY COPE, and were to be had of any deſirable ſize.

Dr. PLOT ſhewed a flint, which had been found in an urn in Staffordſhire, the edges and ſides of which ſeemed to be cut by art as with a chiſſel, and the edge to be crenated like that of the ſide of a ſickle; which were ſuppoſed to be done by art, though which way none could conjecture, any more than they could the uſe of it, or why it ſhould be put in the urn. But ſome conjectured, that it might be the head of a dart, there having been arrows of that kind ſeen by ſome members of the Society; and that the reaſon of its being found in the urn was, that it might be buried with the aſhes of the perſon deceaſed, either as his weapon of war, or as a piece of his own art, or as a trophy.

Two experiments were tried in Dr. PAPIN's boiling engine, viz. to ſee how well and how ſoon gum lac and gum animi would be diſſolved in ſpirit of wine by the help of heat and preſſure.

June 1, at a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN preſident

Sir JOHN HOSKYNS
Mr. HILL
Mr. ASTON
Mr. PERRY
Mr. HOOKE.

The

The preſident reported his view and obſervations made at Chelſea college on the Friday preceding: upon debating of which Mr. HUNT was directed to go thither this evening to ſpeak with Mr. BROMAGE, and to Mr. FRANKLYN, to deſire his father to be preſent with the jury, when they take a view of the ſtrip of ground in controverſy between the Society and the Lord CHENEY; and to bring back an account of his proceedings therein; and to take the preſident's directions what to do farther in that affair.

At a meeting of the SOCIETY on the ſame day, Sir JOHN HOSKYNS, vice-preſident, in the chair:

The minutes of the laſt meeting were read and diſcourſed of.

JEREMY SAMBROOKE, Eſq; was admitted.

Mr. HOOKE communicated a letter to himſelf from Mr. EDMUND HALLEY, dated at Saumur, 19 May 1681; containing ſome articles of literary intelligence, and particularly an account of the books publiſhed by the Royal Academy of Sciences, with a ſhort account of Monſ. CASSINI's hypotheſis of the comet: upon which Mr. HOOKE ſhewed Monſ. CASSINI's book on that comet.

Mr. HOOKE was deſired, when he ſhould write next to Mr. HALLEY, to inquire what was become of the works of Monſ. MYDORGE,[y] which were not printed.

Mr. AUBREY mentioned, that Mr. PASCHAL had informed him, that a comet had been ſeen in the weſt the week before; and other members remarked, that in the Scots Gazette there was alſo mention made of a comet lately ſeen.

Mr SAMBROOKE obſerved, that there had been ſeen a very conſiderable comet in the Eaſt-Indies in the year 1667, of which he had the obſervations made by a Padre, which he promiſed to ſhew the Society.

A letter in Latin to Dr. CROUNE from CAROLUS A JESU, *præpoſitus generalis clericorum regularium matris Dei ſcholarum pauperum*[z], and one of the executors of Signor BORELLI, was read; in which he deſired to be informed, what number of the firſt part of BORELLI's book *De motu animalium*, printed at Rome, might be diſpoſed of in England, that ſo he might take care to ſend them; deſiring only, that returns ſhould be made to him in ſome of the books publiſhed in England.

Mr. CHISWELL was ordered to be ſpoken with on this affair.

Mr. HOOKE ſhewed a collection of obſervations of the comet made at Nurem-

[y] CLAUDE MYDORGE, born in 1585, at firſt counſellor in the châtelet at Paris, and afterwards treaſurer of France in the generality of Amiens. He died in 1647. Baillet, Vie de Des Cartes, Tom. I. p. 36. & Tom. p. 325.

[z] Letter-book, Vol. viii. p. 159.

berg, written by Dr. EIMMERT to Dr. ARNOLDUS, who communicated them to the Society; but there was not time enough to peruſe them.

Mr. HOOKE ſhewed alſo a draught of a mural quadrant made uſe of at Nuremberg.

June 8, Sir JOHN HOSKYNS, vice-preſident, in the chair:

The minutes of the preceding meeting were read.

Sir JOHN HOSKYNS ſhewed a ſpecimen of the printed ſheets and copper-cuts of a ſmall herbal, then printed by Dr. NEWTON; and gave ſome account of the work deſigned to be publiſhed by the doctor.

Dr. GALE delivered in to the Society the copy of Domes-day book, which he had received from the heralds, being the gift of the Duke of Norfolk to the Society; which was delivered to the library-keeper to be regiſtered, and ſafely kept in the library.

Mr. HOOKE gave a full account of Monſ. CASSINI's book concerning the late comets, together with ſome animadverſions on that aſtronomer's theories for explaining the motions of them.

Dr. TYSON preſented the Society with a copy of the tranſlation of Dr. SWAMMERDAM's book of the life of the ephemeron made by Mr. FRANCIS LODWICK.

Mr. HOUGHTON likewiſe preſented the Society with a ſmall treatiſe of his, intitled, *England's great happineſs.*

Mr. HOOKE ſhewed a draught ſent by Mr. SAMBROOKE of a comet, which was ſaid to be ſeen in the Eaſt-Indies in the year 1667, but not ſeen here, being far removed to the ſouth.

Mr. HOOKE explained a theory of his about light, and the manner how the eye becomes the organ of ſight, and ſeems immediately to feel the action of the luminous body, though ever ſo far diſtant, as if actually on the bottom of the eye.

June 22, at a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN, preſident,

Sir JOHN HOSKYNS	Mr. HOOKE
Mr. COLWALL	Mr. PERRY
Mr. HILL	Dr. CROUNE.

The

The preſident gave an account of his diſcourſe with the Lord CHENEY concerning the ſtrip of Chelſea-college ground lying next to the meadows, claimed by his lordſhip: and it was thereupon concluded by the council, that it would be the beſt expedient in this affair forthwith to incloſe the college-lands on the ſouth-ſide next the meadows.

Dr. CROUNE acquainted the council, that Mr. ROSSINGTON was ready to treat with the Society for Chelſea-college, and the ground lying about it, provided he might be ſecured a convenient paſſage: Whereupon the preſident informed the council, that there was a ſmall piece of ground, that lay convenient for that purpoſe, which was now to be ſold. It was ordered therefore, that the preſident and Sir JOHN HOSKYNS ſhould be deſired to take care to purchaſe it, and to treat and agree with Mr. ROSSINGTON about the college.

It was ordered, that all orders made by the preſident during his preſidentſhip ſhould continue till Chriſtmas following St. Andrew's day.

In conſideration of the propoſitions made by Mr. HOOKE for a more ſedulous proſecution of the experiments for the ſervice of the Society, and particularly the drawing up into treatiſes ſeveral excellent things, which he had formerly promiſed the world; the council as an encouragement, according to the [illegible] lities of the Society, agreed to add to his ſalary forty pounds for this [illegible] at Chriſtmas-day.

June 29, at a meeting of the COUNCIL, were preſent,

Sir CHRISTOPHER WREN, preſident,
Sir JOHN LOWTHER
Mr. HILL
Mr. COLWALL
Mr. PERRY
Mr. HOOKE.

The patent to Mr. CHISWELL to be printer to the Society being fairly engroſſed, was read and approved.

The preſident gave an account of his diſcourſe with Mr. ROSSINGTON concerning Chelſea-college, whom he found unwilling to comply with the propoſitions made him by the Society, and to propound only twenty pounds a year for the ſame. Whereupon it was reſolved not to treat farther with him about it, but to think of ſome other way of diſpoſing of it to ſome better advantage for the Society.

At the meeting of the SOCIETY on the ſame day, Sir CHRISTOPHER WREN, preſident, in the chair:

The minutes of the laſt meeting of June 8th were read, and ſome heads of them diſcourſed of.

Mention being made of the great ſtag's horns lately found in a quarry in Ireland, and preſented to the king, the preſident remarked, that he had ſeen them, and from their ſize and ſhape judged them to be the tire of a mooſe deer; and the largeſt that he had ſeen.

He related, that this animal would in a ſhort time fall into a ſcouring, and die, for want of eating graſs; and that it was neceſſary to provide moſs for its food: that its neck was ſo ſhort, that it could not reach its food without kneeling.

He related likewiſe, that the people near Hudſon's Bay live to a great age, as 130 or 140 years, without the uſe of ſpectacles; that they generally go well clad in furs, and have a mantle of furs over their ſhoulders; which being very curiouſly tanned, ſo as to be like a piece of cotton, they lie upon it in the night. The oldeſt, while they are able, run a hunting; and when they can do that no longer, deſire to die, and give themſelves up to their eldeſt ſons to be ſtrangled. After hunting, if it be winter, they chooſe themſelves a convenient place in the ſnow, where they take up their quarters that night, which they do by making a pretty deep hole in the ſnow, and covering it over head with ſkin, reſt thereon very quietly all night: but if it be the time, that the bears range (which they do till the cold forces them to go to ſleep) they trail the guts of what they have killed in hunting in the day round their cabbins at a pretty good diſtance; and having ſo done, they leave them as a bait to divert the bears from falling on them; for upon ſcenting the entrails, the bears proceed no farther, but follow the tract of the guts till they find and eat them; after which they loſe their ſenſe of ſmelling, and are not ſenſible of ſo good a booty ſo near at hand, but depart ſatisfied.

Theſe people uſed to ſtrike fire readily with flint againſt flint; but have been ſince furniſhed by the Engliſh with ſteels, which they uſe with flints.

They drink in the winter-time ſnow melted over a fire in a kettle, the bottom of which is made of a kind of fire-ſtone hollowed with flints like a tray; about the ſides of which they faſten tanned ſkins, ſo as to make the ſides or brims of the ſkillet.

Dr. Wood remarked, that the Iriſh had a way of making milk and ſome other liquids boil in a wooden veſſel; which they performed by heating of pebbles almoſt red hot, and caſting them ſeveral times into the veſſels of milk.

This occaſioned a diſcourſe about the beavers of Hudſon's Bay, and of their ſtrange ſagacity in making dams in rivers, thereby to make lakes for fiſh, ſo that the country is very full of ſuch lakes, ſuppoſed to be made by theſe dams: that the beavers ſend out colonies, when they find they have too many for one lake; who are ſaid to go and find a convenient place in the river, and make a new dam and lake, and plant about it. They in a company will fell great trees, by eating them off at the root; which being felled, they will convey them to the river, and there place them for making a dam.

Mr.

Mr. AUBREY related, that there were many true beavers in Wales.

The preſident gave a deſcription of and conjecture about the way of raiſing water in China for watering ground; which it was deſired might be farther explained.

Mr. HOUGHTON preſented to the Society, for their repoſitory, ſeveral things brought from Barbadoes; a yam, prunella, or purging nut, a cotton cod, a rock weed, a ginger root budding forth, an ear of millet, ſome Caſſava bread, and ſome Guinea pepper. It was affirmed of the cotton cod, that it breaks of itſelf with a great noiſe, when it opens.

The preſident remarked, that it was of late years found, that the blacks, who feed only on potatoes, were apt to die of the dropſy; and that therefore the planters had found it neceſſary to allow them milk and bread, which prevented it.

Sir JOHN HOSKYNS obſerved, that it was ſomewhat like an artichoke.

The preſident thence obſerved, that it was neceſſary, that all wholeſome food ſhould have oils: that moſt roots wanting oil are not of themſelves a good nouriſhment: and that in Ireland, where the people feed much on potatoes, they help themſelves by drinking milk ſoured, to make the potatoes digeſt the better. This ſour milk is called bonny clabbe.

A paper delivered in by Dr. WOOD about the phænomena of a burning glaſs was read and diſcourſed of; and the hypotheſis thereof was judged to have been formed upon ſome miſtake of the appearances obſervable in burning with it.

Two letters of Dr. WALLIS were read and diſcourſed of; the firſt containing an account of his own obſervations on the comet ſeen in December 1680, and January and February $16\frac{8}{8}\frac{0}{1}$; and the latter containing ſome phyſical obſervations[a].

A letter brought in by Mr. HOUGHTON was read, giving an account of the burning of a mountain of peat in * *.

Dr. WOOD remarked, that there was in Windſor-foreſt a place then burning of the like nature.

The preſident obſerved, that peat was made by a certain ſubterraneous plant, which grew and filled and matted up all the place: which might eaſily be diſcovered by waſhing the peat in water, and ſo clearing away all the ſand and earth, which would leave the vegetable matted and felted together.

Dr. SLARE preſented to the Society from Mr. NUKE the ſkeleton of a mouſe very curiouſly done, and promiſed to ſhew his ſkill in making the ſkeleton of any other larger animal, that ſhould be deſired.

[a] It is probably the letter to Dr. GALE, in the Letter-book. Vol. viii. p. 161, about a dried toad, and the blaſting of aſh-leaves.

July

July 6, the Society did not meet; only Signor DAVIA recommended by Signor MALPIGHI was entertained.

July 13, Sir JOHN HOSKYNS, vice-preſident, in the chair:

Signor DAVIA was preſent with his friends.

Mr. SALISBURY and Mr. THOMAS PIGGOT were admitted members.

The minutes of June 29 were read, which gave occaſion of diſcourſing farther,

1. Concerning the affinity and agreement between the ſenſes of taſting and ſmelling: whereupon Mr. COLWALL mentioned the ſtory of JOHN of Liege, who was able to follow a woman by the ſcent.

2. Concerning the way of tanning leather by the natives of Hudſon's Bay, which was extremely ſupple, and would not grow ſtiff upon drying it, after it had been wet, as moſt of our dreſſed leather is apt to do.

Mr. HOOKE mentioned the way uſed by the Indians in Virginia for tanning their leather by the help of fire, making uſe of the brains of the creature mixed with the oil of the hickery and oiſter-ſhell lime.

Mr. HOUGHTON brought in the relation of Sir JOHN NARBOROUGH's voyage through the ſtraits of Magellan to Baldivia; which relation being pretty long, the Society deſired, that Mr. HOOKE would peruſe it; and that, if it contained any thing very conſiderable, it might be tranſcribed.

Mr. MARTIN LISTER being preſent, ſhewed the Society a treatiſe of his, which he was going to print, concerning inſects, being obſervations on GOEDARTIUS's book of inſects; together with the figures of the inſects therein mentioned, curiouſly engraven in copper: which book Mr. LISTER deſired might be printed with the Society's approbation.

The Society thanked him for the pains, which he had taken on that ſubject, and encouraged him to proceed with the ſpeedy publication of his book.

Mr. AUBREY related, that he had newly ſeen a live marten at a ſhop in Cornhill; adding, that there were many of them bred in England; and that Mr. WYLDE had lately received divers ſkins of them from a tenant of his in **.

Mr. LISTER ſaid, that he had ſeen many of them in England, and that they were diſtinguiſhed from pole-cats, by their climbing of trees in the manner of ſquirrels.

Sir JOHN HOSKYNS obſerved, that he had been informed, that there were a ſort of wild pole-cats, which had a ſweet ſmell like civet.

Dr.

Dr. SLARE read part of a letter to himſelf, dated at Francfort in June 1681, from Dr. JORDIS, lately choſen fellow of the Society; and preſented alſo from him five or ſix ſmall ſtones ſhining like marcaſites, taken out of the bladder of an ox. The words of the letter were; " Inter illa, quæ Cl. V. communicanda ha-
" bebam, ſunt præſentes lapilli vel pillulæ, ut videntur, inauratæ, quarum
" præter propter centum ejuſdem formæ, magnitudinis, & coloris in veſicâ bo-
" vinâ fuere inventæ. Ex his unam vel alteram diffractam, armato microſcopio
" oculo examinatus reperi eſſe ſubſtantiam teſtaceam matris perlarum inſtar co-
" loratam, & componi ex lamellis ſibi invicem ſuperimpoſitis, ut in ipſa matre
" perlarum necnon quibuſdam veſicæ calculis conſpicitur; unde jam hic aurei
" coloris ſplendor, cum in nullis aliorum animalium calculis (ſaltem quantum
" ſcio) obſervatus, non facile penetro, niſi ad ſalium in urinis differentiam con-
" fugere liceat, quæ aureum colorem induxerit; quod confirmaretur ex parte,
" quod alchemiſtæ quidam in urinis magnum ſecretum quærant.

" Prodiit in Palitanatu ante aliquot ſeptimanas partus monſtroſus capite admo-
" dum deformi inſtar ululæ. Hujus iconem, & quid rari in uſus anatomiæ obſer-
" vatum ſit, datâ occaſione tranſmittam."

Mr. LISTER affirmed, that he had divers times obſerved the like in an ox's bladder: that he had taken out of one ox about 150; and that he had formerly ſent ſeveral of them to the Society.

Mr. HOOKE ſhewed a new helioſcope, which he had lately made, whereby the figure and true ſhape of the ſun, and the ſpots of it might be better obſerved than by any ways yet made uſe of. He explained the particulars of it.

Several experiments about the propagation of motion were prepared; but it being paſt ſeven o'clock, the Society adjourned.

July 27, at a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN, preſident,

Mr. HENSHAW	Dr. GALE
Mr. HILL	Dr. GREW
Dr. KING	Mr. HOOKE.

The Preſident, Mr. HENSHAW, Mr. COLWALL, Dr. GALE, Dr. CROUNE, Dr. KING and Mr. HOOKE were appointed a committe to go to Chelſea on the Saturday following, and to meet at the Swan-tavern there at nine in the morning to ſpeak with the Lord CHENEY about incloſing the ground of Chelſea-college next the meadows.

It was reſolved, that a legal courſe ſhould forthwith be taken for recovering the arrears of the Society; and that the preſident be deſired to ſpeak immediately to Mr. BALLARD, that it might be diſpatched.

At

At a meeting of the SOCIETY on the ſame day, the preſident in the chair:

The minutes of July 13 were read: whereupon it was farther obſerved, that martens were frequently found upon the downs in Wiltſhire: that there were alſo a ſort of black pole-cats: that ſables ſeemed to be of the ſame kind, having the ridge on their backs, and the tips on their tails, black, but that they were yellow under the belly: and that pole-cats, weeſels, martens, &c. were of the fox-kind.

Dr. TYSON related, that he had taken the liquor out of the glands or bag of a weeſel, and keeping it a conſiderable time in a paper, found that it had a very ſweet and pleaſant ſmell like muſk: that he had obſerved the ſame ſort of bags in pole-cats, weeſels, martens, foxes, dogs, cats, rabbets, hares, rats, mice, &c. as alſo in ſnakes, vipers, and fowls, as ducks and geeſe, which have it contained in pipes, and turkeys and hens in bags: that the oſtrich has likewiſe ſuch a bag, not on the rump, but higher on the back.

Hereupon Dr. TYSON was put in mind to complete and publiſh his deſcription of the anatomy of an oſtrich; which he promiſed to do.

He ſhewed a draught from the life of an embryo preſerved in ſpirit of wine, not bigger than a bee, very completely ſhaped.

He took notice alſo, that he had obſerved lobſters and vipers to have double genitals; and that ſnails, worms, and leeches are hermaphrodites.

Mr. HOUGHTON read a paper of queries, which he had recommended to a brother of his, who had been in Virginia, together with his anſwers and obſervations thereupon.

Mr. HENSHAW preſented ſeveral letters and papers ſent by Sir PETER WYCHE from Hamburgh concerning Dr. WASMUTH's aſtronomico-chronological tables and hypotheſis.

It was deſired, that ſome of the members would peruſe them, to ſee what was contained in them.

Dr. PELL and Mr. CLUVERUS, being both preſent, who had formerly peruſed theſe tables, conceived them to be of little worth.

Mr. HOOKE ſhewed his new-contrived aperture for long teleſcopes, which would open and cloſe juſt like the pupil of a man's eye, leaving a round hole in the middle of the glaſs of any ſize deſired; which was well approved of.

He ſhewed an experiment of making muſical and other ſounds by the help of teeth of braſs-wheels; which teeth were made of equal bigneſs for muſical ſounds, but of unequal for vocal ſounds.

He ſhewed likewiſe his helioſcope perfected by a double reflection, which would exhibit the figure of the ſun very perfectly.

Octob. 5, at a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN, preſident,

Sir JOHN LAURENCE	Mr. ASTON
Mr. COLWALL	Dr. CROUNE
Mr. HILL	Mr. PERRY
Mr. HENSHAW	Mr. HOOKE.

The preſident acquainted the Council with ſome treaty, which he had lately with Sir STEPHEN FOX concerning Chelſea-college.

It was agreed, and ordered, the Preſident and Mr. EVELYN be deſired to treat with Sir STEPHEN FOX about ſelling the houſe and the whole concerns of the college (Sir STEPHEN having by letter to the preſident declared, that he would not treat for the houſe alone, without all the concerns of the Society in Chelſea) and the Preſident and Mr. EVELYN were empowered to ſet a price for the houſe and land, viz. 1500 l. if it might be agreed; but not under 1400 l. and in caſe the laſt ſum be not agreed to, the matter was to be again referred to the Council: and the Preſident and Mr. HOOKE were deſired to ſpeak with Mr. LANE, that he would immediately aſſort the papers relating to the Society's title to Chelſea-college, that they might be ready to be produced to Council.

Octob. 19, the Society, upon ſummons ſent to the reſpective members, met again at Greſham-college.

The preſident being prevented from coming by extraordinary buſineſs, the members preſent deſired Mr. EVELYN to take the chair.

Mr. HOOKE read a letter to Mr. EVELYN from Mr. WILLIAM LONDON, dated at Barbadoes 28 Decemb. 1680, wherein he declared his intention of writing a hiſtory of Barbadoes, and therein giving a true account of the ſituation, ſurvey, ſeaſons, natural productions, plantations, people, artificial curioſities, trade, government, governors civil, military, and eccleſiaſtical; of the cuſtoms and manners of the people, &c. deſigning alſo to do the ſame thing in the ſame method for all the other Engliſh plantations in America; and adding the heads of his diſcourſe: which being likewiſe read, were judged very full and exact. But having in his letter deſired the advice and aſſiſtance of Mr. EVELYN and of the Royal Society, a committee was appointed to conſider farther of his propoſals; and to communicate to Mr. EVELYN what they ſhould think proper to be farther done by the ſaid Mr. LONDON. The perſons named of this committee were Mr. HILL, Mr. ASTON, Dr. PLOT, Sir JOHN HOSKYNS, if in town, and Mr. HOOKE; who were to meet the next day at Greſham-college.

Mr. LONDON having alſo requeſted Mr. EVELYN's aſſiſtance in procuring him

by ſome means ſome of the ſpice-trees from the Weſt-Indies, the ſame was diſcourſed of, and the difficulty of ſuch a buſineſs mentioned. However Mr. EVELYN remarked, that VAN MUNTING [b] had produced thoſe trees, and kept them growing in Holland: and Mr. HOOKE related, that he had been lately informed by one Mr. WHISTON, a broker, that he had procured out of Holland three nutmeg trees growing in pots. It was notwithſtanding looked upon as extremely difficult to procure any ſuch for Mr. LONDON.

Mr. EVELYN obſerved, that HOLLINGSHEAD in his *Chronicle* affirms, that ſaffron was firſt brought into England in the head of a pilgrim's ſtaff.

Mr. HOOKE ſhewed a letter of Monſ. JUSTEL, giving ſome account of the quinquina or Jeſuit's bark; as alſo of the increaſing of the power of the loadſtone. Monſ. JUSTEL being now come to England, it was hoped, that he would give a farther account of thoſe and other particulars mentioned in the ſaid letter.

Mr. HAAK ſhewed ſome new books, which he had lately received from abroad. The firſt was three folio's of OLAUS RUDBECK, profeſſor at Upſal in Sweden. The ſubject of this work was the antiquity of the Northern countries, and particularly of Sweden, and the language and character of this country. The perſon, who brought this work to Mr. HAAK, was preſent, and ſaid, that he deſigned to ſend for more copies of it out of Sweden.

The other book was a natural hiſtory of Bohemia, printed at Prague 1680, in fol. and intitled, *Miſcellanea hiſtorica Regni Bohemiæ: authore* BOHUSLAO BALBINO *è Soc. Jeſu.*

Mr. HAAK preſented two books, one intitled *Cometarum natura, motus, et origo, ſecundum* HEVELII *&* PETITI *hypotheſes*; *authore* JOH. CHRISTO. STURMIO; printed at Altorf in 4to. The other was a French tranſlation of Dr. PAPIN's book on ſoftening of bones, printed at Paris.

Dr. GALE brought in three books, which he had received from Dr. BOHN at Leipſic, viz. 1. GEORGII CASP. KIRCHMAYERI *de Phoſphoris, naturâ lucis, & igne:* Wittemberg 1680, 4to. 2. *Exercitatio* * * [c].

Mr. HOOKE ſhewed a new invention of his concerning the true figure of the rhomb-lines in the polar projection of the planiſphere; as alſo a way of drawing all the ſaid lines true upon ſuch a projection of any bigneſs; with a method of finding the length of any part of any ſuch line; and of ſtraitening the ſaid line or any part thereof with eaſe and certainty, and thereby anſwering many queſtions in navigation without calculations by the help of a ruler and compaſſes without the uſe of tables.

[b] ABRAHAM MUNTINGIUS, author of the book *De verâ herbâ Britannicâ*, printed at Amſterdam 1661 in 4to.

[c] The reſt of the minute was left thus imperfect.

Octob.

Octob. 26, Sir JOHN HOSKYNS, vice-preſident, in the chair:

The minutes of the preceding meeting were read, and diſcourſed upon, and particularly about the directions for Mr. LONDON.

Sir JOHN HOSKYNS mentioned, that the memoirs of the French about the method of deſcribing * * would be fit to be peruſed by Mr. LONDON, as containing a very good method for that purpoſe.

He remarked likewiſe, that there was in the *Quadripartitum botanicum* of SIMON PAULI a very uſeful varniſh for preſerving plants.

Hereupon was occaſioned a diſcourſe about glues and varniſhes; and Dr. KING affirmed upon his own experience, that the gelly of bones made in Dr. PAPIN's method was an excellent cement for glaſſes.

Dr. GALE related, that he had found * * * * that they had a way of glueing wood by dipping a cloth in glue, and putting it between the pieces.

He reported, that he had been newly informed, that Prince RUPERT had lately deſired a patent for a perſon, who had the way of making a gun-powder ten times ſtronger than the common powder.

Dr. GALE was deſired to peruſe OLAUS RUDBECK's book, and give ſome account of it to the Society.

Mr. HOUGHTON ſhewed two bodies, ſuppoſed to be the pizzles of a ſhark.

Nov. 2, Sir JOHN HOSKYNS, vice-preſident, in the chair:

Dr. HUGH CHAMBERLAYNE ſigned the uſual obligation, and was admitted.

HENRY EVE, Eſq; and WILLIAM PAYNE, M. A. rector of St. Mary Whitechapel, were propounded candidates by Dr. TYSON; and WILLIAM PENN, Eſq; by Mr. HOUGHTON.

The minutes of Octob. 26 were read, and ſeveral parts farther diſcourſed of, particularly that about the double pizzle of a ſhark; which Dr. TYSON ſaid to be a miſtake, ſince that fiſh had not a double, but only a ſingle pizzle.

Mr. HOOKE produced a letter, which he had newly received from Mr. LEEWENHOECK, dated at Delft Novemb. 4, 1681, N. S. which being written in Low Dutch, and very long, was referred to the next meeting: and in the mean time Mr. HOOKE was deſired to procure an Engliſh tranſlation of that letter.

Dr. CROUNE moved, that Mr. LEEWENHOECK's letters might be all printed: to which Mr. HOOKE anſwered, that the greateſt part of them were already printed

in the *Philoſophical Tranſactions* and *Collections*; and that there was another of them going to be printed; and that he deſigned to publiſh the reſt in ſome ſucceeding *Collections*.

Mr. HAAK produced a paper, which he had lately received from a gentleman of Berne in Swiſſerland, being a letter in Latin from SIGISMOND KONIG, M. D. of that city, dated there 30 Sept. 1681 [d], containing a large account of the ſymptoms of a woman, a patient of his, who had voided great quantities of ſtones and other calculous matter by vomit, ſtool, and urine; together with a ſmall box, containing ſeveral of the ſubſtances ſo voided. This letter being very long was reſerved for the next meeting.

Mr. HOOKE ſhewed a mechanical way of finding the focus of all parallel rays falling upon the ſpherical ſuperficies of a more denſe refracting medium (whereby would be avoided the tediouſneſs of calculating ſeveral triangles for the finding the focus of every ſingle ray) by the motion of a certain circle upon a point in its diameter excentrically taken, according to a proportion aſſigned.

He alſo ſhewed the geometrical ground and demonſtration of the ſame: and though it was denied by Mr. FLAMSTEAD as falſe and impoſſible, yet Mr. HOOKE perſiſted in his propoſition, and referred it to be judged by Sir CHRISTOPHER WREN, who, he doubted not, would eaſily ſatisfy the Society of the truth and evidence thereof.

Mr. HOOKE likewiſe engaged to produce at the next meeting a mechanical way of finding the foci of all the parallel rays falling perpendicularly upon the plain of a plano-convex glaſs, where the convexity was turned towards the foci thereof: as alſo the geometrical demonſtration of the truth and certainty thereof; which Mr. FLAMSTEAD alſo denied as impoſſible.

Novemb. 9, Sir JOHN HOSKYNS, vice-preſident, in the chair:

The minutes of the preceding meeting were read and diſcourſed upon.

RICHARD ROBINSON, M. D. was propounded candidate by Dr. TYSON.

Mr. FRANCIS LODWICK was propoſed candidate by Mr. HOUGHTON.

Mr. EVE, Mr. PAYNE, and Mr. PENN, were elected fellows of the Society.

Mr. HOUGHTON preſented from Mr. PENN his map of Pennſylvania.

Mr. RICHARD WALLER preſented a picture of Dr. GODDARD, drawn by Mr. WALLER himſelf on memory, after the death of Dr. GODDARD. It being viewed by thoſe, who were preſent, and knew the doctor, was judged to reſemble him in

[d] Letter book, vol. viii. p. 165. It is printed in Mr. HOOKE's *Philoſophical Collections*, N°. ii. p. 68. Decemb. 10, 1681.

many

many particulars, and ordered to be carefully kept with the other pictures of the fellows of the Society.

Mr. HOUGHTON preſented the Society with a book, which he had met with; which being a book of art, he thought it proper to be kept among the Society's books. It was a book of curious patterns for laces and needleworks.

He preſented likewiſe a curious humming-bird.

Mr. HOOKE produced a tranſlation of the long letter lately received from Mr. LEEWENHOECK, and dated 4 Nov. 1681, N. S. which he read; containing an account of divers obſervations and diſcoveries, which he had lately made concerning great numbers of ſmall animals in his excrements, which were moſt numerous when he was troubled with a looſeneſs, and very few or none, when he was well. He alſo found the ſame very obſervable in the excrements of other animals, &c *.

Mr. HOUGHTON acquainted the Society from Mr. SAMBROOKE, that his brother Mr. HODGES was in a ſhort time going to the Eaſt-Indies to reſide at Haukly upon the river Ganges; and that he was very ready to ſerve the Society in what he was able in that place; and therefore deſired, that he might receive ſome directions from the Society in what particulars he could be ſerviceable to them there.

Dr. TYSON gave an account of his having lately diſſected a young lion, in which he had taken notice of ſeveral things very conſiderable; and, amongſt the reſt, that this, as well as moſt other carnivorous creatures, had a very conſiderable ſcent-bag; which he alſo ſhewed, and promiſed to give a more full account of all his obſervations in writing.

Dr. SLARE gave an account, that he had made many chemical trials of ſeveral ſorts of calculous matters; and had found them all to contain a kind of urinous or volatile ſpirit and ſalt, as other animal ſubſtances.

Mr. HOOKE ſhewed and demonſtrated a very expeditious way of finding all the poſſible foci of parallel rays refracted by a plano-ſpherical lens; whereof the convex ſide was turned towards the focus; as alſo what quantity of rays would paſs through ſuch a glaſs, whoſe convexity was the full bigneſs of a hemiſphere.

Mr. HOOKE likewiſe acquainted the Society, that Mr. FLAMSTEAD had now acknowledged, that what he had formerly adjudged againſt the problem ſhewn and demonſtrated at the laſt meeting by Mr. HOOKE, concerning the foci of parallel rays refracted by an hemiſpherical ſurface, was a miſtake of his; and that upon conſidering it more ſeriouſly he had found out the demonſtration, though he had not done it before the way of demonſtrating it was ſhewn by Mr. HOOKE.

November 16, at a meeting of the COUNCIL were preſent,

* This letter is printed in Mr. HOOKE's Philoſoph. Collect. No. iv. p. 93.

Sir

Sir CHRISTOPHER WREN, preſident,
Sir JOHN LAURENCE — Mr. ASTON
Mr. HILL — Mr. HOOKE.

It was agreed and ordered, that the Preſident, Sir JOHN LAURENCE, Mr. COLWALL, Mr. ASTON, and Mr. HOOKE, be a committee for auditing the treaſurer's accounts; and they were deſired to meet for that purpoſe before the next anniverſary election.

The preſident diſcourſing concerning the library of the Society, promiſed to give the Society five pounds to be expended in books of geometry: and Mr. HOOKE was deſired to find out ſuch books, as he ſhould find proper, and were not already in the library. And the Council taking into conſideration the improvement of the library, thought fit to order, that there ſhould be annually expended the ſum of ten pounds in purchaſing philoſophical books.

At a meeting of the SOCIETY on the ſame day, Sir CHRISTOPHER WREN, preſident, in the chair:

The minutes of the 9th inſtant were read, and ſome parts diſcourſed of.

Sir ROWLAND WYNNE was propoſed candidate by Mr. HILL.

Mr. ISAAC DORISLAUS was propoſed candidate by Dr. ALLEN.

Upon a diſcourſe concerning inſtruments uſeful for the ſea, Mr. HOOKE mentioned ſome contrived by himſelf, which would be of great uſe for taking azimuths, altitudes, &c. by a new way not before practiſed, which he deſigned ſhortly to publiſh. He obſerved likewiſe, that he had been newly informed by a perſon ſkilful in ſea-affairs, who had been ſeveral voyages to the Eaſt-Indies, the Straits, and elſewhere, that he had been able to ſee the horizon at ſea in a ſtar-light night, and ſo to take an altitude from it: and that he could thereby find the variation of the compaſs.

The preſident was deſirous, that a good and eaſy contrivance ſhould be thought of, and made for an azimuth compaſs, in order that obſervations of that kind might be made more often and more certain by ſeamen; the difficulty of making which obſervations with the inſtruments now known being the greateſt reaſon, why there were ſo few good obſervations of that kind. He farther obſerved, that no good obſervations could be made at ſea by the help of a perpendicular, which was the reaſon of diſcontinuing the uſe of the aſtrolabe, and making uſe of the ſea-quadrant and back-ſtaff.

Mr. HOOKE mentioned a quadrant of his contrivance, which he was now making, and would ſhortly produce, and which, he conceived, would be much more accurate than any yet uſed for that purpoſe, and which would obviate divers objections: but that ſome parts of it were yet unfiniſhed.

The ſkin of a large crocodile ſtuffed, brought out of Egypt, was preſented from Sir NICHOLAS CRISPE to the Society, and delivered by Mr. HOUGHTON.

Mr. HILL inquired concerning the ſtone ſent from the Eaſt India company to be examined by the Society. It was thought that this ſtone had been long ſince returned to the company, with an account thereof.

There being ſome preſent, who had not heard Mr. LEEWENHOECK's letter read at the laſt meeting, it was deſired, that the abſtract of it might be again read; which was done, and thereupon ſome conjectures were made about the poroſity and pith of ſeveral ſorts of hair. The preſident remarked, that there was a ſort of rabbits, who had a kind of long hair, which was branched towards the top. He mentioned alſo the cleaving of ſeveral ſorts of hair, as that of men's heads, and of pigs briſtles. He conceived likewiſe, that the horn of a rhinoceros was a kind of hair; as were alſo the fins of whales; both which were obſerved to be very apt to cleave.

Mr. HOOKE ſhewed the beard of a morſe, which was very remarkable, having ſtrong and crooked briſtles much like horn, but harder and bigger than the teeth of a large horn-comb, or of a wheat-ſtraw, and hollow at the roots in the fleſh.

Dr. GREW preſented from Mr. LISTER fifteen copper-plates of a book concerning inſects, which he was printing.

Mr. HOOKE brought in the demonſtration of a new way of ſolving the phænomena of refraction, by ſuppoſing the denſer body to refract towards the perpendicular; and ſhewed, that the line of light, that paſſes through two or more different media obliquely to the contiguous ſurface of the tranſparent media, the bulk of the bodies of both media lying in that refracted line, is the leaſt quantity, that is poſſible to be moved to communicate motion from the luminous to the inlightened body.

Mr. HOOKE alſo acquainted the Society with two ſorts of compaſſes, which he was making, for deſcribing all ſorts of ſpiral lines for the rhombs.

He mentioned likewiſe, that Mr. FLAMSTEAD had now confeſſed, that he was miſtaken in his aſſertions againſt the problem, which Mr. HOOKE had formerly demonſtrated to the Society concerning the new way of meaſuring diſtances in great circles laid down on the planiſphere projection of the globe by the help of a ſector and compaſſes, without drawing lines or circles, or making any diviſions, &c. which had been by Mr. FLAMSTEAD before the Society impugned as falſe; but now he acknowledged it to be true and real, as demonſtrated by Mr. HOOKE.

November 23, at a meeting of the COUNCIL were preſent,

Sir

Sir CHRISTOPHER WREN, preſident,

Sir JOHN LOWTHER	Dr. CROUNE
Mr. COLWALL	Dr. KING
Mr. HILL	Mr. PERRY
Mr. ASTON	Mr. HOOKE.

Mr. HILL brought in the conveyance from Sir JOHN BANKS of a fee farm-rent of twenty pounds *per annum*, which was ordered to be put into the cheſt.

Dr. BROWN was deſired to ſpeak to the Lady GRACE PIERREPOINT[f], in order to recover the arrears due from the late Marquis of Dorcheſter[g] to the Society.

At a meeting of the SOCIETY on the ſame day:

The preſident and vice-preſident being not yet come, and a great number of the Society being preſent, Mr. HENSHAW was deſired to take the chair, in order to diſcourſe of ſome diſcoveries made by Mr. LEEWENHOECK, particularly about the ſubſtance and figure of hair: and it was judged, that the glaſſes, wherewith he had made all thoſe ſtrange diſcoveries, were very extraordinary, and made in ſome other manner than what was commonly known and made uſe of.

Mr. HOOKE was of opinion, that they were no other than thoſe mentioned in the preface to his *Micrographia*, viz. very ſmall tranſparent globules uſed whole, or by grinding reduced to a lens, or by another way, mentioned alſo by him in the ſame preface, much more eaſy to be made; a ſpecimen of which, he ſaid, he would ſhortly ſhew, as he had long ſince done to the Society. Theſe he conceived were helped by the way of admitting light upon them in an appropriated room by the extraordinary pains and care of Mr. LEEWENHOECK, in examining the objects in various ways.

However Mr. HENSHAW moved, that Mr. LEEWENHOECK ſhould be requeſted to communicate or publiſh his invention, if it were any new way; which the ſecretary promiſed to do in his next letter to Mr. LEEWENHOECK.

Sir JOHN HOSKYNS, vice-preſident, took the chair.

Sir ROWLAND WYNNE was elected by twenty-five ſuffrages: And,

Mr. JODOCUS CROLL and Dr. ROBINSON were elected by the ſame number of ſuffrages.

Mr. HESSACK, a Swediſh gentleman, was propoſed candidate by Dr. GALE and Mr. HOOKE: And,

Signor GREGORIO LETI by Sir THEODORE DE VAUX.

[f] Younger daughter of HENRY marquis of Dorcheſter. [g] He died Decemb. 1. 1680.

Sir ROWLAND WYNNE, Mr. PAYNE, and Mr. EVE, ſubſcribed the obligation, and were admitted.

Mr. HOOKE produced a new ſort of inſtrument for deſcribing the rhombs or ſpiral lines upon the plano-ſpherical projection on the pole of the world; and he ſhewed how the ſame would eaſily deſcribe all manner of proportional ſpirals, whether greater or leſs, whether wider or narrower; and mentioned alſo what uſe it might be of for navigation and ſea-charts.

November 30. The members of the Society having had the uſual ſummons from the preſident to meet this day, in order to the electing the council and officers of the Society for the year enſuing, there being about thirty preſent, when the preſident, Sir CHRISTOPHER WREN, took the chair, after the ſecretary had read the ſtatutes concerning the election, the Society proceeded to the election of ſome candidates, viz.

Mr. FRANCIS LODWICK,
Signor GREGORIO LETI,
Mr. ISAAC DORISLAUS.

Mr. PITT of Wadham-college in Oxford was propoſed candidate by the preſident.
Mr. SAMUEL BLACKBURNE by Mr. PEPYS,
Mr. HEWER by Mr. HOUGHTON,
Mr. JOSEPH MARTIN by Mr. HOUGHTON.

Sir JOHN PERCIVAL, Dr. ROBINSON, Signor LETI, and Mr. CROLL ſubſcribed the obligation, and were admitted.

Whilſt the liſts were gathering, Monſ. LYENBERGH, envoy from the king of Sweden, preſented the Society with a letter [t], and two books, from Dr. CLAUS RUDBECK, profeſſor of anatomy at Upſal in Sweden: for which the preſident returned the Society's thanks to the envoy, and ordered the ſaid letter and books to be produced at the next meeting, that ſo a more full account might be taken of them.

Monſ. LUDOLFUS preſented to the Society from his uncle Monſ. JOB LUDOLFUS his deſcription of Æthiopia.

The Society then proceeded to the election, and choſe the following eleven members to be continued of the Council for the enſuing year;

Sir CHRISTOPHER WREN
Mr. ASTON
Mr. COLWALL
Dr. CROUNE
Dr. GALE
Mr. HENSHAW
Mr. HILL
Mr. HOOKE
Sir JOHN HOSKYNS
Sir JOHN LOWTHER
Sir JOSEPH WILLIAMSON.

[t] Letter-book, Vol. viii. p. 186.

And the following ten members were choſen in the Council;

Mr. AERSKINE
Mr. EVELYN
Mr. FLAMSTEAD
Dr. GREW
Mr. HALL
Mr. PACKER
Mr. PEPYS
Sir ROBERT SOUTHWELL
Dr. TYSON
Dr. WOOD.

The officers elected were,
Sir CHRISTOPHER WREN, preſident,
Mr. HILL, treaſurer
Mr. FRANCIS ASTON, Mr. HOOKE, } ſecretaries.

Then Dr. GREW, Mr. HALL, Mr. PACKER, Sir ROBERT SOUTHWELL, Dr. TYSON, and Dr. WOOD, were ſworn of the Council.

Several months before this election died Sir JONAS MOORE, Knt. who was born at Whitbee in Lancaſhire [h], about the year 1615 [i], and diſtinguiſhed himſelf very early by his knowledge in mathematics and aſtronomy; ſo that his friend Mr. SHERBURNE [k] repreſents him as eminent in the latter in the year 1640.

Whilſt king CHARLES I. was at Durham, in his expedition to the northern parts, being acquainted by a perſon of quality with Mr. MOORE's ſtudies, his majeſty admitted him to give an account of them to himſelf, and encouraged him to purſue them, with a promiſe of encouragement. His majeſty being afterwards at Holdenby-houſe in 1647 directed, that Mr. MOORE ſhould be employed to inſtruct the Duke of York, then at St. James's, in arithmetic, the uſes of the globes, and geography: but the *malicious and cunning ſubtilty*, as Mr. MOORE expreſſes it [l], of Mr. ASCHAM [*], and the Duke's eſcape from St. James's, April 21, 1648 [m], prevented his Highneſs from making any great progreſs under Mr. MOORE. His loyalty was in thoſe times a conſiderable prejudice to his fortune; but in his greateſt neceſſity he was aſſiſted by Col. GILES STRANGWAYS, then a priſoner in the Tower in London, who likewiſe recommended him to the other eminent perſons, his fellow-priſoners, and proſecuted his intereſt ſo far, as to procure him to be choſen ſurveyor in the work of draining the great level of the fens [n].

[h] Catalogue of aſtronomers, antient and modern, p. 93. ſubjoined to the tranſlation of the Sphere of MANILIUS, by EDWARD SHERBURNE, Eſq; Edit. London, 1675. Fol.

[i] It appears from the inſcription under his picture, prefixed to his *Arithmetic*, that he was in the 45th year of his age in 1660.

[k] *Ubi ſupra.*

[l] Dedication of his *Arithmetic* in 1660 to the duke of York.

[*] Mr. ANTHONY ASCHAM, who had been appointed by the long parliament tutor to the Duke of York. Mr. ASCHAM had been educated at Eton-ſchool and King's-college, Cambridge; and being ſent agent from the parliament to the court of Spain, was aſſaſſinated at Madrid June 6, 1650, by ſome of the royal party.

[m] WHITELOCKE's Memorials, p. 301. Edit. London, 1732.

[n] Dedication of his *Algebra*, publiſhed in his *Arithmetic*, to the Colonel.

Soon

Soon after the Reſtoration he publiſhed at London, in 8vo. his book intitled, MOORE's *Arithmetic: in two books. The firſt treating of the vulgar arithmetic in all its parts, with ſeveral new inventions to eaſe the memory, by* NEPER's *rods, logarithms, decimals,* &c. *fitted for the uſe of all perſons: The ſecond of arithmetic in ſpecies, or algebra, whereby all difficult queſtions receive their analytic laws and reſolution, made very plain and eaſy for the uſe of ſcholars, and the more curious. To which are added two treatiſes, 1. A new contemplation geometrical upon the oval figure, called the Ellipſis: 2. The two firſt books of* MYDORGIUS's *conical ſections, analyſed by that reverend divine Mr.* W. OUGHTRED, *Engliſhed and completed with cuts. By* JONAS MOORE, *profeſſor of the mathematics.* In the preface, dated from his houſe in Stanhope-ſtreet, June 10, 1660, he remarked, that in this edition of his *Arithmetic* he had endeavoured to correct the miſtakes both of pen and preſs, and to alter all ſuch paſſages and rules in the former edition, as he had heard to be objected to, or found too abſtruſe or difficult: but that the times had not encouraged him to finiſh or complete many pieces, which he had formerly promiſed and had by him. "Indeed, *added he*, the abuſe in the birth in the midwife's "hand is none of the leaſt diſcouragements: a piece of mine of aſtronomy and "aſtronomical tables, which coſt me a year's labour and above, was ſtifled in "the preſs, when one ſheet was brought forth, and a great part of the copy loſt, "though I know the method, not yet uſed by any, would have infinitely "pleaſed the ingenious."

About June 1663, he was ſent by the government in ſome office to Tangier [o]; and after his return was advanced to the poſt of ſurveyor of the ordnance, and knighted by king CHARLES II. Being propoſed candidate for election into the Royal Society by the Lord Viſcount BROUNCKER, Novemb. 30, 1674, he was choſen into it on the 3d of Decemb. following; as he was afterwards into the Council of the Society. In the ſame year 1674 was publiſhed at London in 12mo. a treatiſe *collected out of his notes and papers*, by Mr. NICHOLAS STEPHENSON, intitled, *A mathematical compendium; or uſeful practices in arithmetic, geometry, and aſtronomy, geography and navigation, embattelling and quartering of armies, fortification and gunnery, gauging and dyalling; explaining the logarithms with new indices,* NEPER's *rods or bones; making of movements, and the application of pendulums; with the projection of the ſphere for an univerſal dyal,* &c. The laſt work, in which he was engaged, but did not live to ſee publiſhed, was his *New ſyſtem of the mathematics*, printed at London in 1681 in 4to. This was deſigned by him for the uſe of the royal foundation of the mathematical ſchool in Chriſt's Hoſpital in London, of which hoſpital he had been choſen ſome years before his death one of the governors. Of this work the arithmetic, practical geometry, trigonometry and coſmography, were written by Sir JONAS himſelf, and printed during his lifetime. He was ready to enter upon the chapter of navigation, and conceived himſelf within view of the concluſion of his work, when death put a period to his labours, which happened anſwerably to his own deſire, that of ending his days in the ſervice of his royal maſter [p], upon whom he was attending in a journey; his death being ſo ſudden, that he had no time to make a will [q]. He left a ſon, for

[o] See above, Vol. i. p. 259.

[p] Preface to his *New ſyſtem of the mathematics.*

[q] Mr. ASTON's letter to JOHN ERIC OLHOFF, 1 June, 1683, Letter-book, Vol. ix. p. 17.

whom he had procured a reverſion of his office of ſurveyor general of the ordnance, and who enjoyed it for a few years, till his death [r]. Two of his daughters were married to Mr. WILLIAM HANWAY and Mr. JOHN POTTINGER, who both dedicated his *New ſyſtem of the mathematics* to king CHARLES II. Sir JONAS was the great patron of Mr. FLAMSTEAD, for whom he obtained, in March 167$\frac{4}{5}$, the place of royal aſtronomer, with a ſalary of an hundred pounds a year payable out of the office of ordnance [s]; and when the building of a royal obſervatory was reſolved upon in 1675, he inclined to Hyde-park as a proper place for it; but Sir CHRITOPHER WREN mentioning Greenwich, it was immediately fixed upon [t]. He tranſlated from the Italian of TOMASO MORETTI *A treatiſe of artillery, or great ordnance*; which tranſlation, with an appendix of artificial fire-works by Sir ABRAHAM DUGER, was printed at London 1683 in 8vo.

Decemb. 7, at a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN, preſident,

Sir JOHN LOWTHER	Dr. GREW
Mr. AERSKINE	Dr. TYSON
Mr. HILL	Dr. WOOD
Mr. HENSHAW	Mr. ASTON
Mr. PACKER	Mr. HOOKE.
Mr. PEPYS	

Mr. AERSKINE and Mr. PEPYS were ſworn of the Council.

Mr ASTON was ſworn ſecretary.

The Preſident deſired, that the ſtatutes concerning the payments of the members of the Society, and alſo concerning the cauſes of ejection, might be tranſcribed into a paper for the next Council to conſider and debate.

Mr. HENSHAW reported to the Council, that he had treated with Mr. FRANKLIN about the arable and meadow ground of Chelſea-college; and that he was to have a leaſe of the ſame for twenty-one years, to commence from Chriſtmas laſt, at the rate of thirty-two ſhillings *per ann. per* acre for the arable, and *per annum* for the meadow.

The order of November 23, wherein Sir JOHN HOSKYNS, Mr. HENSHAW, and Mr. HOOKE, were deſired to be of the committee, to treat with Mr. FRANKLIN about his leaſe, was revived, and they were deſired to employ immediately a ſcrivener to draw up a book of the ſaid leaſe, to be offered to the next meeting of the Council. And Mr. HENSHAW was deſired to give ſuch inſtructions, as were neceſſary, according to the agreement, which he had made: and becauſe there were pretences ſtill on foot relating to the way, the Council thought fit, that the number of acres ſhould be expreſſed, that the Society's right might not be pre-

[r] General Dictionary, article of FLAMSTEAD (JOHN) Vol. v. p. 258. [s] Ibid. [t] Ibid. p. 259. note E.

judiced: and whereas Mr. HENSHAW reported, that he had agreed after the rate of thirty-two ſhillings the acre, that the rent ſhould be expreſſed in the groſs ſum by computation, with a reaſonable abatement for the prejudice, which that pretence might do to the tenant.

It was ordered, that the tenant be ſummoned to attend the next meeting of the Council, and that Mr. HUNT do call on the man of the Pie in Chelſea, who had dug and carried away gravel out of the college-ground, that he fill up, and level the ſame.

The papers, which were formerly left in the hands of Mr. LANE, to conſider, digeſt, and make an abſtract of the title, were brought back, and left in the cuſtody of Mr. HOOKE.

It was ordered, that Mr. HOOKE ſhould take care, that all orders of Council ſhould be tranſcribed into the Journal-book.

The Preſident and Mr. PACKER undertook to peruſe the writings of the Society, and to make an abſtract of them.

At a meeting of the SOCIETY on the ſame day, the preſident, Sir CHRISTOPHER WREN, in the chair:

Dr. OLAUS RUDBECK's letter and two books, preſented on St. Andrew's day by Monſ. LYENBERGH, envoy extraordinary from the king of Sweden, were now produced, and the letter read. Whereupon it was ordered, that Mr. CLUYERUS ſhould be deſired to peruſe Dr. RUDBECK's work, and make an abſtract of the principal matters contained in it, and give the Society his judgment of it: which being done, Mr. ASTON was deſired to return the author the thanks of the Society [t], with ſome account of the ſentiments of thoſe, who had peruſed his work.

Mr. HOOKE produced a paper, which he had received from Mr. HAAK, being an account of the ſeveral things affirmed to be performed by Dr. ELSHOLT of Berlin; which paper [u] was read. It contained an account of, 1. His univerſal balſamation. 2. His great vine and wine cure in five particulars, *viz.* for improving the vine, procuring and regulating fermentation, improving it in the veſſel and in the glaſs, and making artificial wines. 3. His way of making wines with water. 4. His way of making vinegar of water. 5. His true way of diſtilling ſpirits from grains. 6. Of making eſſence of vegetables. 7. Of depurating alcaline ſalts and pot-aſhes. 8. Of ambering or perfuming *in infinitum*.

It was deſired, that Mr. HAAK might be furniſhed with a proper anſwer by the ſecretaries.

[t] Mr. ASTON's letter is dated in January 168½. Letter-book, Vol. 8. p. 185.

[u] It is printed in Mr. HOOKE's Philoſophical Collect. No. iv. p. 104.

Mr.

Mr. HOUGHTON ſhewed a ſmall Chineſe idol, curiouſly cut and poliſhed out of a very hard and heavy ſtone.

Mr. JUSTELL, formerly propoſed candidate by the Preſident, being put to the ballot, was unanimouſly elected, and being preſent, was admitted by the Preſident.

Mr. HOOKE gave an account of a ſmall treatiſe of JOHN DANIEL MAYER, printed at Sleſwick in 1679, and intitled, *Conſideratio ferri radiantis, quâ in naturam ignis aut lucidi ſpiritus utcunque inquiritur. Quædam de thermis novo artificio parandis adduntur.* In which was contained an account of a very ſtrange experiment to be made with a piece of iron heated till it be almoſt ready to melt; from which iron there will be emitted or darted forth every way a great number of ſparkles, ſome of which will be of a moſt pure ſilver bright light. Theſe the author affirms to be without any hurtful heat; ſo that being received on the back of one's hand they will not burn, nor affect it at all with heat. But Mr. HOOKE remarked, that he had newly tried the experiment with Mr HUNT, and could not find any ſuch effect; but on the contrary, that both of them had found the ſparkles to burn or ſcale the back of their hands: and that, together with thoſe bright ſprinklings, there were other red-hot ones emitted, which, he ſaid, MAYER affirmed, would burn; from whence he raiſed a new theory of light and fire. It was deſired, that the experiment ſhould be further tried, and an account thereof brought to the Society.

There was produced an experiment ſent by Mr. BOYLE, to be ſhewn the Society. It was a new way of producing light by the effuſion of two liquors, one upon the other; both which liquors were very clear and tranſparent, and afforded no light, when they were apart: but whilſt they were poured one upon the other, they afforded a briſk light, which laſted for a little while in the veſſel, that received them.

Mr. HOOKE produced two pendulum clocks, which he had procured and adjuſted, in order to make trial of a curious inquiry concerning the attractive power of the earth at ſeveral diſtances from its centre. This was done by placing one of them at the top, and the other at the bottom of the pillar on Fiſh-ſtreet hill, and accurately examining, whether they would keep together; or whether that, which was neareſt to the earth, would go faſter. At which trial Mr. HOOKE deſired, that ſome other members of the Society might be preſent to bear teſtimony of it.

Dr. SLARE produced a ſmall piece of his ſolid phoſphorus, and with it wrote upon a piece of paper; which was not viſible, when the candles were in the room, but on removing them the letters ſhined very bright and vividly, and were very legible. But the candles being brought in again, the doctor warmed the paper by the fire, the letters appeared of a dark brown colour very legible.

Mr. HENSHAW produced a paper containing the milk-white pieces of glaſs, which had been ſo made by the corruption of a menſtruum contained therein.

This ſubſtance was very brittle, and with one's fingers might eaſily be crumbled into ſand. This was received from Mr. JOHN DWIGHT of Fuſha.

Mr. HOOKE remarked, that he knew a menſtruum, that would produce the ſame effect, *viz.* being put into a glaſs it would in a ſhort time ſo corrode it, as to turn it all into a brittle milk white ſubſtance, like that now produced before the Society; but the parts of the glaſs above the ſurface of the menſtruum would receive no damage by it.

Mr. HEISIG, a Swediſh gentleman, who had been propoſed candidate by Mr. HAAK and Dr. GALE, being permitted to be preſent, gave the Society a Lapland magical drum, and a Runic almanac cut upon a ſtaff; and ſhewed a table curiouſly ingraven on copper, and containing a full explication of the Runic language, publiſhed in Sweden by JOHANNES BURREUS long before WORMIUS had publiſhed his book on that ſubject.

He likewiſe gave an account, that one ANDREAS SPOLA, profeſſor of aſtronomy at Upſal, had given him an account, in a letter dated in July 1680, that in May 1679, as he was haſtening to Upſal, near the city of Jenkoping, upon a pretty high hill, he ſaw the lake called *Water*, and in it the iſland called Wiſengſburg, and the people ſo plain, as to diſtinguiſh men from women, as if it had been but a quarter of a mile diſtant; whereas that lake was really not then viſible, by reaſon of the interjacent hills, it being diſtant alſo at leaſt twenty-two Engliſh miles. This happened at ſun-riſing.

Mr. HOOKE mentioned an obſervation ſomewhat like this, which was affirmed by a miniſter of Sligo in Ireland, that he himſelf, and ſeveral hundreds more, had ſeen in the ſea the perfect repreſentation of an iſland riſing out of it, as it were, with trees on the hills very plain and conſpicuous; but as ſoon as the ſun was ſet, it perfectly diſappeared. This was related by the perſon himſelf, being an archdeacon, in the preſence of Dr. WILLIAM LLOYD, Biſhop of St. Aſaph.

The experiments to be tried at the next meeting, were that of the iron's radiation of ſilver bright ſparkles; and a method of drawing an helix on a cone.

December 14, at a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN, preſident,

Sir JOHN HOSKYNS	Mr. HILL
Sir JOHN LOWTHER	Dr. WOOD
Sir ROBERT SOUTHWELL	Dr. GREW
Mr. HENSHAW	Mr. ASTON
Mr. PEPYS	Mr. HOOKE.

A draught of a leaſe of the meadow and arable ground of Chelſea-college to be let to Mr. FRANKLIN for twenty-one years from Chriſtmas laſt, was read and approved; and Mr. FRANKLIN being called in, was acquainted with the conditions, to

to which he agreed, but desired to have the same to shew; which when he had done, he was to return it, that it might be ingrossed and sealed.

At a meeting of the SOCIETY on the same day, Sir CHRISTOPHER WREN, president, in the chair:

The minutes of the 17th instant were read.

OLAUS RUDBECK, M. D. and professor of anatomy at Upsal, was proposed candidate by Dr. GALE.

Mr. ASTON mentioned, that having perused some part of the said Dr. RUDBECK's works, presented by him to the Society, he had found him to be laborious as well as learned.

Sir JOHN HOSKYNS remarked, that he had been informed, that the Doctor, besides his knowledge in anatomy and antient history, was well skilled in botany, and now writing a history of plants; for which purpose he had already drawn and cut in wood above two thousand plants. That the first part of his designed work would be the history of such plants, as flourished, or could be made to grow, in Sweden, of which there were said to be two thousand, that flourished in that country.

Mr. BLACKBURNE was elected.

Upon reading the minutes taken about JOHN DAN. MAYER's experiments of the radiation of iron, Mr. HAAK, who shewed the book, remarked, that he was certified by the person, who had brought him the said book, that he had himself tried the experiment of the not burning of the silver-bright sparklings of iron, and found it, as affirmed by Mr. MAYER; and that the thing was not doubted of. But there were many present of another mind.

Mr. ASTON read an abstract of Mr. LUDOLFUS's history of Æthiopia, presented by the author to the Society, and he was desired, as soon as he conveniently could, to write a letter of thanks to Mr. LUDOLFUS [x].

Mr. HEISIG's paper about the strange appearance of the lake and island, mentioned in the minutes of the last meeting, was read.

Several things, which he had only shewn at the last meeting, were now presented to the Society; as, 1. A Runic almanac, being a stick about four feet long, and about two inches big. About three feet of it was a prism of eight sides, and the other foot was round like the handle of a two-handed sword. Upon the eight sides of the prism the whole length was cut the almanac Runic; Runic signifying nothing else but letters: but the interpretation was not shewed. 2. A Lapland

[x] Mr. ASTON's letter in Latin, dated 10 December, 1681, is inserted in the Letter-book, Vol. viii. p. 189.

drum,

drum, and the beater or drum-hammer, much the ſame with that deſcribed by SCHOEFFER. 3. A piece of braſs with rings hanging by chains, called the frog, which the Laplanders lay on their drum-head, when they beat it, and by knocking with their drum-ſtick or hammer are ſaid to make it dance to and fro upon the drum-head, till at laſt it fixes upon ſome figure made upon it, and will not be thence removed by any farther taboring: which having found, they pretend, that that mark, on which the frog reſts, gives them ſufficient information.

Mr. HEISIG left alſo for the repoſitory a pebble, and ſome tin twiſt, affirmed to be drawn only by the teeth: but the twiſt being examined, was concluded to be made much in the ſame way as our ſilver twiſt is.

Mr. HUNT brought in from Mr. WYBERD, ſon of Dr. WYBERD, as a preſent to the Society, a ſmall ivory box, in which was contained ſome curious writing made by the doctor, being the Ten Commandments, the Creed, and the Lord's Prayer, all written within the compaſs of a ſilver peny; together with a problem ſolved by him concerning ſome properties of an ellipſis.

Mr. HOOKE ſhewed an engine for exactly deſcribing all manner of proportion and helixes upon cones and cylinders; as alſo of making or turning any variety notable in the ſhape of any fiſh-ſhell; and all helixes, ſcrews, crenated, foliated, echinated, wreathed, &c. conchoeids; and he obſerved, that this engine would be of great uſe for making the diviſions of mathematical and aſtronomical inſtruments, for turning wreathed work, and many other uſes.

Divers members of the Society were well pleaſed with the contrivance; and Mr. PACKER urged very earneſtly, that a complete engine ſhould be forthwith made; at leaſt, that ſome workmen ſhould be conſulted what ſuch an engine well made would coſt: and he deſired, that a deſcription of it might be brought in by Mr. HOOKE.

The experiment propoſed by Mr. HOOKE for the next meeting was an engine to draw all the rhomb-lines upon a globe as truly and exactly, as any greater or leſſer circles could be drawn upon it; which had never been yet done by any perſon; with an explanation of the true nature and properties of all ſuch lines, &c.

Decemb. 21, the preſident and vice-preſident being abſent, Mr. HENSHAW was deſired to take the chair.

Mr. HILL preſented a box of cedar-ſeeds.

The minutes of the laſt meeting were read.

Mr. ASTON read a letter of his to be ſent to Mr. LUDOLFUS, returning him the thanks of the Society for the preſent of his book.

Upon mentioning the agate and cryſtal mountains, and ſeveral other hard

ſtones, as load-ſtones and gems found in ſome plenty in the northern parts of Sweden and Lapland, Dr. GALE related, that EPIPHANIUS mentions, that divers of theſe ſtones were found in the northern regions, and particularly that there were three ſorts of hyacinths to be found there.

Mr. HAAK ſhewed two ſheets, with a draught belonging to them, written by Dr. ELSHOLT of Berlin, containing a deſcription of ſeveral ſorts of phoſphorus known to him, and their effects:

1. Of the phoſphorus Bononienſis.
2. Of the phoſphorus Baldwini.
3. Of the phoſphorus Smaragdinus.
4. Of the phoſphorus fulgurans.
5. Of the phoſphorus liquidus.
6. Of the phoſphorus ſtillatus nubiloſus & * * *.

A letter of Monſ. ERNESTUS GOTTFREIDUS HEYSIUS to Mr. HAAK was read, containing an account of ſeveral remarkable particulars:

1. Concerning a ſecond edition of Dr. PAPIN's book about ſoftening of bones, and the improvement of it in France; and of a book of Dr. DAURAN about the alteration of the juices of the body by a natural chemiſtry.

2. Concerning a book of Monſ. DU VERNEY, *Circa ſpirituum animalium generationem, quo dictos ſpiritus non tantum in ſubſtantiâ cerebri corticali et glanduloſa et cerebello elaborari, ſed et in ſpinali quoque medullâ produci et rationi et* αὐτοψίᾳ *innixus aſſerit.*

3. Concerning another treatiſe of Monſ. DU VERNEY about the fabric of the ear, which was to be ſoon publiſhed.

4. Concerning load-ſtones, one of which Monſ. HEYSIUS ſaw in the hands of Monſ. DU GLUS, which weighing but two drachms, took up two pounds of iron; and which, as the owner affirmed, would take up one hundred and ſeven times its own weight.

5. Concerning the ſtrange effects of a ſpecular burning glaſs of two ells in diameter ſuddenly melting almoſt all ſorts of bodies, and converting others into glaſs.

The mention of heat occaſioned a diſcourſe concerning the effects of cold, particularly the phænomena obſerved of frozen eggs and apples, that they being put into water would in a ſhort time freeze about themſelves a certain ſhell or cruſt of ice.

Mr. HENSHAW ſuppoſed this to be produced from the particles of cold, which iſſuing out of the egg or apple, and entering into the water, cauſe the parts of the water

water to freeze into ice, and ſo leave the parts of the egg or apple unfrozen.

Mr. HOOKE conceived it not to be by any really iſſuing of particles of cold, but that the egg or apple needing a much greater degree of cold to freeze them than the water, they being already frozen, and ſo having in them that degree of cold, and the water being yet unfrozen, and having a degree of heat in it enough to keep it unfrozen, they being put together, reduce each other to a middle degree of temper as to heat and cold, which is cold enough to freeze the water into ice, but yet warm enough to leave the egg or apple unfrozen.

Dr. GREW ſuppoſed, that it might proceed from the ſpirituous part contained in the egg or apple; and the water of it, in the water, in the ſame manner as ſpirit of wine would remain unfrozen, when water with the ſame degree of cold would be turned into ice.

But Mr. HOOKE ſuppoſed, that there was no need of having ſuch a ſpirituouſneſs as vinous ſpirits, becauſe there are inſtances of other bodies, that require much greater degree of cold to freeze them than water, ſome of which were yet much leſs ſpirituous in that kind than water, as a ſtrong brine or ſolution of ſalt, and quickſilver, which no cold had been yet found ſufficient to congeal; and becauſe there are other bodies more ſpirituous than water, which yet congeal ſooner, as oil of anniſeed, which grows hard with a much leſs degree of cold. He therefore ſuppoſed it to be from the particular texture of the body, which might be of a very different nature in other reſpects from a vinous ſpirit, and yet might agree with it in this, of being ſubject to be frozen.

Mr. HOOKE produced a globe of about a foot diameter ſo fitted with an inſtrument, that he could thereby both geometrically and mechanically draw all the rhomb-lines upon it moſt exactly: which he explained, and by ſeveral experiments proved the truth thereof.

1681, *January* 4, Sir CHRISTOPHER WREN, preſident, in the chair:

The minutes of the two preceding meetings were read, and ſome parts of them diſcourſed of.

Upon mentioning the phoſphorus, the preſident moved, that a quantity thereof might be procured, in order to make ſeveral other experiments with it more exactly for the true nature of its flame, and what affinity it hath with other flame; what effects the preſence or abſence of the air produces; what part or qualification of it is the cauſe thereof; how its effects may be increaſed and diminiſhed, and the like.

Dr. SLARE related, that he had put a piece of his phoſphorus in a ring under a red ſtone.

Mr. HENSHAW mentioned an experiment, which he had ſeen tried with calcined

lead, that being preſently put up into a glaſs bottle, in order to make an artificial carbuncle, had continued to ſhine three days; and having been kept therein cloſe ſtopped from the air for three months, and then opened and expoſed upon a board to the air, had taken fire, and burnt the board, upon which it lay.

Mr. HOOKE gave an account of a book, which he had newly procured from Paris, of father DE FONTANEY, a Jeſuit, containing his obſervations and hypotheſis of the late comet of 1680 and 1681; together with ſome diſcourſes about, and cenſures of the hypotheſes of ſeveral other writers [y]. This account being long, was reſerved for another meeting.

The preſident moved it, as a thing very deſirable to be procured by the Society, on account of the ſtrange effects which it would produce, that a very large burning or ſpecular concave of metal might be forthwith made, in order to make ſeveral trials therewith. This was agreed to by ſeveral other members, as a thing, that might be of very great uſe for the farther diſcovery of the nature and effects of heat, eſpecially for diſſolving many things, and calcining of ſeveral ſorts of bodies.

Mr. ASTON brought in and read an account of Dr. OLAUS RUDBECK's *Atlantica*; as alſo a letter of thanks, which he had written to the author for his preſent of that work to the Society.

Dr. GREW produced a paper from Mr. LISTER for the Society, which was read, containing an account of ſeveral curious obſervations made by him about Roman urns found in divers parts of Yorkſhire, and other parts of the north: of which urns he had obſerved three ſorts; ſome of which were very elegantly adorned with baſſo relievo's, and other marks, which he ſuppoſed to be the workmen's names, and not the names of the perſons, whoſe aſhes were contained in thoſe urns; for that he had found the ſame character upon ſeveral of them, which were of the ſame kind and ſhape and materials. He obſerved them to differ much from ours in their materials and glazing, for that moſt of them were not glazed, and others were varniſhed, as it were, with a bitumen; which he ſupported from a paſſage of PLINY. He remarked, that he had found ſeveral places, where the Roman pots were made; one between Wilber-foſs and Bornbie on the Moor, ſix miles from York; another at the ſand-hills at Santon near Brigg in Lincolnſhire; in both which places there were many remains of pots and urns within leſs than a mile from the Roman road. In the making of thoſe pots and urns the Romans generally uſed more ſand than clay; and they baked them in coffins. Some of theſe pot-ſherds, which he ſuppoſed to be of the ſame colour with the clay, being now baked again, turned red like our pots [z].

Mr. LISTER ſent likewiſe to the Society a preſent of a picture of a remarkable kind of *cornu Ammonis*, in his poſſeſſion, and would have ſent the ſtone itſelf, if he had had an opportunity.

[y] See Mr. HOOKE's Philoſophical Collect. No. iv. p. 106. Jan. 10. 168½.

[z] Mr. LISTER's paper is printed in Mr. HOOKE's Philoſoph. Collect. No. iv. p. 87.

Dr.

Dr. SLARE ſhewed a paſſage in a letter of Monſ. M * * of Paris, giving an account of a ſtrange tooth, which grew ſoft in the head after it had been hard; and afterwards grew hard again; but ſoon after fell out.

Mr. HOOKE ſhewed an engine for deſcribing all manner of helixes upon a cone, which he affirmed to be able to divide any given length, though exceedingly ſhort, into almoſt any aſſignable number of given parts; as for inſtance, an inch into 100,000 equal parts, and that with the greateſt eaſe and certainty imaginable; which he conceived to be the beſt way yet thought of in the world for perfecting all manner of aſtronomical and geographical inſtruments.

January 11, at a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN, preſident,

Sir JOHN LOWTHER	Dr. WOOD
Mr. PEPYS	Dr. GREW
Mr. HILL	Dr. TYSON
Mr. COLWALL	Mr. HOOKE.
Mr. ASTON	

The preſident having been impowered by former orders to diſpoſe by ſale of Chelſea-college with the appurtenances, reported, that he had ſold it with the lands belonging to it to Sir STEPHEN FOX for his majeſty's uſe, in caſe the Council ſhould ratify the ſaid ſale, for 1300 *l.* ready money, to be paid by Sir STEPHEN FOX at one payment at the ſealing of the conveyances.

The Council hereupon judged, that the preſident had done a ſervice to the Society, and approved of the ſaid ſale at the rate of 1300 *l.* ready money, and returned him thanks accordingly; and ordered, that the papers relating to the title be lodged in counſellor BAILEY's hands, in order to give ſatisfaction to the attorney-general.

The Preſident and Mr. HENSHAW were deſired to treat and agree with Mr. FRANKLIN concerning the ground of Chelſea-college, and the rent now due.

Mr. HILL having treated with Dr. HORNECK concerning his arrears, being 28 *l.* 19 *s.* and the doctor having propoſed to give his bond for 20 *l.* to be paid within half a year, with a requeſt to withdraw from the Society for the future, it was ordered, that the treaſurer be deſired to agree with the doctor accordingly, and take his bond to himſelf for the 20 *l.* and to give the doctor a full diſcharge for the time paſt.

In purſuance of an order of 22 June 1681, it was ordered, that the treaſurer pay Mr. HOOKE the ſum of 40 *l.*

At a meeting of the SOCIETY on the ſame day,

The minutes of the preceding meeting were read, and ſeveral parts diſcourſed of.

Mr. THOMAS CRISP preſented a very large branch of white coral, of which ſeveral pieces had been broken off; but he preſerved moſt of them, and brought them along with it, and deſired, that they might be again fixed on with cement; which was ordered to be done.

Mr. HOOKE brought in a preſent from RALPH BOX, Eſq; of a very large ſtone, or calculus of a turtle, formed like a bezoar ſtone.

Mr. LISTER's paper on the antiquities found in Yorkſhire being again diſcourſed of, it was ordered to be regiſtered: upon which occaſion Mr. RICHARD WALLER mentioned, that he had found ſome obſervations agreeable to thoſe of Mr. LISTER, in a book of JOANNES SMETIUS, intitled, *Antiquitates Neomagenſes*, printed at Nimeguen in 1678; and to ſatisfy the Society more fully, he ſent for the book itſelf, and preſented it to the Society.

Mr. HOOKE ſhewed a new inſtrument, by which he deſcribed a certain curve line, which might be called an inverted parabola, or parabolical hyperbola, having theſe properties, that it is infinite both ways, and hath two aſymptotes, as an hyperbola; and that one of the aſymptotes being laid upon the axis of a parabola, and upon which occaſion lines drawn parallel to it, cutting the parabola and curve, the tangents of the curve are always at right angles with the tangents of the curve. This gave occaſion to much diſcourſe concerning ſome properties of the ſame; as alſo, whether it would ever arrive at a certain line drawn upon the cylinder, &c. which Mr. HOOKE affirmed it would never do, though it approached nearer to it every revolution.

January 18, at a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN, preſident,

Sir JOHN LOWTHER	Dr. GREW
Mr. HENSHAW	Dr. WOOD
Mr. HILL	Mr. ASTON
Mr. COLWALL	Mr. HOOKE.
Mr. PEPYS	

Mr. FLAMSTEAD was ſworn of the Council.

The preſident gave an account of his proceedings in the diſpoſal of Chelſea-college; for which the Council returned him their thanks, with their earneſt requeſt, that he would complete and finiſh the ſaid undertaking.

Mr. HILL was deſired to ſpeak with Mr. EDWIN about depoſiting the money, when it ſhall be received, in the Eaſt-India company.

The treaſurer read over a liſt of the names of ſuch members, as do not pay at all, or are much in arrears: whereupon he and the two ſecretaries were deſired to

to meet the preſident and Sir JOHN HOSKYNS at the preſident's houſe every Monday night; and they were appointed a committee to conſider of all matters relating to the arrears, and what expedients were fit to be made uſe of for the recovery of the ſame, and to report their proceedings and opinions therein to the Council.

Dr. WOOD reported his proceedings with Mr. SHERIDAN concerning his arrears, viz. that he had propoſed to pay down 10 *l.* provided he might continue of the Society, and be excuſed from any further payment for the future: which propoſal being debated, was rejected.

Mr. COLWALL reported the ſeveral anſwers of Mr. HOARE and Dr. MILLES to his demand of their arrears; which were left to be conſidered of by the committee.

Whereupon the preſident moved, that the anſwers made by ſeveral members upon ſuch demands ſhould be regiſtered in a book, to be produced, when the Council ſhould conſider of that affair.

An order was paſt for the payment of Mr. WICKS's ſalary for one year, ending at Chriſtmas preceding; and it was further ordered, that a ſtop be put to the ſalary of the clerk and operator for the future, till the Council ſhall have farther conſidered and ſettled that affair.

At a meeting of the SOCIETY on the ſame day, Sir CHRISTOPHER WREN, preſident, in the chair:

A letter in Latin from WILHEM TEN RHYNE, dated at Batavia 23 July 1681, and directed to Mr. OLDENBURG [z], was brought in by Mr. HAAK, and read; in which he deſired to be informed concerning ſome affairs in England; and gave an account of ſome obſervations, which he had made, and ſome which he had by him, which he was willing to communicate; of a treatiſe ſent by him to Holland, which he was deſirous might be printed in England, concerning the uſe of moxa, and the *acupunctura* of the Japaneſe phyſicians, which he had taken out of their praxis. It was hereupon deſired, that Mr. ASTON would make inquiry concerning Mr. TEN RHYNE's kinſman, JOHN GROENVELT, and concerning the treatiſes mentioned in his letter, whether they could be procured; and to write an anſwer to that letter [a], in order to ſee, whether he would continue a correſpondence with the Society, though Mr. OLDENBURG were dead.

Mr. TEN RHYNE in his letter remarked, that moxa was made of artemiſia: whereupon Dr. SLARE affirmed, that he had made a kind of moxa of the fibres of mugwort, being well dried, and the duſt blown away.

Mr. HENSHAW was of opinion, that the virtue of the moxa lies only in burning and cauteriſing; and that the ſame might be done with any other burning ſubſtance; which would diſcuſs the humours, and raiſe a bliſter; and that amongſt

[z] Letter-Book, Vol viii. p. 164.
[a] Mr. ASTON's letter, dated January 168½, is inſerted there, p. 187.

ſeveral barbarous people the uſe of firebrands was commonly applied to parts, where any acute pain was felt, as in the head or limbs.

Mr. HOOKE was of opinion, that there might be ſome peculiar virtue in the very ſubſtance of the moxa, which might cauſe this effect, beſides the heat and cauteriſing; which virtue might lie in the ſolid oil of it, which moſt vegetables upon burning yield, as tobacco, paper, linen, &c. in which ſolid oil lies very much of the virtues and qualities of the vegetable ſubſtance, which being ſeparated from the ſalts of vegetables, they were found all alike; and that this only ſpecificated them.

The preſident ſpeaking of the practice of the Chineſe phyſicians obſerved, that they were extremely curious about feeling the pulſe of the patient, examining the beating thereof, not only in the wriſt, but in divers other parts of the body; by which they pretended to make great diſcoveries of the diſeaſe. And he was of opinion, that the antients might know and make more uſe of the information of the pulſe than our modern phyſicians of Europe; and that there might be more GALEN's curioſity about pulſes than was at preſent underſtood.

Mr. HOOKE was of opinion, that the pulſe might diſcover ſomewhat of the ſtate of the part, where it was, by means of the ſtopping of the blood; whether it were in the vein, artery, or muſcular fleſh, the artery being thereby more ſtrained and extended.

The preſident conceived, that there might be ſomewhat even in the motion of the parts of the artery itſelf; for that it is very viſible in diſſections in living ſubjects, that the artery had a peculiar muſcular motion of its own diſtinct from the pulſe of the heart; and that by diſſecting it appeared plainly made up of three ſorts of muſcular coats, the innermoſt of them having long fibres, the outermoſt round fibres, and the middlemoſt diagonal or tubical fibres.

Mr. HOOKE produced an inſtrument, and ſhewed a way of exactly deſcribing the ſpiral of ARCHIMEDES by a new property thereof, and that with as much eaſe and exactneſs, as a circle could be deſcribed; whereby not only a given arch might be divided into any number of equal parts, but a ſtrait line given equal to the circumference of the circle.

January 25, at a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN, preſident,

Sir JOHN LOWTHER	Dr. CROUNE
Mr. HILL	Dr. GREW
Mr. COLWALL	Mr. FLAMSTEAD
Mr. PEPYS	Mr. ASTON
Mr. HENSHAW	Mr. HOOKE.
Mr. EVELYN	

The

The preſident reported his proceedings relating to Chelſea-college with Mr. BAILEY, Sir STEPHEN FOX, and the attorney general.

It was ordered, that no perſon whatever, who is a foreigner, ſhall be admitted fellow of the Society, without a diploma ſent to him from the Society.

The preſident deſired, that it might be farther conſidered, what expedient might be agreed upon for ſtopping the proceeding in too eaſy a choice of perſons propounded to be elected: and it was propoſed, whether the beſt expedient to prevent the ſame were not, that after the perſon ſhould be propoſed in the Society, the council at their next meeting ſhould conſider, whether he be fitly qualified for promoting the ends of the inſtitution.

And whereas notice had been taken in the council, that ſeveral perſons had been of late admitted members of the Society without ſubſcribing the bond, and paying their admiſſion-money; to prevent this for the future, it was propoſed, that after any any perſon had paſſed the ballot, and been declared choſen by the preſident, the perſon, who propounded him, ſhall take care to bring him to the treaſurer to pay his admiſſion-money and to ſign his bond, and receive an acquittance for the ſame from the treaſurer; which acquittance being ſhewn to the ſecretary, the perſon ſhall be admitted to write his name in the ſtatute-book, and by the ſecretary be preſented to the preſident for admiſſion.

Theſe two laſt orders were to be again debated at the next meeting of the council, in order to be paſſed into a ſtatute.

It was ordered, that a book of blank bonds be forthwith provided for the treaſurer for ſuch perſons ſo to be admitted: and

That the ſecretaries make trial of ſome perſons for writing between this and the next meeting of the council, and give an account thereof to the next meeting.

Dr. GREW's order brought in by himſelf was ſigned.

" At a meeting of the council of the Royal Society,

" Dr. GREW having read ſeveral lectures before the ſaid Society, of the anatomy of plants, ſome whereof have been already printed at divers times, and ſome are not printed, together with ſome others of their colours, taſtes, and ſalts; alſo of the ſolution of ſalts, of the waters of this city of London, and of mixture; all of them to the good liking and approbation of the ſaid Society, it is therefore ordered,

" That he be deſired to cauſe them to be printed together in one volume: and in regard of the great number of figures belonging to them, to take upon himſelf a more particular care of the impreſſion."

At a meeting of the SOCIETY on the ſame day,

The preſident being called away by ſome urgent occaſions, Mr. HENSHAW was deſired to take the chair.

The minutes of January 18th were read and diſcourſed of.

Mr. ASTON gave an account concerning GROENVELT, the phyſician inquired of in Mr. TEN RHYNE's letter; and he was deſired to haſten his anſwer to that letter.

Mr. HUNT brought in, as a preſent from Mr. BAGFORD for the repoſitory, a horn or tooth of ſome ſtrange animal, and the bearded head of an Indian arrow, being made of an hard wood, and bearded with fangs like the ſting of a bee or waſp.

Mr. HOUGHTON related, that having ſpoken with Monſ. GROENVELT, the perſon mentioned in the letter of WILHEM TON RHYNE, he had been informed by the ſaid Monſ. GROENVELT, that the ſaid WILHEM TEN RHYNE was phyſician to the Dutch factory at Batavia, and one of the council there.

Mr. HOOKE ſhewed a new method of deſcribing a parabola, which on a plain is exactly as a circle by the help of compaſſes; which method he demonſtrated to be geometrically as well as mechanically true: by which means he deſigned to make a true gage for the forming the ſhape of the ſpecular concave.

Feb. 1, Sir JOHN HOSKYNS vice-preſident in the chair.

The minutes of the preceding meeting were read.

Part of a letter from Mr. CASWELL to Mr. FLAMSTEAD was read, giving an account of his having lately taken the fall of the river Severn, and found it fall three yards three inches in five miles. The river is indeed ſwift; and yet Mr. CASWELL was of opinion, that the meaſure of the fall was too great, though it was taken with a quadrant, and, he thought, very carefully. He mentioned alſo the hight of Rekin hill in Shropſhire by levelling down from the top to the Severn river; which hight he found to be 396 yards above that river; and the place of the Severn, to which he brought down the meaſure, he gueſſed to be 40 yards above the ſea. On the top of the Rekin he meaſured angles of altitude of other hills, whoſe diſtance he pretty well knew, by the help of his triangle-work; and he found Sliperſtoneclear hill in Shropſhire to be 600 yards high; Caradocke hill 490 yards: and for other reaſons he gueſſed the Longment hill to be near 600 yards, and the Brithin, Cavanateſter, and Malagolven above 500. Theſe four laſt he only gueſſed. He added, that trying the hight of Rekin by angles of altitude and diſtance, he had calculated it to be 30 yards higher than he found it to be by actual meaſure. Whether this was cauſed by refraction or unſkilfulneſs of meaſure and obſervation, he would not be poſitive.

A pro-

A propoſal of one ROBERT LOWMAN was read, in which he pretended to make all rivers navigable, and deſired the council's approbation of his deſign. He was called in, and aſked, whether he had any thing farther to deſire of the Society, or to propound: to which he anſwered, that he only deſired an approbation or recommendation of his propoſal, he having a deſign thereby to carry up coals to Wincheſter and Saliſbury. The vice-preſident told him, that the Society would take time to conſider of his requeſt, and give him an anſwer the next week.

Mr. ASTON read a letter to himſelf from Mr. LISTER.

Dr. SLARE gave an account of ſome farther experiments, which he had made with the new ſhining ſubſtance [b]; which was read; and he produced ſome of the ſubſtance, and a trial thereof was made with ſucceſs in the gallery, which was, that by exhauſting the air, this ſubſtance flamed more.

Mr. HOOKE gave an account of the contents of a letter to Mr. HAAK from a gentleman of Berlin, mentioning, that Dr. ELSHOLTZ hoped, that he ſhould ſoon have the perpetual noctiluca ſo as to enlighten the whole room, he being already able to read a large print by it: and that provoſt ANDREW MULLER was ready ſtill to give a ſpecimen of his knowledge in the Chineſe language by the help of a certain clavis invented by him; and that *conſideratis conſiderandis* he would impart his knowledge in that and other curioſities.

Mr. HOOKE produced ſeveral eggs and apples, which had been covered with ſnow and ſalt all the day, in order to try the experiments, which had been formerly propoſed by Mr. HENSHAW, viz. whether two of ſuch frozen eggs or apples being at the ſame time put, the one into a glaſs of cold water, the other into a glaſs of warm, that, which was put into the warm, would not ſooner freeze, and form a cruſt of ice about itſelf, than that, which was put into the cold. But two of them being ſo ordered and ſuffered to lie in the waters about half an hour, neither of them had contracted a cruſt of ice; which was judged to be occaſioned by the warmth of the meeting-room, in which the experiment was tried.

Feb. 8, at a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN, preſident,

Sir JOHN LOWTHER	Dr. TYSON.
Mr. HILL	Dr. WOOD
Mr. COLWALL	Mr. FLAMSTEAD
Mr. PEPYS	Mr. ASTON
Mr. HENSHAW	Mr. HOOKE
Dr. GREW	

Mr. WILLIAM BAILEY and Mr. NICHOLAS JOHNSON appearing from the attorney general, in order to ſee the conveyance of Chelſea-college and the apperte-

[b] An account concerning a farther proſecution of experiments with the phoſphorus by Dr. SLARE is printed in Mr. HOOKE's *Philoſ. Collect.* N°. 5. p. 84.

nances thereof to his majeſty, ſealed with the common ſeal of the Society, the council being met, the deed of ſale was read over, and the common ſeal was ſet to it, the whole council conſenting thereto. And at the ſame time Mr. JOHNSON produced an acquittance to be ſigned by Mr. HILL the treaſurer upon the receit of the money.

It was ordered, that the 1300 l. now received by the treaſurer from Mr. JOHNSON be depoſited in the Eaſt-India company: and that the obligation from the ſaid company for the ſame be depoſited in the iron cheſt; and that the keys of the ſame be in the cuſtody of the perſons mentioned in the ſtatutes; and that at the ſame time the three charters and the common ſeal be alſo put into the ſaid cheſt.

Sir JOHN HOSKYNS was deſired to call again upon Mr. BAILEY, and to obtain a copy of the conveyance of Chelſea-college to the king, and to peruſe the papers now in the hands of Mr. BAILEY, to ſee, whether any of them be of farther uſe to the Society, and not belonging to Chelſea-college, and to bring back ſuch with him, and to leave the reſt in Mr. BAILEY's hands.

Mr. HILL returned and brought in a note from COOK and CARY for the payment of 1300 l. to the Eaſt-India company; and he was deſired to procure the bond of that company for the ſame upon the Friday following, and to bring it in, that it might be put into the iron cheſt.

At a meeting of the SOCIETY on the ſame day, Mr. HENSHAW was deſired to take the chair.

The minutes of the preceding meeting were read and diſcourſed of.

Mr. WICKES brought in a ſecond paper from Mr. ROBERT LOWMAN, wherein he humbly deſired, that in caſe he ſhould meet with ſome unexpected difficulties in his undertaking, he might have the liberty to crave the Society's direction and advice.

The Society thereupon thought fit to deſire Sir JOHN HOSKYNS, Mr. HILL, Mr. ASTON, and Mr. HOOKE to conſider of his propoſal, and to give him ſuch teſtimonial, as they ſhould think proper.

The difficulties, which Mr. LISTER had met with in his deſign of printing a diſcourſe of his about inſects, being diſcourſed of, the Society endeavoured to find out ſome expedient to have the thing done at their charge, if there could be procured a ſufficient number of ſubſcribers to take off ſuch books at a very eaſy rate, as would pay for the impreſſion. It was thought, that this might be eaſily effected, if there could be ſubſcriptions enough of the Society to take off fifty copies; and that ſome care were taken by the ſecretaries to procure ſubſcriptions from the two univerſities and their other correſpondents to make up the number in all 150, Mr. LISTER having engraven the plates at his own charge, and given them to the Society.

Sir JOSEPH WILLIAMSON acquainted the Society, that the duke of NORFOLK was newly arrived in England.

Upon diſcourſing farther concerning phoſphorus, there were ſeveral diſputes, whether there were any ſuch thing as *flammula vitæ:* and it was conceived by ſome, that the experiments of phoſphorus plainly proved ſuch a *flammula*, as being extracted either immediately out of the blood, or mediately out of the urine. Mr. HOOKE was of opinion, that there could be nothing proved of that nature by it; for though by a certain preparation, a ſhining burning ſubſtance was extracted from it, yet it was poſſible, that as a ſhining and burning ſubſtance might be extracted out of other ſubſtances not animal; as was particularly proved by the ſhining of other ſubſtances, and particularly lime, formerly mentioned by the preſident, which was made of that quality by the violence of the fire: and for the quality of burning, he urged, that oil of vitriol and oil of turpentine would produce very ſtrange effects by mixture. He mentioned alſo an experiment with oil of turpentine and rectified ſpirit of urine, to ſhew the ſtrange motion and expanſive power of liquors. It was thereupon deſired, that he would ſhew theſe experiments at the next meeting.

Hereupon was alſo occaſioned a farther diſcourſe concerning the nature of fire, and how conſonant experiments were to the theory of the diſſolution of bodies by the air as a menſtruum.

Part of a letter from Berlin to Mr. HAAK was read * * *

Mr. RICAUT upon occaſion of this letter mentioned WERNERUS * * *

Feb. 15, at a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN, preſident,

Mr. CODWALL	Mr. HENSHAW
Mr. HILL	Mr. ASTON
Dr. CROUNE	Mr. HOOKE.

JOHN WILKINSON having been employed by the ſecretaries in tranſcribing ſome papers in proſecution of an order of council of the 25th of January laſt; and he there producing his writings, they were well approved of; and it was thereupon ordered, that the treaſurer ſhould pay him ſixteen ſhillings for the time paſt, and eight ſhillings a week for the time to come, during which he ſhould be employed by the ſecretaries or either of them, upon his producing a note from either of them for his having been ſo employed.

The treaſurer acquainted the council, that PAUL RICAUT, Eſq; has paid his 52 s. on account of his arrears; and that he had been abſent out of England for many years. It was ordered, that Mr. RICAUT be diſcharged of his ſaid arrears to Michaelmas laſt, he preſenting to the library his own printed books, and ſealing the uſual bond for the time to come.

The

The treaſurer brought in the Eaſt-India company's bond for 1305 l. 6 s. 8 d. which was put into the cheſt: and when the bond ſhould be renewed in March following, the word *ſucceſſors* was to be inſerted.

With relation to the collection of money in arrear to the Society,

Mr. RICAUT being applied to by the treaſurer, paid fifty two ſhillings upon his arrears, and excuſed himſelf, that he had been many years out of England, declaring, that he would pay for the future.

Mr. WOODROFFE being applied to by the treaſurer, alledged, that about ſeven years before, he had declared to Sir ROBERT SOUTHWELL, that he would withdraw from the Society.

Sir NICHOLAS STEWARD doubted of his arrears being ſo much as were demanded.

Dr. MILLS and Mr. HOARE being ſpoken to by Mr. COLWALL, did not refuſe to pay, but hoped abatement.

Sir WILLIAM PETTY had ordered his lady to pay ten pounds of his arrears by letter to Dr. WOOD.

The treaſurer acquainting the council, that of late years a part of the ſee-farm rent of the Society was not anſwered, by reaſon that the counteſs of DORSET had ſold away in parts the barony of Lewes; and that what remained in her hands was not ſufficient to anſwer the payment of the ſaid rent; the treaſurer and Mr. PACKER were deſired to inquire how this fee-farm rent was anſwered to the king before it was the Society's, and who were then the collectors: as alſo to inquire of Sir JOHN BANKES, the former owner, and to ſpeak to Mr. GOODWIN, attorney at Lewes, and deſire his advice about the beſt way of proceeding in this affair.

With reſpect to the arrears, it was ordered,

That Mr. RICAUT be diſcharged from the payment of more arrears, in conſideration of his abſence from England, he preſenting his books to the library, and ſealing the bond for future payment:

That Mr. HOUGHTON be deſired to acquaint Dr. WOODROFFE, that the council could take no notice of his withdrawing from the Society, unleſs it had been formerly done according to the ſtatute, by ſignifying his deſire to the preſident; and that there was ſeven years ago a conſiderable arrear due: that however, becauſe the doctor might believe, that his ſignification to Sir ROBERT SOUTHWELL might have been ſufficient, if he would pay 20 l. to the treaſurer, he ſhould be diſcharged from all arrears, and remain at his own choice, whether he would continue, ſigning the bond, or recede:

That

That Mr. ASTON be desired to write to Sir NICHOLAS STEWARD, and send him an account of his arrears, Mr. PACKER undertaking to give an answer:

That Mr. ASTON be likewise desired to write to Dr. MILLS and Mr. HOARE, Mr. COLWALL undertaking to obtain their answers: and

That Dr. WOOD be desired to acquaint the lady PETTY, how the money is to be paid, and return thanks to Sir WILLIAM PETTY.

At a meeting of the SOCIETY on the same day, Sir CHRISTOPHER WREN president in the chair.

The minutes of the preceding meeting were read and discoursed of.

Mr. ASTON read a letter from Mr. LISTER [c], in which he observed, that the taking off fifty copies of GOEDART was very obliging; and that he would print it, if he could: but that his own papers were but trifles in consideration of those excellent manuscripts, which Mr. WILLUGHBY had left behind him; wishing, that the Royal Society would interest themselves in promoting the printing of those manuscripts: that the history of fishes was, to his knowledge, made ready for the press four years before by Mr. RAY, and put into the hand of Mr. CHILD [d], the merchant in London, who married Mr. WILLUGHBY's widow, and who had all the rest of his papers: and that it was pity, that Mr. WILLUGHBY's curious and voluminous observations on insects, in which he greatly delighted, should be lost; as they probably would, without some such powerful intercession and solicitation as that of the Royal Society. With this letter Mr. LISTER sent six English turquoises.

Upon reading this letter it was ordered, that inquiry should be made after Mr. WILLUGHBY's manuscript on fishes; and Sir JOHN LOWTHER being present undertook to speak to Sir JOSIAH CHILD about it.

Mr. HOOKE was desired to inquire, whether Mr. RAY was in town; and, if he were, to inquire of him, whether he had any of the philosophical manuscripts of Mr. WILLUGHBY in his hands.

Mr. HAAK produced a paper, which he had received from a correspondent at Berlin, being a catalogue of the writings of ANDREW MULLER, viz. ANDREÆ MULLERI *Greiffenhagii de Sinensium rebus aliaque opuscula:*

1. ABDALLÆ *Persæ historia Sinensis, Persicè.*
2. *Eadem Latinè cum notis marginalibus editoris et interpretis.*
3 *Anhang zweer Retten die erste eines Moscovitischen Besandten nach Siberien nach China, die* ANDERE HERNE ZACHARIE WAGNERS, *durch ein gross. Theil de Wall und unter en dern auch nach China.*

[c] That dated at York, Feb. 11. 168½. inserted in the letter book vol. viii. p. 177.

[d] Afterwards Sir JOSIAH CHILD.

4. *Com-*

4. *Commentatio alphabetica de Sinarum Magnæque Tartariæ rebus.*

5. *Basilicon Sinense, seu Regum & Imperatorum Sinensium Nomina & res quædam gestæ ab exordio ad nostra usque tempora.*

6. *Imperii Sinarum mappa geographica è mappâ amplissimâ, quam ipsi dederunt, in angustiorem formam redacta, & literis Latinis expositа.*

7. *Imperii Sinarum nomenclator geographicus, prior classicus, posterior alphabeticus, tertius Index addendorum.*

8. *Præfationes in historiam Sinensem, Basilicon, Commentationem alphabeticam, Nomenclatorem, &c.*

9. *Propositiones inventi Sinici, Editio quarta cum notis.*

10. *Epistola de Inventо Sinico, cum notis.*

11. *Oratio Dominica Sinicè cum versione & notis, &c.*

12. *Observationis Sinicè.*

13. *Monumenti Sinici historiæ textûs, commentarii, &c. antehac nondum editum examen.*

14. *Historia de Sinis ex Armenico Latinè versa.*

15. *Excerpta de Sinis e Gregorio Malasiense.*

16. *Besser untorricht vender Siniser Schrift und Drack alstwa in hern Delie Grohnitzen untorricht vender Lutherischen und Reformirten Kirchen Enhallowist. Accedunt Iter, &c.*

17. *Specimen analisitæ literariæ.*

18. *Symbolæ Syriace,* 1. MOSIS MARDENI & ANDREÆ MASII *Epistolæ Syriacè cum Versione & Notis.* 2. *Dissertationes,* 1. *de* MOSE MARDINO, 2. *de Syriacis sacræ Scripturæ Versionibus.*

19. *Commentarius de perantiquo Pentateuchi Hebraici manuscripto, quod anno* CHRISTI 334 *in insula Rhodo scriptum est, jamque in Bibliothecâ Electorali asservatur.*

20. *Actio Plagii Literarii Sinensis, &c.*

21. *Specimen chronologicum.*

22. *Specimen . . . . . Mandarinici.*

23. *Index generalis Authorum rerumque, &c.*

24. *Catalogus Opusculorum ab Authore hactenus editorum & ineditorum.*

25. *Elenchus Librorum rariorum tum manuscriptorum quam editorum pro Emptoribus.*

Mr. ASTON read a letter[e], which he had written to Signor MALPIGHI, to return him the Society's thanks for his picture and present of books.

Mr. ASTON presented from Mr. THOMAS MORRIS of Westminster a manuscript of PAULUS OROSIUS.

Dr. WOOD presented Monsr. DES CARTES's works, viz. 1. *Principa & Specimina,* Amstelod. 1664. 2. *Meditationes,* ibid. 1663. 3. *Geometria,* 2 volumes, ibid. 4. *De Homine,* Lugd. 1664. 5. *Lettres,* 3 volumes, Paris 1657: as also MERSENNUS's *Cogitata Physico-Mathematica,* Paris 1664.

Dr. SLARE presented the Society with a ball taken out of the stomach of an Alpine

[e] Letter book, vol. viii. p. 191.

goat,

goat, given him by Mr. FRY, an apothecary, who had taken it out of the animal.

He ſhewed a ſtrange ſort of rice ſhaped like a clutched fiſt, and ſaid to grow in Morocco.

Mr. HOOKE ſhewed the two experiments, which had been ordered at the laſt meeting, 1. The moving of oil of turpentine upon ſpirit of wine. In the firſt trial in highly-rectified ſpirit of wine, the turpentine ſunk; but in brandy it ſucceeded well, and exhibited a great variety of motions.

2. The mixture of oil of vitriol with oil of turpentine, which grew very hot, and ſwelled much, as was expected, but not ſo much as had happened in ſeveral other trials.

The preſident being now preſent, and Mr. FLAMSTEAD having cavilled againſt the method ſhewn by Mr. HOOKE of deſcribing a parabola, and affirming it to be falſe, the Society deſired Mr. HOOKE to ſhew again the way, which he had demonſtrated at the laſt meeting: and which he now repeated, and demonſtrated the ground thereof. Upon which the preſident declared to the Society, that it was true and certain, and the beſt way yet known of deſcribing that curve, and never publiſhed before.

February 22, at a meeting of the COUNCIL were preſent,

Sir JOHN HOSKYNS vice-preſident,

Mr. HENSHAW	Dr. GREW
Mr. COLWALL	Dr. TYSON
Mr. HILL	Mr. FLAMSTEAD
Mr. PEPYS	Mr. HOOKE.

Mr. HOOKE, in proſecution of the deſire of the Council, having attended Sir WILLIAM JONES with the ſtate of the caſe concerning the arrears due to the Society from ſeveral members, produced Sir WILLIAM's opinion thereupon as follows:

" The king by his charter grants to the preſident and council of the Royal " Society power to make ſuch by-laws, as they ſhall think fit for the government " of the Society; which he injoins and commands to be inviolably obſerved, ſo " as they be reaſonable, and not repugnant to the laws and ſtatutes of this " kingdom.

" They make a by-law or ſtatute, that every fellow pay one ſhilling a week " for defraying the charges and expences of the Society.

" Every member at his admiſſion does ſubſcribe a promiſe or engagement, " that he will obſerve the ſtatutes and orders of the Society, and has notice of " this ſtatute.

" Many Fellows in arrears.

" Qu. Whether theſe arrears are reaſonable? how? and by what action, and " for what time back?

" I think an action may be brought for the recovery of the arrears; and it is " not material in the cauſe, whether the laws be confirmed by the chancellor, " chief juſtice, &c. And the action to be brought muſt be an action of debt " in the name of the corporation. It will be beſt to bring it for the whole ar- " rears, and let the defendant plead the ſtatute of limitation to all but ſix years, " if he ſhall think fit. Perhaps ſome will think it a diſhonour to do it: however " it will be a bar but for what is above ſix years.

" WILLIAM JONES."

Mr. HILL reported, that Mr. HOAR had paid his arrears due upon bond, viz. eight pounds nine ſhillings, and taken up his bond, and deſired to be diſcharged from the Society for the future: to which purpoſe he would write to the preſident: but that the ſaid Mr. HOAR ſtill owed upon the old arrears twenty pounds ſixteen ſhillings.

Mr. HILL reported alſo, that Dr. MILLES had refuſed to pay his arrears, though due upon bond, amounting to 7 l. 16 s. Whereupon after a debate it was thought fit, in reſpect to the perſon, that a letter ſhould be written to him, to acquaint him with the reſolution of the Society to put his bond in ſuit, and to preſs him to pay, or give his poſitive anſwer.

Mr. HILL reported concerning Mr. STANHOPE, that he had ſome years before paid to the ſociety 16 l. and deſired to be diſcharged at that time from the Society. Whereupon it was ordered, that the account ſhould be examined and reported to the council.

He reported the anſwer of Mr. EDMUND WALLER as follows: Mr. WALLER ſaid, that the plague happening ſome time after the Society was eſtabliſhed, and he being perpetually in parliament had never been able to attend the Society, either to ſerve them, or receive any advantage thereby: that he was now of a great age, had loſt half his fortune for the king, and having a great charge of children, hoped, that he ſhould be conſidered as others, who had not been able to wait on them as well as he: and he humbly took leave to conſider how he might be able to ſerve them.

Mr. HOUGHTON brought in an account of his ſucceſs in collecting arrears:

That he had been four times to find Sir NICHOLAS SLANING, and that he was now gone into the country:

That Mr. HOAR had paid his arrears on bond, and deſired to be excuſed from attending on the Society for the future:

That

That Dr. CLENCH readily paid his arrears, and was willing to do any thing, that ſhould be for the Society's ſervice for the future.

Mr. HOUGHTON being deſired, promiſed to deliver in writing the reſt of the anſwers, which he had received.

The council deſired, that inquiry ſhould be made concerning the deceaſe of ſeveral members, and the time of it; as of the Lord BRERETON, Mr. BARRINGTON, Mr. HOAR, junior, Sir KINGSMILL LUCY, Sir JONAS MOORE, ſenior, the lord Viſcount STAFFORD, and Sir JOHN WILLIAMS; and likewiſe, who were the executors or perſons liable to pay their debts, in order to the procuring their reſpective arrears due to the Society.

It was reſolved, that the caſe of Signor SAROTTI, Monſ. SPANHEIM, and ſome other foreigners, with relation to their payments, be debated at the next meeting of the council.

At a meeting of the SOCIETY on the ſame day, Sir JOHN HOSKYNS vice-preſident in the chair:

The minutes of the preceding meeting were read.

The turquoiſe-ſtones mentioned in a letter of Mr. LISTER read at the laſt meeting were now produced; ſome of which being broken appeared of a very curious blue like lapis lazuli. It was deſired, that ſome of them ſhould be tried by a lapidary, and by ſome other means, to find out the true nature of them.

Mr. DACRES preſented by Mr. HOUGHTON a parcel of cuttings of a leaf, ſuppoſed from the ſmell and taſte not to be tobacco, but of ſome other plant, wrapped up in a roll of plantain leaf, which is uſed by lighting it at one end, and applying the other end to the mouth, and drawing the ſmoke through it.

Mr. HOOKE preſented ſome papers given him by Mr. ARNOLDUS of Nuremburg, viz.

1. A repreſentation of the appearance of the comet, as it was obſerved there by Mr. EYMART, and printed upon blue paper with the hightening of the lights of it by a white laid on, as was ſuppoſed, with a pencil.

2. A repreſentation of the view of the inſide of a church in Nuremberg in rebuilding, made by ANDREAS GRAFFEN.

3. A taille douce made by SUSANNA MARIA SANDRACTINA, after a painting of PIETRO BERETTINI of Certona.

4. A map of the country of Venezela given by the Emperor CHARLES V. to the noble family of the VELSER's of Augſburgh.

Mr. HOOKE likewiſe ſhewed a draught of a ſextant made by Mr. EYMART for making obſervations of the late comet.

The experiments of phoſphorus were ſhewed by Dr. SLARE, viz. ſome pieces of that ſhining ſubſtance exalted to a much greater perfection; with which experiments the Society was very well pleaſed, eſpecially the Earl of AYLESBURY, the Lord CAVENDISH, and Monſ. JUSTEL, who had not ſeen the like.

March 1, Sir JOHN HOSKYNS vice-preſident in the chair:

The minutes of the laſt meeting were read.

Mr. ASTON gave an account, that Dr. BROWN with ſome other phyſicians had diſſected an oſtrich; and had drawn up an account of his obſervations made in that diſſection, which he now communicated to the Society; and it was accordingly read[f].

Mr. HOOKE produced a long letter from Mr. LEEWENHOECK, containing an account of ſeveral curious obſervations and diſcoveries made with a microſcope by himſelf. The letter being in Low Dutch was not read; but Mr. HOOKE having tranſlated half of it read it to the Society, wherein was an account of ſeveral curious diſcoveries relating to the fibrils, hair or ſmall claws of muſcles[g]. He promiſed to tranſlate the remaining part of this letter againſt the next meeting.

Mr. HOUGHTON ſhewed a very curious piece of turned work, viz. a double branched candle-ſtick of box, with ſixteen branches all glewed together upon a ſtock in two rows one above the other, and ſo ordered with a globe of glaſs with a ſmall arch, as almoſt to fill the whole cavity of the globe: of which Mr. HUNT was ordered to make a ſmall draught to be inſerted in the regiſter-book.

Mr. HOUGHTON brought in alſo a piece of white marble ſtained red, and half a large bladder ſuppoſed to be the crop of a pelican; both which were given him for the repoſitory by Mr. SMITH of Chriſt-Church.

Mr. HOOKE ſhewed a way of deſcribing all varieties of ellipſes by a new ſort of compaſſes invented by himſelf, in which he made uſe of the ſame inſtrument, with which he deſcribed the parabola and ſpirals.

March 8, at a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN, preſident,

Mr. HILL	Dr. GREW
Mr. COLWALL	Mr. ASTON
Mr. PACKER	Mr. HOOKE.
Mr. PEPYS	

[f] It is printed in Mr. HOOKE's *Philoſ. Collect.* N°. 5. p. 147.

[g] Ibid. p. 152.

The

The opinion of Sir WILLIAM JONES concerning the way of recovering the Society's arrears was again read.

The ſeveral anſwers of Mr. HOAR, Dr. MILLES, Mr. STANHOPE, Mr. WALLER, Sir NICHOLAS SLANING, Mr. LE HUNT, Sir JAMES SHAEN, Dr. THOMAS COX, Capt WYNDE, Dr. CLENCH, Dr. CHAMBERLAYNE, Dr. ALLEN, and Dr. KING were reported by Mr. HOUGHTON.

Upon debating the anſwer of Mr. HOAR, it was ordered, that he ſhould from henceforth be left out of the treaſurer's books, and out of the liſt of the Society.

Upon the debating of Dr. MILLES's anſwer, it was ordered, that Mr. HOUGHTON ſhould go with another letter from the ſecretary, and preſs him for a poſitive anſwer to the ſame.

Mr. STANHOPE's anſwer being debated, it was ordered, that he ſhould be left out of the treaſurer's book, and out of the liſt of the Society, for the future; he now alledging, that he gave notice to be ſo left out of the Society, when he paid his laſt arrears.

Mr. EDMUND WALLER's anſwer being read, it was ordered, that Mr. HOUGHTON ſhould again attend Mr. WALLER, and ſee to get what he can of his arrears, and make as good a compoſition with him as poſſible.

Concerning Sir NICHOLAS SLANING, it was ordered, that there ſhould be a letter of demand ſent to him into Cornwall; and that the leaving him out of the Society ſhould be for ſome time ſuſpended: and that the ſecretary ſhould in ſome part of the letter intimate, that the Society deſigns to take out of their body, the names of thoſe, who ſhould remain in arrear.

Mr. HOUGHTON was deſired to call again upon Sir JAMES SHAEN, and if he would pay twenty pounds, to deliver up to him his bond: as alſo to call again upon Dr. COX, and acquaint him, that the arrears due from him were due upon his bond.

Mr. HOUGHTON was deſired to inform himſelf concerning the time of the death of Sir JONAS MOORE, ſenior, Sir KINGSMILL LUCY, and of other members.

Signor SAROTTI, Monſ. SPANHEIM, Dr. HUISH, and Dr. PAPIN were ordered to be left out of the treaſurer's book, but not out of the Society, but to be as honorary members.

Mr. PACKER reported the anſwer of Sir NICHOLAS STEWARD, that he was willing to pay ten pounds, and deſired to be diſcharged from the Society for the future. Whereupon it was ordered and deſired, that the treaſurer and Dr. CROUNE ſhould write to him, and put him in mind of his former promiſe of paying his

arrears to the Society; and of procuring his ſon to be admitted of the Society to ſucceed him.

Mr. HOUGHTON reported Capt. WYNDE's anſwer, that he would ſpeak with the preſident about his arrears; and it was reſpited till he had ſo done.

He reported alſo Dr. ALLEN's anſwer: to which he was deſired to return this meſſage from the Society, that the Society expected and demanded the full arrears due upon bond; and that they would diſcourſe with him afterwards concerning the other arrears.

Mr. HILL reported the anſwer of Dr. KING, that he having made ſeveral experiments, and brought in the accounts of them to the Society, conceived, that they might balance his old arrears: which being debated, it was ordered, that in conſideration of his trouble and charges, and of the accounts brought in, as was alledged, the ſaid Dr. KING ſhould be diſcharged of all his old arrears due to the Society before he gave his bond.

Mr. PACKER gave an account of his inquiry concerning the way of collecting the fee-farm rent; and he was deſired to continue his care to be farther informed about that affair, and to report his ſucceſs to the council.

Mr. ASTON read a letter from Dr. BATHURST, containing many expreſſions of reſpect and kindneſs to the Society, and that he deſigned to ſend them ten pounds; and that he had bequeathed more to them in his will.

Mr. ASTON read alſo a letter from Dr. PLOT, giving an account of his ſollicitations of Dr. CLARKE, Dr. BATHURST, and Mr. SMITH, viz. that Dr. CLARKE was dangerouſly ſick; that Dr. BATHURST and Mr. SMITH hoped, that they ſhould not be obliged to the weekly contributions. But that Dr. BATHURST would ſpeedily preſent to the Society ten pounds; and that Mr. SMITH would alſo preſent them with ſomewhat conſiderable.

It was ordered, that Dr. THRUSTON be left out of the treaſurer's book and out of the liſt of the Society for the future.

Upon debate concerning the manner of cancelling the names of ſuch, as ſhould be left out of the Society's liſts for the future, it was agreed, that it ſhould be done by placing a croſs before the name, with the time, when it was ſo cancelled.

Mr. HILL read a letter from Sir ROBERT SOUTHWELL deſiring to be accommodated with ſome of the things in the repoſitory, of which there were duplicates. Whereupon it was ordered, that he ſhould be ſo accommodated; and it was referred to Dr. GREW to examine the particulars laid aſide for him; and to take an account thereof; and that they be delivered to ſuch perſon, as Sir ROBERT SOUTHWELL ſhould ſend for them.

Mr. HOUGHTON brought in anſwer from Mr. MOXON in writing, which was read, but the debate of it was reſpited to the next meeting, it being late.

At a meeting of the SOCIETY on the ſame day:

The preſident and vice-preſident being abſent, Mr. HILL the treaſurer was deſired to take the chair.

The minutes of the preceding meeting were read, and ſome parts diſcourſed of.

Mr. HOOKE brought in the tranſlation of Mr. LEEWENHOECK's letter, which he read and explained ſome parts of it, and gave an account of what obſervations he had himſelf formerly made about the fibrils of muſcles, their ſmallneſs, and form much like a chain of beads or a necklace of pearl; and he remarked, that he had ſeveral times written to Mr. LEEWENHOOECK to deſire him to inquire farther concerning the nature of muſcles.

Mr. HOOKE was deſired to anſwer this letter of Mr. LEEWENHOOECK, and to ſend him the *Philoſophical Collections*, that had been printed, and to publiſh this letter in the next *Collection*.

Mr. CLUVERUS's account of three tracts or relations concerning the nature and effects and theory of comets (ſhewn to the Society by Mr. ASHMOLE, and which, by reaſon they were printed in the German tongue, were recommended to the peruſal of Mr. CLUVERUS) was read. He promiſed alſo to bring in an account concerning another tract referred to him for his peruſal.

A letter of Mr. HEVELIUS to Mr. CLUVERUS was read; whereupon it was deſired, that when an anſwer ſhould be ſent him, the *Philoſophical Collections* ſhould be ſent with it.

Dr. GALE brought in a letter to himſelf from Mr. HEVELIUS, dated at Dantzick 17 January, 1681 N. S. [g] concerning a comet and the occultation of palilicium or bulls eye by the moon; which was read.

Dr. GALE produced alſo other letters to himſelf, viz. 1. from Dr. BOHN of Leipſic, dated there 15 July, 1681 [h], intimating his deſign of ſending over ſome papers, and deſiring to know the Society's judgment about the Clauderian embalming.

2. From profeſſor STURMIUS of Altorf, dated there 10 February, 1681 [i], giving notice of the obſervatory to be erected at Nuremberg.

3. From Dr. BOHN of January 8, 1681, containing a draught of a monſtrous female fœtus.

Theſe letters were ordered to be peruſed again at the next meeting.

[g] Letter book, vol. viii. p. 151. [h] Ibid. p. 163. [i] Ibid. p. 155.

The

The extremely ſmall ſtringy parts of the muſcles of a lobſter were ſhewn by Mr. HOOKE in a microſcope; whereby it appeared, that theſe filaments of muſcles were not more than the tenth part of the diameter of the hair of one's head.

March 15, at a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN, preſident,

Sir JOHN LOWTHER	Dr. GREW
Mr. HILL	Dr. WOOD
Mr. COLWALL	Mr. ASTON
Dr. GALE	Mr. HOOKE.

It was ordered, that the treaſurer pay fifty ſhillings for Mr. LISTER's 50 books; and that Mr. HUNT receive one ſhilling for each upon delivering them, and repay the treaſurer: and

That a letter be written to Dr. PARKER by Mr. ASTON; and that if no anſwer be returned, there be ſome farther application made to him by ſome friend.

At a meeting of the SOCIETY on the ſame day, the preſident being abſent, Mr. HILL the treaſurer was deſired to take the chair.

Mr. ASTON read a letter to himſelf from Mr. LISTER, dated at York 4 March, 168½[k], mentioning, that he had ſent up fifty ſmall books, intitled *Appendix ad hiſtoriæ Animalium Angliæ tres tractatus, &c. continens addenda & emendenda*, of which 150 copies only had been printed at his own expence; the ſaid fifty copies to be diſpoſed of amongſt the members of the Society at one ſhilling each. He mentioned likewiſe, that he had ſent a black muſcle rarely to be met with in England except in the river Tees, and a piece of a rock perforated by the pholades of the ſea.

Mr. ASTON read a paper of WILLIAM BRIGGS, M. D. concerning a new theory of viſion[l], explaining the cauſe, why, though the picture of the object be made in both eyes, and ſo be ſeen by both, yet the imagination forms but one idea, which he conceived to be an harmonious tenſion of correſponding fibres of the optic nerve.

Some objections were made about the tenſion of ſuch fibres; but becauſe the debating thereof would have been too long for the preſent meeting, it was reſpited to another.

Mr. ASTON read a propoſal of Dr. GREW for publiſhing by ſubſcription in folio an edition of all his writings, except his *Muſeum Regalis Societatis*; which deſign was well approved of, and ſubſcribed to by ſeveral preſent.

[k] Letter book, vol. viii. p. 179. N°. vi. p. 107. for March 168½.
[l] It is printed in Mr. HOOKE's *Philoſ. Coll.* 7.

Mr. HOOKE

Mr. HOOKE exhibited an experiment to ſhew, that the heat of the fire was not propagated in the ſame manner as the heat of the ſun; for that a plain looking-glaſs plate being put between the concave metal and the fire, though it ſeemed very little to hinder the propagation of light, yet it took off almoſt all the heat in the focus of the concave; as was experimented by ſeveral there preſent, and particularly by a nobleman of Savoy introduced by Sir THEODORE DE VAUX.

Dr. SLARE, for the entertainment of the ſtrangers, ſhewed ſome experiments with his phoſphorus, which he had formerly ſhewn to the Society.

March 22, the preſident being abſent, Mr. EVELYN was deſired to take the chair.

The minutes of the preceding meeting were read and diſcourſed of.

Mr. ASTON read a letter from Dr. BATHURST in anſwer to one from Mr. ASTON about his arrears to the Society; in which letter the doctor ſent a bill of ten pounds to be paid to the treaſurer.

Mr. ASTON read an extract of a letter in Latin to Mr. HAAK from Monſ. HEYSINS [m], containing obſervations made with the thermometer, and on the magnet, and the poroſity of gold and ſilver.

Much diſcourſe was occaſioned hereby about the colours of glaſs.

Dr. TYSON ſhewed in the eyes of ſheep thoſe particulars, which were mentioned in Dr. BRIGGS's *New theory of viſion*, read at the laſt meeting.

Mr. HOOKE brought in Mr. LISTER's preſent for the repoſitory of the ſhells of a very large thick river muſcle, and a ſtone all over incruſtated, wherein were ſome kinds of worms.

Mr. HOUGHTON preſented for the repoſitory a piece of coarſe *** cloth, affirmed to be made of materials very different from flocks, hemp, cotton, &c. as alſo two lumps of a kind of braſs ſaid to be taken from the Guinea gold in the Indians refining of it, and commonly known by the name of Guinea drops.

Dr. SLARE brought in from Mr. MELLING the ſcorpion, which he had formerly ſhewn to the Society alive, now well preſerved in ſpirit of wine in a glaſs ſealed up hermetically.

Mr. HILL preſented from Sir ROBERT SOUTHWELL four pieces of amber, which were very extraordinary; one contained a very large ſpider; the ſecond contained a kind of moth or ſmall fly; the third divers ſmall flies; the fourth **** .

[m] Letter book, vol. viii. p. 192.

March 29, the preſident being abſent, Sir JOSEPH WILLIAMSON was deſired to take the chair.

The minutes of the preceding meeting were read and diſcourſed of.

Mr. HOOKE read a letter to himſelf from Mr. LISTER, dated at York 21 March, 168½[n], giving an account of a patient of his, who had for about the ſpace of four months been troubled with great pains, and ſometimes with horrors and chillneſſes, and at laſt with a moſt violent vomiting, with which he caſt up a great quantity of blood; and in that a ſtrange creature, the ſhape of which was particularly deſcribed by him in words and by a figure, and thereby ſhewn to be different from that of any other creature ever ſeen by him. He endeavoured to give ſome probable conjectures at the cauſe of the monſtrous production, ſuppoſing it to have been generated out of ſome ſeminal water ſwallowed in pond-water, which he often drank, when wearied with labour in his employment, which was that of a baker. The ſtrangeneſs of this relation, with the atteſtation of it by Mr. LISTER, as it pleaſed the Society, ſo it occaſioned much diſcourſe concerning the reaſon of ſuch ſtrange kinds of monſtrous productions; and ſeveral other inſtances of the like nature were related on this occaſion; as Mr. HOUGHTON mentioned an acquaintance of his, a barber in the Old Jewry, who for many years paſt voided pieces of the cucurbitive worm, ſometimes two or three yards at a time: that he had taken all the medicines, which he could imagine, even to a conſiderable quantity of ſublimate itſelf, being almoſt careleſs of his own life; and yet was not able to free himſelf from that diſtemper. He alſo mentioned another perſon, who had voided one of theſe worms, which had 507 joints, and was in all ſeven yards and three quarters long; which worm was yet to be ſeen preſerved.

Dr. SLARE related an obſervation, which he had made of a like worm vomited up by a cat.

Mr. ASTON was of opinion, that thoſe kinds of worms might proceed from ſome other cauſes than thoſe mentioned by Mr. LISTER; and mentioned two inſtances, that he conceived to favour his conjectures, which were ſome obſervations, that had lately been made of worms of a conſiderable ſize, found in the kidneys; one whereof had eat out all the parenchyma of the kidney, and left nothing but a ſkin or bladder. He therefore queried, how the ſeminal principle could paſs all thoſe narrow paſſages and digeſtions, which it muſt do before it arrived at the kidney, and yet keep its ſeminal principle alive. To this there were ſeveral anſwers made, and arguments alledged for the method of explaining mentioned by Mr. LISTER.

Mr. HOOKE read an account, which he had received from Mr. HALLEY, of an occultation of the bull's eye by the moon, which had been obſerved 28 Oct. 1680, at Ballaſore in the Eaſt Indies by Mr. BENJAMIN HARRY, maſter of the ſhip Berkley Caſtle; by which it appeared, that the Dutch maps of the Eaſt In-

[n] Letter-book, Vol. viii. p. 164. It is printed in Mr. HOOKE's Philoſoph. Collect. No. 6. p. 641.

dies

dies are no leſs than 13 degrees falſe in their longitudes, and the French maps of Monſ. SANSON no leſs than 18 whole degrees.

The third paper of Mr. CLUVERUS was read, giving an account of another treatiſe about the late comet; which being printed in High Dutch, he had been deſired to peruſe.

There was another paper, which Mr. HOOKE would have read, *viz.* his tranſlation of an account of the diſcovery to the ſouthward of Nova Hollandia in the Eaſt Indies in the year 1643, extracted out of the journal of captain ABEL JANSEN TASMAN, and publiſhed in Low Dutch by DIRK REMBRANTSE: but this account * being ſomewhat long, it was deferred. However, Mr. HOOKE moved, that the Society would take care to collect all ſuch voyages, as had been already publiſhed, or that could by any other ways be procured. Whereupon it was deſired, that Mr. HILL and Mr. HOOKE would endeavour to procure and buy as many of that kind, as they ſhould meet with, for the uſe of the Society, and bring in an account of the expence to the council.

April 5, the preſident in the chair:

The minutes of the preceding meeting were read and diſcourſed of.

Mr. HOOKE read a ſecond letter, which he had received from Mr. LISTER dated at York April 4. 1682, adding this further obſervation concerning the man, who vomited a worm, that he was then perfectly recovered; and that this fact had brought into his memory many others, which had happened in thoſe parts, but ſo ſtrange and ſo imperfectly related, that he could not venture to mention any of them.

Upon this occaſion the queſtion concerning the generation of theſe ſtrange creatures within the body of man was again diſcourſed of; and the ſtrangeneſs of their ſhape cauſed ſome of the members to doubt, whether this creature was ever really alive; and whether, if ſo, it could be produced from the previous ſeed of any other creature, eſpecially becauſe of its ſhape and magnitude ſo different from thoſe of any other creature. But it was agreed, that the particular quality of the place, in which ſeed had been foſtered, *viz.* the ſtomach and guts of a man, might cauſe that ſeed, whatever it were, whether of a toad, frog, or ſome inſect, to grow thus monſtrous; to which cauſe might be aſcribed the monſtroſity of divers other ſtrange births.

This occaſioned a farther diſcourſe about the various and ſtrange manners of the productions of inſects; and it was again urged, that the papers of Mr. WILLUGHBY, formerly mentioned, ſhould be procured for the Society, if poſſible. Mr. HILL informed the Society, that they were left in Warwickſhire; and that if Mr. RAY ſhould be deſired to look them out, they might be had for

* It is printed in Mr. HOOKE's Philoſoph. Collect. No. 6. p. 179.

the Society. Sir JOHN LOWTHER affirmed, that Sir JOSIAH CHILD was willing to deliver them to the Society.

The preſident gave an account of the writings of Dr. WIBERD, which the Society had deſired him to peruſe, *viz.* that the ſaid doctor had been very diligent and curious in obſerving the figure, quality, refraction, *&c.* of the parts of the eye, and had many very good obſervations and concluſions thereupon; but that in relating he was ſomewhat too prolix and particular, and owns, that he ſet them down for his own memory; and therefore that it were very deſirable, that the ſaid writings might be recommended to ſome knowing and judicious perſon in the ſtudy of anatomy, geometry and optics, to peruſe the ſame, and make an abſtract of whatever was neceſſary and pertinent, and to leave out ſuch other things, as ſhould be judged otherwiſe; and that being done, to procure it to be printed and publiſhed in the doctor's name.

Mr. ASTON read a letter from Dr. SIBELIUS dated at Amſterdam, giving an account, that he had ſent the diſcourſe of Dr. WILHEM TEN RHYNE, formerly mentioned, to Dr. GROENVELT; and Mr. ASTON added, that Dr. GROENVELT had received it, and promiſed to bring it that afternoon to the Society; but that Mr. HOUGHTON, who had undertaken to bring it, was gone out of town.

Mr. HOOKE read a letter [p], which he had ſent to Mr. LEEWENHOECK concerning the diſcoveries, which he had made and ſhewn the Society four or five years before of the figure of the fibrills of the muſcles of crabs, lobſters and ſhrimps, &c. *viz.* that they in appearance through a microſcope reſembled a necklace of ſeed pearl; and that every one of thoſe fibrills, which was not much above a hundredth part of the bigneſs of an hair, ſeemed to be diſtinct ſtrings of pearls or bullets; and that the whole bulk of the fleſhy part of thoſe muſcles was made up of an infinite number of thoſe fibrills lying parallel by one another; but that he had not hitherto been able to ſee that figure in the fibrills of the muſcles of the fleſh.

He alſo read a letter from Mr. LEEWENHOECK in anſwer to the ſame, dated at Delft 4 April, 1682, N. S. [q] giving an account, that he had at the deſire of Mr. HOOKE viewed the muſcles of crabs and ſhrimps and had found the ſame appearance; but that he had diſcovered them to be of the ſame nature with the rimples in the fibrills of fleſh-muſcles; and to be compoſed of other leſs fibrills, as are thoſe of fleſh.

The preſident gave an account of Signor BORELLI's book *De motu muſculorum*, peruſed by him, *viz.* that the author had been very elaborate and ingenious in his inquiries into that ſubject; but ſeemed to be very much miſtaken in ſeveral things aſſerted by him, and particularly in the motion of a horſe, and in the ſtrength of the motion of a muſcle; for that, according to his calculation of the ſtrength, it was impoſſible, that the tendons of ſeveral muſcles could ſuſtain ſuch a force, though they ſhould be as ſtrong as a piece of iron of the ſame bigneſs.

[p] See Mr. HOOKE's Philoſoph. Collect. No. 7. p. 189. [q] Ibid. p. 188.

Mr.

Mr. HILL desired, that the former letter sent to Mr. LEEWENHOECK might be likewise read; but Mr. HOOKE not knowing whether he had any copy of it, Sir JOSEPH WILLIAMSON and Mr. HILL were very urgent to have all papers entered into books. The Society thereupon thinking it a matter not so proper to be discoursed of at these meetings, desired, that it should be recommended to the council to consider of it at their next meeting.

Mr. HOOKE read a letter, which he had received from Mr. WILLIAM MORGAN, his majesty's cosmographer, signifying his respect to the Society, which had caused him to send them a present of his new map of London, Westminster, Southwark, and all the adjacent suburbs, desiring their approbation of it; and that they would be favourable in their censures of what they might find not so perfect, as could be wished; and that they would give it their good word, which would be a great encouragement. The Society desired, that their thanks might be returned to him for his map, and that there might be some favourable character given of it in the Collections of this month [r].

The shape and structure of the fibrills of the muscles of a lobster were shewn in a microscope by Mr. HOOKE; and plainly seen by several of the members present, who had had some doubts of the truth of the appearance, as having not been able at other times to discern them.

April 12, Sir CHRISTOPHER WREN president in the chair:

The minutes of *April* 5 were read; and upon occasion of those concerning the transformation of creatures by means of the qualifications of the place, wherein they are fostered, the president related, that he had observed in a garden made out of the ruins of an old building, that the leaves of all the plants became speckled and striped; and that the same plants being transplanted from thence to another place would for some time continue striped and speckled. The change effected in mules and in the redstreak fruit was also mentioned. It was likewise urged, that there are many of the Jews black, who yet are very strict in not mingling with other nations; and that Europeans, by continuing to inhabit in Africa, have been found to turn black, and that Blacks in England, after a few generations, become white: and that wild asparagus, which is very small and sticky, being planted in gardens, and heightened with dung, become large and soft.

Mr. ASTON read a letter to himself from Signor MALPIGHI, dated at Bologna 1 *April*, 1682 [s], giving an account, that LAURENCE BELLINI's medical works were printing there, in which he explained a course of physic by mechanical principles in a mathematical method: That BORELLI's posthumous works were published; and that father BARTOLI a Jesuit had published a book on freezing and ice.

[r] There is nothing said of it in Mr. HOOKE's Philosoph. Collections, No. 7. for April 1682.

[s] Letter-book. Vol. viii p. 203.

Mr.

Mr. HAAK preſented a ſmall tract, which he had newly received from Leipſic, intitled, *Acta eruditorum publicata Lipſiæ calendis Januarii, anno* MDCLXXXII. it being the firſt of that kind, which had been there publiſhed, the author thereof deſigning to continue the publication of them every month. It contained an account, 1. Of Dr. GREW's *Muſeum Regalis Societatis.* 2. Of *Sacrum Anticchenum Concilium*, publiſhed by Dr. EMANUEL à SCHELSTRATEN, canon of Antwerp. 3. Of ZIALOWSKI's *Brevis delineatio Eccleſiæ Orientalis Græcæ.* 4. Of the Chevalier LEWIS DU MAY's *Prudent Voyageur.* 5. Of a treatiſe, intitled, *Traité du Droit de Chaſſe.* 6. Of Dr. TYSON's *Anatomy of a porpeſs.* 7. Of BLASIUS's *Anatome Animalium.* 8. Of Dr. BATES's *Vitæ ſelectorum aliquot virorum.* 9. Of HENRY VALESIUS's edition of *Ammianus Marcellinus.* 10. Of ABRAHAM MUNTINGIUS's book *De verâ antiquorum herbâ Britannicâ.* 11. Of Monſ. GRELOT's *Relation nouvelle d'un voyage de Conſtantinople.* 12. Of SCHERZER's *Anti-Bellarminus.* 13 Of *Obſervationes quædam anatomicæ.* 14. Of a new way of doubling an equilateral triangle, by Father COLPITIUS. 15. Of HEVELIUS's obſervations on an eclipſe of the moon 29 Aug. 1681.

Mr. HAAK remarked, that the ſaid Father COLPITIUS had about four years ſince publiſhed a large book of mechanics; but that it had not yet been brought into England; but that he, Mr. HAAK, had ſent for it, as alſo for ſuch other of theſe monthly *Acta Eruditorum*, as had been ſince publiſhed at Leipſic.

Mr. HOOKE gave an account of a voyage made by the Dutch in the year 1643 to the ſouth of Nova Hollandia, ſhewing the way, which they had taken upon the globe, together with an account of the moſt conſiderable remarks, which they had made on the variation of the needle, the hollowneſs of the ſea, and the nature of the countries.

He alſo ſhewed in a microſcope a very curious ſort of ſand, brought out of Italy, and different in ſhape from all the other ſand ever ſeen by him, being very fine and white, and yet all the grains thereof were of ſome round or oval figure, and none angular, as all the ſand in England is.

He ſhewed likewiſe part of a fleſh muſcle in a microſcope; but the rimples mentioned by Mr. LEEWENHOECK could not be diſcovered, though examined by a very good microſcope.

Dr. WALLIS preſented the Society with a copy of PTOLEMY's Harmonics, publiſhed by himſelf at Oxford: and the preſident deſiring him, that he would farther inrich the Society with all the reſt of his works, he promiſed to do it.

Mr. HOUGHTON preſented a ſmall book of Dr. EDWARD WILSON, intitled, *Spadacrena Dunelmenſis.*

The preſident moved, that ſome experiments might be made about the ſtrength of timber and iron.

April 19. The preſident being abſent, Sir JOSEPH WILLIAMSON was deſired to take the chair.

The

The minutes of the preceding meeting were read: after which the ſubject formerly diſcourſed of concerning the alteration of the form of animal bodies, by the variety of food, climate, ſoil, and uſage, was again debated, and ſeveral arguments alledged for and againſt the opinion.

Mr. ASTON by the way remarked, that he had ſeen an he aſs in Spain ſeventeen hands high.

Mr. HILL ſaid, that he had been told by Mr. COLWALL, that a Black, who had had the ſmall pox in England, grew afterwards white.

It was conceived by ſome, that the cuticula might be ſomewhat of the nature of hair, nails, horns, &c. and that there might be various changes effected by art in each of them.

Mr. HOOKE mentioned the way of making a white ſtar in the forehead of a horſe by ſcalding out the old hair, or ſome other way making alteration there: That it is generally affirmed, that the plucking out hairs or feathers by the roots will make the hairs or feathers, that grow anew, to become white: That from the texture, which he had obſerved in a porcupine's quill, he conceived, that the texture of ſome ſorts of hairs might be * *.

Dr. PLOT obſerved, that there were ſeveral parts in England, as in Oxfordſhire, Staffordſhire, &c. where ſheep have four, others ſix, others eight, and ſome twelve horns all at once: That the gelding of bulls makes their horns grow larger; but that the gelding of rams makes them grow leſs: That the gelding of a buck, when the horns were on, would make them never ſhed; but that when the horns were off, they would never grow again: That ſheep in Dorſetſhire have exceedingly great horns, but in ſeveral other places none at all.

Mr. HILL mentioned, that he had been informed by Mr. CHETWYND, that the Lord FERRERS, upon deſtroying a warren in his park, found, that his deer loſt their horned heads.

Dr. PLOT confirmed this, having ſeen the ſaid deer, which, he ſaid, were very large, and fair, but had no horned heads. But he remarked, that the reaſon was the want of burrows.

He related alſo, that at Clarendon the contrary had happened, *viz.* that whilſt the warren was in the park, the deer were obſerved to have no horns; but as ſoon as the warren was removed, they were found to be preſently horned.

Mr. ASTON gave a farther account of what progreſs he had made in the peruſal and printing of the treatiſe ſent over by Dr. WILHEM TEN RHYNE: and he read a letter, which he had written concerning the ſame to his friend in Holland.

Mr.

Mr. CLUVERUS was desired at his leisure to peruse the discourse published and presented by Dr. WALLIS, *viz.* PTOLEMY's Harmonics; which he undertook to do.

April 26. The whole time of the meeting was employed in entertaining the Morocco ambassador, by shewing him the repository and library; with which his excellency seemed well pleased, but more particularly with a very fair Alcoran written in Arabic.

After his excellency's return into the meeting-room he inscribed his name in the charter-book among the Fellows of the Society in a fair character in Arabic, and so was waited upon to the gate [1], where he took coach and returned.

April 27, at a meeting of the COUNCIL were present,

Sir CHRISTOPHER WREN president

Sir JOHN LOWTHER	Dr. GREW
Mr. HILL	Mr. ASTON
Dr. CROUNE	Mr. HOOKE.

A letter of Mr. WILLIAM BALLE to Mr. HOOKE concerning his arrears due the Society being read, wherein he desired to know what they were,

It was ordered, that Sir JOHN HOSKYNS be desired to acquaint Mr. BALLE what arrears were due from him to the Society, and to procure from him a positive answer concening them. Mr. BALLE's bond was dated 21 Oct. 1676.

It was desired, that Mr. ASTON and Mr. HOOKE should meet on the Monday following to draw up a catalogue of benefactors.

Mr. HILL acquainted the council, that Dr. CASTELL had paid his arrears, and desired to take up his bond: Whereupon his bond was presently delivered to Mr. HILL to be returned to the doctor.

The bill for 1300 *l.* was delivered to Mr. HILL, and he was desired to have an indorsement upon it, so that the money may be called in when the Society shall have occasion for it.

Upon the report of Dr. MILLES's answer touching his arrears, it was ordered, that Mr. HOUGHTON should be desired to carry him a note of what was due, and acquaint him, that he had given his hand for the payment thereof; and that the council had ordered the bonds of all such, as had not duly paid their dues, to be forthwith put in suit.

Dr. CROUNE was desired, and undertook, to speak to Dr. COXE in particular con-

[1] Of Gresham-college.

cerning his arrears due to the Society. After which Mr. HOUGHTON was desired to call upon him for the same.

Mr. HOOKE was desired, when he should meet Mr. COLGRAVE, to inquire of him how the arrears of the late Marquis of Dorcester might be procured from the Lady GRACE PIERREPOINT.

May 3. Sir JOSEPH WILLIAMSON was desired to take the chair.

The minutes of April the 19th were read.

Mr. COLLINS presented his book about *Salt and Fishery*[u].

Dr. PLOT presented his *Natural history of Oxfordshire, being an essay towards the natural history of England*[x].

Mr. HOOKE read a discourse about the manner and reason of the propagation of light, whereby he explained the difficulties of DES CARTES's propension to motion, and Mr. HOBBES's conatus to motion, by showing how they might both be understood to be actual local motion: which was done by shewing what was to be understood by a human moment and a sensible space, and how much shorter moments, how much smaller bodies, how much shorter spaces, how much quicker motions might suffice to perform the several propagations of the local motions of light through a sensible particle of body thousands of various ways successively, without interfering with one another[y].

This occasioned much discourse, and some difficulties supposed therein were removed by some farther discourses thereupon.

Mr. HOOKE shewed some experiments of colours, as particularly the changes made into green by spirit of urine, and into purple by aqua fortis put upon a blue syrup of violets.

He shewed also the experiment with the tincture of *lignum nephriticum*, which by a solution of salt of tartar after some time standing grew thick and muddy, but by pouring in a little spirit of nitre, began to grow clear up from the bottom, and so made a representation of the changes caused in the air by the various steems arising out of the earth.

Hereupon Sir JOSEPH WILLIAMSON inquired, whether the barometer had been any further improved; and whether yet any certain theory had been founded.

Mr. HOOKE answered, that the barometer, that stood in the meeting-room, shewed the alterations very sensibly; so that the alterations, which in the common barometer were but two inches, were by that made four feet; and conse-

[u] Printed at London 1682 in quarto.
[x] Printed at Oxford 1677 in folio.
[y] See Mr. HOOKE's Posthumous Works, p. 129 *&c. seqq.*

quently the thouſand part of the whole difference was made very ſenſible: that there had not been any more rules made different from thoſe, which he had taken notice of twenty years before, *viz.* that in windy and rainy weather the quick-ſilver was loweſt; and that in calm and dry weather it was higheſt: But the cauſe was not yet determined: that he had farther obſerved the ſmooth under ſurface of the clouds to be high in dry weather, and low in wet: that he conceived, that the lower region of the air might be increaſed or diminiſhed by the ſteams iſſuing out of the earth at one time, and being ſoaked up or imbibed at another: that in thundry weather he ſuppoſed great quantities of hot ſulphuerous ſteams to iſſue out of the earth, which cauſed the ſultrineſs that preceded: that he had often ſeen the lightning kindle at the ſurface of the earth, and dart up into the clouds; and had often ſeen the thunder-cloud increaſed by continued ſteams of vapours, like ſmoke riſing under the cloud, and aſcending into it: and that the clouds ſeemed to ſwim like froth upon the ſurface of ſeveral regions of air.

A gentleman recommended by Mr. BOYLE ſhewed the Society ſome tables of multiplication, by which he affirmed, that multiplication, diviſion, and the extraction of the root might be much facilitated.

Mr. HOOKE, Mr. COLLINS, and Mr. CLUVERUS were deſired to meet this gentleman at Dr. PELL's lodgings on the Friday following at four in the afternoon, and to draw up a report to the Society concerning theſe tables.

The experiments appointed for the next meeting were for the trying of the ſtrengths of ſeveral ſorts of timber.

May 10, at a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN preſident

Mr. HILL	Mr. FLAMSTEAD
Dr. WOOD	Mr. ASTON
Dr. GREW	Mr. HOOKE.
Mr. PACKER	

Mr. HILL acquainted the council, that he had received 13 *l.* from Sir NICHOLAS STEWARD, and had given him an acquittance in full of all his arrears.

Upon Mr. HILL's reporting the anſwer of Dr. CROUNE to his demand of the doctor's arrears, it was reſolved, that Mr. HILL ſhould acquaint the doctor, that what he paid ſhould be diſpoſed of for the uſe of the Society with his good liking.

Mr. HILL reported, that captain WOOD was lately dead at Portſmouth; and that he doubted, that little of the captain's arrears would be received.

Mr. PACKER having a deputation from the preſident to be vice-preſident, was ſworn as vice-preſident.

Dr. Wood having alſo a like deputation, was likewiſe ſworn vice-preſident.

It was ordered, that the treaſurer ſhould be deſired to ſend immediately Mr. Hunt to ſuch members, as were more intimately concerned in the affairs of the Society, by being actually at preſent, or having been of the council, deſiring them, that they would give a good example to others, by paying all their arrears; and the rather at preſent, becauſe of the approaching term, that the Society's reſolutions of proceeding to ſuit in caſe of refuſal may be proceeded upon. Mr. Houghton was alſo deſired to be aſſiſtant herein, to apply to ſuch perſons, as the treaſurer ſhall direct.

At a meeting of the Society on the ſame day, Mr. Henshaw vice-preſident in the chair:

The minutes of the preceding meeting were read.

Whereupon was occaſioned ſome farther diſcourſe concerning the barometer; and Mr. Henshaw was of opinion, that the gravitation of the air was cauſed by new * * * from other parts to the upper regions of the air. Mr. Hooke thought, that moſt of theſe changes might be cauſed, partly by the temperature of the ſeaſons, as to heat and cold, partly by particular exhalations and breathings out of the earth itſelf, and the particular qualifications of the earth at that time; for that it was obſervable, that the earth at ſome times was more ſpongy and ſucking than at others; partly alſo by the very nature of the air itſelf cauſed by ſuch exhalations, being ſometimes more apt to diſſolve, at other times more apt to precipitate moiſture.

Dr. Slare ſhewed a very large calculus taken out of the kidney of a woman about four years before, who yet neither knew, that ſhe had the ſtone, nor died of that diſtemper.

The maſk-head of Signor John Alphonso Borelli was ſent into the Society by Mr. Octavian Pulleyn, being preſented to the Society by the Lord Kingſton.

Mr. Henshaw preſented a very curious ſmall tortoiſe, as alſo a piece of a ſhell, whereby the helical contortions of the central parts appeared very plainly.

The experiments were the trial of the ſtrength of ſeveral ſorts of timber by the help of an engine, made after the manner of a double ſtiliard or lever, whereby it was found, that a parallelopiped * inches broad, and * inches thick, and * inches long between the two places of bearing, being charged in the middle with the weight of ſeven great hundreds did but juſt break, and that not till after it had ſuſtained the ſaid weights ſeveral minutes.

May 17. Mr. Mr. Henshaw vice-preſident in the chair:

The minutes of the preceding meeting were read.

Mr. FLAMSTEAD read part of a letter from Mr. CASWELL, containing ſeveral obſervations made by him in his travels about the ſurveying of the weſt parts of England.

Dr. SLARE gave an account from the Morocco embaſſador of a certain perſon, who was always dumb except at noon.

Hereupon Dr. GALE related his converſation with the chirurgeon at Lambeth, who had been dumb for three or four years, and was recovered firſt in his preſence, by praying by him: and that much of the printed relation concerning him was true.

Mr. LODWICK, who was very well acquainted with this chirurgeon, both before and ſince, gave an account of what he knew concerning him.

Mr. HOOKE read a diſcourſe of his own about local motions, ſenſible and inſenſible times, and celerity, being a farther continuation of the diſcourſe read by him to the Society in the meeting of the 3d of May, which was well approved.

The experiments were made in order to find the exact ſtrength of ſeveral ſorts of wood, white fir, aſh, &c. by trying what weight on the middle of a priſm of the wood of a certain length, breadth and thickneſs, was ſufficient to break it.

May 24, Sir JOHN HOSKYNS vice-preſident in the chair:

The minutes of the laſt meeting were read.

Dr. SLARE brought in a letter in Latin to himſelf from Dr. ELSHOLZ, dated at Berlin 30 April 1682, which was read, and contained an anſwer to certain queries ſent by Dr. SLARE concerning the propoſitions, which were lately publiſhed in the *Philoſophical Collections*[z], and aſcribed to the ſaid Dr. ELSHOLZ. But from this letter it appeared, that they were the propoſitions of GEORGE MOLLERUS, who aſſerted, that he was able to make them good; and, if he had not been fifty years old, would have come to England; and that for a valuable conſideration, he was ready to communicate all or any of them. In this letter Dr. ELSHOLZ mentioned his obſervations lately made about *Phoſphorus fulgarius*; and queried, whether the ſerum of the blood, cow's milk, or man's ſpittle, might not by inſpiſſation be brought to produce a phoſphorus as well as urine. This letter alſo incloſed the anſwers to Dr. SLARE's queries, which were read.

Mr HOOKE ſhewed an earthen veſſel, which ſeemed as if it had been covered with burniſhed copper: but he conceived, that there was nothing of metal in it, but that it was a peculiar quality of the glazing, which made it loſe of that colour: that he knew the way, how to make * * to look like ſilver or white metal:

[z] N° 4. p. 104.

that

that there were ſeveral ways with little or no addition to change the colour of glaſſes very conſiderably; and thereupon he ſhewed a piece of glaſs, which gave a purple, blue, green, yellow, red, according as it was held various ways to the light.

He alſo ſhewed a piece of glaſs, which he had newly changed into an opal in a very little time.

Hereupon the way of making chalcedonies and opals and * * *, was diſcourſed; as alſo concerning the Indian gold thread, the covering of which is of plated wire, but drawn finer than the hair of a man's head, and flatted and twiſted about ſilk, as over gold twiſt; ſo that ſome were of opinion, that it was only a varniſh: but Mr. HOOKE affirmed, that he had found it to be covered with a flatted wire, which he conceived to be gold. Sir JOHN HOSKYNS ſuppoſed, that it might be ſome other factitious metal, and that becauſe he had been informed they could do ſuch things, and had likewiſe known a gold-beater in Green-Arbour Court in the Old Bailey, who every day made a quantity of a certain metal for his trade, by which he could get ten pounds in a morning.

The experiments tried were about the ſtrength of ſeveral pieces of timber, by examining what weight was neceſſary to break a priſm of each, a foot long, one inch and an half board, and an inch thick, of which ſize they were all made.

May 31, Sir CHRISTOPHER WREN preſident in the chair.

The minutes of the preceding meeting were read and diſcourſed of, and by the way Dr. GREW affirmed, that by trials he had found, that ſpittle by mere evaporation would yield a ſalt.

Mr. COLWALL ſent in a letter, which he had received from Mr. THOMAS CRISP, dated at Dornford 27 May, 1682 [a], with a ſmall animal found in digging about a pond-bank; which animal, upon being viewed, was found to be a grylla-talpa.

Mr. HOOKE produced the letters, which Dr. CROUNE had received from Rome concerning fifty copies of Signor BORELLI's book *De Motu Animalium*, ſent over with a catalogue of the books to be returned; as alſo ſome accounts concerning the *Cortex Peruvianus*, or Jeſuit's bark, for curing agues [b]; which being part in Italian and part in Spaniſh were rendered into Engliſh by Mr. HENSHAW.

It was deſired, that copies ſhould be taken of theſe papers concerning the *cortex*, and that Dr. GOODALL ſhould have an account of them, they being in anſwer to his queries.

Some further experiments were made to try the ſtrength of timber of ſeveral ſorts.

[a] Letter-book, vol. viii. p. 218. [b] Ibid. p. 205.

June

June 7, Sir CHRISTOPHER WREN preſident in the chair:

The minutes of the preceding meeting were read, and diſcourſed of.

Hereupon was occaſioned a diſcourſe about the motions of pendulum clocks, concerning which Mr. HOOKE affirmed, that he had in the year 1664 read ſome diſcourſes before the Society, that the length of pendulum clocks in ſeveral countries ought to be different, and therefore that the pendulum clocks could not be fit inſtruments for keeping time at ſea ſufficient to diſcover the longitude, though they could be carried never ſo ſteadily; and that he had ſince been aſſured by ſeveral perſons from ſeveral places, that there was ſuch a different motion of them, that in places more towards the line they were to be made ſhorter to keep the ſame time: and that Captain SHEERES had newly confirmed that obſervation, by relating his own experience at Tangier with a pendulum clock adjuſted in England, before he went; which he had found to move there too faſt; and therefore was obliged to make his pendulum longer conſiderably.

The preſident thereupon acquainted the Society, that Capt. SHEERES was again in a ſhort time to go to Tangier, and therefore deſired, that he might be furniſhed with inſtructions for making that and ſeveral other experiments very accurately; for that he had engaged to receive ſuch inſtructions, and to do his utmoſt to obſerve them, and to give an account thereof to the Society.

Hereupon the Society diſcourſed farther concerning the comparative meaſures of ſeveral countries, both of weight, length and capacity; and ſeveral authors were mentioned, who had taken pains in adjuſting that affair; among whom the preſident ſuppoſed Mr. JOHN GREAVES to be the moſt accurate. Dr. WIBERD was alſo ſuppoſed to have uſed much care in comparing the meaſures of capacity with thoſe of weight in his *Tactometry*.

Mr. HOOKE mentioned likewiſe Monſ. PICART as having taken much pains in comparing the meaſures of the length of other countries with the Paris foot in his book concerning of the meaſure a degree upon the earth.

Hereupon the preſident inquired of Mr. HOOKE the reaſon, why the meaſure of a degree upon the earth was not taken here in England, as had been formerly deſired. To which he anſwered, that if the Society would defray the expence thereof, he was willing to take care of it, and to ſee, that it ſhould be accurately done: that the French in their experiments had made uſe of ſome of thoſe means, which long before they had undertaken it, himſelf had propounded and diſcourſed of to the Society; and that in the uſe thereof they had doubtleſs been very accurate, as appeared from the account, which they had given thereof in Monſ. PICART's book; by which notwithſtanding it was evident, that they differed very little from the length of ſuch a degree long before examined in England by Mr. NORWOOD between London and York: that therefore, if the thing were to be done now again here, it would be neceſſary, that yet more accurate ways ſhould be made uſe for performing

forming it; or else it would be but *actio actii*: that it would be necessary both for this and any other accurate trials, that the Society should have in their custody an accurate measure of the standard-foot of London: and that for other experiments also they have the true weights and measures of England, with which to make the comparisons of other weights and measures. Whereupon it was desired, that Mr. HOOKE would take care to procure those for the Society, that they might be always ready to have recourse to, when there should be occasion.

The president was of opinion, that the best standard for this occasion would be a certain part of the length of a degree upon the earth, if at least, upon several accurate trials of the measure of a degree in several latitudes, it should be found the same, and not different, as it would be, if the body of the earth were oval, and not perfectly globlular.

Mr. HOOKE read a discourse sent to him from Dr. JOHN CARTE, a physician at Manchester, of which Dr. CARTE affirmed, said, that he had sent an account to Dr. GREW about three years before [c]; but Dr. GREW declared, that he had not received it. It related to a certain distemper, to which the workmen employed in the smelting mills in Derbyshire were very subject, and which was called by the couutry people the *Belland*.

Dr. SLARE communicated a letter sent to him by Dr. ANTHONY NUCK, dated at Harderwick 18 May 1682, in which were some remarkable particulars: that Monsr. ANDREAS, professor of philosophy at Faneker, had in a treatise, intitled, *Bilanx Bilsiana & Clauderiana*, lately published by him, boasted himself to be the only person, who since DE BILLS knew the secret of embalming bodies in DE BILLS's method, though he did not in that book discover it, but only his own ignorance in anatomy: that in the mean time the heirs of DE BILLS affirmed themselves only to know it, and had lately offered it, but at too high a price, to a friend of Dr. NUCK: that BLASIUS was printing a treatise, which he called *Anatomia practica*; as also Dr. WILLIS's works with an index reduced into another method.

That Monsr. BIDLOO, a skilful chirurgeon of Amsterdam, had newly shewed him above 100 anatomical figures of the parts of a man as big as the life, ingraven on copper, with a description of the parts, but not of their use.

That a physician of Amsterdam had written a learned treatise concerning the muscles, and intended to publish it, if he had leisure.

[c] In the Letter-book, Vol. viii. p. 67. is a letter of Dr. CARTE to Dr. GREW, dated at Manchester 6 Decemb. 1678. mentioning, that he had written to him before concerning the *Belland*, and that he had since been in Derbyshire, where all that he could learn farther of it was, that the workmen were less subject to it in those smelting mills, that stand in an open and moveable air, or that have a large chimney, and are not built close: that he had met with a gentleman, who told him, that a servant or two of his had it very severely in their bellies, and were cured by taking the salt, which comes from the sulphur-well at Knaresborough: and this remedy was one of the likeliest, that he, Dr. CARTE, had heard of.

That

That Dr. MUNICKS of Utrecht was writing an *Œconomia Animalis.*

That Dr. NUCK himſelf had diſcovered the mouths of ſeveral veſſels not yet deſcribed near the cheek tooth, as alſo the trunks and branches of the greater ſalival ductus's diſperſed through the glands; together with the branching of the ſmall arteries in thoſe glands, which he had preſerved by injecting wax, and thereby could ſhew the clinging of theſe curious veſſels to the arteries like ivy to a tree: that in the cavity of the breaſt he had diſcovered ſeveral lymphatic veſſels riſing from the glands, and diſcharging into the veins, which he found by the diſcovery of multitudes of valves in the ſaid veſſels; of which he inſerted a figure and deſcription: that he had diſſected the veſſels of the lungs, and ſo preſerved them by filling each of them with wax of a different colour: that he had made ſome curious obſervations on the divarication of the bronchial arteries: that he had found out an excellent way of preſerving the lungs of animals by inflation, and had by him thoſe of a horſe, a dog, a cat, and an hare: and that he was very ready to ſend to the Royal Society any ſpecimens of his anatomical preparations, which they ſhould deſire.

Mr. HALL preſented to the Society for the repoſitory a large gloſſopetra found by one HENRY GRIFFITH of Colesford in the foreſt of Dean, miner in the Blacks in the pariſh of Staunton in the county of Glouceſter.

The experiments were ſome farther trials about the ſtrength of ſeveral ſorts of wood.

June 14, Sir JOHN HOSKYNS vice-preſident in the the chair.

Upon reading the minutes of the 7th concerning the quicker or ſlower motions of a pendulum in different climates, Sir JOHN HOSKYNS remarked, that the Society had formerly made trial of wire-pendulums of about 38 inches in the way of a common meaſure, and he thought, that the alteration made by the air might be avoided by incloſing them in a glaſs with a quickſilver regiſter.

Upon mentioning, that Mr. HALLEY had found his pendulum at St. Helena ſlower upon a mountain than at the bottom, it was deſired, that he would communicate that and ſuch like philoſophical obſervations, as were not yet entered in the Society's books.

Sir JOHN HOSKYNS ſuggeſted the putting Captain SHEERES upon inquiries concerning the plants growing about Tangier, adding, that formerly there had been ſomething of that kind done there; but that the deſign came to nothing on account of the untimely death of the perſon, who managed it: and that Dr. LAWRENCE, now living there, was thought a fit perſon for ſuch inquiries.

Upon reading the account of the *Belland*, a diſeaſe common among the workmen in the ſmelting mills, which had been ſent to Mr. HOOKE from Mancheſter, Dr. GREW ſaid, that he had one from Keckworth, which he was willing to produce and compare with it.

Dr. GALE propoſed to the Society the conſidering of ſome method to keep the manuſcripts of the Arundel library from being deſtroyed by worms. Upon which Sir JOHN HOSKYNS obſerved, that Sir KENELM DIGBY uſed to waſh the leaves of his books with alum water, which made them fit to write on, kept them from cankers, and gave them a luſtre: and that honey mingled with the glue keeps it from being brittle and breaking. Dr. SLARE added, that honey is put into ſeveral medicaments to keep them from hardening. It was remarked likewiſe, that bad glue and wooden covers breed worms; and that paſtboard is the moſt convenient binding.

A book intitled, *New Experiments and Obſervations made upon the icy Noctiluca, &c.* [d] was preſented by the author, Mr. BOYLE.

An Indian bird's neſt was preſented from Dr. ALLEN.

WALTER MILLS, M. D. fellow of the college of phyſicians, London, was propoſed candidate by Dr. SLARE.

June 21, Dr. GALE was deſired to take the chair.

The minutes of the preceding meeting were read and diſcourſed of; and upon mentioning of pendulums, Mr. HILL remarked, that GASSENDUS in one of his diſcourſes had affirmed, that he had obſerved pendulums to move quicker in winter than in ſummer.

A letter from * * to Dr. GREW [e] was read.

Mr. FLAMSTEAD obſerved, that it was remarked, that if the workmen employed in the ſmelting mills worked every other week in the mine under ground, they would eſcape the belland; but if they continued much longer in the ſmelting mills, they would certainly be ſome way or other affected with it.

Dr. GALE made a motion concerning the new binding of the manuſcripts of the Norfolcian library, they being much decayed. This being diſcourſed of was referred to the council to conſider of at their next meeting.

Mr. HOOKE read a long diſcourſe, being the ſubſtance of three lectures, which he had miſſed the reading of at two laſt meetings, concerning the means, how the ſoul becomes ſenſible of time, explaining the organ of memory, and its uſe for retaining and producing ideas therein ſtored up [f].

June 28, Sir JOHN HOSKYNS vice-preſident in the chair:

[d] Printed at London in 1682, in 8vo.

[e] This was probably that on the belland, mentioned at the preceding meeting.

[f] See his poſthumous works, *p.* 140, *& ſeqq.*

The minutes of the preceding meeting being read and diſcourſed of, there being ſeveral perſons preſent, as Sir JOHN HOSKYNS, Sir WILLIAM PETTY, Sir ROBERT SOUTHWELL, Mr. HENSHAW, Monſ. JUSTEL, Monſ. AUZOUT, and others, who were not at the laſt meeting when Mr. HOOKE's diſcourſe was read, it was deſired by them, that Mr. HOOKE ſhould read the ſame again, which he accordingly did.

After which ſome objecting, that this diſcourſe ſeemed to tend to prove the ſoul mechanical, Mr. HOOKE anſwered, that no ſuch thing was hinted, or in the leaſt intended in it; it being only deſigned to ſhew, that the ſoul forms for its own uſe certain corporeal ideas, which it ſtored up in the repoſitory or organ of memory, and that by its power of being immediately ſenſible of thoſe ideas, whenever it exerts its power for that end, it thereby becomes ſenſible of thoſe ideas formerly made, as if they were made at that inſtant, but with this difference, that the farther they were removed from the center or ſeat of its more immediate momentary reſidence, the more faint are the reflections or reactions from them; and that this occaſions the notion of the diſtance of time.

Mr. HOOKE ſhewed a very eaſy way of plainly demonſtrating the problem of ARCHIMEDES, whereby he proved, that the tangent of his ſpiral at the point of one revolution from the center will cut a ray produced from the center at right angles to the ray from the touched point; ſo that the part between the point of interſection and the centre ſhall be equal to the circumference of the circle, that paſſes through the point of the ſpiral, where the ſaid tangent touches it; which was performed with any ſuppoſed *præcognita* in geometry known.

July 5, Sir JOHN HOSKYNS vice-preſident in the chair.

The minutes of the preceding meeting were read and diſcourſed of, and the Society deſired, that Mr. HOOKE would, with what convenient ſpeed he could, print his diſcourſes and lectures read before the Society; as alſo a more full deſcription of all theſe ſeveral inſtruments, which he had ſhewn that year to the Society, together with the demonſtrations of the grounds and reaſons and uſe of them; which, he ſaid, he was willing to do as ſoon as he could find leiſure to fit them for the preſs.

He alſo more particularly explained that problem, which he had ſhewn at the laſt meeting concerning the nature of the ſpiral of ARCHIMEDES, and the tangent of any part thereof.

A letter of Monſ. JUSTEL to Mr. HOOKE was read, giving an account of a new invention found at Paris, of making wood incombuſtible with a ſmall charge; an experiment of which the inventor had ſhewn the French King at Verſailles with good ſucceſs: and that the ſame perſon had undertaken to make a fireſhip of the like nature; and pretended to have a method of preſerving all kinds of fruits.

July 12, at a meeting of the COUNCIL were preſent,

Sir JOHN HOSKYNS vice-preſident in the chair

Mr. HILL	Dr. TYSON
Mr. COLWALL	Mr. ASTON
Dr. GREW	Mr. HOOKE.

Upon reading Mr. COLLINS's propoſal for printing a book of algebra in ſuch manner, as by the ſaid propoſal appeared, it was ordered by the council, that the treaſurer ſubſcribe for 60 copies; and that notice be given of the ſaid propoſal and this order at the next meeting of the Society.

It was ordered, that Sir WILLIAM PETTY be deſired to accompany thoſe members of the council, who by a former order were deſired to ſpeak to Sir JOHN CUTLER for obtaining Mr. HOOKE's arrears.

At a meeting of the SOCIETY on the ſame day, Sir JOHN HOSKYNS vice-preſident in the chair.

The minutes of the preceding meeting were read and diſcourſed of.

A letter of Monſ. JUSTEL was read, and he being preſent with Monſ. AUZOUT gave a farther account of the making wood ſcarce combuſtible.

Mr. ASTON read a letter to himſelf from Mr. HEVELIUS [g].

A letter of Monſ. CASSINI to Mr. FLAMSTEAD was read, containing an account of his obſervations of the eclipſe of the moon * * * * * * laſt, together with thoſe made by * * * * Monſ. AUZOUT, DE LA FONTANEY, at Paris, Rome, and Copenhagen, which confirm the difference of the meridians between Paris and Copenhagen found by former obſervations of the ſatellites of Jupiter. To theſe Mr. FLAMSTEAD had added his own correſponding obſervations, and Mr. HALLEY ſhewed his, by which it appeared, that the difference of the meridians of Paris and London was $9\frac{1}{3}$ minutes of time.

A propoſal was read of Mr. JOHN COLLINS for the printing a book of Mr. THOMAS BAKER, rector of Biſhop's Nymphton, intitled, *The Geometrical Key; or the Gate of Equations unlocked; or a new Diſcovery of the conſtruction of all Equations however affected, not exceeding the fourth Degree, viz. of Linears, Quadratics, Cubics, Biquadratics, and the finding of all their roots as well falſe as true, &c.* [h] This propoſal was well approved of after a long debate concerning it; but the concluſion of what was to be done by the ſecretary for promoting of the printing this work, was deferred till the next meeting.

[g] In the journal book, vol. 7. p. 92. there is no farther account of this letter; but it was probably that inſerted in the letter book, vol. 8. 214. dated at Dantzick, *ipſo ſolſtitii æſtivi die* 1682, wherein Mr. HEVELIUS complained, that his name had been left out of the Society's yearly catalogue for 1681.

[h] This book was publiſhed at London 1684, in 4to.

Mr. HOOKE read a diſcourſe concerning the unlimited extent and diviſibility of matter, ſhewing the bulk of a man to be in a medium betweem them; and how far endeavours hitherto uſed had informed us concerning the media between them; and how much farther mechanical contrivances could yet advance us beyond the imaginations of moſt men hitherto known.

Dr. MILLS was elected.

July 19. The minutes of the laſt meeting were read, and every member reſolved to take from the treaſurer one copy of Mr. BAKER's book, the propoſals of which had been read at that meeting, and to recommend it.

Dr. GREW ſhewed a book ſaid to be written in the Chineſe character, and to contain the principles of their religion.

July 26, Dr. WOOD vice-preſident in the chair.

The minutes of the preceding meeting being read, and the ſubject of them diſcourſed of, Dr. GREW mentioned, that Dr. JOHNSON was the owner of the book ſhewn at the laſt meeting; and that the two firſt leaves of it were wanting, which was diſcovered by the Indian numbers, with which the leaves were marked. It was conjectured, that the characters now uſed in arithmetic were taken from thoſe characters; and that theſe were much the ſame with thoſe of the Chineſe for numbers, and ſo ſeemed derived primarily from them.

Mr. HOOKE read a paſſage, that he had met with in DIGGES's *Stratioticos*, wherein he affirms, that his father had a method of diſcovering all objects pretty far diſtant, which lay round about in the country; and that this was by the help of a book or manuſcript of ROGER BACON of Oxford, who, he conceived, was the only man beſides his father, who knew it. This was the more remarkable; for that this *Stratioticos* was printed in 1579[i]; which was more than thirty years before METIUS or GALILEO made their diſcovery of thoſe glaſſes: and therefore it ſeemed evident, that ROGER BACON was the firſt inventor of teleſcopes, and LEONARD DIGGES the next reviver of them, both Engliſhmen.

Dr. PLOT being preſent ſaid, that he conceived, that this book of ROGER BACON, which accidentally fell into the hands of LEONARD DIGGES, might have been in the cuſtody of Mr. THOMAS ALLEN of Glouceſter-hall in Oxford.

Mr. AUBREY remarked likewiſe, that there was a paſſage in the preface of LEONARD DIGGES's *Pantometria*[k], which mentions the ſame thing to be known by him; and that he had ſhewn it to divers; which book was printed ſome time before the *Stratioticos*[l].

[i] At London in 4to

[k] This book is ſaid by Mr. WOOD *Athen. Oxon.* vol. I. fol. 180. to have been attempted by LEONARD DIGGES in his younger years; and that ſuch parts of it, as were left obſcure and imperfect at his death, being ſupplied by his ſon THOMAS, that work was printed at London 1591, in fol.

[l] It was not printed till twelve years after.

Mr.

Mr. HILL obſerved, that there was a great controverſy between the ſaid DIGGES and the Lord chief baron * * to which of them the reviving of that invention was to be aſcribed.

The ſame thing is alſo mentioned in Dr. DEE's commentary upon ROGER BACON's epiſtle to the pope.

Mr. HILL took notice likewiſe, that FRACASTORIUS had mentioned in the 8th chapter of his *Homocentrica* his being able to diſcover things at a diſtance by the help of two ſpectacle glaſſes ſet at a diſtance one before another; which was about the year 1530.

Dr. GREW preſented a calculus or ſtone very hard, voided by ſtool, and ſent by Mr. MATTHEWS of Ledbury near Glouceſter.

He preſented alſo from Dr. JENNER a box of *lapides Judaici*, taken up in Lydiard park near Swindon in Wiltſhire.

Dr. GREW read a letter from Dr. COGA, vice-chancellor of the univerſity of Cambridge, wherein he mentioned, that HEVELIUS's laſt book was not to be found in that univerſity.

Mr. HOOKE ſhewed a Chineſe perſpective-box, in which by help of reflection the room and figures were conſiderably lengthened.

He alſo gave an account of the theories contained in the ſecond volume of BORELLI's book *de Motu Animalium*.

He ſhewed two optical experiments in a darkened room, the one of the ſucceeding of colours, viz. yellow, green, and blue; and the other of making the repreſentation of a man's face and body, or any ſuch object, of any convenient bigneſs, ſo as to be able to delineate the ſame exactly upon paper, cloth, or the like.

Auguſt 2, at a meeting of the COUNCIL were preſent

Sir CHRISTOPHER WREN preſident

Mr. HILL	Dr. GREW
Mr. COLWALL	Mr. ASTON
Dr. CROUNE	Mr. HOOKE.

The draught of a ſtatute brought in by the preſident was read, and debated, and ſome amendments made therein; and was again read in the following words, viz.

" The Society being inſtated in a revenue, which, it is hoped, may in time " improve to be anſwerable to the expences, and not contemptible in order to

" the ends designed; the council think it not reasonable, that any members should " be eligible into the council, who are so far from improving the revenue, that " they are backwards to pay their own just dues: and therefore propose the " following statute;

" No person shall be capable of being chosen into the council, who hath not " at or before the tenth day of November preceding the election accounted with " the treasurer, and paid his dues to the Michaelmas before: and in order there- " unto the names of those, who have not paid till the Michaelmas preceding, " shall not be inserted in the printed lists for the use of the Society at the election " day."

It was put to the vote, whether this statute shall be read at another meeting; and it was unanimously agreed to.

The draught also of a second statute being read and debated, the question was put, whether this statute should be read at another meeting of the council, and was unanimously agreed to. The statute was as follows:

" The statute for election of fellows having by long experience been found in- " sufficient for bringing in persons qualified for the ends of the institution of the " Royal Society, few balloting in the negative, and presuming the person to be " well known to the member, that proposeth the candidate; it is thought requisite " by the council to propose this statute following;

" Every person, that would propose a candidate, shall first give in his name to " some of the council, that so in the next council it may be discoursed *vivâ* " *voce*, whether the person is known to be so qualified, as in probability to be " useful to the Society. And if the council return no other answer, but that " they desire farther time to be acquainted with the gentleman proposed, the pro- " poser is to take that for an answer: and if they are well assured, that the can- " didate may be useful to the Society, then the candidate shall be proposed at the " next meeting of the Society, and balloted according to the statute in that " behalf; and shall immediately sign the usual bond, and pay his admission-mo- " ney upon his admission."

Dr. CROUNE presented to the Society six books lately sent him from Italy, viz.

ESCHINARDI *Centuria Prob. Opticorum*, 4*to*.
Borelli EUCLIDES *restitutus*, 8*vo*.
ARCHIMEDES & APOLLONIUS, 8*vo*.
Observationes cometicæ.
Ragguagli del ESCHINARDI.
Il fosforo di CROLLIO.

Aug. 5, at a meeting of the COUNCIL were present

Sir

Sir CHRISTOPHER WREN preſident

Mr. HILL	Dr. GREW
Mr. COLWALL	Mr. ASTON
Mr. HENSHAW	Mr. HOOKE.

The order of Auguſt 2d relating to a ſtatute to be made for rendering perſons not eligible, who had not paid their arrears, was again read; and it was thought not fit at preſent to be made a ſtatute: but it was thought, that an order to the following purpoſe might produce the ſame effect:

That the liſt be printed with ſeveral titles diſtinguiſhing all the fellows into the foreigners honorary and ſuch as uſually attend the Society, and pay their dues; and that a little mark be made before their names of ſuch, as have been benefactors, and ſuch as frequently account with the treaſurer for their arrears: and that the preſident intimate to the Society, that he hopes they will eſteem ſuch, who ſhew their affection to the Society this way, as more properly eligible into the council than ſuch, who are not like to attend their affairs, notwithſtanding they are left to their liberty according to the ſtatutes, &c.

The ſecond ſtatute, which had been read the 2d inſtant, was read again, and fully debated, and being put to the vote, it was paſſed in the affirmative *nemine contradicente*.

Aug. 9, at a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN preſident

Mr. HENSHAW	Mr. COLWALL
Dr. GALE	Dr. WOOD
Mr. HILL	Dr. GREW.

It was conſidered, whether the following perſons ſhould not be left out of the liſts to be printed, which was agreed to, with reſervation to make amendments at the next meetings:

The Lord ANNESLEY	Mr. JOSEPH MOXON
Dr. AGLIONBY	HENRY Earl of Peterborough
Sir THOMHS CLUTTERBUCK	RICHARD Earl of Ranelagh.
The Lord DURSLEY	Sir NICHOLAS SLANING
The Lord Viſcount FITZHARDING	Mr FRANCIS BORTHWICK
Sir FRANCIS VANE	Dr. SAMUEL WOODFORD
Sir HENRY FORD	Dr. BENJAMIN WOODROFFE
Sir WILLIAM LE HUNT	ROBERT Earl of Yarmouth
Sir ANTHONY LOWTHER	ARCHIBALD Earl of Argyle
Dr. JACQUES DU MOULIN	CHARLES Earl of Carliſle
Mr. JENKES	JOHN Earl of Crawford, LINDSAY.
Mr. OLIVER HILL	

Theſe

Theſe twenty three were ordered to be left out of the liſts to be printed for the election on the 30th of November next; and alſo to be left out of the treaſurer's book for the future.

Mr. SHERIDAN deſiring to pay in 10 *l.* it was left to Dr. WOOD to treat with him.

Sir JOHN BANKES's arrears to Michaelmas 1681, were 48 *l.* 14 *s.*

The treaſurer was allowed to abate for abſence, if deſired.

Octob. 19, at a meeting of the COUNCIL were preſent

Sir CHRISTOPHER WREN preſident
Sir JOHN HOSKYNS — Mr. HILL
Sir CYRIL WYCHE — Dr. TYSON
Mr. COLWALL — Mr. HOOKE.

Sir JOHN HOSKYNS propounded a particular of an eſtate near Raleigh in Eſſex, which was read and debated, whether it were fit to be purchaſed by the Society. It was valued at 86 *l. per ann.* and there was demanded for it 1400 *l.* which was about ſeventeen years purchaſe. It was thereupon reſolved, that Dr. WOOD ſhould be conſulted with, and deſired to procure ſuch an information concerning the ſame, as the council might thereupon ground their farther proceeding about it. To this end Sir JOHN HOSKYNS was deſired to write that day to Dr. WOOD to that effect.

Mr. HILL alſo propounded a fee-farm-rent payable from Monmouth of 40 *l. per ann.* and ſomewhat more. This was thought fit to be conſidered of, when an account concerning the former propoſal ſhould be returned.

It was farther diſcourſed, whether it were not the beſt way for the Society to lay out their ſtock in purchaſing actions in the African company, or in ſome other company, if neither of the former ways ſhould be thought fit to be proceeded with.

Octob. 25, at a meeting of the COUNCIL were preſent

Sir CHRISTOPHER WREN preſident,
Sir JOHN HOSKYNS — Mr. PACKER
Mr. HILL — Mr. ASTON
Mr. COLWALL — Mr. HOOKE.
Dr. WOOD

The propoſal of Sir JOHN HOSKYNS concerning the eſtate to be purchaſed by the Society at Raleigh in Eſſex was again debated; and Dr. WOOD gave an account of the ſituation of the place to be five or ſix miles within the hundreds; and that

that therefore it would not be valued at above years purchaſe: and that becauſe of the difficulty of tenants, and becauſe at that time he had himſelf newly agreed for another eſtate within the hundreds at thirteen years purchaſe; and that ſome eſtates had been ſold for twelve years purchaſe; though ſome others had yielded, but very ſeldom, fifteen years purchaſe. Whereupon Dr. Wood was deſired to inform himſelf farther concerning it, and to give the Society an anſwer; which he undertook to do.

Upon reading over the liſt drawn up and agreed to by the council, Auguſt 9, 1682, concerning ſuch members, as were ordered to be left out of the treaſurer's book, and the liſt of the Society, it was agreed to, and ordered, that thoſe twenty three members, mentioned in the ſaid liſt, ſhould be left out of the liſt to be printed for the next election, and out of the treaſurers's book for the future.

The council likewiſe in peruſing the liſts, and finding many fellows of the Society exempted from payments in whole or in part, either by order, promiſe, or intimation at their admittance, conceived this way to have been prejudicial to their affairs, and a diſcouragement to others, who duly paid; and conſidering, that the reaſon of their exemption was in conſideration, that thoſe members were admitted for their great abilities to be ſerviceable in their experiments or otherwiſe to the Society, and were therefore exempted from payment; it was ordered, that for the future no perſon ſhould be exempted from payment, or left out of the treaſurer's books, except foreigners. And if the members formerly exempted ſhall be pleaſed to bring in experiments at their own charge, they ſhall be conſidered by ſtriking off their dues in balance to their ſervice and charge, and not otherwiſe. And whereas the Society looked upon themſelves as gueſts to the fellows of Greſham-college, the council did not intend to charge them with payments, but, if they deſired it, to take off their dues annually in conſideration of their kindneſs; though they hoped alſo, that thoſe fellows would contribute their labours and ſtudies.

Mr. Colwall moved, that the bonds of ſuch of the Society, as were much in arrear, might be put in ſuit; which being debated, it was agreed and ordered, that Mr. Hooke ſhould find out the bonds of Dr. Whistler, Dr. Milles, Dr. Allen, and Dr. Croune, and ſpeak to Mr. Ballot to take care to put the ſame in ſuit. But before he was to do this, it was ordered, that Mr. Hunt ſhould attend upon each of them, and acquaint them with the order, to ſee whether they would pay their reſpective dues without farther trouble.

Mr. Colwall acquainted the council, that he deſigned to propoſe Mr. Turner and Mr. Paget for candidates at the next meeting of the Society.

Mr. Hooke alſo acquainted the council, that Mr. Haak deſigned to propound Mr. Arnoldus candidate. But the conſideration of this matter was reſpited till ſome farther reſolution be concluded by the council.

On the ſame day the Society upon ſummons ſent by the preſident met again,

after their receſs, at Greſham-college, Sir CHRISTOPHER WREN the preſident being in the chair.

Monſ. JUSTEL and Monſ. AUZOUT deſired, that Monſ. HUBIN, enameller to the French King, might be admitted to be preſent, for that he had ſome experiments to ſhew the Society; which was granted.

Mr. HOOKE read a diſcourſe concerning comets [m], and in this firſt part of it gave an account of ſeveral of his own obſervations concerning the appearances of the comets in 1680 and 1681; in which he mentioned ſeveral new and wonderful appearances of them, taking notice of the other remarks concerning them, as of their place, poſition, magnitude, motion, way or courſe, only in ſhort, and by the bye, referring his obſervations in thoſe particulars to the other parts of the diſcourſe.

Dr. [n] LISTER's tranſlation and notes of GOEDARTIUS *de Inſectis*, fifty copies of them having been bought by the Society for the uſe of their members, were brought in, to repay the treaſurer what had been laid down for them.

Monſ. HUBIN ſhewed the Society three experiments:

The firſt was a ſyphon fountain neatly made, which is at large deſcribed in SCHOTTUS.

The ſecond was an icuncula, which deſcended and aſcended in the water by the preſſure of the thumb upon the top of the water; which had been ſhewn to the Society ſeveral years before.

The third was a ſmall glaſs cane of water ſo well exhauſted of air, that with the ſhake of the hand the water would ſink ſo briſkly againſt the bottom of it, as to ſound like the ſtroke of ſome very hard body: which was an experiment, that had likewiſe been ſeveral years before ſhewn the Society.

Mr. HOOKE ſhewed a new projection of the ſphere into a concave cylinder, which could be opened into a plain, in which he deſcribed the rhomb lines geometrically and mechanically by a very eaſy inſtrument, and very fit for the uſe of navigators.

Mr. JOHN COLLINS delivered to the members of the Society propoſals for printing Mr. BAKER's *Geometrical Key*.

Nov. 1, at a meeting of the COUNCIL were preſent

[m] *See his* Poſthumous Works, *p.* 149. *& ſeqq.*

[n] So he is ſtiled in the books of the Society from this time, though he had not the degree of doctor of phyſic till March 1682, when he was created ſo by the univerſity of Oxford. Wood Faſt. Oxon. vol. ii. col. 224.

Sir

Sir JOHN HOSKYNS vice-preſident

Sir JOHN LOWTHER	Dr. GREW
Mr. COLWALL	Dr. TYSON
Mr. HILL	Mr. ASTON
Mr. PACKER	Mr. HOOKE.

It was again debated concerning the propounding of Mr. TURNER, and it was put to the vote, and there were eight affirmatives and one negative.

It was thereupon debated and ordered, that a paper ſhould be drawn up concerning the conditions, upon which perſons were admitted into the Society.

Dr. GREW read a letter of Dr. LISTER, wherein mention was made of the prices of the forty ſeven books for the Society's uſe; and it was thereupon ordered, that the treaſurer ſhould pay 17*l.* 12*s.* 6*d.* to Dr. LISTER for the ſame.

It was again debated, whether the twenty three members mentioned in the liſt to be left out of that to be printed againſt St. Andrew's Day, ſhould alſo be left out of the treaſurer's book for the future; and it was agreed on and ordered to be done accordingly.

At a meeting of the SOCIETY on the ſame day, Sir JOHN HOSKYNS vice-preſident in the chair.

The minutes of the preceding meeting were read and diſcourſed of.

Mr. HOOKE delivered in the pictures of five ſtrange birds, which had been taken at Nuremberg in Germany, and there delineated and ingraven in copper. They were preſented by Mr. ARNOLDUS, who had lately received them from Nuremberg. 1. An onocratulus. 2. Scherben or ſeerab, as it is called in High Dutch, a kind of Soland gooſe. 3. A ſtrange kind of breaſted duck. 4. A kind of bittern. 5. A ſort of buſtard. They were ordered to be kept in the library with Mr. WILLUGHBY's *Ornithologia*.

A paper ſent by Sir ROBERT SOUTHWELL to Mr. HENSHAW was read, containing a more full and exact deſcription of the ſubterraneous cavern near Kingroad by Briſtol, formerly deſcribed by Captain STURMY.

Dr. WALTER MILLS was admitted follow.

Mr. HAAK preſented a printed ſheet, intitled *Epiſtola invitatoria ad obſervationes magneticæ variationis communi ſtudio junctiſque laboribus inſtituendas, à* JOHANNE CHRISTOPHERO STURMIO, *P. P. Altdorf.* The contents of which were related by Mr. HAAK, who had peruſed it, to be an invitation to ſuch, as were intelligent and curious to make obſervations of the preſent variations of the magnetical needle from the meridian of their reſpective places of abode, with a deſire,

that they would communicate ſuch their obſervations to Mr. VOLCKAMER at Nuremberg, that they might be publiſhed for the common benefit. Profeſſor STURMIUS delivered four rules how he deſired the obſervations ſhould be made. 1. That they ſhould all agree upon one certain time, viz. on the next æquinoctial and ſummer ſolſtice days; and the meridian being once fixed, to reſpect the obſervation every month. 2. To take great care in finding the true meridian by large inſtruments, and ſome other ways deſcribed by him. 3. To have two very good needles well fitted to ſhew minutes, which muſt not be either very large or very ſmall, but of a middling ſort. 4. To take care to avoid the proximity of iron, or other magnetical body, at the place of obſervation.

November 8, Sir JOHN HOSKYNS vice-preſident in the chair:

The minutes of November 1 were read and diſcourſed of, particularly concerning Profeſſor STURMIUS's propoſals about making and collecting obſervations of the variation of the magnetical needle. Upon which Mr. HOOKE related, that he had lately got an obſervation to be made thereof at Liſbon, and expected to receive an account from Ireland, and ſome other parts, concerning the ſame.

Mr. HOOKE read a letter, which he had received from Dr. CARTE of Manchester, giving an account of ſome obſervations, which he had made on a patient, who had voided by vomit and ſtool ſeveral live millepedes [o], ſome of which were produced and ſhewn.

He communicated likewiſe a letter from a friend, giving an account of the obſervations made by him in the anatomy of a bat, &c.

He read alſo an account from a friend of his, giving an account of a lamb, that had been taken out of an ewe, which had been generated *extra uterum*; and mentioning a woman lately deceaſed in Cornwall of the age of 154 years.

Dr. TYSON related, that he had received an account from Oxford of a bitch, which had divers puppies generated *extra uterum* in the abdomen.

Mr. HOOKE read part of a further diſcourſe concerning his obſervations and theory of comets; and the remainder of it was referred to another meeting.

Dr. CHAMBERLAYNE's propoſals about a bank of credit were left with the Society, together with his anſwers to ſeveral objections, that had been made againſt it [p].

November 15. Dr. GALE vice-preſident in the chair:

The minutes of the laſt meeting were read and diſcourſed of.

[o] This letter is printed in Dr. HOOKE's Philoſophical Experiments and Obſervations. p. 75.

[p] Mr. TURNER and Mr. PAGET were elected fellows at this meeting, though there is no entry of it in the Journal-book, vol. vii. p. 101. See the minutes of the following meeting.

With

With regard to the great age, to which ſome perſons attain, Dr. GALE related, that in a trial at law at York, the teſtimony of a perſon was admitted for 120 years or more. This man lived at Ellerton, near Richmond, in Yorkſhire, and maintained himſelf by fiſhing on the river Swale. Mr. HOUGHTON added, that he had been informed, that the ſame perſon, when he died, was 157 years old. There is a record of it in the year 1665 in the Remembrancer's-office.

Mr. EVELYN remarked, that Sir WALTER RALEGH had in the account of his voyage to Virginia related, that he there met with a king of that country, who was 300 years old, and who lived alſo a conſiderable time longer, as had been certified by other writers. He ſuppoſed, that it might be Captain SMITH, who had been there, and ſeen him about thirty years after Sir WALTER RALEGH had been there. He farther thought, that the king's name was was POUHATAN, but was not certain whether it were ſo or not.

Dr. GALE added, that he knew a man, who lived at Coton, not far from Cambridge, who was above 120 years old: and that he had been told there, that this man had been puniſhed, when he was 100 years old, for fornication: that he had a renovation of his hair, and a new ſet of teeth, after he was of that age.

Mr. HOUGHTON mentioned, that he had been credibly informed, that the people of Ireland commonly lived to the age of 150 years.

Mr. HOOKE took notice of what Sir CHRISTOPHER WREN had formerly acquainted the Society, that the people at Hudſon's Bay commonly live to 120 or 130 years of age; and till that age are very luſty, and commonly go to hunting, which when they are no longer able to do, they uſually invite all their kindred, and lie down and reſign themſelves to be ſtrangled by the eldeſt of thoſe, who ſurvive, and who takes the care of government in his father's ſtead.

Mr. HOOKE read a further diſcourſe concerning comets, therein explaining how it may be ſuppoſed, that comets are burning bodies, and that the blaze of them is made partly by ſteams into flame: that all theſe ſteams do proceed from a ſmall ſolid body or ſtar actually on fire, which is inveloped with a white cloudy body of ſteams, or ſmoke, which make up the appearance of the nucleus in the middle; from which doctrine he deduced ſeveral concluſions, which he undertook to explain more fully hereafter.

Mr. TURNER and Mr. PAGET, who were choſen at the laſt meeting, were admitted fellows.

November 22, at a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN preſident
Sir JOHN HOSKYNS
Mr. HENSHAW
Mr. COLWALL
Mr. HILL
Dr. TYSON
Mr. ASTON
Mr. HOOKE.

A committee was appointed for auditing the treaſurer's accounts, conſiſting of the preſident, Mr. COLWALL, Dr. TYSON, and the two ſecretaries.

Upon the conſideration of laying out part of the ſtock of the Royal Society to the beſt advantage, it was concluded, that 200 *l.* original ſtock in the African company ſhould be bought at the rate, which it then went at, 260 *per cent.* that is in all 520 *l.* And Mr. HILL was deſired to contract for the ſame, and to ſee it transferred, according to the cuſtom in that company, giving a declaration to the Society, that the ſaid money is in truſt for the Society.

Mr. HILL preſented a propoſal from Mr. JOHN COLLINS concerning his undertaking to print a diſcourſe of Dr. WALLIS's, intitled, *A treatiſe of Algebra hiſtorical and practical*, written in the year 1676 by Dr. WALLIS, and then ſent by him to Mr. COLLINS to be communicated with other members of the Royal Society, and ſince inlarged by him, ſo as to contain not only an hiſtory, but likewiſe an inſtitution of algebra, according to the ſeveral methods hitherto in practice, with many additions of his own; provided the treaſurer, in the name of the Society, would engage to take off ſixty copies at three half pence a ſheet. This propoſal of Mr. COLLINS being read, was well approved of, and Mr. HILL the treaſurer was deſired to do as was requeſted, and to take care, that as many of the Society, as were deſirous to have the treatiſe, might be deſired to ſubſcribe for it, and take it off of the Society at the ſame rate.

At a meeting of the SOCIETY on the ſame day, Sir CHRISTOPHER WREN preſident in the chair.

The minutes of *November* 15 were read, and ſome amendments made therein.

Mr. ASTON read a letter to himſelf from Mr. HEVELIUS, dated at Dantzick 17 November 1682, N. S[q]. deſiriug the aſſiſtance of the Society for the printing of his globes, of which he had the deſign ready drawn, but wanted the engraving of the plates. His propoſals to be offered to a bookſeller were; 1. That the author would take care of the delineations of the ſtars and conſtellations; but that the undertaker ſhould maintain an engraver at Dantzick till the whole be completed. 2. That he would reſerve the dedication to himſelf, and expected ſome globes to preſent to his friends, and ſome acknowledgment for his great labour and charge. 3. That he had the privilege of the emperor and king of Poland for the ſole vending them. He added, that the undertaker and engraver ſhould have the publication of his *Uranographia*; which would be quite finiſhed in the ſpring.

In the ſame letter was an account of the obſervations, which he had made of the late comet, with ſome other celeſtial obſervations, and the daily places and motions of the comet taken off from a globe, but not by calculation, and a ſmall draught of the apparent figure of the comet on the of Auguſt [r].

[q] Letter-book, vol. viii. p. 231.

[r] This part of the letter is printed in the Philoſophical Tranſactions. Vol. xii. N° 143. p. 16. for January 168$\frac{2}{3}$.

Whereupon Mr. HOOKE fetched his obſervations on the ſame comet, and ſhewed the figure of it taken by himſelf on the ſame day, having carefully obſerved it with a fourteen feet teleſcope, and delineated it with his own hand.

Mr. HOOKE read the contents of a treatiſe of Dr. WALLIS of Oxford ſent to Mr. COLLINS, to be communicated to the Society. Concerning which the author ſaid, that the whole was ſubmitted to the Society, to be printed, or otherwiſe diſpoſed of, as they ſhould pleaſe. If printed, he ſuppoſed it might make about fifty or ſixty ſheets. This was a treatiſe of algebra hiſtorical and practical, written in the year 1676, and then ſent by Dr. WALLIS to Mr. COLLINS, to be communicated to others, who were members of the Society; and it was ſince inlarged ſo as to contain, not only an hiſtory, but an inſtitution of algebra, according to ſeveral methods hitherto in practice, with many additions of his own; together with an account of the original, progreſs, and advancement of what is now called algebra from time to time, and by what ſteps it attained to the hight, at which it then was.

A committee was choſen by ballot, to audit the treaſurer's accounts, viz. Mr. COLLINS, Mr. HAAK, Dr. KING, Mr. LODWICK, and Mr. PERRY.

November 28, at a meeting of the COUNCIL were preſent,

Sir JOHN HOSKYNS vice-preſident

Mr. HILL	Dr. TYSON
Mr. COLWALL	Mr. ASTON
Mr. EVELYN	Mr. HOOKE.
Dr. GREW	

Mr. HILL ſealed and delivered a declaration of truſt for the 200 *l.* ſtock lately purchaſed in his name, and transferred to him by Mr. RYDER.

November 29, at a meeting of the SOCIETY, Sir CHRISTOPHER WREN preſident in the chair:

Prince BORGHESE making a viſit to the Society, was entertained with ſeeing the curioſities of the repoſitory and library, and afterwards in the meeting-room with ſome experiments mathematical and mechanical, particularly with the inſtruments and ways of deſcribing various ſorts of regular and geometrical curve-lines, and the uſe of them.

His Highneſs ſubſcribed his name in the charter-books, as one of the members of the Society.

DON JOSEPPE DE FARIA, knight of the order of CHRIST, and envoy extraordinary from the King of Portugal in England, was propoſed candidate by the preſident.

Sir JOHN CHARDIN, Knt. was likewiſe propoſed candidate by the preſident.

November

November 30. The Society met upon ſummons, as uſual, for electing the council and officers for the year enſuing.

Before the Society proceeded to the election DON JOSEPPE FARIA and Sir JOHN CHARDIN were elected fellows, and after ſealing their bonds, and ſubſcribing their names, admitted fellows by the preſident.

As ſoon as a ſufficient number of members were come, they proceeded to the election of the ſcrutators, who were Mr. FLAMSTEAD and Mr. CLUVERUS.

The eleven continued of the COUNCIL were

Mr. ASTON	Sir JOHN HOSKYNS
Mr. COLWALL	Sir JOHN LOWTHER
Mr. EVELYN	Mr. PACKER
Dr. GREW	Sir JOSEPH WILLIAMSON
Mr. HENSHAW	Sir CHISTOPHER WREN.
Mr. HILL	

The ten choſen into the COUNCIL were

Sir ANTHONY DEANE	Mr. PERRY
Mr. CREED	Sir WILLIAM PETTY
Dr. HOLDER	Dr. PLOT
Dr. KING	Dr. SLARE
Mr. MEREDITH	Sir CYRIL WYCHE.

The officers elected were

Sir JOHN HOSKYNS preſident
Mr. HILL treaſurer
Mr. ASTON, Dr. PLOT } ſecretaries.

December 6, at a meeting of the COUNCIL were preſent

Sir JOHN HOSKYNS preſident

Mr. HILL	Dr. GREW
Mr. COLWALL	Dr. PLOT
Dr. HOLDER	Mr. ASTON.
Dr. KING	

Mr. HOOKE delivered up the bonds to Mr. HILL, the key of the cheſt and the council books to Mr. ASTON; and the key of the preſs to Dr. PLOT.

The great ſeal was put into the iron cheſt, the keys remaining in the hands of the preſident, Mr. HILL and Mr. ASTON.

Mr. HILL's acknowledgment of a truſt of 200 *l.* ſtock in the African company for the uſe of the Society was put in the cheſt, as alſo the ſeal of the Eaſt-India company for 300 *l.* of the Society's lying there at intereſt. Mr.

Mr. ASTON was desired to speak to Mr. RICAUT about the getting some original books from Sir JOHN CHARDIN, which he seemed willing to give the Society.

At a meeting of the SOCIETY on the same day, Sir JOHN HOSKYNS president in the chair.

Mr. ASTON read a letter from Dr. LISTER [1], mentioning his having lately met with PAYERUS *de glandulis intestinorum*; the principal part of which book he found to consist of such discoveries, as were communicated by himself to the Society, and afterwards printed in the *Philosophical Transactions* five years before that book was published.

The same letter contained an account of a tincture of indigo injected into the guts of a live dog, which after three hours was found to pass coloured into the *lacteæ*.

Dr. AGLIONBY, Dr. TYSON, and Dr. SLARE were desired to try over again the experiment, aud to make report of the success.

Dr. SMITH was said to have observed the chyle retaining a perfume (given it) in the *lacteæ*.

A paper of Dr. LISTER about chyle was read, being some probable thoughts concerning its whiteness, and what it is after it is conveyed into the artery [2].

Upon this Dr. GREW objected, that the whiteness of chyle proceeds not solely from a saline principle, but an oleous one likewise: that therefore the milk of all plants is oily: that the milk of goats beard dries into a gum, and burns like turpentine: and that it is the whey and buttery parts mixt together, which make milk.

Upon a discourse concerning animals ruminating some things, that are in the stomach, and not others, Dr. GREW remarked, that those animals have a sort of *papillæ* in the stomach very like those belonging to the taste in the mouth, which might be proper for distinguishing the several substances fit to be resumed.

Upon reading a letter from Dr. TEN RHYNE, the camphire-tree at Chelsea was said to come from him; and a number of other plants were named as natural to hot countries, but capable of being made to grow in cold, of which it was wished that a catalogue were procured, though it was said, that VAN MUNTING in Friesland had made most sort of trees grow in that country, even cinnamon and nutmeg.

The Prince BORGHESE having promised the Society a pulumbus marinus,

[1] Letter-book, Vol. viii. p 220.

[2] Ibid p 223. *& seqq.* printed in the Philosophical Transactions. Vol. xii. N° 143. p. 6. for January 168¾.

which is often brought forth, having fœtus's in the uterus, Dr. PLOT took notice out of his *Natural hiſtory of Oxfordſhire* of ſeveral other animals, to whom the ſame thing had happened. Dr. TYSON in a dog-fiſh diſſected at Greſham-college found a ſeries of fœtus's, ſome near a foot long, ſome three inches, and others one inch, and perfect eggs like that of a hen.

Mr CLUVERUS preſented eight months of the *acta eruditorum*, publiſhed at Leipſic.

December 13, at a meeting of the COUNCIL were preſent,

Sir JOHN HOSKYNS preſident,

Sir ANTHONY DEANE	Mr. MEREDITH
Sir CYRIL WYCHE	Dr. SLARE
Mr. HILL	Dr. PLOT
Mr. COLWALL	Mr. ASTON.
Dr. GREW	

Sir ANTHONY DEANE was ſworn of the council.

Mr. MEREDITH was deſired to ſpeak to Dr. AGLIONBY concerning his arrears in order to the compounding for them, provided that he enter into a bond for the future.

Upon a propoſal of the preſident, that there might be an effectual courſe taken with ſuch fellows of the Society, as were in arrears for their weekly contributions, it was propoſed, that ſuch perſons, as were two years in arrear to the Society, ſhould have their names left out of the liſt, and their bonds be ſued of courſe,

Mr. ASTON having acquainted the council, that the *Philoſophical Tranſactions* [a] might be carried on the next year, if ſome encouragement were given to the publiſhers, by taking off a good number of copies, as ſoon as they ſhould be printed;

[a] The *Philoſophical Tranſactions* began to be republiſhed in January 1683. with N° 143. The *Preface* to that number was as follows: "Although the writing of theſe *Tranſactions* is not "to be looked upon as the buſineſs of the Royal "Society; yet in regard they are a ſpecimen "of many things, which lie before them, con"tain a great variety of uſeful matter, are a "convenient regiſter for the bringing in and pre"ſerving many experiments, which, not enough "for a book, would elſe be loſt, and have pro"ved a very good ferment for the ſetting "men of uncommon thoughts in all parts at "work; and becauſe moreover the want of "them for theſe four laſt years, wherein they "have diſcontinued, is much complained "of; that the Society may not ſeem now "to condemn a work they have formerly en"couraged, or to neglect the juſt expectations "of learned and ingenious men, they have "therefore thought fit to take care for the revi"val thereof, that they may be publiſhed once "every month, or at ſuch times, whereof fore"notice ſhall be given at the end of theſe and "the following *Tranſactions*. Neither is it doubt"ed but that thoſe, who deſire to be accommo"dated herewith, will moſt readily endeavour "themſelves, or by others, to ſupply and keep "up that ſtock of experiments and other phi"loſophical matters, which will be neceſſary "hereunto; with this aſſurance given them, "that whatever they ſhall be pleaſed to com"municate, ſhall be diſpoſed of with all fidelity."

It

It was ordered, that the treaſurer ſhould buy of them at the current price ſixty copies, for the uſe of the Society, every time that the *Tranſactions* ſhould be publiſhed during the enſuing year.

It was ordered, that Dr. GREW take upon him the care of the repoſitory under the name of *præfectus Muſei regalis Societatis, &c.* and that he make a ſhort catalogue of the rarities, with a method for the ready finding them out: as alſo a catalogue of the benefactors, and the particulars given by them: that he enter into a book all ſuch things, as ſhall be given hereafter, with the name of the donor, and from time to time obſerve what may be neceſſary for the preſervation and augmentation of the ſaid repoſitory, and make a report thereof to the council; and that he bring in to the uſual meetings of the Society ſuch deſcriptions of natural things there contained, as have not yet been publiſhed in his book. Dr. GREW accepted of this office.

At a meeting of the COUNCIL at ſix o'clock in the afternoon of the ſame day were preſent,

The PRESIDENT

Sir CYRIL WYCHE	Dr. GREW
Sir JOSEPH WILLIAMSON	Mr. MEREDITH
Mr. HILL	Mr. PERRY
Mr. COLWALL	Mr. ASTON.

Sir JOHN HOSKYNS took the oath of allegiance and ſupremacy as preſident of the Royal Society.

The preſident appointed Sir CHRISTOPHER WREN, Mr. HENSHAW, Sir CYRIL WYCHE, and Mr. DANIEL COLWALL to execute each of them the office of vice-preſident.

At a meeting of the SOCIETY on the ſame day, Sir JOHN HOSKYNS preſident in the chair:

Mr. WATTS, keeper of the phyſic-garden at Chelſea being permitted to be preſent, produced a parcel of curious exotic plants, which had been brought from the Eaſt-Indies, the names of which were *Acacia Jacatenſis*; *Phaſeolus arboreſcens Malabaricus*; *Herba ſentiens*; *Vicia perennis fruticoſa*; *adianthum Indicum*; *Kalapar arbor baccifera*; *Acacia tinctoria maxima*; *Pæonia Zeylonica ſuperba*; *Flos Cankin arbor baccifera*; *Muſcenda Zeylon*; *Chriſta pavonis*; *Filex ſcandens à Pegu*; *Muſcoides arboreſcens Indica à Tunquin*; *Welmendia*; *Scabioſa Zeylonica*; *Althæa Indica tinctoria*; *Flos Margri*; *Morunga*; *Priapus vegetabilis Zeylon*; *arbor trifolia flore muſcato odorata*; *Polypodium Indicum Cluſii*; 22. *Cinnamomum.*

A rattle-ſnake of about four foot long, brought alive from the Weſt-Indies, was ſent by Mr. LEEDS the merchant to be ſhewn to the Society. It had been four months in a barrel without eating.

Mr. HOUGHTON preſented ſome freſh ſaſſafras berries.

Dr. GALE preſented from Sir GEORGE WHEELER his book of travels into Greece and Aſia.

Monſ. CONRAD VAN BEUNINGEN, envoy extraordinary from the States General, was elected a member, and afterwards admitted, having ſigned the uſual bond for the payment of the weekly contributions.

Dec. 20, Sir CYRIL WYCHE vice-preſident in the chair:

Mr. HOOKE brought in a tall exhauſted glaſs with a feather incloſed, which appeared to fall from the top of a glaſs with a velocity equal to that of a more ſolid body in the air; but the ſame feather upon readmiſſion of the air fell wavering and ſlower by many degrees. The intention of this experiment was to ſhew the eaſy divi..bility of the body of the æther; that though the motion of a comet be ſwift, yet the reſiſtance made to its motion is but ſmall: and that though the flame of a comet gives a little way to the æther, yet it does not follow it, like that of a candle moved in the air, being a groſſer body.

Part of a letter of Dr. LISTER to Mr. ASTON[x] was read, containing an anſwer to ſome objections, which had been offered againſt his conjectures about the whiteneſs of chyle. Mr. ASTON was deſired to communicate it to Dr. GREW.

A letter from Dr. TYSON to Dr. PIT was read, containing an account of the diſſection of a monſtrous lamb large and well grown; but when it was yeaned, not having a mouth or other paſſage to the oeſophagus.

From hence it was queſtioned how this lamb was nouriſhed in the uterus, it being the received opinion, that the fœtus takes in its nouriſhment by the mouth, which Dr. TYSON confirmed by ſeveral arguments, inſtancing particularly in an embryo, in which he found the tongue large and well formed, as being neceſſary for its nouriſhment, the legs and arms ſmall and imperfect. Mr. HOOKE was of opinion, that the blood contributes much to the nutrition of an embryo; and in this caſe of the lamb there was no doubt made by any one.

Dr. TYSON judged the lamb to be ſuffocated, as ſoon as it was yeaned, by its being divided from the umbilical veſſels, which communicated the air contained in the arteries of the ſheep. He ſaid, that there were two pabulums neceſſary for maintenance of animal life, the one ſulphureous, the other nitrous. This he explained by the white and yolk of an egg; the yolk being the ſulphureous pabulum analogous to chyle; the white being the nitrous pabulum analogous to the air in breathing animals: which he concluded from its fermentativeneſs to be impregnated with air: as alſo that a chick, as ſoon as the white is conſumed in

[x] This letter was dated at York 17 December, 1682, and is inſerted in the Letter-book, vol. viii. p. 243.

the ſhall, is immediately hatched and thruſt into the air, to be helpt by it; the remainder of the yolk continuing in its belly, as one part of its nouriſhment.

Several things were mentioned of Mr. HOOKE's experiment of blowing into the lungs of a dog, which keeps the animal alive, not by raiſing the lungs to make the blood circulate, but perfecting the blood by the nitrous particles of air, which have that efficacy, as to make the blood come out of the lungs an arterial blood, which entered into them a venal.

Dr. TYSON added, that he had found ſpirit of man's blood and ſpirit of nitre mixt together turn of a deep red colour like arterial blood.

Sir CYRIL WYCHE deſired Dr. TYSON to produce the experiment at the next meeting.

Dr. AGLIONBY reported, that the King had lately eaten ſome truſles found in England as good as any beyond ſea.

Sir JOSEPH WILLIAMSON remarked, that they came from Ruſhton, a houſe of Lord CULLEN's in Northamptonſhire within two miles of Kettering; and he moved, that Mr. LUTTER the gardener ſhould be inquired of concerning the particularities in the finding them, and whatever might be obſervable; which was approved of; and Dr. PLOT was deſired to charge himſelf therewith.

Mr. PAYNE preſented a ſea-plant, rooted in, and ſeeming to have grown out of a hard pebble-ſtone, found in an oiſter-barrel.

Mr. HUNT brought in a petrified moſs, and a large hare's foot, given for the repoſitory.

ROBERT PIT, M. D. profeſſor of anatomy at Oxford, having been formerly propoſed candidate by Dr. PLOT, and being deſirous to be of the Society, was unanimouſly elected.

Mr. SALISBURY produced a braſs-ring, ſaid to be taken from the root of a ſheep's tongue, and almoſt covered with the ſkin: but the perſon, who wrote the account of it to him, being unknown, and the circumſtances of the fact not appearing, it was no farther conſidered.

168$\frac{2}{1}$. *Jan.* 3, at a meeting of the COUNCIL were preſent,

Mr. COLWALL vice-preſident

Sir WILLIAM PETTY	Mr. MEREDITH
Sir JOHN LOWTHER	Dr. GREW
Mr. HILL	Dr. PLOT
Mr. EVELYN	Mr. ASTON.

Mr.

Mr. COLWALL took the oath of allegiance and ſupremacy, and the oath of office as vice-preſident.

Some of the council having lately ſpoken to Mr. EVELYN about buying 250 *l.* ſtock of his in the Eaſt-India company with a ſum of money of the Society, lying then at uſe in the ſaid Eaſt-India company, the council having conſidered of the affair, aſked Mr. EVEVYN, if he were willing to take 750 *l.* for 250 l. ſtock, taking his money from the ſum due to the Society by the Eaſt-India company? to which he agreed. Whereupon it was ordered, that the ſeal of the Eaſt-India company to the Society for 800 *l.* be delivered up to Mr. EVELYN in exchange of 250 *l.* ſtock in the ſaid company belonging to him; and a bond to be given the Society for the payment of 50 *l.* by Mr. EVELYN on the 25th of March next enſuing.

It was ordered and agreed, that the intereſt of the aforeſaid 750 *l.* be to the Society until this day, and for the future belong to Mr. EVELYN: and

That the entry of the ſtock be made in the name of Mr. HILL or Sir JOHN LAWRENCE, and a declaration of the truſt delivered to the council by the reſpective perſon.

The Earl of ANGLESEY having formerly bought Mr. OLDENBURG's books and papers, and it being ſuppoſed, that his Lordſhip had received ſeveral of the Society's papers therewith, it was ordered, that his Lordſhip ſhould be ſpoken to, either to reſtore them, or let copies be taken.

The ſecretaries having drawn up a ſtate of the papers in their office, and it appearing, that ſeveral things of the Society's had not been put into their hands, as ought to have been; it was ordered,

That Mr. HOOKE deliver up into the hands of either of the ſecretaries all ſuch books and papers, as any way belong to the Society, or came to his hands upon the account of his having been ſecretary.

At a meeting of the SOCIETY on the ſame day, Sir CYRIL WYCHE vice-preſident in the chair.

Upon the reading of the minutes of the laſt meeting, wherein are mentioned ſome reaſons of Mr. LISTER's not thinking an oily ſubſtance to be neceſſary in the compoſition of chyle and other white juices, particularly of plants; Sir WILLIAM PETTY mentioned an experiment, which he had made by beating common oil with water for the producing not only the colour of milk, but likewiſe the taſte.

But the conſiderations of Mr LISTER and Dr. GREW having been upon the particular production of whiteneſs in bodies by oils or ſalts, Mr. HOOKE obſerved in general, that whiteneſs proceeded from the reflection of multiplicity of rays: that

that therefore glaſs, though of itſelf tranſparent, yet when beaten to a ſmall powder, is white; that blue glaſs is the ſame, and that ultramarine, the ſtrongeſt blue, when very finely ground, makes a whitiſh powder: that in liquors two heterogeneous bodies (not mixing well together) one of which is tranſparent, the other beat into ſmall balls, make a white by the reflection and refraction of more rays from the little opake bodies.

Sir WILLIAM PETTY added, that vinegar by corroding lead, and dividing it into ſmall particles, makes a white powder or *ſaccharum Saturni*.

From the notion of white a tranſition was made to that of black, as being a body, that reflects few or no rays.

Sir WILLIAM PETTY ſaid, that a plate of lead turns blackiſh, only by being peckt full of holes.

Mr. HOOKE remarked, that black and white marble being expoſed equally to the fire, the black is much hotter than the white; becauſe this reflected back the rays, which the other did not: and that a white marble or ſtone, if one half of it were coloured black, would, when expoſed to the fire, be much hotter in the black part, than in the white.

The not reflecting rays from dark bodies might proceed from ſeveral cauſes. Sir WILLIAM PETTY named three, 1. Throwing in of rays into the hollowneſſes of a body, which are not ſent out again. 2. The ſticking of rays in a body. 3. A faintneſs in ſending back a ray like that of a ſlack ſtring.

Mr. FLAMSTEAD queried, why a ſpunge is not blacker, ſince it is ſo full of holes, that abſorb the light.

Mr. HOOKE anſwered, that though the hollowneſſes were many, yet there were alſo many reflecting and refracting parts in a ſpunge, which he had often obſerved to conſiſt of many clear pipes a little inclining to yellow. Other reflecting parts in it were many, as he had often obſerved in its texture.

Dr. AGLIONBY brought in ſome queries about the truffles found in Northamptonſhire, which were read and ordered to be tranſmitted to Mr. WATTS.

An EUCLID in Greek was preſented by Dr. WOOD.

Dr. PLOT ſhewed a paper with Arabic letters and ſome ſtrange characters, being a ſpell found wrapt up in the hair of the Guinea Negros; which, they ſay, makes them valiant.

An experiment was made for proving, that bodies retain their gravity in the æther; but by reaſon of ſome accidents in the making of it, there was nothing concluded from it.

Jan.

Jan. 10, Sir CYRIL WYCHE vice-preſident in the chair:

Upon a caſual diſcourſe concerning the entries of experiments brought in by the curator, ſome orders of the council made in the preſidentſhip of Sir JOSEPH WILLIAMSON were revived:

1. That the experiments to be made by the curator at the next meeting be declared at the preceding meeting, to the end, that all perſons might come provided to ſpeak with relation to them.

2. That the curator give an account in writing of the intent of the experiment, as it is entered by the ſecretary, to the end that both the curator may be ſecured of a full entry, and the ſecretary warranted.

Mr. RICHARD WALLER brought in for the repoſitory, a ſkeleton, which he had made, of a rattle ſnake lately diſſected.

Dr. TYSON produced ſeveral figures of the parts of the rattle-ſnakes, as they were drawn by Mr, FAITHORNE, Mr. WALLER, and Mr. HUNT, and were ready to be engraved.

A paper was read, containing ſeveral curious obſervations made by Dr. TYSON upon a *tænia*, or jointed worm, which he found alive in the guts of a dog diſſected by him; the worm itſelf about three feet long being ſhewn preſerved in ſpirit of wine.

The experiments for the next meeting were to prove the gravitating of bodies in the æther; and to ſhew bodies different in colour to be variouſly ſuſceptible of heat.

January 17. Mr. EVELYN in the chair.

The firſt experiment, being the proof of the gravitating of bodies in the æther, as much as the air, was made; for which purpoſe Mr. HOOKE brought in a long narrow glaſs well exhauſted, having a long ſpiral wire faſtened to the top, which bore an empty glaſs ball hanging at the end of it. The glaſs had a ring drawn round juſt at the faſtening of the glaſs-ball to the wire, that the true place and ſeat of the ball might be obſerved; which being well taken notice of, the air was then let into the receiver, and the ſituation of the ball obſerved to be ſtill the ſame it was before.

The ſecond experiment was to ſhew the different ſuſceptibility of heat by a white and black body: for which purpoſe Mr. HOOKE brought in a white marble ſtone, the one half of it being coloured with a black colour. When the ſtone had been a good while expoſed equally to the fire, though the black part ſeemed to moſt preſent to be the hotteſt; yet it was agreed, that if the ſtone were very much heated through, the white would appear the hotteſt, as touching the hand with a more cloſe and even ſurface. Dr.

Dr. TYSON read a part of his anatomy of a rattle-ſnake[y].

In the explaining the figure of the ſtomach and guts, he had occaſion to name that of the *Acus marinus Oppiani*; of which he produced the draught, it being one continued pipe or cavity without ventricle or valve, and ſomething tapering towards the ends. Upon mentioning the ſcent-bags, which he found in the ſnake, full of ſtrong ſcent peculiar to that animal, he diſcourſed of the different ſhapes of them in ſeveral ſpecies of animals, and their different inſertions into ſeveral parts near the anus.

He ſuppoſed the lungs to contain a good part of a year's proviſion of air, as the ſtomach does of victuals; and remarked, that animals, which do not often uſe reſpiration, have commonly a bladder for the containing a large quantity of air: that animals of little heat have proportionably leſs expence of it; but that ſomething of air, or what is analogous to it, is neceſſary even to fiſhes, who take it in by the bronchiæ, together with the water, and not only die after being ſometime out of the water, but likewiſe if the water in the ſmall veſſels, in which they ſwim, be not often changed.

Mr. WALLER brought in the figures of the jointed worm, which he had carefully drawn, both by the naked eye and the microſcope; particularly the end taken for the head was found a part ſeeming tendinous with hooks coming out of it on all ſides, whereby it faſtened itſelf to the guts.

In a letter from Mr. LISTER, it was remarked, that the juice of a prickle-pear, either raw or preſerved, might be very uſeful in making chyle paſs tinctured into the lacteæ.

The experiments appointed for the next meeting were for the farther proving the gravity of bodies in the æther.

January 24. Sir JOHN HOSKYNS preſident in the chair.

Upon reading the minutes of the laſt meeting, wherein mention was made of the difference of black and white marble in receiving and reflecting heat, it was farther ſaid, that the black is of a different nature from the other, and might probably contain ſomething of bitumen.

A letter from Dr. PLOT to Mr. ASTON[z] was read, containing ſome obſervations concerning the brines in Staffordſhire, and the generation of ſand in them upon boiling, though they are ſtrained through ever ſo many folds of fine lawn.

The diſſolubility of theſe ſands in water having been mentioned as attempted, it was conceived not practicable; and Mr. HOOKE ſaid, that nitre might be

[y] It is printed in the Philoſophical Tranſactions, vol. xii. N° 144. p. 25. for February 168⅔.

[z] Letter-book, Vol. viii. p. 250. It is printed in the Philoſophical Tranſactions. Vol. xii. N° 145. p. 96.

mixed with ſand, and baked in an oven ſo as to loſe its ſaltneſs, and become a perfect ſtone no ways diſſolvable in water.

Upon mentioning ſmall animalcules found in Staffordſhire brine, and paſſing through the fineſt ſtrainer, it was ſaid, that there had been animalcules found in ſea-brines made by the ſea at Limington.

From hence a diſcourſe happening concerning animals in pepper-water, Mr. HOOKE gave notice, that he had obſerved them turned into aurelias, which he would ſhew the Society at their next meeting.

Dr. TYSON read a continuation of his *Anatomy of a rattle-ſnake.*

Mr. COLWALL preſented to the Society for the repoſitory fourteen particulars given him by Mr. JOHN EVANS, who brought them from the Eaſt-Indies, which were, 1. A ſmall cup made of a rhinoceros's horn. 2. A piece of rhinoceros's ſkin. 3. A petrified crab. 4. A ſea-bean. 5. A mirabolin. 6. A ſnake-ſtone. 7. A piece of cannanore-ſtone. 8. A piece of ſallow wood. 9. A piece of Entacka wood. 10. A cullumba root. 11. An Arabian ſtone to provoke urine. 12. A piece of wood good for green wounds. 13. A piece of China ink. 14. A piece of benzoin.

He alſo gave ſome ſhells found near Reading 20 feet under ground.

Sir CHRISTOPHER WREN produced a letter to himſelf from Mr. LEEWENHOECK, written at Delft 22 January 168$\frac{2}{3}$[a]; which was ordered to be tranſlated againſt the next meeting.

Dr. SLARE communicated an account of a murrain in Swiſſerland, with the method of cure, in a letter to himſelf from Dr. WINKLER, chief phyſician of the Prince Palatine, dated December 22. 1682.[b] This murrain appeared in a ſwelling, or ſome bliſter on the tongue; which being broken with a ſilver inſtrument, and the matter wiped away, there are given the following medicines, ſoot, gunpowder, ſalt, brimſtone, equal parts, and as much water as is neceſſary to waſh it down; of which a large ſpoonful was a proper doſe.

Mr. HOOKE ſhewed an experiment of raiſing the ſpirit of wine much higher than in the ordinary barometer, made with quickſilver and ſpirit of wine.

January 31. Sir JOHN HOSKYNS preſident in the chair.

Sir ANTHONY DEAN ſhewed the Society a large thick cake of ruſt, which he had taken up out of a ſhip, that had lain ſixteen years covered with the ſea at Harwich. This cake was ſo incloſed in the keel of the ſhip, that the ruſt falling down could not be waſhed away at any time with the water. It was formed from

[a] It is printed in the Philoſophical Tranſactions, Vol. xii. N° 145. p. 74. for March 168$\frac{3}{4}$.

[b] It is printed ibid. p. 93.

the

the ruſt of a long bolt, that faſtened ſome adjoining timber of the ſhip; which bolt had been of the diameter of an inch and a half, but was now in ſeveral places almoſt conſumed. Though the cake looked very much like iron, yet when it was tried with a magnet, it did not adhere to it.

Mr. HOOKE was of opinion, that a peculiar vinegar of the oak had diſſolved ſome parts of the bolt, and precipitated them into the place, where they were found.

But Sir ANTHONY DEAN affirmed, that he had found iron to ruſt ſooner in elm than in oak, and in beach than in elm.

Mr. HOUGHTON ſaid in general, that in the preparation of powder of ſteel, the filings of ſteel being mixt with vinegar became a hard lump, which was afterwards beat in pieces in a mortar for uſe.

Whatever were the cauſe of the diſſolution of the iron, and gathering in a hard lump, it was ſaid, that Sir CHRISTOPHER WREN had found a great cake of iron, which had inſenſibly grown from the decay of a bar of iron, that faſtened ſome of the ſtones of a pinnacle upon Weſtminſter-hall; which cake was of ſo great ſolidity, as to raiſe ſeveral tons of ſtone out of their place, and thereby ruin the pinnacle.

Dr. PLOT ſent the Society two ſmall boxes of the following earths. Firſt box, 1. Moyra, an earth, wherewith the Turks paint their walls of their houſes. 2. A depilatory, $\frac{2}{3}$ lime, and $\frac{1}{3}$ orpiment, made in a cataplaſm, to take away hair. 3. Beiloon, which made into paſte takes away ſpots. It is uſed by the Turks in bathing to make their ſkins ſoft. 4. L'Ombra from Aleppo, uſed for ſhadowing by painters. The ſecond box, 5. *Orpimentum nativum, quod Arabies dicunt continere aliquid ſimile lapidi ſpeculari.* 6. *Terra verd* from France, uſed in painting, fat like *terra ſaponaria*, and ſticking to the tongue like a bole. 7. Zaffer, uſed for tinging glaſs blue. 8. *Bolus Aleppenſis.*

Dr. SLARE obſerved, that this, as well as other zaffer, was not given abroad pure, but diſguiſed with other ingredients by others, that owned the mine: that he had heard of but one mine, which was in the Duke of Hanover's territory, in a place called the Hartz: and that the name of the mineral in Dutch is *cobalt*.

Upon reading the minutes of the laſt meeting, it being queſtioned, whether nitre and ſand could be baked into a ſtone by any the hotteſt fire; Mr. HOOKE was deſired to bring in a trial.

Dr. PLOT communicated from an unknown hand the anatomy of a monſtrous pig, having no paſſage for the fœces, nor viſible ſign of ſex [c].

He alſo ſent an account of an unſucceſsful trial made at Oxford, of making an

[c] Letter-book, vol. viii. p. 256. It is printed in the Philoſoph. Tranſ. vol. xii. N° 147. p. 188.

infusion of rhubarb, injected into the guts of a live dog, pass coloured into the lacteæ; as also some doubts, whether the holes found in the body of the broad worm were mouths, and not air-vessels [d]. To which Dr. TYSON answered, that it would be difficult to have a worm of eight yards long nourished by so small a part as that supposed to be the head, where also he could find no hole with a microscope: that the worm was full of chyle, when he put it into spirit of wine; and that it presently muddied the wine, and became more empty: that he found one joint of the worm separated, and at a good distance from the rest; and yet that joint was alive and full of chyle: that the holes on the body of the worm were not so regular on each side, as the air-vessels of the silk-worm.

Part of a letter communicated by Mr. BEAUMONT was read, containing some observations of several mines near Upsal in Sweden.

A letter from Mr. LISTER to Mr. ASTON [e] was read, giving an account of the contents of his book, intitled, *De fontibus medicatis Angliæ: Exercitatio nova & prior:* printed at York 1682, in 8vo. Several copies of which were sent by him, and presented to the president and several members of the Society.

February 7. Sir JOHN HOSKYNS president in the chair.

Mr. HOOKE brought in a way of measuring the rise and fall of quicksilver in the barometer upon a spiral line, of which he was ordered to deliver an account in writing, that it might be considered and registered.

The translation of Mr. LEEWENHOECK's letter to Sir CHRISTOPHER WREN of January 22, 168$\frac{2}{3}$ was read, concerning generation from an animalcule, not an egg; the muscles of a flea, and its testicles, the worm and nympha, the sting and wings of a gnat, and its feathers; the alteration made in the blood by *sal volatile oleosum.*

A letter from Mr. LISTER with some draughts in metzotinto, dedicated to Sir JOHN HOSKYNS, was read, containing an account of a Roman altar in all its dimensions, as it was found near the river Tine in the bishopric of Durham [f].

Some account by Monsr. JUSTEL of the philosophical books publishing in France [g] was read.

A letter from Dr. PLOT, dated at Oxford 5 February 168$\frac{2}{3}$ [h], was read, giving an account of several philosophical matters examined by an ingenious assembly at Oxford. It was as follows:

"The company met as usually, where first report was made, that the experi-
"ment of baking nitre with sand in equal proportions did not succeed, either in

[d] Letter-book, vol. viii. p. 257.
[e] Ibid. vol. viii. p. 247.
[f] Ibid p 261. It is printed in the Philosophical transactions, vol. xii. N° 145. p. 70.
[g] This is propably Mr. JUSTEL's letter to Mr. ASTON in the Letter-book, vol. viii. p. 265.
[h] Ibid. p. 267.

"the

" the baker's oven, or in a ſtronger heat in a crucible. The mixture, 'tis true, " came to a hard concretion, but being put into water (though cold) the ſalt diſ- " ſolved, and the ſand fell into the ſame minute particles it conſiſted of before " the mixture. However, it was queried, whether ſome other ſort of ſand, ſuch " as ſea-ſand, &c, might not anſwer expectation in this point, though that, which " was uſed, did not. In fine, 'twas concluded, that this experiment muſt needs " ſucceed, however, in any ſand with a ſufficient heat, as we ſee it does in vitri- " fication in the glaſs-houſes, &c.

" As to the chyle-like ſubſtance, whereof this lumbricus latus ſeemed to be " full, the company deſire to know, whether the animal voided it upon its being " put into the ſpirit of wine, or whether you ſaw it through the tranſparent coat " of it: And as to the quantity of ſlime it left in the ſpirit of wine, though but " a little while in it, it was deſired (with ſubmiſſion) that you would conſider, " whether it were neceſſary it ſhould all come forth of oral paſſages, it being con- " ceived probable, that this ſlime might come forth of all the pores of the animal " in all parts, upon its being put into the ſpirit of wine, which being of a ſearch- " ing pungent nature, might eaſily inſert itſelf into all the pores, and expel " the ſlime, by ſeparating it, both from the animal, and its parts from one " another.

" The preſſure of a body ſuſpended on a ſpiral wire, was alſo conſidered, but " that experiment was not conceived nice enough to try the difference of gravita- " tions *in vacuo* and *in aere*. Beſides it was hinted by way of objection, that " ſprings did loſe much of their reſtitutive power in the receiver of an air pump " well evacuated, which 'tis reſolved ſhall be tried this week by two (exquiſitely " made) minute watches, one to be put within, and the other to remain without, " the receiver; which if found true, 'twill be to little purpoſe to proceed any fur- " ther in that matter.

" We failed this week alſo of tinging the *lacteæ* with an infuſion of indigo in luke- " warm water, the dog having gnawn his cord aſunder, and eſcaped before we " met; but we have gotten another which will hardly be ſo fortunate. The ſuc- " ceſs you may expect this day ſevennight.

" To fill up the time of this meeting, one of the company gave us an account " of ſome ſtrange effluviums from the body of a maſter of arts of his own college, " which both he and ſome others of our company had frequently ſeen. This gen- " tleman is now about 21 years of age, who, whenever he puts off his clothes in " the dark, there appear ſparks of fire between his ſhirt and his waiſtcoat; " whence they iſſue ſo violently, that they may be plainly heard to crackle, as " ſparks do ſometimes from wood, and this without any frication, or other vio- " lence uſed.

" There was alſo a problem ſtarted, viz. why the arterial blood is not conveyed " by a direct paſſage to the liver, but firſt through the veſſels belonging to the in- " teſtines: whereas to all other ſecretory viſcera it is conveyed directly out of the " aorta.

" aorta. The arteria hepatica ſeeming to be to the liver as the arteria bron-
" chialis is to the lungs, only for the uſe of the particular part.

" Mr. GOULD of Wadham College brought in the draught of a prodigious po-
" lypus found in a man's heart here at Oxford, which I have ſent you here in-
" cloſed with his account of it.

" The POLYPUS.

" The perſon, in whom we found this polypus, was a poor labouring man, a
" mere ſtranger to the town, ſo that there cannot be given ſo particular account
" of the ſymptoms he laboured under as the thing requires. He died above a
" year and a half ago, no relations then or ſince inquiring after him. If there be
" much heed to be given to the uſual outward medical ſigns, he ſeemed to be of
" a melancholic conſtitution. As far as we could learn from the vulgar, who con-
" verſed with him in his illneſs, for he conſulted no phyſician at all, the diſ-
" temper he was infeſted with, was ſome fits of the falling ſickneſs; an obſtinate
" quartan of above a year's continuance; a deep jaundice to that degree, which
" is called the black, with its uſual conſequent, an univerſal ſettled cachexy; a
" ſenſe of much preſſure at his ſtomach (as he termed it) very great ſhortneſs of
" breath, with grievous involuntary ſighings, prodigious palpitations of his heart,
" frequent ſwoonings. He died, according to the judgment of his attendants,
" in a ſhivering fit of his ague, with convulſions like thoſe of the epilepſy, not
" without foaming at the mouth. Our deſign, upon this fair occaſion of a body
" wholly at our own diſpoſal, was to make a muſcular diſſection; ſo that a nice
" particular ſcrutiny was not made in every part affected: what appeared obvious
" is this, viz. a liver upon deep inciſions appearing bloodleſs, ſtuft throughout
" with a yellow gritty ſandy ſubſtance, ſuppoſed to be gall concreted by a mor-
" bid acid. The like ſubſtance of a darker hue being alſo in the veſicula bilis,
" his ſpleen only large, and of too ſoft looſe a texture. His omentum all rotten,
" his ſtomach black with membranes extremely flaccid and thin, appearing mor-
" tified; and upon cutting of it out, though tied cloſe, it ſent forth an intolerable
" ſouriſh rancid ſcent beyond that of aqua fortis: his lungs were diſtended, and
" full of a purulent froth; his veins of an extraordinary bigneſs, particularly the
" jugulars, where the polypus paſt, were $\frac{3}{4}$ of an inch diameter; an argument ſuffi-
" cient to demonſtrate polypus's to be of a long growth, and not extemporary
" concretions made in veſſels, after death, as ſome fancy.

" The draught of the polypus I thought to have taken off by the new way,
" and afterward with a pen to have perfected it ſomething fairer than now I ſend
" it; but the attempt did not ſucceed: ſo I hope, Sir, you will pardon the ſend-
" ing of it thus defaced with thoſe blots in correcting the deſcription of it; but
" hereafter, if it be worth publiſhing, the draught may be amended. What I
" have written is all that occurred to my mind at the ſhort warning I had for this
" deſcription; ſo I hope you will excuſe all faults, &c."

February 14. Sir JOHN HOSKYNS preſident in the chair.

There

There was preſented by Dr. PLOT another parcel of earths; 1. *Terra Nilotica*. 2. *Verde viridis Cypria*. 3 A yellow mineral earth from Cyprus. 4. *Creta rubra* from France.

A preſent of ſeveral medals for the repoſitory was made by Captain HADLEY.

Mr. JAGER, a friend of Mr. CHOLMONDELEY, was propoſed as a good correſpondent for the Society in the Eaſt-Indies; and it was ordered, he ſhould be written to.

Sir WILLIAM PETTY named a tincture of ſaffron, to be tried how it would paſs into the lacteæ. The other colours, that were named, were litmus blue, gambogium and cochineal.

Dr. GREW remarked, that there were ſeveral things, that cauſed a ſmell and colour in the urine, when there was neither of them perceptible in the blood.

A letter from Dr. PLOT, dated at Oxford 12 February 168$\frac{2}{3}$[1], giving an account of what had paſſed at a philoſophical aſſembly there, was read, and was as follows:

"The company being met, the method and ſucceſs of the experiment on Friday upon the ſpring of a watch in a well exhauſted receiver of an air-pump, was firſt diſcourſed of. The trial whereof was made in this manner: we took a watch and a pendulum clock both of the beſt reputation amongſt us for going well, and ſet them exactly together on Thurſday in the evening, and locked them up in a room for fifteen hours, that we might firſt know what difference there would be between them in all that time, ſo that allowance might be made when we come to trial of the experiment. In the morning we found them differ a minute and a half: however we proceeded to the trial, and hung the watch up in the top of a tall receiver, which being well evacuated, we locked the watch and clock up again for four hours; then returning again, we found the watch had loſt in that little time near three minutes. Then locking them up again, we returned not after till twelve hours were expired, when we found the watch had loſt near nine minutes; whence making ſome abatement for what the watch loſt of the clock the night before, we concluded, that the watch had loſt ſeven minutes at leaſt. But ſome objections being made, upon a little bubble or two that appeared upon the hole under the bottom of the receiver, through which the air is exhauſted, and the gages being ſunk a little, that poſſibly ſome moiſture might be gotten into the receiver (upon ſome defect of the ſtop-cock) which might affect the ſpring of the watch, and occaſion this difference; it was deſired, that further time might be allowed for frequent trial of this experiment, haſty determinations in ſuch nice matters being looked upon amongſt us as very pernicious.

"The ſame day we alſo tried Mr. LISTER's experiment for tinging the lacteæ, with an infuſion of indigo, which upon filtration being found to be no true

[1] Letter-book, Vol. viii. p. 271.

" tincture, the liquor being tranſmitted clear, it was ordered, that Mr. LISTER " ſhould be wrote to, to know how he made his tincture; and that for this time " a tincture of Venus ſhould rather be uſed: but whether by reaſon of the aſtrin- " gency of the injected liquor, or becauſe we waited for the event not long " enough (though the dog was kept empty and faſting above two days, and 12 " ounces of liquor were injected at leaſt) there was not the leaſt appearance of any " tincture in the lacteals. However, we are not diſcouraged by theſe many diſ- " appointments, but many other tinctures are thought of, and frequent trials " will be made, ſome whereof were ordered at this meeting.

" Then there was an account given of the diſſection of the genitals of a boar " made at Chriſtmas, which animal (as they all agreed) has evidently four di- " ſtinct ſeminal juices, and as many diſtinct exits for them: the exit of the proſ- " tates, whoſe juice is extreme clammy, and very like the gluten in the cervix " uteri of pregnant cows, being a hand's breadth and more diſtant from the reſt; " and all the other exits (but that of the proſtates) about the criſta gallinaginis. " The proſtates are covered with very ſtrong muſcles to ſqueeze out the afore- " ſaid clammy juice. The juice brought from the ſtones by the vaſa deferentia " was very thick and white, and the epididymides were full of the ſame. There " are two diſtinct ſorts of veſiculæ ſeminales; the one extreme large, membra- " nous, like the ſkin containing the ſpawn of fiſhes, which diſcharged a vaſt quan- " tity of very thin, almoſt limpid, juice on the jugum of the criſta gallinaginis; " the other veſiculæ ſmaller, nearer the urethra, were more thick and glandulous, " yielding a thick white juice, juſt under each ſide of the criſta. The penis was " ¾ of a yard long, crooked toward the end, winding about like a wimble. " There is a valve juſt behind the exit of the proſtates.

" Another of the company gave a ſtrange relation, but a very true one, how a " friend of his, a maſter of arts of this univerſity, who was exceedingly troubled " with deafneſs, had found out a remedy for it, in great meaſure at leaſt, by go- " ing into the bellfry of his college on the 1ſt of November laſt, where ſtaying " for ſome time among the bells (which are the biggeſt in town) he found his " hearing ſo well reſtored, that it continued with him near two months after; " and decaying, he repaired to the ſame remedy, and recovered it again, as he " conſtantly now does, as often as he finds that ſenſe to fail him. The relations " of Mr. BOYLE and Dr. HOLDER concerning perſons, that could hear better in " London ſtreets upon the ratling of coaches, with the reaſons of it, were here- " upon diſcourſed of; but this being more conſiderable in divers reſpects, I was " however ordered to acquaint you with it. Your's, &c."

Upon a diſcourſe about the polypus found in a diſſection of a man's heart at Oxford, Dr. KING mentioned his having predicted a polypus in a patient four or five days before he was troubled with it; and that he afterwards cut it out of his heart, being as big as his fiſt.

He alſo mentioned a ſtone, which he had found, that had ſtopped up the paſſage of the vein going into the left auricle of the heart.

Dr. TYSON mentioned his having diſſected an hydropie body not quite cold, in which ſome of the blood let out of the veins into the thorax, as it came to cool, turned preſently into a matter like that of a polypus.

Mr. HOOKE brought in a method of explaining the cauſe of gravity, an account of which he was to give in writing.

Feb. 21, Sir JOHN HOSKYNS vice-preſident in the chair.

There was preſented by Dr. PLOT a ſmall box of Engliſh earths, 1. A white earth for poliſhing ſilver. 2. A very weighty white earth deſcribed in the *Natural Hiſtory of Oxfordſhire*, ch. 3. p. 4. 3. *Lac Lunæ* deſcribed, ibid. ch. 3. 4. A bole of Oxfordſhire. 5. An earth found under Fairy-rings.

A note from Monſ. JUSTEL [h] was read, together with a letter to him from two capuchins at Nantes, Frere TRANQUILLE D'ORLEANS and HENRY DE MONTBAZON, capucins de Louvre, dated 13 February 168$\frac{2}{3}$. N. S. [i] intimating their deſign of writing to the Society concerning ſeveral diſcoveries made by themſelves in phyſic and chemiſtry. Mr. ASTON was deſired to acquaint Monſ. JUSTEL, that the Society was ready to accept the offer of their correſpondence; and that they needed only to direct their letter to one of the ſecretaries, from whom they ſhould alſo receive ſuch anſwers, as were requiſite.

Mr. HENSHAW having been deſired by the Society to peruſe Mr. LISTER's book of the mineral waters in England, there was accordingly read a particular account of the contents of the book, together with ſeveral obſervations upon the matters there treated of; as alſo an intimation of ſome things fit to be made trial of before the Society, which were recommended to Mr. HOOKE.

1. Whether iron bruſh ore of the foreſt of Dean would anſwer the magnet?

2. Whether the mud and ſand of the Bath-water being heated, would ſend forth a kind of a flame or light?

3. Whether the filings of iron, if moiſtened with water, will grow hot like quick lime? the truth of which experiment Dr. SLARE ſeemed to atteſt.

4. Whether red oker burnt would apply to the magnet?

5. Whether okers diluted ſo long till the water will no longer turn inky with galls have yet a vitriolic efflorescence?

6. Whether by means of kelp put into ſea-water there be gotten a freſh potable water?

There were alſo ſome exceptions againſt the inflammableneſs of nitre, the

[h] Letter-book, vol. viii. p. 284. [i] Ibid. p. 280.

cauſing of rain, thunder, and ſubterraneous heat, chiefly by pyrites and ſal calcarium.

Upon the mentioning black lead to be found only in Weſtmorland, Mr. HERBERT ſaid, that there was a mine of it belonging to Mr. HIEROM BAULKS, but he knew not whether it were the ſame.

Mr. HOOKE mentioned one in New England, and Mr. HOUGHTON one in Penſilvania, and Dr. PLOT one in Cumberland.

It was ordered, that Mr. LISTER ſhould be deſired, if he could ſpare it, to ſend up a piece of that petrified aſh, which he ſaid had the qualities of the magnet; as alſo ſome ſamples of ores and earths for the repoſitory.

Upon mentioning ſome medicated ſprings to be full of pyrites, the preſident and Mr. AUBREY affirmed, that ſeveral, that were dug in Surrey and Kent as far as Shooter's hill, were full of pyrites.

A letter from Mr. WILLIAM MUSGRAVE of New-college in Oxford to Mr. ASTON, dated February 20, 168$\frac{2}{3}$[k] was read, giving an account of two ſeveral experiments made with two tinctures of indigo injected into the duodenum of two dogs, according to Mr. LISTER's direction; in both which experiments the lacteæ appeared coloured blue in the ſame proportion as the tinctures themſelves were to one another.

This account was ordered to be regiſtered; and, for the greater authority, Mr. MUSGRAVE was to be deſired to name the perſons, who were preſent at his making the experiments. His account was as follows:

" I have lately repeated Mr. LISTER's experiment mentioned in the laſt tranſ-
" action, much after his own manner, and with ſucceſs: I ſyringed about ℥xii
" of a moderate tincture of indigo, without any filtration beforehand, into the
" ileon of a dog, which had had no meat nor water for ſixteen, and but little meat
" for twenty four hours before the experiment, the guts again being put into the
" abdomen, &c. Three hours after I returned, and upon opening the abdomen
" of the dog (which had been kept muzzled all this while) I ſaw ſeveral lacteal
" veins of a bluiſh colour: they were eaſily ſeen, when the meſentery lay looſe,
" but upon ſtretching it did diſappear. Two days after I tried another experi-
" ment, in which I ſyringed ℥xii of tincture of indigo into the ileon of a luſty
" dog, which had been kept faſting thirty ſix hours before. Though my experi-
" ment did not ſucceed as I expected, yet I met with this obſervable; upon putting
" in the guts after I had injected the tincture, I ſaw four or five of the lacteals
" full of a deep azure liquor; which was the happy event of my tarrying longer
" than ordinary about ſewing up the gut. I might urge ſeveral arguments from
" anatomy to prove, that thoſe veſſels, that appeared thus more or leſs blue, were
" really lacteals; but if I argue only from the colour it may be ſufficient. Now

[k] Letter-book, vol. viii. p. 279.

" the

" the colour of theſe veſſels being (in both the experiments) differing from that of " the blood veſſels; and there being the ſame differences in the deepneſs of the " colour of the veſſels that was obſerved in the deepneſs of the colour of the " tincture, I am apt to think, that I do not impoſe on myſelf in this matter. " There were two gentlemen of this univerſity, who are no ſtrangers to anatomy, " and were pleaſed to aſſiſt me in the experiments before mentioned, and can at- " teſt the truth of what I write to you.

" You will have a larger account of the teſticles of a boar, as ſoon as the author " of the account, already ſent to you, has any opportunity to try over his experi- " ment a ſecond time.

" That ſome polypuſes grow in a very little time may be true, but 'tis hard " to think that all do ſo; for when a polypus is the cauſe of the palpitation of the " heart for ſeveral years, and the palpitation increaſes, we may ſuppoſe, that the " polypus increaſes alſo.

" The great haſte, that I am in, does force me to write after an unuſual manner " to you, and perhaps not expreſs myſelf clearly to you; but I hope you will ex- " cuſe, &c. New-college, February 20, 168⅞."

A lump of earth being produced by Mr. AUBREY, upon trial made thereof Dr. PLOT found it to be a good marl, and no better.

The experiment was made of a body poiſed ſo, as juſt to be covered with water, which by a knock at the bottom of the veſſel was made to ſink more into the water: an account of which was expected from Mr. HOOKE.

Feb. 28, at a meeting of the COUNCIL were preſent

Sir JOHN HOSKYNS preſident

Sir WILLIAM PETTY	Mr. PERRY
Mr. HILL	Dr. PLOT
Mr. PACKER	Mr. ASTON.
Dr. KING	

The ſpeedy collecting of the arrears being conſidered, it was ordered,

That the bonds of Dr. THOMAS COX, Dr. JAMES ARDERNE, Dr. JOHN ALLEN, and ANTHONY Earl of Shafteſbury be put into the hands of Mr. OLIVER SALISBURY, an attorney, who was deſired to ſpeak to the executor of the Earl of SHAFTESBURY and to the other three perſons, and upon their refuſal to pay him, immediately to deſire an appearance of the three perſons, and put their bonds in ſuit in the moſt expeditious way poſſible.

It being mentioned, that the Society wanted experiments at their ordinary meet-

ings, Dr. TYSON and Dr. SLARE were propoſed as perſons very fit to aſſiſt the Society in that work, and unanimouſly accepted. Whereupon it was ordered,

That Dr. TYSON aſſiſting the Society this year in making anatomical diſſections and obſervations, and Dr. SLARE in making chemical and other experiments, ſhall be rewarded each of them at the end of the year with a piece of plate to the value of 20*l*; and that the expences, which they ſhall be at in making experiments, ſhall be allowed them, as is uſual to other curators.

It was mentioned, that Dr. TYSON and Dr. SLARE would ſo ſettle the buſineſs among themſelves, that the Society at every meeting ſhould never be without an experiment from one of them.

A propoſal being made, that the mathematical inſtruments or engines, which had at any time been made by the Society, or given to them, as alſo the apparatus made uſe of in the making experiments, might be taken an account of, brought together, and carefully preſerved; it was ordered accordingly,

That Mr. HOOKE be ſpoken to, that he give the beſt account he can of them at the next meeting of the council, there being many of them ſaid by the preſident to be laid together in an upper room.

Mr. ASTON having propoſed, that he might have authority to buy up any ſmall new book for the Society, or other neceſſaries for the execution of his office, or ſmall preſents for his correſpondents; it was ordered accordingly, and that he ſhould be repaid his expences by the treaſurer.

At a meeting of the SOCIETY on the ſame day, Sir JOHN HOSKYNS preſident in the chair.

Upon the burning a pyrites, as deſcribed by Mr. LISTER, the powder was found to apply very well to the magnet.

A letter from Monſ. MARIOTTE to Mr. ASTON, dated at Paris February 23. 168$\frac{3}{4}$. N. S.[1] was read, giving an account of ſome new books printed there; as alſo of ſome obſervations of CASSINI upon VENUS, and of Monſ. VARIN about the neceſſity of ſhortening the line of the pendulum, beating a ſecond in places near the æquator $\frac{2}{172}$ of a Paris inch.

Upon ſpeaking of the Paris foot, Mr. FLAMSTEAD being ſaid to have it made, it was deſired, that the Society might cauſe one to be made after his model, to be kept in the repoſitory.

In the ſame letter of Monſ. MARIOTTE, a demonſtration having been mentioned, how the length of the pendulum at Paris being 3 feet 8$\frac{1}{2}$ lines ſhould near the æquator be two lines leſs, and near Spitſberg one and $\frac{1}{2}$ longer, upon the ſup-

[1] Letter-book, vol. viii. p. 286.

poſition,

poſition of the diurnal motion of the earth; it was queried by Mr. HALLEY, what poſition, as to the meridian, their pendulum vibrated in: as alſo what hight from the ſea; he having been forced at St. Helena to contract his pendulum, being then at the hight of 400 toiſes; which he took to proceed from the decreaſe of the gravitating power at that hight from the ſea.

A letter of Dr. PIT of Oxford to Dr. PLOT[m] was read, giving an account of ſome trials made with a magnet upon ſeveral preparations of crocus martis, ſome of which applied very well to the magnet, and others not: as alſo of a child of eight months old having the dura mater in all parts firmly faſtened to the cranium. The letter was as follows:

" I communicated your laſt to the company, who own themſelves much obliged " to you for the information you gave at the laſt meeting: but we cannot think " we have yet merited ſo far, as the public notice of the Society, and deſire only " their pardon, or at moſt a favourable acceptance of thoſe little things we " can hence preſent you with. Mr. MUSGRAVE and Mr. PACKER, &c. who " made the experiment of tincture of indigo, are fully ſatisfied, that they ſaw it " in very many of the lacteæ, but they intend to make further trials of that " kind, and deſign a more perfect account, than they can at preſent preſent you " with. We made a few experiments of crocus of ſteel applying to the magnet, " and crocus from the diſtillation of ſal armoniac on filings: the *crocus cum ſulphure*, " readily applied to the load-ſtone; but eſpecially *tart. chalybeat.* though the " metalline parts had been ſo far divided by the tartar, as to paſs through the pa- " per filtre: but the crocus from the diſtillation of ſal armoniac, after it had been " ſome time in a ſtrong fire, and the *crocus martis aſtring.* (calcined in a re- " verberatory) did not take the leaſt notice of the magnet, and yet we doubt not " but theſe crocuſes with fluxing powder may be reduced into ſteel. Theſe little " trials are of ſome uſe in medicine, but whether they may be to any advantage " compared with Dr. LISTER's obſervatory, we refer to you. I am confident " there is no black lead found in Dorſetſhire; you may have flint and chalk " enough there, but nothing like that mineral. I ſaw the dura mater in a child " of eight months old firmly in all parts faſtened to the cranium. The impreſ- " ſions frequently ſeen in the oſſa ſincipitis of the arterial branches, where the dura " mater was, as uſually diſingaged from the ſkull, make it probable it had been " affixt to it. But of this I deſire you to enquire: your anſwer to it, and a fur- " ther account of what ſhall be the next week obſerved by the Society, will very " much oblige us, particularly, &c."

March 7, Sir JOHN HOSKYNS preſident in the chair.

There were preſented from Dr. PLOT four more earths, viz. 1. Tobacco-pipe clay from Shotover. 2. Some yellow oker from Shotover. 3. Clay yellow oker from Shotover. 4. Terra lapidoſa found between Thame and Kinſey in Oxfordſhire.

[m] Letter-book, vol. viii. p. 288.

Three

Three earths were likewiſe ſent to the Society by Mr. FLAMSTEAD, which had been found in digging a well at Greenwich. They ſeemed to be all clay, though of very different colours.

A letter of Mr. GOULD to Mr. ASTON, dated at Wadham college in Oxford March 6, 168$\frac{2}{3}$[n] was read, mentioning, that a tincture of ſtone-blue appeared freſh not only in the lacteæ, but alſo in the *receptaculum* and *ductus thoracicus*: that the ſame tincture with an acid turned into a lively red, but with an alcali the blue was more intended: that a vial filled to the neck with oil of vitriol mixt with a little water continued to run over ſeveral days together: and that oil of tartar *per deliquium* falling on a deal ſhelf was in ſome time covered with a perfect nitre.

This occaſioned a diſcourſe concerning aerial magnets; oil of vitriol drawing water out of the air; and calx's growing heavier in the air; Dr. SLARE remarking, that phoſphorus after burning increaſed above four times its own weight.

In a diſcourſe about ſalts it was propounded by Mr. HENSHAW, whether any perſon could make it appear, that ſalts, which had never been in the fire, would by mixture together produce an actual heat.

A letter of Mr. LISTER to Mr. ASTON, dated at York March 3, 168$\frac{2}{3}$[p] was read, containing an anſwer to ſome objections, that had been made to ſome paſſages in his book about mineral water. It was as follows:

" Objections fairly put are, and will be ever, welcome to me; but if ſtudiouſly " made to beget diſcourſe, I am an enemy to them, and ſhall decline anſwering " them, becauſe they hinder a man's own thoughts and tire him, like a great " duſt raiſed in a ſandy road, that blinds a man rather than promotes his journey. " And indeed one is apt enough to raiſe duſt of himſelf, for there is yet little " enough, that can be diſcourſed of in natural philoſophy, but is too liable to ob- " jections. However I will tell you what I think of thoſe you ſent me, though " they may be anſwered, and are ſo in a great part in the book.

1. " Nitre is not of itſelf inflammable; if it be meant of ſalt-petre, melted in a " crucible, it is true, but if the ſame be caſt into the naked fire, it is otherwiſe, " for it flames readily. Thus brimſtone itſelf is to be melted and kept ſo inflamed: " but it ſerves my turn to diſtinguiſh betwixt the two nitres, that ſalt-petre is " inflammable in a naked fire, and that rock-nitre is not ſo, however managed. " Beſides the eſſential difference of the cryſtals, if it be meant, that ſalt-petre " will not take fire of itſelf, nor will rock-nitre; but if the vegetation of this " latter be hot, which I think I have ſufficiently proved, it is enough for my " purpoſe.

2. " That the pyrites need not be ſo much concerned in rain: it is leſs con- " cerned in rain than rock-nitre, becauſe it is infinitely leſs in quantity, becauſe

[n] Letter-book, vol. viii p. 298. [p] Ibid. p. 292.

" the

" the greateſt part of the mountains are of lime-ſtone: but if it be true, that all " ſprings and waters vaporate or ſend forth a humid vapour upon the account of " vegetating ſalts, which I think I have proved, then is the rock-nitre much " concerned, as alſo the pyrites, and I will not ſay but alſo vegetating ſalt too.

" But I cannot ſolve thunder ſhowers without a vapour from the pyrites: and " much more I could ſay, if it were convenient to anticipate my papers, to " prove it.

3. " That nitre and other things beſides the pyrites and lapis calcarius may be " the cauſes of ſubterraneous heats, &c. agreed: but it muſt be remembered, " that the baths of England are my taſk only. As for nitre, if it be meant ſalt-" petre, I think it will not be proved, that there ever was found of it in the " bowels of the mountains, but only where men and beaſts have frequented. And " in ſprings, where it is not naturally found, it is far from me to ſuſpect it as a " cauſe. As for Borelli, I never ſaw the book: but I am apt to believe the py-" rites a ſufficient cauſe of the inflammability of all the vulcanos of the world, " for that all the other *metalla inflammabilia* are very ſmall and inconſiderable, if " compared to it; and GOD forbid they ſhould be otherwiſe, being many of " them pernicious poiſon, and therefore providentially little and rare.

" I do purpoſe to print the 2d part ſome time this year, if I live, and then I ſhall " endeavour to give what ſatisfaction I can to ſuch reaſonable objections as ſhall " be fairly put.

" The book is ſo ill printed, for want of letters and a corrector, that I am " aſhamed of the little impreſſion I made here: however I have ſent them all up " to Mr. CHURCHILL to diſpoſe of them as you ſhall order, there being not above " thirty left undiſpoſed of.

" I have likewiſe ſent up in the ſame box the copper plate of the altar, and " deſire only a hundred fairly printed off to be reſerved for me to be put to a " book I intend, and then the plate is at your ſervice: it will print well and long " enough, being a rough ground, eſpecially if care be taken, that the ink be all " well and firmly ground, otherwiſe theſe kind of plates, are ſoon ſpoiled. I re-" commend you to Mr. P. TEMPEST in the Strand to get it well printed, for " myſelf and you.

" You may command what earths I have by me, and any thing elſe to facili-" tate the experiments deſigned; but I deſire you would particularly name them, " and the circumſtances you deſire to be informed of, &c. York March 3, " 1682.

A letter of Monſ. JUSTEL to Mr. ASTON, dated March 5, 168$\frac{2}{1}$.[q] was read, mentioning new relation publiſhed by monſ. REZOLET of the weſtern parts of America from Canada to the gulph of Mexico; as alſo giving an account of

[q] Letter-book, vol. viii. p. 296.

mortar-pieces caſt at Paris, ready fixed to the angle of forty five degrees, which could be ſo managed by proportioning the powder, as to throw a bomb to any diſtance within 1300 toiſes. This letter took notice likewiſe, that the pretended contrivance of rendering wood incombuſtible was found to be a cheat.

Dr. SLARE brought in a vitrified ſubſtance made of half an ounce of petre to an ounce of ſand, being a trial of ſomething, that had been ſaid of petre and ſand baking into a ſtone.

Dr. SLARE communicated an account of ſome experiments ſent by Dr. PIT about the force of a loadſtone upon ſeveral crocus's, and other chemical bodies, made out of iron.

He alſo ſhewed the *crocus cum ſu'phure*, to apply to the magnet: but the *crocus martis reſtringens*, made in a reverberatory fire, not to yield to it at all.

March 14. Sir JOSEPH WILLIAMSON in the chair:

A gentleman of Pruſſia, at the deſire of Mr. HAAK, had leave of the Society to be preſent.

An account being given of Dr. PLOT's having examined ſome earths ſent at the laſt meeting by Mr. FLAMSTEAD, which the Dr. found to be different marls, Sir WILLIAM PETTY took occaſion from hence to move, that the *criteria* or diſtinguiſhing qualities of ſeveral natural things might be ſo agreed on, that there might be no ambiguity in the terms. He inquired particularly what was the notion of marl, fullers-earth, clay, &c.?

To this Dr. PLOT anſwered, that he thought clay might be diſtinguiſhed by its not diſſolving in water; and that therefore it was commonly ground of bogs:

That marl had always a greet mixt with it;

That fuller's earth was without greet:

That loam is an earth fit for making bricks, which will not crack in the fire:

That chalk is injured by being wet, and becomes unfit to ſcore:

But that oker ſcores better and firmer for being wet:

That free-ſtone has no ſlates nor grain: that it will cut uniformly, and not eaſily break to pieces as marble: that it is ſofter in the quarry than out: that it will ſaw without ſand and water.

Dr. PLOT was then deſired, at his leiſure, to draw up a farther account of theſe and other things of the like nature, and ſend it to the Society.

Mr. HOOKE diſtinguiſhed ſtones into thoſe, that had a bituminous and ſulphureous cement, and thoſe, that had a ſaline:

That the bituminous burnt to lime:

But that the ſaline turned hard:

That marble was a bituminous, but Portland ſtone a ſaline:

That loam was a mixture of ſand and clay:

That clay was fitteſt for making bricks; and ſo uſed by the Romans; but required a long time for the making them: that the clay muſt be laid open to the air and froſt to have the body of it opened:

That ſtones, that are flaky, ought to be laid in the building as they lie in their bed; elſe they will be apt to moulder and decay:

That ſome ſtones, that cut firm, yet by lying in the air, diſſolved, ſeeming to be made of a vitriolated ſalt.

Dr. PLOT being ſaid to have twenty two ſorts of iron ore ſent him out of Suſſex, Sir WILLIAM PETTY remarked, that a criterion of them, and of all iron, was, that, if they are a little calcined in the fire, they ſtick to the tongue.

Upon reading the minutes of the laſt meeting, wherein was mentioned the tinging of the lacteæ with ſtone-blue, Sir WILLIAM PETTY took notice; that the paſſages into them muſt neceſſarily be very large and open, ſince they received ſo groſs a body: that he conceived it to be ſmalt, which appears to the eye very rough upon painting: and that indigo being but a *fecula* was not proper neither: for which reaſon he preferred liting and violet, that had been formerly mentioned for blues:

The words *conſiderably bigger* having been uſed in ſome things, that were read, Sir WILLIAN PETTY cautioned, that no word might be uſed but what marks either number, weight, or meaſure.

A letter from Mr. GOULD to Mr. ASTON, dated at Wadham-college in Oxford, March 13, 168⅔[r] was read, giving an account of a trial made of the attraction of oil of vitriol in glaſſes of different mouths. The firſt glaſs, the mouth having ½ an inch diameter, weighed with the liquor 4℥. 1ʒ. 36 gr. but after having ſtood a week weighed 4℥. 33. The ſecond glaſs of rectified oil of vitriol *per ſe* having the opening three inches diameter, and weighing 1℥. 1ʒ. 41 gr. after it had ſtood a week, was increaſed in weight 7ʒ. 25 gr. ſo that the alteration was ſomething after the proportion of the diameter of the veſſels.

[r] Letter-book, vol. viii. p. 303.

Mr. HOOKE obſerved, that things, which had ſuffered the fire, were apt to attract.

Upon mentioning the attraction of nitre by oil of tartar, Sir WILLIAM PELTY recommended to the Society the diſtinguiſhing of chemical ſalts by ſome ſenſible mark, ſuch as the riſing of ſpirit of wine ſeven, eight, or ten inches to a flame, and ordinary aqua vitæ not above an inch.

Mr. HOOKE ſaid, that he took volatile bodies to be ſuch, as mixt eaſily with the air: that the more eaſily they mix, ſo much the more volatile they are. He named three degrees of them; ſome, that mix with cold, ſome with a tepid, and ſome with a very hot.

Fixed bodies he underſtood to be ſuch, as will not mix with the air.

It being queried at the laſt meeting, whether ſalts not having ſuffered the fire, would heat by being mixed;

Mr. HOOKE mentioned braſs lumps found in cole-pits, being a kind of vitriolate ſalt, which have been ſaid to take fire by rain and weather, burning the houſes, where they have been laid.

He alſo named fermenting ſubſtances, ſuch as hay.

Dr. PLOT named a ſtuff called lam, lying among the ſhale of cole-pits, which being mixed with water and other ſubſtances there found, ſets the pits on fire, though no perſon had worked there for a long time.

Upon mentioning in the minutes French mortar-pieces ſhooting 1300 toiſes, it was queried, whether the force of powder would not put the out fuzée: as alſo whether grenados ſhot in a ſhort gun by one of the King's gunners, was not the invention of Sir WILLIAM PETTY about eight or nine years before.

Dr. TYSON was ready to exhibit the anatomy of a worm, which was deferred, as the time was too far ſpent.

Mr. HOOKE brought in an experiment for proving an attraction from the ſurface of a glaſs of water to the place ſtruck with a fiddle-ſtick on the ſide; an account of which was directed to be brought in.

Dr. PLOT ſhewed a parcel of legumina and other grains brought from the Indies; the names of which were Surinam peaſe, clay peaſe, Eaſt-India maiz, black ſpeckled peaſe, Eaſt-India kidney beans ſpotted red, caſhou, a black-eyed pea, Jamaica peaſe, a large flat white bean, the red pea, a large black ſpotted pea.

Sir WILLIAM PETTY mentioned an opinion of ſome men, that freſh ſalmon would

would ſtink by being carried through a field of beans at the time when they are bloſſoming: but the truth of it was very much doubted.

March 21. Sir JOSEPH WILLIAMSON in the chair.

Upon reading the minutes of the laſt meeting, which mention iron ore's ſticking to the tongue, after having ſuffered fire;

The ſame quality was aſſerted to be in ſeveral boles, in many of which Dr. SLARE was of opinion, there is iron contained.

Upon mentioning ſome things, that had been formerly treated of by the Society, it was recommended to the council to conſider of a way of making a general index, like a concordance, to the journals and regiſter-books of the Society; for the doing which it would be neceſſary to frame a dictionary of ſuch words or heads, as are to be inſerted into the concordance; as alſo to look over the journals and regiſters, and to rectify them, if there be occaſion.

A letter of Mr. GOULD to Mr. ASTON, dated at Wadham-college. March 20, 168⅔ [1] was read, mentioning the eaſy flaming of the ſteams, which ariſe from the pouring oil of vitriol upon filings of ſteel, when a candle is applied to them. Upon which Dr. SLARE was deſired to prepare the ſame for the next meeting.

In the ſame letter was a fuller account of the imbibing of the moiſture of the air by oil of vitriol. The quantity of the oil of vitriol at firſt was but 6 ʒ. 6 gr. but the increaſe in a fortnight's time was 11 ʒ. 5 gr. over and above.

A letter from Dr. PLOT was read, containing an account of a monſtrous birth of one TAYLER of Heywood in Staffordſhire; the monſter itſelf being promiſed to be ſent to the Society at their next meeting. In the mean time there was read a letter of Mr. SAMPSON BIRCH of Stafford to Mr. WALTER CHETWYND of Ingſtry giving him a particular information of the matter of fact.

The Society not doubting of the ſincerity of Mr. BIRCH, but being not over credulous of ſtrange ſtories, Sir ROWLAND WYNNE undertook to write to Sir CHARLES WOLSELEY about it, as living near the woman, who produced the monſter, and having been formerly her maſter.

Dr. SLARE produced a phoſphorus, which had formerly ſhined for five or ſix hous *in vacuo Boyliano*; but then being extinct it could never be brought to ſhine again by any extraordinary heat applied to it, but had continued dark for about five months.

The vacuum was tried by breaking one end of the glaſs under water, and proved good.

[1] Letter-book, Vol. viii. p. 309.

There was alſo ſhewn a phoſphorus in water, which darted flaſhes through the water like lightning: upon which was read an analogy between common lightning and the phoſphorus [t], they ſeeming to agree in many particulars.

1683. *March* 28, at a meeting of the COUNCIL were preſent

Mr. COLWALL vice-preſident

Mr. HENSHAW	Mr. MERIDITH
Mr. PACKER	Mr. PERRY.
Mr. HILL	Mr. ASTON.

The arrears of Sir JONAS MOOR and Mr. THOMAS BARRINGTON being upon bond, were ordered to be demanded of their executors.

The council having taken notice, that the journal books of the meetings of the Society, which have been written ſince 1677, have ſeveral vacancies in them, omiſſions of things and names, and miſtakes; it was ordered,

That any three or more of the council, then preſent, or of any other members of it for the preſent year, be a committee to meet at the repoſitory, and inſpect the journal books, to note any vacancies, omiſſions, or miſtakes; or, Mr. HOOKE being preſent, to mend them, and ſupply them, with his conſent or opinion, and on juſt occaſions alter and ſtrike out ſuch places or paſſages, as he and they ſhall agree to; and in caſe of diſagreement, make report to the council, that they may take farther order therein: and if the omiſſions and vacancies be ſuch, as could not be ſupplied, then to draw lines there in void ſpaces, that for the future there may be no new thing written therein.

At a meeting of the SOCIETY on the ſame day, Mr. HENSHAW vice-preſident in the chair.

A letter from Mr. GOULD, dated at Oxford, March 27, 1683, was read, mentioning an experiment made there by ſteeping true Engliſh ſlate in water, and mixing with it the infuſion or powder of galls, to ſee, whether it would turn inky. This ſucceeded according to expectation, and ſeemed of good uſe, both for diſtinguiſhing the true ſlate, and finding out the mineral, which probably makes it ſo good a medicine.

Upon diſcourſing concerning Iriſh ſlate, Sir WILLIAM PETTY remarked, that there were two ſorts in Ireland; the one more ſtrong or ſlaty, found at Slane in the county of Meath; the other an earth or bole, being blacker and leſs ſlaty than the former, taſting ſomething alumiſh, and being found near ſome places, which afford alum. This being the beſt is found in Kerry near Armagraſs.

It was recommended to Dr. SLARE to try the experiment abovementioned before the Society at their next meeting.

[t] Dr. SLARE's account of his experiments on this ſubject is printed in the Philoſophical Tranſactions, N°. 150. p. 289.

Mr.

Mr. GOULD's letter contained likewiſe a trial to ſeparate the acids from the mercury in mercurius dulcis, by ſpirit of ſal armoniac, upon which the mercury appeared in a black form. This experiment was repreſented as of good uſe in caſes of poiſon by ſublimate, and for the ſubduing acid juices in the body.

This experiment was recommended to Dr. SLARE to be made by him.

In the ſame letter was a farther account of the addition to the oil of vitriol this third week; which (the liquor being now very weak) was but one drachm twenty grains; but the increaſe in the whole above treble the firſt weight.

Upon this Dr. SLARE gave an account of his having expoſed in a broad glaſs ſix drachms of oil of vitriol, which after eight hours weighed one drachm thirty-two grains more. After 32 hours it had gained three drachms and a half above the firſt weight: and this was done, the room being very cloſe, and the air very dry.

This experiment, though the additions after three weeks were not expected to be conſiderable, was thought fit by Mr. HENSHAW to be farther carried on by an inquiry into the nature of the compounded liquor, whether the increaſe would prove a ſalt or a phlegm. He propoſed the diſtilling it *in balneo*, and ſome other ways, whereby a nitrous ſalt would be made to riſe before a vitriolic.

Dr. PLOT ſent a farther relation of the monſtrous birth in Staffordſhire, as it came to him in a letter from Mr. SAMPSON BIRCH, alderman and apothecary of Stafford [u], together with the ſubſtance itſelf, which was to be ſhewn the Society, and then ſent him back.

This ſubſtance appeared much the ſame, as was deſcribed. It was ordered to be left in Dr. TYSON's hands to make ſome obſervations on it, and to get the figure of it taken.

Two letters to Mr. ASTON were read, the one from Mr. ANDREW BORCKMAN, dated at Hamburgh March 16, $168\frac{2}{3}$[w], incloſing another from JOHN ERIC OLHOFF, ſecretary of the republic of Dantzick, dated there February 1, $168\frac{2}{3}$[x], giving notice of the latter's having ſent the Society for themſelves and ſome others a preſent of a book publiſhed by himſelf, containing the judgments of ſeveral learned men in Europe upon the performances of Mr. HEVELIUS in aſtronomy.

A letter from Dr. LISTER to Mr. ASTON, dated at York March 26, 1683[y], was produced, containing an account of an hydrophoby in a man bitten by a mad dog; which letter was referred to the next meeting.

[u] Two letters of his to Dr. PLOT, one dated Feb. 1, and the other Feb. 28, $168\frac{3}{4}$. are inſerted in the Letter-book, vol. viii. p. 330 and 333. An extract of them is printed in the Piloſoph. Tranſ. N° 150. p. 281.

[w] Ibid. p. 312.

[x] Ibid. p. 313.

[y] Ibid. p. 314. It is printed in the Philoſophical Tranſactions. Vol. xii. N° 147. p. 162. for May 1683.

Dr. TYSON read a large diſcourſe concerning the *lumbricus latus* [z], conſiſting of ſeveral obſervations of his own, and a refutation of ſeveral errors maintained at ſeveral times concerning it.

Mr. HOOKE was ready to bring in a magnetical experiment; but it was deferred till the next meeting.

Mr. HUNT preſented for the repoſitory a large ſhell of an echinus marinus from a friend of his.

April 4. Mr. HENSHAW vice-preſident in the chair.

Mr. HOOKE exhibited an experiment tending to explain magnetiſm:

There were two flat pieces of wood like rulers, the one having a pin faſtened in the middle; the other was in the middle ſuſpended by that pin like a needle of the compaſs. By knocking gently on the end of the lower piece of wood, the upper piece moved towards the line of knocking, or not a quarter of the compaſs from it. The application of this experiment was not declared.

Mr. WALLER ſhewed ſome rough ſapphires, which ſtrongly adhered to the magnet.

It was much doubted, whether thoſe ſubſtances be what they are ſold for; and it was deſired, that an inquiry be made of Mr. RALPH BOX concerning them.

Dr. SLARE made a trial of Iriſh ſlate, tinging with galls, but not applying to the magnet, though after burning.

He alſo made a trial of the taking fire of the fumes of oil of vitriol and filings of ſteel.

The filings of ſteel, with a little water poured on them, did not heat ſenſibly to the touch.

He gave an account, that the oil of vitriol mentioned at the laſt meeting, was now increaſed to fourteen drachms ſeventeen grains.

A letter of Mr. WILLIAM MUSGRAVE to Mr. ASTON, dated from New-college, Oxford, March 3, $168\frac{2}{3}$ [a], was read, mentioning, that Dr. WALLIS had lately met a remarkable piece of antiquity, which was the date 1133 in figures, on an old mantle-tree at the miniſter's houſe at Helmdon near Brackley in Northamptonſhire.

That he had tried whether a tincture of the ſtone hæmatites will tinge with galls, but without ſucceſs.

[z] It is printed in the Philoſoph. Tranſact. N° 146. p. 113. [a] Letter-book, Vol. viii. p. 323.

That Mr. WELSTEAD of Merton-college, and himſelf had injected one drachm of gutta gamandra, diſſolved in warm water, into the axillary vein of a luſty young dog, which had been kept faſting thirty-ſix hours before: that as ſoon as the dog was untied (which was as ſoon as could be) he was ſo uneaſy, that he laid down and employed his whole endeavours in breathing, which he did as faſt as poſſible for a quarter of an hour, at the end of which a blue thin matter came from him *ab ano*; and he breathed with difficulty a quarter of an hour longer, and then died. Being opened, the meſeraic veins were found diſtended to double their uſual ſize; and the blood appeared thinner than ordinary, and not ſo apt to coagulate as uſual.

That Dr. MERRYWEATHER, practitioner of phyſick at the Devizes, had ſent an account of a woman in that neighbourhood, who was cured of a tympany of eight years ſtanding by an onion diet.

Mr. LISTER's obſervations on a caſe of hydrophoby were read.

April 11, Mr. HENSHAW vice-preſident in the chair.

Monſ. BENJAMIN DE BROECKHUYSEN, a phyſician of Holland, being permitted to be preſent, gave the Society two copies of his book *de oeconomia corporis animalis juxta methodam philoſophiæ Carteſianæ.*

There were preſented from Dr. PLOT the following ſpecimens;

Lignum foſſile from Nidlington and Duclington in Oxfordſhire.
Blue Oker to colour gloves from Darlaſton in Staffordſhire.
Creta umbra from Hinkley in Staffordſhire.
Rubrica from Ipſton in Staffordſhire.
Yellow Oker from Willen-hall in Staffordſhire.

Mr. PAYNE preſented likewiſe ſome pieces of urns both of earth and glaſs, with a ſtone ring found therewith.

An extract of a letter from Monſ. ANDREW ARNOLDUS to Mr. HAAK, dated at Paris 6 Aprll 1683, N. S. [b] was read, mentioning, among other things, that his father at Nuremberg had lately received ſome Bohemian muſhrooms, which in dreſſing ſeemed petrified, but were found to contain ſome of them nine, and others twelve grains of fine ſilver.

It being queried, whether theſe muſhrooms were like thoſe of England, Dr. SLARE ſaid, that they were.

Another ſort, common in Germany, being dried and ſtrung, keep the year round, and are good for eating.

Upon mentioning the inſcription in Indian figures, *anno* 1133, Mr. HENSHAW

[b] Letter-book. Vol. viii. p. 325.

remarked,

remarked, that this ſort of figures were firſt brought from the Moors by POPE SYLVESTER II. who had long ſtudied in Spain, though they were not in common uſe till long after.

Mr. HOOKE brought a draught in perſpective of a ſquare ſaid to be equal to a circle.

April 18, at a meeting of the COUNCIL were preſent

Mr. COLWALL vice-preſident,

Mr. CREED	Dr. GREW
Mr. HILL	Mr. PERRY
Dr. KING	Mr. ASTON.

Mr. EDWARD HAYNES and Mr. WILLIAM GOULD being recommended as candidates (together with ſome others) the council approved of the two named, and ordered them to be propoſed to the Society at the next meeting, as perſons capable of being elected fellows.

At a meeting of the Society on the ſame day, Mr. HENSHAW vice-preſident in the chair:

There were preſented by Dr. PLOT the five following earths;

Talcum Staffordienſe, amblicot clay from Stafford, fit to make pots for glaſs-houſes.

Terra ſaponoria Comberferdienſis, in Staffordſhire.

Earth of Lawton park in Staffordſhire, in which filings of iron, wrapt up and melted again, make a purer ſort of iron than before.

Terra Anglica ignota.

Bolus Harbonenſis in Staffordſhire.

Mr. HOUGHTON brought in a bundle of ſeeds of different ſorts, which he had collected towards the furniſhing a particular theſaurus of ſeeds in the repoſitory.

He having conſulted Mr. BOX about the ſapphires mentioned at the meeting of April 4, was informed, that they came all from Lyons in France.

But there being little anſwered about ſmalts, Mr. HOOKE ſaid, that out of a copper mineral calcined and powdered, and mixed with ſand, is made a bluiſh glaſs, which being quenched in water, cracks and crumbles into a fine blue powder.

Mr. CLUVERUS and Mr. PERRY were deſired, either of them, to read over Monſ. DE BROECKHUYSEN's *Oeconomia corporis animalis*, and give ſome ſhort account of it.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at New-college April 17, 1683[c], was read, concerning the nitron of Egypt, which, he was informed, has

[c] Letter-book, Vol. viii. p. 326.

ice

ice on the top of ſome of the rivers of that country. It was brought from Egypt by Mr. HUNTINGDON, and given by him to Dr. PLOT, who preſented ſome of it to Mr. MUSGRAVE, who thought it to be a ſort of ſal armoniac.

Mr. HENSHAW deſired, that Dr. PLOT would ſend the Society ſome of it, it ſeeming in PLINY to be only a nitre, and being accompanied with ſuch a yellowiſh oil as that is.

Mr. MUSGRAVE's letter mentioned likewiſe his having ſeen the famous febrifuge of THOMAS CORNELIUS CONSENTINUS, much reſembling *antimonium diaphoreticum* as to its colour, and altogether inſipid as that.

It mentioned likewiſe the caſe of a girl dead with the palſy.

An experiment formerly ſhewn the Society by Mr. HENSHAW was again exhibited, of a bar of iron having a different direction or polarity, as either end of it is turned to or from the earth.

This occaſioning ſome diſcourſes about magnetiſm, Monſ. JUSTEL affirmed, that he had ſeen a peculiar ſort of load-ſtone, which being ſtruck on an iron both backward and forward, firſt forward, and then backward, did not deſtroy its magnetiſm, as others uſually do.

Mr. HUNT preſented from Mr. TAYLOR a very large ſaw of the priſtis.

Mr. EDWARD HAINES and Mr. WILLIAM GOULD having been mentioned to the council, were propoſed to the Society for candidates; the former being recommended by Mr. FLAMSTEAD and Mr. HALLEY, and the latter by Dr. PLOT.

April 25. Sir JOHN HOSKYNS preſident in the chair.

It was deſired, that a more full account of the experiment about the magnet, ſhewn at the laſt meeting by Mr. HENSHAW, might be taken, and entered into the Regiſter-book [d], which was done as follows:

" Mr. HENSHAW, at the deſire of ſome of the Society who had not ſeen it, " brought a magnetical experiment, which he had many years before ſhewn in " the ſame place; which becauſe it is ſurpriſing, and has been heretofore known " by very few, he was deſired to bring in an account of what he had exhibited, " in writing.

" The experiment was this: he took a piece of iron of a foot length, broad " about $\frac{3}{4}$ of an inch, and thick about $\frac{1}{7}$, that had never been touched with " the loadſtone, though any piece of iron of any length and figure will have the " ſame effect. Holding this piece of iron erect or perpendicular to the horizon, " he applied a verſorium, or magnetical needle to both the ends of this piece of

[d] Vol. vi. p. 38.

" iron. In this poſition, the north end of the needle always turned to that end of " the iron, that was uppermoſt, and the ſouth point of the needle to that end of " the iron, that was held downwards; and changing as often and as faſt as he " could the poſition of the ends of the iron, as turning that end which was firſt " uppermoſt to be lowermoſt, and that which was lowermoſt uppermoſt, the " needle had no particular regard to either of the ends, but ſtill turned the north " point to that which was uppermoſt, though it had juſt before turned ſouth to it, " when that end was lowermoſt. This phænomenon he leaves to be diſcuſſed " by thoſe of better judgment, whether it does not confirm the opinion of Dr. " GILBERT, that the whole globe of the earth is a great magnet; and of Monſ. " DES CARTES, that the magnetical effluvia of the earth are carried in certain " lines from one pole of the magnetiſm to the other.

" He further ſhewed, that there was a very great latitude as to the erection of " this iron to almoſt any angle to the horizon, wherein the needle performed its " part with the ſame conſtant reſpect; but if the iron were held parallel to the " horizon, the needle had no regard to either end of the iron, nor any reſpect to " the whole body of the iron, when applied to it in an horizontal poſition; and yet " when the iron is held in a perpendicular poſition, if the needle be applied to it, " and removed gently and gradually from the bottom to the top, and, *vice verſa*, " the needle will ſtand eaſt and weſt, or at right angles to the iron, when the needle " is brought a little beyond the middle of the iron. And he thinks it a notable " confirmation of the above-mentioned theory, what Mr. EDMOND HALLEY " (who had formerly ſeen this experiment) affirms, that in the iſland of St. He- " lena, the needle turns its ſouth point to the uppermoſt or erect end of the iron; " whereas in our northern hemiſphere, it conſtantly turns its north point."

A letter from Dr. PIT to Mr. ASTON, dated at Oxford April 25, 1683 [e], was read, deſiring, that ſome of the Egyptian earth, being in the Society's repoſitory, might be weighed conſtantly every fortnight till the 17th of June, and the ſeveral weights ſet down, in order to the comparing them with the like trials at Oxford.

This letter contained likewiſe an account of two optic nerves found by Dr. PIT in each eye of a jack, and formerly in thoſe of a barble, of which he intended to ſend a farther account.

A letter of Mr. LISTER's to Mr. ASTON, dated at York April 23, 1683 [f], was read, giving an account of his having ſent to the Society ſeveral ſamples of minerals relating to the hiſtory of iron. They were in number twenty-four, and the greateſt part of them calcinations; but he offered ſome crude, if the Society ſhould deſire them.

Mr. ASTON was deſired to accept of that offer, and to inquire of him what obſervations he had made about braſs lumps; whether they take fire in moiſt weather? whether his Indian iron came from Golconda? whether he knew of a rock in Yorkſhire ſtuck over with large nautilus's?

[e] Letter-book, p. 334. [f] Ibid. p. 327.

Dr. SLARE ſhewed a piece of brown oker, which after ignition being placed on the ground plainly attracted the needle, that was applied to it.

He farther obſerved that end of the oker, which was towards the ground, to draw the ſouth pole, and its oppoſite the north pole; as alſo, that the yellow oker gains no polar verticity this way, though it turns red after it has been burnt in the fire, as the pyrites, and other iron ores are obſerved to do.

He gave a farther account of oil of vitriol expoſed to the air twenty-five days before: That the laſt five days it had gained but forty-two grains: That the liquor taſted ſubacid, like a weak flegm of vitriol: That oil of vitriol gains in eight days of very wet weather but half a drachm more than in ſeven of dry and very hot weather; which is very inconſiderable.

May 2. Sir JOHN HOSKYNS preſident in the chair.

A box of iron ores being preſented by Mr. LISTER, the greateſt part of them calcined, were now examined by a good magnet; as black lead, gur, yellow oker, brown oker of the Spaw, golden pyrites, mundic, Suſſu ball mine, Derbyſhire blue iron, Virginia iron ſtone, red emery, black emery, Eaſt-India iron ore, Swediſh iron ore, petrified wood, or pyrites from Lough Neagh in Ireland, the earthy contents of Malton Spaw: All theſe cleaved to the loadſtone.

Upon mentioning Dr. PIT's having diſcovered two optic nerves in the eye of a barble and pike, it was recommended to Dr. TYSON to examine the eye of thoſe fiſhes, and report how the optic nerves ordinarily appear.

Mr. ASTON read a diſcourſe of WILLIAM BRIGGS, M. D. and fellow of the college of phyſicians, being a continuation of his diſcourſe about viſion[g], read formerly before the Society; wherein were anſwered ſeveral objections, which had been propoſed againſt his theory; and ſome farther argument urged in confirmation of it.

Mr. CLUVERUS gave an account of Monſ. DE BROECKHUYSEN's *Oeconomia corporis animalis.*

Mr. GOULD and Mr. HAINES were elected fellows of the Society.

May 9. Sir JOHN HOSKYNS preſident in the chair.

A piece of the nitron of Egypt, ſent by Dr. PLOT, was preſented to the Society; as alſo ſome ſand of that country, taken from a place not covered with the Nile.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at New-college, Oxford, May 8, 1683[h], was read, giving an account of his having cut out the cœcum

[g] This continuation is printed in the Philoſophical Tranſactions. Vol. xii. N° 147. p. 171. for May 1683.

[h] Letter-book. Vol. viii. p. 335. See Philoſophical Tranſactions, N° 151. p. 324, for September 1683.

of a bitch ten days before with ſo good ſucceſs, that the bitch was very likely to continue luſty and well.

Dr. TYSON remarked, that the cœcum of a bitch and ſeveral other animals was ſmall and full of glands, but without excrements; but that it was contrary in a rabbit, and ſome others.

The ſame letter mentioned a tincture of hæmatites not turning black upon an infuſion of galls.

An account of the magnetical experiment, ſhewn by Mr. HENSHAW, was read, and ordered to be regiſtered.

Dr. TYSON ſhewed the figure of the inward parts of the polypus, wherein were remarkable the beak like a parrot's, with ſtrong muſcles to it; a large globous liver, and the gall contained in the *veſica fellis*, which was perfectly black, ſo as to be made uſe of inſtead of ink; with other particulars relating to the ſtomach, ovarium and acetabulum.

Dr. SLARE brought in the chemical analyſis of the urine of a healthy man after drinking plentifully of wine and other ſtrong drinks. There was no vinous ſpirit: the firſt thing, that aſcended, was an inſipid liquor like a flegm. There were two ſorts of ſalts ſhewn, the one ſeeming a marine, by other qualities, as well as the figure.

He was deſired to communicate a copy of the proceſs, in order to its being regiſtered.

Dr. WILHEM TEN RHYNE's book *De Arthritide*, &c. being printed off, a copy of it was ordered to be put into the library.

Mr. GOULD was admitted fellow.

May 16, Sir JOHN HOSKYNS preſident in the chair.

Upon inquiring what alteration had happened to the *terra Nilotica*, which had been ordered to be weighed and expoſed to the air? Mr. ASTON anſwered, that upon the 7th of May there were weighed out, and put into an exact pair of fine ſcales, three drachms, thirty-ſeven grains, and $\frac{17}{20}$ of that earth, being all the parcel given by Dr. PLOT; but that the poiſe ſince that time was not ſenſibly altered.

Upon mentioning the heavineſs of the air in fair weather, and its lightneſs in rain, it was obſerved, that fair weather was very hazy and unfit for a teleſcope; but rainy weather clear, by reaſon of the rains gathering up, and carrying away all the little drops diſperſed in the air, whereby it becomes more pure and dry.

Hence

Hence Mr. HENSHAW obſerved, that watery grounds were uſed to be floated for the better carrying away and clearing them of water.

Sir JOHN HOSKYNS was of opinion, that floated grounds became thereby levelled, and ſo apter to lie dry.

Upon reading Dr. SLARE's account of a man's urine, after drinking wine, it was taken notice of, that there was no vinous ſpirit found, though Dr. WILLIS ſpoke much about it.

Dr. KING named an experiment, which he had formerly made, to prove the circulation of the blood, but having other uſes: He injected into the artery of a dog eighteeen ounces of milk, which after half an hour's time, and divers circulations, came out of a vein, then opened, in a leſs or greater quantity, according to the blood mixed with it, but not altered in colour or other qualities, but ſwimming upon the blood. After ſeven or eight hours the dog uſually died convulſive.

Mr. ASTON read a letter to himſelf from Monſ. MARIOTTE, dated at Paris 25 April, 1683, N. S[1]. in anſwer to one about the motion of the pendulum in ſeveral climates; as alſo concerning a book of Monſ. PERRAULT, aſſigning new proportions to the five orders of architecture; and concerning Monſ. DU VERNEY's treatiſe of the organs of hearing; on which occaſion Monſ. MARIOTTE mentions his own opinion, that the perception of the ſenſory lies in the inward membrane, incompaſſing the nerve; which membrane comes from the *pia mater*.

An account was given of two printed letters of Monſ. PERRAULT and Monſ. MARIOTTE, preſented to the Society for their library; the former aſſerting the organ of viſion to be the retina, the latter the choroid.

There was read likewiſe a tranſlation of a paper, received from Monſ. JUSTEL, being a ſummary of the experiments about magnetiſm made at Paris by Monſ. CHAMARS, with other things relating thereto.

A curious ſmall quadrant of two feet radius, very well fitted up, for the taking diſtances as well as hights, to be ſent to Venice, was brought by the inſtrument-maker, Mr. WYNNE, to be ſhewn to the Society.

May 23. Sir JOHN HOSKYNS preſident in the chair.

A diſcourſe being occaſioned concerning the ſlope, which is neceſſary in the bed of a river for making the water flow conveniently, one foot deſcent in 200 having always been accounted too much; Mr. PACKER was aſked his opinion about the deſcent of the new river water between Ware and Iſlington; which upon all the windings was eſtimated to be about fifty miles: to which he anſwered, that he conceived it might be about fifty feet.

[1] Letter-book, vol. viii. p. 336.

A letter of Monſ. JUSTEL to Mr. ASTON, dated at London 1 June 1683, [k] was read, concerning ſome things lately made in France; and, among the reſt, a ſort of candleſtick very good for preſerving the ſight, and increaſing of light; and a new kind of pneumatic engine, ſaid to be made more perfect than that then in uſe: and that Monſ. D'ALANCE, a very curious gentleman at Paris, had made trial of it.

Mr. HALLEY having a new hypotheſis concerning the variation of the compaſs, and the magnetiſm of the earth [l], made ſome experiments for the better explaining it.

He placed two loadſtones and a needle triangular wiſe, ſo as the needle might be equally diſtant from either pole. The needle lay indifferent, not pointing to either pole, but between both.

If the needle was removed altogether on one ſide, then it pointed to the neareſt pole, and took no notice of the other. To apply this, he ſuppoſed four magnetical points or poles in the earth; the firſt of theſe, and nigheſt to us, lying in or near the meridian of the land's end, within about ſeven degrees of the north pole. By this the variation of Europe and Tartary are chiefly governed, till the other magnet pole concerns itſelf, which lies in the meridian of California, about ſixteen degrees from the north pole. By this North America is affected; and the ſea on both ſides of it from the Azores to Japan. The third pole lies in a meridian, about twenty degrees weſtward of the ſtraits of Magellan, about ſixteen degrees from the ſouth pole. This governs in South America and the ocean on both ſides of it. The laſt pole, and of greateſt force, is in the meridian of Nova Hollandia, and the iſland Celibes, about twenty degrees from the ſouth pole. This rules the Cape of Good Hope to the middle of the South Sea.

Though the ſimple force of each of theſe poles, and much more the complicated one of two or more, are able to do much; yet he propoſed as a deſideratum, to know the proportion, in which the virtue of a magnet decreaſes, when you remove from one of its poles?

Dr. TYSON brought in a lizard, which he had anatomiſed, together with the figures curiouſly drawn by Mr. WALLER [m]. The things remarkable in it were four penis's, as in a rattle ſnake; the lungs a large bladder; the teſtes lying high in the body, and the kidneys near the anus.

May 30, at a meeting of the COUNCIL in the repoſitory were preſent

Sir JOHN HOSKYNS preſident

Sir ANTHONY DEANE	Dr. KING
Mr. CREED	Dr. SLARE
Mr. HENSHAW	Mr. MEREDITH
Mr. HILL	Mr. ASTON.

[k] Letter-book, vol. viii. p. 339. June 1683.

[l] This theory is printed in the Philoſophical Tranſactions, vol. xii. N° 148. p. 208. for

[m] Mr. RICHARD WALLER, F. R. S.

It

It was ordered, that the ſecretaries take all their minutes at the table in a ſmall book, which ſhall remain to the Society.

That a committee be appointed every month for looking over the entries to be made in the journal and other books of the Society; and that Mr. HILL, Dr. SLARE, and Mr. PERRY, or any two of them, take care of the firſt month.

At a meeting of the SOCIETY, on the ſame day, Sir JOHN HOSKYNS preſident in the chair:

There were preſented from Dr. PLOT the following particulars, 1. *Sulphur Orientale.* 2. Metallic coals, ſuch as take fire of themſelves. 3. Clod ſalt from the brine pits in Staffordſhire. 4. Natural vitriol cryſtallized, from Chemnitz, juſt as it was taken out of the earth. 5. Green ſpar.

Dr. AGLIONBY produced an account, taken out of the ſecond volume of RAMUSIO, concerning an herb growing in Tartary, called *Baſſracan*, being of ſuch excellent uſe, that it ſuſtains both horſe and man, and is the beſt part of their food in the deſerts. The ſame herb was afterwards taken notice of to grow in Epirus and near Padua.

A letter of Mr. LISTER to Mr. ASTON, dated at York May 28, 1683*, was read, containing anſwers to ſome queries, which had been formerly ſent him concerning ruddle, ſeeming to be a ſort of hæmatites; the ſpontaneous firing of pyrites, and the powder of the melted ſtones of Ætna applying to the loadſtone; and cornua Ammonis, found plentifully at Huntley Nabb, in a ſort of ſtones called cuts-heads.

Dr. SLARE ſhewed an experiment of two clear liquors, which upon mixing together by day-light flamed during two or three minutes; then caſt up ſhining ſubſtances like ſtars againſt the ſides of the glaſs, flaſhed like lightning, and filled the glaſs with a white ſmoke.

June 6, at a meeting of the COUNCIL were preſent

Sir JOHN HOSKYNS preſident

Sir ANTHONY DEANE	Dr. KING
Mr. HENSHAW	Dr. SLARE
Mr. COLWALL	Mr. MEREDITH
Mr. HILL	Mr. ASTON.

It was reſolved, that Mr. HOOKE ſhall receive every meeting day order for the bringing in two experiments at the next meeting-day, together with a declaration by word of mouth of the purpoſe and deſign of the experiments, and an account in writing of the hiſtory thereof, and the purpoſe as aforeſaid, ſuch as may be fit to be entered in the regiſter: and that at the end of every quarter there ſhall

* Letter-book, vol. viii. p. 340.

be

be a meeting of the council, where his performances ſhall be conſidered, and a gratuity ordered him accordingly; and that from this time he have no other ſalary.

The ſecretary was ordered to leave a copy of this order at Mr. HOOKE's lodgings.

At a meeting of the SOCIETY on the ſame day, Sir JOHN HOSKYNS preſident in the chair.

Upon the mentioning the bactracan, the preſident remarked, that it was deſcribed in BAUHINUS's *Pinax*, under the name of *Panax Heracleo ſimilis*; which Mr. CHARLES HOWARD ſaid was growing upon the downs in Surrey and in ſeveral other parts of England.

A piece of cinder of Ætna was beaten ſmall, and tried by a magnet (as Mr. LISTER had given advice to do) for the better finding the concern of the pyrites in natural vulcanos. It appeared plainly, that ſome of the ſmaller parts ſtuck to the magnet.

The preſident obſerved, that the cinder of Ætna was like the cinder *ſulphuris vivi*.

Upon naming the *cornua Ammonis*, Dr. GALE ſaid, that about Whitby in Yorkſhire there were ſeveral of theſe ſnake-ſtones.

Mr. EVELYN remarked, that there were great quantities of ſmaller ones in the copperas beds.

Sir JOHN HOSKYNS mentioned, that they were generally to be found in the places, where petrifactions are made.

Sir ROBERT SOUTHWELL gave a deſcription of a fiſh, which he had lately ſeen at Sir NATHANAEL HERNE's Lady's houſe, called a ſea-bat, having a kind of fins placed along the top of the back, like wings, on each ſide, a little tail, and ſhort legs.

Mr. HALLEY deſcribed a ſailing fiſh about St. Helena, called a carvel, being like a worm in a bladder.

There were preſented from Dr. PLOT, 1. A piece of rock cryſtal from Madagaſcar. 2. Naphtha from Pitchford in Shropſhire. 3. Sand from St. Chriſtopher's; which being examined by a magnet, ſeemed to conſiſt moſtly of iron, it being black and ſparkling in colour, and almoſt as ſenſible of the magnet as filings of ſteel.

There was alſo examined by a magnet ſome ſand, ſuch as is uſed in ink-horns, and

and ſaid to be brought from Ormus, which adhere ſtrongly to the magnet, as the former.

Mr. HAAK ſhewed a load-ſtone, which uſually takes up a ſix pound weight. The ſame ſtone, when ſatiated with filings of iron, would not take up $\frac{1}{4}$ a pound; nor much more than $\frac{1}{2}$ a pound, till all the filings were carefully wiped away.

A ſmall pair of braſs compaſſes with iron points being ſet upright with the feet upwards, the ſtone held over it in the air, and not touching it, kept the compaſſes ſtanding for two or three minutes of time.

Mr. WALLER repeated the experiment made at the laſt meeting by Dr. SLARE. He put a phoſphorus into oil of vitriol; then he poured into them oil of turpentine, which flamed up from the ground above half a yard high. Upon the pouring in a larger quantity of oil of turpentine the flame was the ſtronger.

Mr. AUBREY related from an eminent embalmer, that he found a ſort of inſects in dead bodies, which he concluded to be bred in the brain; but of this there was no proof offered.

Dr. GALE being to write to Dr. BOHN of Leipſic had a preſent allotted to be ſent to Dr. BOHN of Mr. LISTER's book *de Aquis Medicatis*, and ſome of the late *Philoſophical Tranſactions*.

Dr. SLARE ſhewed ſome figures made upon diſſecting the guts and uterus of a goat.

June 13, Sir JOHN HOSKYNS preſident in the chair.

Upon reading the trials made with a magnet on ſand from Ormus and St. Chriſtropher's, Mr. WICKS was deſired to procure from the Eaſt-India ſhips a quantity of the ſhining ſand of St. Chriſtopher's and James river in Virginia for the making farther experiments.

Count ZINZENDORF, envoy from the elector of Saxony, having been introduced, there were firſt ſhewn the magnetical experiments made the laſt week by Mr. HAAK.

Then Dr. SLARE tried an experiment of BARTHOLINUS. He poured into a deep glaſs receiver ſix ounces of freſh drawn aqua fortis, and into that four ounces of recent ſpirit of Venice turpentine well rectified. The receiver was lightly ſtopped with a cork, for the keeping down the fumes: then was ſet in the ſun. In leſs than a quarter of an hour there was ſaid by one perſon to be ſeen a flame in the glaſs; but upon ſpeedy viewing it, this was rather thought to be the ſun paſſing among the ſteams.

June 20, at a meeting of the COUNCIL were preſent,

Sir JOHN HOSKYNS preſident

Mr. COLWALL
Mr. HILL
Dr. SLARE
Mr. MEREDITH
Mr. ASTON.

Mr. HOOKE being called in, and the order made concerning him on the 6th of June being read, he then declared his ſatisfaction therewith, and his reſolution to proceed in his office of curator upon thoſe conditions.

Leave was given to Mr. HOOKE to have acceſs to the journals or council-books upon occaſion of his buſineſs with Sir JOHN CUTLER[a].

At a meeting of the SOCIETY on the ſame day, Mr. HENSHAW vice-preſident in the chair.

In an occaſional diſcourſe about the production of gold, Mr. HENSHAW remarked, that though it was often found in the beds of rivers, yet it ſeemed rather to be bred in a ſtone like a white marble, of which Dr. BROWNE brought a piece from Chremnitz, which was now viewed, and appeared to be ſuch.

Some ſand from the Danube given formerly by Mr. BEMBDE, and containing gold, being tried with a magnet, adhered to it very ſtrongly.

A diſcourſe having formerly been read of a bitch bearing her puppies *extra uterum*, Dr. TYSON ſhewed a draught, that had been taken of the uterus of a bitch, together with four or five places *extra uterum*, where ſeveral puppies had been contained in ſkins of their own.

There was alſo ſhewn one of the puppies bred *extra uterum*, together with ſeveral pieces of bones and ſome ſkulls, the inſides of which were all filled with hairs growing out of the ſides.

Dr. TYSON likewiſe ſhewed a part of the great artery of a woman, having ſeveral diſtinct flat bones growing to the inſide:

As alſo the bone of a chicken, which after having been broken had cemented itſelf together very ſtrongly.

Dr. SLARE ſhewed how freſh ſpirit of nitre highly rectified, poured upon freſh ſpirit of wine highly rectified, would not ferment, or cauſe any ebullition: but if the ſpirit of wine were poured upon the ſpirit of nitre, the effervescence became very great and ſcarce to be equalled.

There was alſo repeated the experiment of BARTHOLINUS, tried at the laſt meeting, with aqua fortis and ſpirit of turpentine. About a quarter of an hour after theſe two bodies were mixt, there was an extraordinary ſtrong and ſudden

[a] Who had refuſed paying Mr. HOOKE his ſalary for reading the Cutlerian lectures.

effervescence

efferveſcence, which not only flung off the cork of the glaſs receiver, but broke out a piece of the ſide. But no flame was obſerved by any perſon.

It was hinted, that the conflict of bodies ought not to be attributed to alkali's and acids, there being little or no alkali to be found in the two preceding experiments, though the heat and ebullition in the liquors was extraordinary.

June 27. Sir JOHN HOSKYNS preſident in the chair.

In ſpeaking of bodies, wherein gold is found, Mr. HOOKE ſaid, that lapis lazuli was copper or the pyrites.

Mr. EVELYN counted glauber for gold, being univerſally to be found in other bodies.

He remarked likewiſe, that it was found in a brook falling into the lake of Geneva.

Mr. HOOKE ſaid, that there had been ſome taken up in the weſt parts of England.

Upon ſpeaking of the waſhing gold ſand, it was related, that one Mr. PLEDWELL of the Temple recovered 1500 *l.* in gold, when his chamber was burnt, upon waſhing the rubbiſh.

There being mentioned ſome Bohemian muſhrooms containing gold, as was certified in a letter from Nuremberg, Mr. EVELYN ſaid, that he had a very perfect muſhroom petrified, which he took to be a field muſhroom. Mr. HOOKE was of opinion, that the greateſt part of the petrified muſhrooms grew in the water.

Upon reading the experiments of the laſt meetings about efferveſcence, Dr. GREW remarked, that two or three drops of ſpirit of wine poured into aqua fortis made no alteration; but that if eight or nine drops were put in, they ſtirred it ſufficiently.

There were preſented from Dr. PLOT for the repoſitory, 1. *Selenites dodecahedros*, mentioned in his *Natural Hiſtory of Oxfordſhire*. 2. A piece of a cup made of the true Lemnian earth, having a peculiar ſmell, which was ſuppoſed by Dr. GREW to be oil of ſulphur. 3. *Selenites ſeu lapis ſpecularis* from Shotover.

The firſt experiment brought in by Mr. HOOKE was the ſhewing how a piece of unmelted lead would ſwim in melted lead [b].

Upon this it was diſcourſed by ſome, that the air keeping to the unmelted lead hindred the melted lead from taking it in.

[b] Regiſter, vol. vi. p. 65. It is printed in his *Philoſ. Experiments and Obſervations*, p. 89.

It was alſo ſaid, that the ſurfaces of bodies often bear up a weight, which will ſink, when it is emerſed.

Upon diſcourſing of the droſs of metals, Mr. HOOKE took notice, that iron upon heating turns it in a ſcale; and ſo as often as it is taken off; but that the ſame ſcales are eaſily reducible to iron.

Upon mentioning the riſing of ice in rivers upon a thaw, it was conceived, that rivers do not freeze at the bottom; but if ice were accidentally carried down to the bottom of a river, the ſame in a thaw growing like a honey-comb would certainly riſe up again.

The ſecond experiment of Mr. HOOKE was to ſhew how high water will riſe in any place [c]:

The experiments appointed for Mr. HOOKE at the next meeting.

1. A ſcale to meaſure the force of mounting waters.
2. An experiment to examine the ſpecific gravity of melted metals.

July 4, Sir JOHN HOSKYNS preſident in the chair.

Dr. WETHERALL, Lord Biſhop of Cork, was elected unanimouſly.

There being a diſcourſe about petrified muſhrooms, Mr. RICAUT ſaid, that he had ſeen great quantities of them taken out of the Red-ſea.

He remarked likewiſe, that he had ſeen coral fiſhed up at the iſle Fagignana, near Sicily, which at the firſt taking out of the water was ſomething pliable, but became hard afterwards by lying in the ſun.

To this was objected the authority of BOCCONE and ſome others.

It was anſwered, that there might be a difference in coralline bodies; and that ſome plants might be more hardened with a coralline juice than others.

Mr. HENSHAW mentioned a coralline, which he had ſeen on the coaſt of England, the under branches of which were hard, and the upper parts ſoft, though all lying under water.

Dr. SLARE ſhewed the thigh-bone of a man having an exoſtoſis in the middle four inches long, and an inch and $\frac{1}{2}$ broad.

A letter from Mr. MUSGRAVE to Mr. ASTON, dated at New-college, Oxford, July 1, 1683 [d] was read, giving an account of the alteration in weight happening

[c] Regiſter, vol. vi. p. 66. It is printed in his *Philoſ. Experiments*, &c. p. 90.

[d] Letter-book, vol. ix. p. 14.

in

in the terra Nilotica between the 1ſt of May and the 17th of June; the gain of eleven drachms and ten grains being in all that time but two grains, the greateſt increaſe of weight being in wet weather.

The ſame letter gives likewiſe an account of an experiment of the injection of 4 ℥ of warm water into the thorax of a dog, which cauſed a rigor in his hinder parts, and difficulty of breathing; but the ſymptoms were paſt in two days time.

Mr. LISTER ſent a draught of a piece of the wall in York, being a remainder of a Roman building, together with a diſcourſe about it[e]; which being read, was very well approved of. In the length of the *didoron* he inclined to PLINY, who calls it a foot and a half, and not to VITRUVIUS, who makes it but a foot. But the paſſage of VITRUVIUS being turned to in a manuſcript of the Norfolcian library, the length of the *didoron* was read a foot and an half.

Mr. HOOKE ſhewed the rule for calculating the preſſure of water in a pipe[f].

He ſhewed likewiſe a way to find the true and comparative expanſion of any metal, when melted[g].

The experiments appointed for the next meeting were,

1. Comparing of buckets, forcers, and pumps:
2. The model of a new kind of wind-mill of Mr. HOOKE's invention.

July 11, at a meeting of the COUNCIL were preſent,

Sir JOHN HOSKYNS preſident

Mr. HILL.	Dr. SLARE.
Dr. GREW.	Mr. ASTON.

The journal books being not yet corrected and perfected, according to an order of March 28, the preſident was pleaſed to undertake the trouble of doing it; and the journal books were left at the repoſitory for his uſe.

Dr. ALLEN MOULIN of Ireland being propoſed as a candidate by Dr. SLARE in the name of Mr. BOYLE, was approved of by the council.

It being thought proper, that ſome man ſhould be appointed to keep the door of the meeting-room during the time, that the Society was aſſembled, the porter, who removed the ſeats, was ordered to wait, and to have 12 *d.* a time, when he waited.

At a meeting of the SOCIETY on the ſame day, Sir JOHN HOSKYNS the preſident in the chair.

[e] It is printed in the *Philoſ. Tranſactions*, vol. xii. N°. 149. p. 238. for July 1683.

[f] Regiſter, vol. vi. p. 68. It is printed in his *Philoſ. Experiments*, p. 91.

[g] Regiſter, vol. vi. p. 71. It is printed in his *Philoſ. Experiments*, p. 94.

Upon

Upon reading the minutes concerning Mr. LISTER's obſervations on a Roman wall found out by himſelf at York, a paper of Mr. WALLER concerning the wall at Verulam was read. This wall was made of brick and flints. The bricks lay in three rows, as at York in five. The ſpace between the ranges of bricks was 2 feet 7 inches, which is near the meaſure laid down by PALLADIO. The length of the bricks was $16\frac{6}{10}$ inches; the breadth 12 inches and near $\frac{7}{10}$, ſometimes a quarter of an inch narrower; the thickneſs $1\frac{6}{10}$ inch, but in ſome $1\frac{7}{10}$ more, in other $\frac{2}{10}$ or $\frac{3}{10}$ leſs.

Mr. PAYNE took notice, that he had meaſured a Roman brick in London wall, which was about 17 inches long and an inch and half thick.

It was deſired, that if a whole brick could be procured, it ſhould be ſent to the Society.

Dr. TYSON brought in two pieces of a Roman pavement lately taken up near Croſby ſquare [h], where it was 9 feet under ground, that, which was above, being all made earth.

Dr. SLARE explained ſome hyſterical ſymptoms by a ſolution of ſal armoniac in water, which gave a conſiderable degree of cold without any ebullition of the liquors.

He alſo explained the cold paroxyſm of an ague by a mixture made with volatile ſalt of human blood, and a ſpirit of vinegar or acetum radicatum, which produced a remarkable degree of cold with a very high ebullition [i].

While the liquor was in this condition, there was poured into it a ſpirit of ſulphur *per campanam*, which immediately altered the temper of the liquor to a manifeſt warmth, and raiſed the weather-glaſs above an inch and half.

Mr. HERBERT propoſed, that the Jeſuits powder might be put into the cold liquor, to ſee whether it would hinder the effervescence.

Dr. ALLEN MOULIN of Ireland was propoſed as a candidate, having paſſed the council.

Mr. HOOKE ſhewed the model of a new ſort of wind-mill [k].

He ſhewed likewiſe a way to ſtop any great weight from falling down to the bottom, when the rope or chain, by which it is drawn, chances to break [l].

The experiments appointed to be made by him at the next meeting were about chariots.

[h] In Biſhopſgate ſtreet.

[i] See *Philoſ. Tranſact.* N°. 150, p. 295. &c.

[k] An account of it is entered in the regiſter, vol. vi. p. 73. and printed in Mr. HOOKE's *Philoſ. Experiments*, &c. p. 107.

[l] Regiſter, vol. vi. p. 75. It is printed in his *Philoſ. Experiments*, p. 109.

At

At a meeting of the COUNCIL were preſent,

Sir JOHN HOSKYNS preſident
Mr. HILL — Dr. SLARE
Mr. HENSHAW — Mr. ASTON.
Mr. COLWALL

It was ordered, that Mr. HUNT provide ſix keys for the preſſes, which he may lend to any of the council: but if any, who are not of the council, deſire a book to read in the library, Mr. HUNT ſhall ſet down their names and the title of the book in a quire of paper, and when he receives the book again, ſhall ſtrike out the name: and

That Mr. HUNT bring down all the inſtruments, which lie in the upper rooms, and lay them in the library to be viewed and diſpoſed of as ſhall be moſt proper.

At a meeting of the SOCIETY on the ſame day, Sir JOHN HOSKYNS preſident in the chair.

Upon mentioning the printing Mr. LISTER's obſervations about the Roman wall at York, it was ſuggeſted, that a note ſhould be added ſignifying, that a manuſcript of VITRUVIUS in the Norfolcian library agreed with Mr. LISTER's opinion about the meaſure of the *didoron*.

Dr. SLARE gave an account of his examination of the oil of vitriol, which had increaſed its quantity by lying expoſed to the open air. The liquor, which was firſt drawn off, was an inſipid water near the quantity of that gained out of the air: then there was an oil of vitriol about the quantity, which was firſt expoſed.

Dr. CHARLES WILLOUGHBY was propoſed as a candidate by the Biſhop of Cork.

Dr. ALLEN MOULIN was elected a member.

A long letter of Mr. LEEWENHOECK[m], dated July 16, 1683, was read, containing ſeveral curious obſervations about the manner of generation, ſuppoſed by him to be out of the animalcules found *in ſemine maſculino*, which is received in the point of the egg, which he calls *het plaetie of ſtipie van het cloir vat het eij*; in which place alone it receives its nouriſhment and growth.

This letter contained likewiſe ſeveral obſervables in the parts of a frog; the deſcription of the animals found in the ſeed and the excrement; a notion of digeſtion in the ſtomach and guts by breaking the meat in pieces through the motion of theſe parts; and an opinion concerning the motion of the blood in a fever.

[m] It is printed in the *Philoſ. Tranſact.* N°. 152. p. 367. for October, 1683.

Notice was given the Society, that after the next meeting there would be an adjournment during the long vacation.

Mr. HOOKE ſhewed two experiments for the converting an horizontal circular motion into a perpendicular, or any otherwiſe ſloped circular motion, or *vice verſa*, &c. of which he gave in the following account [a]:

" Then I ſhewed the two following experiments or inventions, which were " both to do the ſame thing, but by different ways, and with different advan- " tages; namely, *how to contract a horizontal circular motion into a perpendicular, " or any otherwiſe ſloped circular motion, and vice verſa*, keeping in all parts of the " revolution the ſame velocities with the velocities of the correſponding parts of " the revolution of the circulating body, that communicated the motion. And " this without wheel pinions or trundles, and without any conſiderable friction " or impediment to the motion of either; which are of great uſe in mechanic in- " ventions and engines, though poſſibly not ſo well underſtood by the greateſt " part of mechanicians, much leſs by thoſe, that make uſe of them, and leaſt of all " by others, not concerned in either.

" The firſt was perfoi med by the means of a double croſs, after the ſame man- " ner contrived with the ſingle croſs deſcribed and explained in an invention I " formerly ſhewed to this Society, of an engine to make all manner of dials, " both mechanically and geometrically true to the minuteſt diviſions, without " the help of calculations or troubleſome * * * * * of practical geometry.

" The only thing to be taken heed of in this invention was, that the arms of " the intermediate piece between the horizontal and perpendicular axis ſhould be " in the ſame plain, and that the axis of it ſhould lie equally inclined to both the " other axes.

" This way performed the effect with the greateſt ſteadineſs, freeneſs, and eaſi- " neſs of motion, without friction or wearing, and ſo for moſt uſes is beſt, though " it be ſomewhat more troubleſome and chargeable in the making; but for di- " vers other uſes the ſecond way was more eaſy, which was done only by a ring " joining the two ends of the cylinders (namely, of the horizontal and of the per- " pendicular) together, each of which ends had a hole or loop through it fit to " receive the ſaid ring, as by the model and experiment made therewith plainly " appeared.

" This ſecond or latter way, though it were more ſimple and eaſy to make, " was not in the uſe thereof, where ſtrength was very conſiderable, or equality " of motion was neceſſary, ſo good as the former; though for many ordinary " uſes it might ſerve well enough, and ſo be of more general and common uſe " than the other, and ſo is valuable upon the account of its plainneſs and practi- " cableneſs. For in mechanics (contrary to the opinion and practice of moſt pro- " jecting mechanics and ignorant ſpectators) an invention is valuable not for the

[a] Regiſter, vol. vi. p. 79.

" clutter, pomp, complication, and difficulty; but for the ſimplicity, plainneſs, " obviouſneſs, and eaſineſs, both of underſtanding, making, uſing, and repair- " ing, which makes it approach the nearer to the example of nature, which doth " nothing in vain, or by longer and more difficult ways, which may be done by " a ſhorter.

" Nor were theſe inventions only uſeful for communicating a motion of rota- " tion true at right angles, but of doing the ſame thing at any other inclination " of the axes, which in many caſes is very uſeful; as alſo for conveying a vi- " brating or reciprocating motion, and farther likewiſe for conveying a reverſed, " circular, or reciprocated motion to a parallel cylinder, ſome good uſes whereof " I may hereafter make appear.

July 25, Sir JOHN HOSKYNS preſident in the chair.

Dr. MOULIN was admitted fellow.

Dr. WILLOUGHBY was elected and admitted.

Mr. ABRAHAM HILL, in his own name and that of Dr. TILLOTSON, dean of Canterbury, preſented to the Society for their library a manuſcript of Dr. ISAAC BARROW, containing his demonſtrations of ARCHIMEDES and APOLLONIUS.

It was obſerved upon Mr. LEEWENHOECK's letter of July 16th, that the point, where the animal of the male ſeed is to be firſt received, and where it is to be firſt nouriſhed, is placed in the yolk of the egg; and accordingly, that Mr. LEEWENHOECK made ſearch for the animal in the yolk of the egg: whereas he ought to have looked for it in the white; which is certainly the firſt nouriſhment of the chicken, the colliquamentum being there to be found after twelve hours incubation.

It remained to know, whether Mr. LEEWENHOECK by the abovementioned point did not mean the cicatricula, which adheres to the yolk of the egg.

Mr. LEEWENHOECK having hitherto been unſucceſsful in tracing the animal, it was deſired, that he would examine a greater variety of eggs, and particularly thoſe of a ſilk-worm.

Dr. SLARE having in the meeting of July 11, produced a cold liquor, cauſing an ebullition, ſuch as may be ſuppoſed in agues, and it being deſired to know what effects the Jeſuits powder would have, being mixed with it, brought the following experiment[p].

He made a ſtrong infuſion of the cortex Peruvianus in a highly dephlegmated ſpirit of vinegar, which being examined by a quantity of volatile ſalt of human blood caſt into it, whether any fermentation would enſue; it was found, that it did,

[p] See *Philoſ. Tranſact.* N°. 150. p. 301.

and that very conſiderably. But having afterwards infuſed a quantity of opium in the ſaid tincture, it was found, that the volatile ſalt made much leſs ebullition.

He joined chalk with the cortex Peruvianus, which ſo far altered the liquor, that the uſual ebullition did not ſucceed.

The Society adjourned, as uſual, during the long vacation.

Octob. 24. The Society met again at Greſham-college after their receſs, having been ſummoned in the uſual manner, Sir JOHN HOSKYNS preſident being in the chair.

Monſ. LUDOLFUS, the author of the hiſtory of Æthiopia, with two other gentlemen his companions, were permitted to be preſent at this meeting.

Mr. ASTON gave an account, that he had received a preſent to the Society from Signor MALPIGHI, being the following books, 1. *Ricreatione dell' Occhio et della Mente nelle Oſſervatione delle Chiocciole del Padre* PHIL. BUONAMY: printed at Rome in 4to.

2. *Relazione del ritrovamento del uovo delle Chiocciole:* printed at Bologna in 12mo.

3. *Eraſiſtratus, ſive de Sanguinis miſſione: authore* LUCA ANTONIO PORTIO: in 12mo.

4. *Del Ghiaccio del Padre* DAN. BARTHOLI: 1683, in 4to.

5. *De urinis & pulſibus, de miſſione ſanguinis et febribus, de Morbis Capitis & Pectoris, a* LAURENTIO BELLINI: Bologna 4to, 1683.

6. *De Cometarum Naturâ & Ortu à* DOMINICO GUGLIELMINI: Bologna 1681 fol.

There came no letter with this preſent; but Mr. ASTON writing to Signor MALPIPHI [q] ſent him, in the Society's name, Dr. GREW's *Anatomy of plants*, Mr. LISTER's book *De fontibus medicatis Angliæ*, ſome of the *Philoſophical Tranſactions*, *Prælectiones poſthumæ* ISAACI BARROW, and Dr. WILHEM TEN RHYNE *De Arthritide*.

A letter of Mr. HEVELIUS to Mr. ASTON, dated at Dantzick July 17, 1683 [r] was read, together with his obſervations about the conjunction of SATURN and JUPITER, and ſome occultations of the fixt ſtars [s].

An anſwer being returned by Mr. ASTON [t], there were ſent him as a preſent from the Society, Dr. GREW's *Anatomy of plants*, Mr. LISTER *De fontibus medicatis Angliæ*, ISAACI BARROW *Prælectiones poſthumæ*; Dr. TEN RHYNE *De Arthritide*, ſome of Mr. HOOKE's *Philoſophical Collections*, and ſome of the *Philoſophical Tranſactions* for this year.

[q] Mr. ASTON's letter was dated 23 May, 1683, and is inſerted in the letter-book, vol. ix. p. 24.

[r] Letter-book vol ix. p. 12.

[s] Ibid. p. 1 and 9. Theſe obſervations are printed in the Philoſ. Tranſact. N°. 151. p. 325. for Sept. 1683.

[t] Dated Auguſt 23, 1683. and inſerted in the letter-book, vol. ix. p. 25.

A letter

A letter of Mr. LEEWENHOECK, dated September 17, 1683[u], was read, containing a deſcription of three ſorts of animals found in the ſcurf of the teeth, when it is mixed or diſſolved in ſpittle or rain-water. Theſe animals die in the water upon putting in a drop or two of wine-vinegar.

This letter contained alſo an account of the ſubſtance in the noſe and face called worms, which are nothing elſe but pieces of hair, ſometimes to the number of twenty or thirty, mixed with a clammy body.

It contained likewiſe a diſcovery of the ſtructure of the cuticula in a man to be all ſcaly like a fiſh, and the ſcales ſhewn to be five-ſided, to lie three deep one upon another, to expoſe but one third part of a ſcale to view, to ſhed at ſome times from the body, to be ſo ſmall, that a ſand will cover 200 of them. It was alſo affirmed, that there are no viſible pores for the ejection of ſweat.

It was deſired, that Dr. SLARE would endeavour to borrow one of Mr. MELLIN's glaſſes, whereby theſe obſervations of Mr. LEEWENHOECK might be examined at the next meeting.

Some being apt to doubt, whether bodies ſo ſmall as Mr. LEEWENHOECK mentioned, are really to be ſeen, Dr. KING affirmed, that he had ſeen things after 3000 times magnifying, which were then no bigger than the point of a fine needle.

Dr. GREW objected againſt there being no pores in the body, and ſaid, that he had ſeen pores in the hand ranged in ſpherical triangles, and ſome in elliptics.

The diſcourſe falling from microſcopical worms to other large worms in the teeth, Sir ROBERT REDDING mentioned a worm found in a hollow tooth: and Sir THEODORE DE VAUX mentioned a paper of Sir THEODORE MAYERNE's, which the Society had ſeen, concerning a woman, who killed worms in the teeth.

Dr. KING mentioned a worm, which he had found in the liver of a mouſe.

Mr. ASTON was deſired to inquire in his anſwer to Mr. LEEWENHOECK, whether the latter had obſerved any worms in the putrefaction of boils or the ſmall pox.

A letter of Monſ. JUSTEL to Mr. ASTON[w], containing ſome deſcription of Sir SAMUEL MORLAND's engine for carrying water to Verſailles; that it conſiſted of fourteen wheels, twenty pipes to carry water up to the top of the tower, and fourteen deſcending to carry it to Verſailles, which had each eight inches diameter.

With this letter came a book preſented to the Society by the author, Monſ.

[u] It is printed in the Philoſ. Tranſact. N°. 159. vol. ix. p. 568. for May 1684.

[w] Letter-book, vol. ix. p. 27.

HAUTEFEUILLE, about the improvement of perſpective glaſſes, and the beſt ways of finding the focus of long objectives; concerning which book the Society's opinion was deſired by the author.

Mr. HOOKE having juſt caſt his eye upon it did not ſeem to find any thing new, which might be of very great concern; but the book being longer than he could read at preſent, it was referred to be peruſed by ſome of the members.

Dr. HOLDER mentioned, that an earthquake having lately happened in ſeveral parts of England, it would be proper, that the Society ſhould procure ſuch accounts thereof, as they might rely upon hereafter in the forming of a theory.

Mr. AUBREY ſhewed a part of a letter from Rutland concerning the earthquake in that county; but it was not circumſtantial, either in the day, time of the day, or duration.

Dr. GALE promiſed to bring a letter, which he had received from Derby, concerning the earthquake.

It was deſired, that ſuch members, as could procure accounts, would communicate them; and that Dr. PLOT be written to about it.

From ſeveral members of the Society and others, meeting at Oxford for making experiments, was communicated an obſervation of the weight of the earth of the Nile about the time of the overflowing of that river, but eſpecially a relenting of a piece of nitroon or nitre, brought from Ægypt, which continually wet the papers, on which it lay, both in rains and dry weather, from the middle of June till about the end of September.

There was alſo an intimation of fiſh having lived in a ciſtern upon rain-water only for half a year, till upon the freezing of the water they died by breaking of the ice.

There was alſo mention made of a probable way of tinging white marble black, but it was not diſcovered.

An experiment was propoſed of tying the Fallopian tubes of a bitch preſently after her being limed.

Mr. MELLIN, the maker of the curious microſcopes, preſented to the Society BARTHOLOMÆUS *de proprietatibus*.

GUARINI's book, *Delle miſure delle incommenſurabile*, was preſented by Dr. AGLIONBY.

Mr. HOOKE was deſired to bring in ſuch experiments as he ſhould have ready at the next meeting.

Octob.

Octob. 31. Sir JOHN HOSKYNS preſident in the chair.

Mr. LEEWENHOECK's laſt obſervations having not yet been tried, Dr. AGLIONBY, Dr. TYSON, and Dr. SLARE were deſired to undertake the trial, and report the ſucceſs.

The preſident queried upon the aſſertion, that there are no pores, how that would agree with MALPIGHI's diſcovery of glandules in the ſkin, whereby the ſweat is ſeparated.

Dr. GREW produced a draught of the apparent ſituation of the pores in the middle of the hand; whereupon he obſerved the magnitude of the pores and their poſition.

As to the magnitude, he ſaid, that the pores were biggeſt, where the hand was hardeſt and moſt callous.

In the poſition of the pores, he ſaid, that they were ranged to anſwer three ſorts of motion in the hand, one towards the right, another to the left, and the third motion in graſping.

He confirmed the truth of Mr. LEEWENHOECK's obſervations in his ſchemes of ſeveral ſorts of wood [x], which he had obſerved with a glaſs of his own, though Dr. GREW differed from him ſometimes in his deductions or the philoſophical part.

Upon mentioning worms being found in the air during a plague-time by father KIRCHER, Dr. AGLIONBY ſaid, that the late murrain in Germany preceded by a blue miſt, which might be ſome ſort of inſects.

It was queſtioned whether the engine deſcribed in Monſ. JUSTEL's letter were Sir SAMUEL MORLAND's: however it was wiſhed, that a draught of it might be procured.

Mention being again made of Monſ. HAUTEFEUILLE's book, Mr. HOOKE ſaid, that he had formerly contrived glaſſes of parallel pieces, but found them unſerviceable.

Dr. GALE ſhewed a letter from Mr. WILLIS at Derby concerning the laſt earthquake. It happened on the 6th of October two minutes before eleven at night. It was then calm, but in the day the wind had been ſtrong from the ſouth-weſt. From the ſame corner for two minutes was heard a roaring noiſe like thunder, before the ſhaking was felt. The earthquake was ſaid to be more violent towards the north-eaſt.

[x] Thoſe obſervations are printed in the Philoſ. Tranſact. N°. 148. p. 197. for June 1683.

Dr.

Dr. GALE ſaid, that he had been informed, that the ground had cleft in ſome places

Mr. HILL remarked, that the earthquake had been ſaid to ſhake a bed-ſtead with a man in bed above ſix inches out of the place.

Dr. AGLIONBY having read over the Italian book intitled *Relazione di retrovamento dell' uovo delle Chiocciole*, delivered in a good account of it in writing, which was read.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at New-college Oxford, Oct. 27, 1683 * was read, mentioning, that the company meeting the night before in the natural hiſtory ſchools there, Dr. PLOT made a diſcourſe concerning earths; which, when perfected, would make a table of all kinds of earths, ſuch as the Society had deſired of him at his being in London.

In this letter it was aſſerted, that hard tempered iron upon ſtriking yields a larger ſpark, and deeper in colour, than ſteel will; and that a magnet carried in a pocket attracted unequally at different times.

It was mentioned in this letter, that in the aſſembly it had been ordered to try the way of ſoftening and hardening iron; the alteration in the poles of a needle after cutting it in two; and whether bricks heated and afterwards grown cold, lying north and ſouth, will acquire a verticity.

It was deſired by ſome preſent, that if any of the Society had taken the trouble of defining and diſtinguiſhing the ſeveral ſorts of earth in England, they would produce their draught together with Dr. PLOT's.

Mr. LISTER promiſed to bring in a table of ſands and clays, ſuch as he had found in the north of England; as alſo ſome ſamples of the things themſelves.

He ſhewed the way, which he had made uſe of, for the keeping his account of the barometer, which was approved of as very eaſy and convenient. He ſhewed likewiſe the book containing three or four years account. Every table containing a month's account was printed off upon a copper-plate. The upper line contained the inches from twenty eight to thirty one incluſive, each inch divided by lines into ten parts. The lines by the ſides ſhewed the days of the month to thirty one. The account was kept by drawing a red line at the hight of the quick-ſilver ſuch a time of the day. The account for the whole month was but one red line bending as the quick-ſilver riſes or falls.

Mr. LISTER remarked, that by ſeeing the red line, he could generally tell what weather had been at any time, without reading the particular written by the ſide: That he had often predicted weather four days before it happened: That upon a great ſtorm, ſuch as he had obſerved three at ſeveral times, he found the

* Letter-book, vol. ix. p. 35.

top

top of the quickſilver flutter and break like yeaſt in a vat, ſticking in little atoms againſt the ſide of the glaſs: Which obſervation ſeemed new to all who were preſent.

Mr. HOOKE brought in an experiment, in order to meaſure the ſtrength of the wind [x].

Mr. CRISPE preſented to the Society ſome pieces of a white ſubſtance, incruſted by the dropping of water through the vault of *Roma ſubterranea*.

November 7, Sir JOHN HOSKYNS preſident in the chair.

Mr. AUBREY related, that the widow of Mr. THOMAS MERRY had ſeveral mathematical papers of her huſband's, which might be viewed by ſome of the Society, upon whoſe approbation the widow might be encouraged to print them. He inſtanced in a new method of demonſtrating EUCLID different from all yet printed.

There were preſented from Dr. PLOT, N° 48. a ſample of iron-ore from Walſall in Staffordſhire, working alone, in which the white liquor, called *Gur*, is often found by the miner. 49. A piece of *lapis aſbeſtus* from Cyprus, found ſometimes in the iſle of Angleſey. 50. A piece of ſtone from Molecup, ſuch as they make mill-ſtones of in Staffordſhire. 51. A piece of natural copper, found like a dye.

Mr. LISTER remarked, that the veins of copper at Keſwick in Cumberland lay above two yards thick.

The ſkin of a rangifer was preſented by Mr. RICHARD WALLER.

Part of a letter from Mr. TANCRED ROBINSON to Mr. LISTER, dated at Montpellier, Auguſt 4, 1683, concerning the fabric of the bridge Pont de St. Eſprit on the Rhine, &c [y]. was read.

Mr. ASTON brought in a propoſal of Mr. JOHN DAVIS of Nottinghamſhire, of ſeveral things performable by himſelf; as to make a machine to weave loop lace; an engine for the making of twiſt; a way to card wool with a wheel; a way to make a jack go longer than ordinary without winding up or pullies; a pattern of a machine for weaving, as in a ſilk ſtocking frame; ſome ways ſuppoſed by him new, of raiſing water, &c.

Mr. HOOKE conceived, that moſt of the things, which he propoſed, were already practiſed in London.

[x] There is no account of this experiment entered in the Regiſter-book.

[y] Letter-book. Vol. ix. p. 31. It is printed in the Philoſophical Tranſactions, Vol. xiv. N° 160. p. 584. for June 1684.

A letter from Mr. MUSGRAVE to Mr. ASTON, dated at New-college, Oxford, Novemb. 3. 1683 [z], was read, giving an account of the cutting in two a magnetic needle; of a loadſtone capt taking up moſt filings upon the edge of the iron; and of an opinion ſuggeſted by Dr. ALDRICH, that the ear muſt have two tympanums for the judging of harmony; ſince if harmony proceeds barely from vibrations concurring, three fourths would be the ſweeteſt notes.

Mr. HOOKE ſhewed the impreſſion of a medal taken off upon fiſh-glue or iſinglaſs; which he ſaid was done by diſſolving the glue in ſpirit of wine, and laying it upon the medal till it be dry [a].

Dr. LISTER gave an account of a way, that had been uſed in England of taking off the impreſſion of a medal, and contracting it at the ſame time by repeated laying on of mouth glue, and filling it with brimſtone.

November 14, Sir JOHN HOSKYNS, preſident in the chair.

The preſident having, according to the ſtatute, nominated five members, not of the council, to audit the treaſurer's accounts, they were ballotted for, and elected, being Dr. AGLIONBY, Dr. TYSON, Mr. RICHARD WALLER, Mr. HOOKE and Mr. LODWICK.

Mr. HOOKE was deſired to go with Mr. AUBREY to Mrs. MERRY, to examine the mathematical papers of her huſband.

Monſ JUSTEL preſented to the Society the new book of Monſ. DU VERNEY *De l'Oreille*.

Dr. PLOT ſent the following ſpecimens:

52. Lead ore from Craven, mixt with a ſpongy ſtone bluiſh. This, he ſaid, was found upon examination to contain a piece of ſilver no bigger than a ſmall pin's head in an ounce of the ore.
53. A ſea-cockle from Scanderoon, which is to be diſſolved and uſed in colouring.
54. Copper ore from Ecton Hill in Staffordſhire.
55. Madely copper-ore in Staffordſhire.

Dr. AGLIONBY ſhewed a heavy ſtone found among coals, which was judged to be pyrites.

The *Gur*, mentioned by Dr. PLOT, was ſuch, as Mr. LISTER formerly ſent a bottle of to the Society, and which is not mentioned in Dr. GREW's *Muſeum*.

[z] Letter-book, vol. ix. p. 37.
[a] His account of this method is entered in the Regiſter, Vol. vi. p. 81, 82, and printed in his Philoſophical Experiments and Obſervations, p. 111, 112.

Mr. LISTER mentioned two ſorts of *Gur*: this, which is of iron, and medicinal, upon burning it in a crucible, turns to a ruſty colour, and applies to a loadſtone, as good iron uſes to do. Another ſort is found in a lead-mine, and is of a different nature.

A remark was made of the earthquake on the 6th of October from Mr. FLAMSTEAD of Derby, that at Porto Yale, four miles above Wirtſworth, north by weſt, ſome miners being in a ſhaft ſeventy-two yards under ground, heard a noiſe like that of a great ſoughing wind, and preſently felt the rock and engines, and all things elſe about them, ſhake [b].

A letter from Mr. MUSGRAVE to Mr. ASTON, dated at New-college, Oxford, November 10, 1683 [c], was read, containing an account of Dr. PLOT's having tinged white marble a quarter of an inch deep: That a loadſtone was cut *ſecundum meridianum*, the north of one half drawing the north of the other: That Mr. PIGOT's experiment had been tried with ſucceſs, the upper end of the bar (which end ſoever it was) always drawing the north of the middle: That Dr. PLOT had ſhewn a branch of an Engliſh cork-tree with ſome of the leaves and acorns, growing at Abington in Cambridgeſhire; and had given an account of the ſeveral methods uſed by the ſmiths at Wolverhampton in Staffordſhire, for the hardening of their iron: That Dr. SMITH had undertaken to procure a new chart, by which it appeared, that Muſcovy and China are not ſo far diſtant from each other, as the maps commonly made them; which chart was made by a perſon, whom Dr. SMITH knew at Conſtantinople, and who had not long ſince travelled from Muſcovy to China.

Upon occaſion of mentioning the cork-tree, it was ſaid, that there was one at Mr. EVELYN's, at Mr. BALLE's, and perhaps other places.

A paper of Dr. GREW was read concerning the pores, [d] chiefly in the hands and feet, in purſuance of what he had ſaid at the laſt meeting. He firſt took notice of the viſibleneſs of the pores, which was ſhewn in a new ſcheme of part of the hand very much magnified; their ſituation upon the ridges, not within the parallel furrows; their convenience as to the motion of the adjoining parts; their extraordinary largeneſs in ſome places; and their neceſſary uſe for the health of the body.

Mr. HOOKE ſhewed an inſtrument to meaſure the velocity of the air or wind, as follows [e]:

" I ſhewed *an inſtrument to meaſure the velocity of the air or wind, and ſhewed to* " *find the ſtrength thereof*, which was by four vanes put upon an axis, and made very " light and eaſy for motion; and the vanes ſo contrived, as that they could be " ſet to what ſlope ſhould be deſired.

[b] This account is inſerted in the Letter-book, Vol. ix. p. 40.

[c] Letter-book, Vol. ix. p. 39.

[d] It is printed in the Philoſophical Tranſactions, Vol. xiv. N° 159. p. 566. for May 1684.

[e] Regiſter, vol. vi. p. 83.

" It was ſeveral times tried and examined in the long gallery of Greſham-col-
" lege, whereby it appeared, that by walking from one end thereof to the other,
" and carrying the ſame above one's head, the doors and windows of the ſaid gal-
" lery being ſhut, and ſo the air within it being not in motion but ſtagnant, the
" inſtrument made ſo many turns, as there were circumferential lengths of the ſaid
" vanes in the length of the gallery: and if by trial it were found to be more or
" leſs than the due meaſure of thoſe circumferential lengths, then by ſetting the
" ſaid vanes either flatter or ſharper, in reſpect of the way of its motion through
" and againſt the air, the ſame was eaſy to be adjuſted.

" The uſe of which may be of very great conſequence in the buſineſs of ſailing
" and ſteering a ſhip upon the ſea, and for examining the power and ſtrength of
" the wind upon land in order to the theory of ſhipping, for which it was
" deſigned."

Mr. HOOKE ſhewed a convenient way of copying any thing, &c. by making a thin plate of fiſh glue diſſolved in ſpirit of wine, and well clarified; then poured upon a glaſs plate as thin as paper, lying there till it be dry; at which time the lines of the object may be drawn upon it as they appear under [f].

November 21, at a meeting of the COUNCIL in Mr. HOOKE's lodgings were preſent

Sir JOHN HOSKYNS preſident

Dr. HOLDER	Mr. PERRY
Mr. HENSHAW	Mr. MEREDITH.
Mr. HILL	

The minutes of this council were taken by the preſident in the abſence of both the ſecretaries [g].

The auditors of the treaſurer's accounts appointed on the part of the council were the Preſident, Mr. ASTON, Mr. COLWALL, Mr. PERRY, and Mr. MEREDITH.

The gratuity due to Dr. SLARE and Dr. TYSON could not be aſcertained for want of the books, wherein were contained the orders relating to that matter.

It was reſolved, that Dr. GREW, Dr. GALE, Mr. ASTON, Dr. PLOT, and Dr. AGLIONBY be excuſed from payments due from them to the Society laſt Michaelmas.

At a meeting of the SOCIETY on the ſame day, Mr. ASTON being indiſpoſed, no minutes were taken; but Mr. HOOKE brought in a paper of curioſities brought by Captain ROBERT KNOX from Tunquin, upon the main of China, and preſented by him to the Society for their repoſitory, viz.

[f] Regiſter, Vol. vi. p. 82. and Dr. HOOKE's Philoſophical Experiments, p. 112.

[g] Mr. ASTON was indiſpoſed, and Dr. PLOT at Oxford.

1. A Tunquin plow and yoke, both varniſhed with the true lacker varniſh, which grows in Tunquin, and is thence tranſported to Japan for making thoſe curious cabinets, ſcreens, boxes, &c. which are thence brought into Europe. This plow is ſo light and eaſy to be made and uſed, that the Captain judged it might be of very good uſe here in England. The ſhare is caſt of iron very curiouſly.

2. Two Tunquin pictures, the firſt repreſenting the mandarins barge and progreſs therein upon the water; the ſecond their progreſs at land with their guard and retinue.

3. A true dolphin's ſkin, caught by the Captain in his homeward bound voyage, and ſtuffed, being very different from the porpeſs, which is commonly here called and eſteemed to be the dolphin.

4. A paper of the lime commonly uſed in the Indies to ſpread upon the Betele leaf. It was extremely fine and white, and had nothing of the ſulphureous burning taſte, which our Engliſh lime generally retains.

5. The Betele nut, being ſomewhat like a nutmeg for ſubſtance. If cut, it appeared veined, and ſolid like a nutmeg, and had a thin ſhell, that incloſed it, and without that a ſtringy pod ſomewhat like mace; but more like the outward tegument of the cocoa nut.

6. A paper of the dry leaves of Betele, which are gathered from a climbing plant growing up againſt the bodies of other trees like our ivy, but yet of a very different ſpecies.

Theſe three laſt are the ingredients, that compoſe that maſticatory, which is ſo generally uſed in all India. Their manner of preparing it is thus: They ſlice the nut into very thin ſlices, as we commonly do nutmegs here; then taking a green Betele leaf, which they gather freſh every morning, they ſpread upon it ſo much of the aforeſaid lime tempered with water, to the conſiſtence of batter for fritters, as almoſt to cover one ſide of it: then laying a little of the ſaid ſliced nut upon the lime, they fold up the leaf, and ſo put it into their mouth to chew.

7. The root of the tea-tree, which the Captain deſigning to bring home growing had planted, and kept growing in a pot of earth aboard the ſhip, but which by the way was gnawed and ſo killed by the rats. It is in taſte very bitter.

8. The tea-ſeed, being a kind of corn as big as a hazel-nut; which it was hoped might grow in England, it growing in that part of China, where there is both froſt and ſnow.

9. A ſtick of the wood, with which they make their gun-powder in Tunquin.

10. A ſmall pipe of Tunquin marble, broken off from the ſteps of one of their temples.

11. A branch of the tea-tree, the tree and leaf being as big as an ordinary bay-tree.

12. The leaves or blades of the Indian gallingale.

13. A ſprig with leaf of the bogaw-tree, worſhipped by the Chingaleſe, but not regarded in Tunquin.

14. Some ſprigs of a ſhrub called Ki-to-hepe, much eſteemed for its medicinal virtues.

15. A plant called Ki-luke. It is eaten raw with raw fiſh as a ſalade.

16. A plant called Ki-may. Bruiſed with ſalt, and applied to the legs, it alleviates pains in them from ſtrains or wearineſs with walking.

17. A ſprig of a ſhrub called Ki-vong, of ſtrange virtue; for being put into water it driveth the crabs from it; and being put to the mouth of the holes, where they have burrowed themſelves, they immediately run out, or are killed in their holes. And it is for that end uſed by the natives to catch them.

18. The Betele leaf, very well preſerved in a book, ſo that the true ſhape may be ſeen.

19. The ſprigs of a tree called Ki-coy. This is the plant, with which they dye their cloth black in this manner: They boil the leaves in water, and then dip their cloth in it: then dipping their cloth in mud, as at Ceylon, it turns of a perfect black.

20. A ſprig of the kitule-tree; the virtues of which tree are deſcribed in the *Hiſtory of Ceylon.*

21. The leaves of the *deutro* or *dotra*, called by the Chingaleſe, attuna atta, but by the Tunquineſe ki-karrock. It is of a ſtrange intoxicating nature. See LINSCHOTEN.

22. The ſeed of the Tunquin oranges, the beſt in the world.

23. The ſeed of a certain bean or peaſe that grows in Java, and is there eaten commonly as peaſe or beans are here.

24. The ſeeds of water-melons, which grow in the iſland of St. Jago. One of the melons was from thence carried to Tunquin very fair and freſh; and being there eaten, the ſeeds taken out of the melon grew and throve very well, though they had none of them in that country; and ſo, it was hoped, they might do in England.

25. The Lichen plumbs, accounted the beſt plumbs of China.

26. The plumbs called in the Chingaleſe Murtas, growing alſo plentifully in Tunquin. It is both pleaſant and wholeſome to eat.

27. The ſeed, with which they make oil, not much different from our linſeed oil, being uſed for painting; as alſo for burning in lamps, and of great uſe for anointing for any pains of the body. In the Chingaleſe language it is called Endra-atta; in Tunquin, Hot-to-doo.

28. The ſeeds of a plant, called in the Tunquin language Hot-com-gon; in the Chingaleſe language Kermda-etta.

29. The ſeeds of the Deutro, uſed in the Indies for intoxicating. See SPRAT's *Hiſtory of the Royal Society.*

November 24, at a meeting of the COUNCIL at Mr. HOOKE's lodgings were preſent,

Sir JOHN HOSKYNS preſident

Mr. HENSHAW	Mr. MEREDITH.
Mr. HILL.	Mr. PERRY.

The minutes of the laſt council were read[b].

It was ordered, that Mr. ASTON be deſired to take care, that the papers needful be brought to the Society on the Wedneſday following, and on St. Andrew's day; and Mr. HUNT was ordered to ſpeak with him for that purpoſe: That Mr.

[b] The minutes of the following council were taken by the preſident.

PAGET

PAGET be excuſed from payment due at Michaelmas; and that Mr. HILL acquaint him, that ſomething of his work was expected: And,

That a preſent be made from the Society to Mr. KNOX; and that it be of about 50 *s.* or 3 *l.* value.

It was reſolved, that it is the opinion of the council, that Mr. HOOKE ſhould be owned and aſſiſted by the Society as far as lawfully they may, and is warrantable by the orders and journals of the Society.

It was ordered that Mr. HOOKE have 15 *l.* upon account, as part of what he is to have, when he brings in the account of the experiments made this year: And

That inquiry be made for ſuch a clerk for the Society, as may perform the laborious part of the ſecretaries office.

November 27, at a meeting of the COUNCIL were preſent,

Sir JOHN HOSKYNS preſident

Sir ANTHONY DEANE	Dr. SLARE
Dr. HOLDER	Mr. PERRY
Mr. EVELYN	Mr. MEREDITH
Dr. GREW	Mr. CREED.

The minutes of the laſt council were read.

Dr. VINCENT and Mr. BAILEY were propounded, in order to their being elected fellows, and approved.

Reſolved, that Mr. WALLER's tranſlation of the Florentine experiments be licenſed: And

That Mr. CRAMER be clerk to the Society in WICKS's place, and be ſubject to the directions of the ſecretaries in the ſervice of the Society, and have about 30 *l. per ann.* or as can be agreed: and that Mr. WICKS be told, that his attendance is of no farther uſe:

That the ledger and journal books of the Society be brought in a box every meeting, as by former orders, and be ſhut up when the preſident is in the chair: And

That a liſt of all the papers and books in the ſecretaries cuſtody be kept in the treaſurer's cheſt, and be called over before two of the council at the beginning of the ſecretaries entering upon their office after election.

Mr. HOOKE acquainted the council, that he intended to write an hiſtorical account of the experiments, which he had ſhewed before the Society, together with a de-

a declaration of the uſe and conſectaries of each, and an idea of natural philoſophy built upon them: and he deſired, that the experiments not heretofore clearly made, and which were imperfectly entered, might be repeated at the Society's charge: which was ordered accordingly, with this addition, that at the meeting before any ſuch experiment made, he ſhould give the Society notice, that ſuch as pleaſed might be preſent.

November 28, at a meeting of the SOCIETY, Sir JOHN HOSKYNS preſident in the chair.

Dr. NATHANAEL VINCENT and Mr. EDWARD BAILEY were propoſed to the Society as candidates by the preſident.

A letter of Dr. WALLIS to Dr. PLOT, dated at Oxford November 16, 1683, [i] was read, concerning an antient mantle-tree in Northamptonſhire, on which the date of it (for the year of our LORD 1133) is expreſſed by numeral figures; which ſhews the great antiquity of thoſe figures in England.

A letter from GRIFFITH HATLEY, M. D. to Dr. GREW, dated at Maidſtone in Kent, November 12, 1683 [k], was read, concerning a bed of ſhells found about ſix feet under ground at Hunton in Kent about five miles from Maidſtone, and a mile from the river Medway. Theſe ſhells were ſuppoſed by Dr. HATLEY to be *lapides ſui generis*, and not ſhells petrified.

Two letters from Mr. MUSGRAVE to Mr. ASTON were read, one dated at New-college, Oxford, November 17, 1683 [l], the other November 26 [m]; both mentioning ſome experiments there tried, viz.

That filing takes off the polarity of iron:
That a knife touched with a magnet after whetting attracts more than before:
That a rough magnet ſtruck with a hammer ſeems to emit briſtles, which are the *ramenta* of the ſtone: And,
That the needle turns juſt at the center of gravity.

There was alſo an account of ſeveral electrical bodies; of metallic earths; and other earths of promiſcuous uſe.

Mr. HOOKE delivered in a box for the repoſitory the curioſities given by Captain KNOX, which had been ſhewn at the laſt meeting.

Mr. HOOKE ſhewed an inſtrument, which was one part of a way-wiſer; his account of which was as follows [n].

[i] Letter-book, Vol. ix. p. 46. It is printed in the Philoſoph. Tranſ N° 154. p. 399. for December 1683.
[k] Letter-book, Vol. ix. p. 42. It is printed in the Philoſoph. Tranſact. N° 155. p. 463.
[l] Letter-book, Vol. ix. p. 52.
[m] Ibid. p. 54.
[n] Regiſter, Vol. vi. p. 84.

"I

" I ſhewed an inſtrument I had contrived, and ſhewed ſome of the Society " about twenty years ſince, by which the way of a ſhip through the ſea might be " exactly meaſured, as alſo the velocity of any running water or river, and thereby " the comparative velocity of it in its ſeveral parts. By this alſo the quantity of " the water vented by any river into the ſea, or any other river, might be found. " It was one part of a way-wiſer for the ſea; the whole engine being deſigned to " keep a true account, not only of the length of the run of the ſhip through the " water, but the true rumb or leeward way, together with all the jackings and " workings of the ſhip. This part of the engine now ſhewn was the vane, fly, " or firſt mover of the whole, feeling as it were, and diſtinguiſhing the ſeveral " qualifications of the ſhip's courſe; but was to be regulated by ſeveral other " additions in the compleated engine, which I deſign ſhortly to get executed."

A letter of Mr. HEVELIUS to Mr. ASTON, dated at Dantzick 30 September 1683 [o], was read, giving an account of the laſt comet ſeen at Dantzick from July 30, to September 4, 1683 [p], and preſcribing ſome conditions for a bookſeller, who would undertake to print his *Uranographia* and globes.

November 30, the day of the anniverſary election of the council and officers for the year enſuing:

Dr. NATHANAEL VINCENT and Mr. EDWARD BAILEY were elected fellows.

Mr. BOYLE ſent a depoſitum of an *arcanum* to remain ſealed in the cuſtody of the ſecretary.
He likewiſe preſented a piece of native cinnabar.

The ſecretary having read the ſtatutes for election of officers, the preſident drew the two ſcrutators by lot, who were JOHN HERBERT, Eſq; and Mr. EDWARD PIGOT.

The Society then elected out of the old council the following eleven perſons, who ſhould remain ſtill of the council for another year, viz.

Sir JOHN HOSKYNS	Mr. HILL
Sir JOSEPH WILLIAMSON	Mr. MEREDITH
Sir CYRIL WYCHE	Dr. GREW
Sir CHRISTOPHER WREN	Dr. PLOT
Mr. HENSHAW	Mr. ASTON.
Mr. COLWALL.	

There were then ten others elected out of the Society into the council, viz.

GEORGE Earl of Berkley	Dr. GALE
Sir ROBERT REDDING	Dr. TYSON
Dr. AGLIONBY	Mr. LISTER
Dr. BROWN	Mr. FLAMSTEAD
Dr. CROUNE	Mr. HALLEY.

[o] Letter-book, vol. ix. p. 57. [p] It is printed in the Philoſoph. Tranſact. N° 154. p. 416.

The

The Society then proceeded to elect the preſident and other officers, and accordingly choſe Sir CYRIL WYCHE preſident by thirty voices out of forty-three; Mr. HILL treaſurer, and Dr. PLOT and Mr. ASTON ſecretaries, as the laſt year.

Then the oath of office was adminiſtered to the new preſident, and the ten perſons newly choſen into the council by the following perſons, Sir JOHN HOSKYNS, Sir CHRISTOPHER WREN, Mr. HENSHAW, Mr. MEREDITH, Mr. HILL, Mr. PERRY, Dr. PLOT, Mr. ASTON, &c.

Not long before this anniverſary election the Society loſt by death, an eminent member,

Mr. JOHN COLLINS, born at Wood-Eaton near Oxford, on Saturday March 5, 162$\frac{4}{5}$, and ſon of a non-conformiſt divine, who, though not ſuffered to preach in church, was permitted to do ſo in priſons to malefactors, which with correcting the preſs afforded him a ſubſiſtence. At ſixteen years of age Mr. COLLINS was put apprentice to Mr. THOMAS ALLAM, a bookſeller without the Turl-gate of Oxford; but the war between the king and parliament breaking out ſoon after, he left that trade, and was employed in clerkſhip under, and received ſome mathematical knowledge, from Mr. JOHN MARR, one of the clerks of the kitchin to the Prince of Wales, eminent for his ſkill in mathematics, and for thoſe excellent dials, with which the gardens of King CHARLES I. were adorned. But the inteſtine troubles and confuſions increaſing, Mr. COLLINS loſt that employment, and went to ſea ſeven years, moſt part of which was in an Engliſh merchant-man, that became a man of war in the Venetian ſervice againſt the Turks; in which having leiſure, he applied part of his ſtudy to the mathematics and merchants accounts; and upon his return to England taught them together with writing[a]; and in 1652 publiſhed *An Introduction to Merchants Accounts*, which had been drawn up for the uſe of his ſcholars. It was reprinted in 1665, but the greateſt part of the impreſſion was conſumed in the fire of London the year following. A new edition was publiſhed in 1674, in fol. with the addition of two more accounts. His *Sector or a Quadrant; or a Treatiſe containing the Deſcription and Uſe of four ſeveral Quadrants, &c.* was printed at London 1658, in 4to, as his *Mariner's plain Scale new plained*, and his *Treatiſe of geometrical Dialling*, were the year following. In 1664 he publiſhed at London in a quarter of a ſheet, *The Doctrine of Decimal Arithmetic, Simple Intereſt, &c. as alſo of Compound Intereſt and Annuities, generally performed for any Time of Payment.* After the reſtoration he was appointed accountant to the exciſe-office, then kept in Bartholomew-Lane near the Royal Exchange. October 10, 1667, he was propoſed candidate for election into the Royal Society by Dr. SETH WARD, Biſhop of Saliſbury, and on the 17th of that month was choſen a member of it, ſeveral of his pieces being printed in the *Philoſophical Tranſactions*.

In March 1668, he had an offer of an employment in Ireland, but had no great inclination to leave his own country[b].

[a] WOOD, Faſti Oxon. vol. ii. p. 117.

[b] Copy of a letter of his, dated March 11, 1668, among Dr. PELL's papers.

He was nominated by the Earl of Shaftesbury, while Lord High Chancellor, in divers references concerning suits depending in Chancery about intricate accounts, to assist in the stating thereof; which he performed with such success, that his reputation in that respect occasioned him to be much employed in other places and by other persons.

Upon the loss of his place in the Excise-office, and of that under the commissioners of accounts, he was recommended by Sir PHILIP WARWICK in a letter[c] dated May 1670, to Sir JOHN TREVOR, one of the principal Secretaries of state, as long known to, and respected by him for his great and useful parts, and greater modesty; and that, besides his knowledge of mathematics and accounts, he was a great master of trade: "I conceive, *added Sir* PHILIP, he takes "better measures of it, and knows the hinges it turns on better than any discourses "I have met with, and can rectify the methods of several accounts relating to "the navy and such affairs, if he be leisurely dealt with, for he neither makes "noise nor shew. I find (for he is neither covetous nor greedy) he could "reckon 200 *l. per ann.* for a reasonable subsistence: which if his Majesty and "my Lords Commissioners think fit to buy him at, sure he may be set on work "immediately upon such subjects, as he will soon earn his wages, though it be "an extraordinary allowance; and the next commissioners of appeals place, "which falls in the Excise (which is now rather a bounty than a salary) may take "off that extraordinary charge." Sir PHILIP WARWICK wrote another letter in his favour, August 6, 1677, to Mr. BRENT, inclosing a paper recommending Mr. COLLINS to the Lord Treasurer, the Earl of DANBY; in which letter he stiled him *A man of good arts, and yet great simplicity; able, but no ways forward*; and observed, that he had deserved, when he was in employment, the small pension assigned him, when he quitted that employment. Sir PHILIP wrote a third letter of recommendation, October 31, 1678, to CHARLES BERTIE, Esq; secretary to the Lord Treasurer, mentioning, that in the small office, which Mr. COLLINS had in the Excise while the Earl of Southampton was Treasurer, he was very trusty to his charge, and very careful in the true stating of the accounts at Brooke-house; and that he could have very ample testimonies of his services in attending the commissioners, and more lately in his office of accountant to the Royal Fishery company. "But as a man, *continues Sir* PHILIP, that hath attended more "his business than himself, he fell short of receiving those salaries, which were promised him: but I contract myself and my suit to you, and pray you to represent "it, if it would do any good, in my name to my Lord Treasurer, that he having, "upon dissolving the then commission for Excise, but a poor pension of fifty "pounds *per ann.* settled on him by privy seal, and of which he is now five or six "years in arrear, you would be instrumental to get him such a portion, as might "be comfortable to him, and whereof, I assure you, he stands in great need for "his family as well as for himself, his present subsistence being only sometimes "taking some intricate accounts of merchants, which are litigant, and others, who "call him thereunto upon such occasions. I extend my request somewhat farther, "that if my Lord Treasurer have need of such a man's service, as he may probably upon the balance of trade or of a steady account of another nature, you

[c] Copies of this and two following letters are extant among Dr. PELL's papers.

" would remember him, and gain him ſome employment; for thus he will re-
" commend himſelf."

Mr. COLLINS publiſhed at London in 1680 in 4to, *A Plea for bringing in of Iriſh Cattle, and keeping out of Fiſh caught by Foreigners.* His next piece was, *An Addreſs to the Members of Parliament of the Counties of Cornwall and Devon about the Advancement of Tin, Fiſhery, and other Manufactures.* His book intitled *Salt and Fiſhery* was printed at London 1682 in 4to: but his *Arithmetic in whole Numbers and Fractions, both vulgar and decimal, with Tables for the Forbearance and Rebate of Money, &c.* did not appear till ſome years after his death, being publiſhed at London in 1688, in 12mo, by Mr. THOMAS PLANT, accountant.

After the act at Oxford, July 10, 1682, riding from thence to Malmeſbury in Wiltſhire, in order to view the ground to be cut for a river between the Iſis and Avon, and drinking cider while he was hot, he contracted an aſthma and conſumption, which at length put an end to his life at his lodging on Garlick-hill in London, on Saturday November 10, 1683, his body being interred, on the Tueſday following, in the pariſh church of St. James Garlick-hill, in the ſouth iſle juſt behind the pulpit [d].

About five and twenty years after his death, all his papers and moſt of his books came into the hands of Mr. WILLIAM JONES, F. R. S. amongſt which were found manuſcripts upon mathematical ſubjects of Mr. BRIGGS, Mr. OUGHTRED, Dr. PELL, Dr. SCARBURGH, Dr. BARROW, and Mr. ISAAC NEWTON, with a multitude of letters received from, and copies of letters ſent to, many learned perſons, particularly Dr. PELL, Dr. WALLIS, Dr. BARROW, Mr. NEWTON, Mr. JAMES GREGORY, Mr. FLAMSTEAD, Mr. THOMAS BAKER, Mr. BRANCKER, Dr. EDWARD BERNARD, Monſ. SLUSIUS, Monſ. LEIBNITZ, Monſ. TSCHIRNAUS, Father BERTET, and others.

From theſe papers it appeared, that Mr. COLLINS was ſo ſollicitous in his ſearch after uſeful truths, ſo indefatigably induſtrious in proſecuting theſe inquiries, and of ſo communicative a diſpoſition, that he held a conſtant correſpondence for many years with all the eminent mathematicians of his time, and ſpared neither pains nor coſt to procure what was requiſite to promote real ſcience; ſo that the world was obliged to him for the greateſt part of the late diſcoveries in all uſeful learning [e]. It was from his papers chiefly, that the great NEWTON's claim to the invention of fluxions was eſtabliſhed, as may be ſeen in the *Commercium Epiſtolicum* D. JOHANNI COLLINS *& aliorum de Analyſi promotâ, juſſu Regiæ Societatis lucem editum*, London 1712, in 4to.

Another of the Society's Members, who appears to have died in the year 1683, was

[d] WOOD, ubi ſupra, col. 117.

[e] See farther concerning his character and merits of him the article in the GENERAL DICTIONARY HIST. AND CRITICAL, Vol. IV. p. 406, 407, and the notes B and C.

JOHN BEAL, D. D. who was deſcended of a good family in Herefordſhire, where he was born [f], being nephew of Sir WILLIAM PYE, attorney of the Court of Wards [g]. He was born about the year 1603 [h], and educated at firſt at Worceſter ſchool [i], and thence removed to Eaton college [k]; from which he was tranſplanted to King's-college in Cambridge, where he read philoſophy to the ſtudents for two years [l]. At his entrance into that univerſity, he found the writings of the Ramiſts in high eſteem, from which they ſunk within three or four years after, without the ſollicitation of any party or faction, or other concernment, merely by the prevalence of ſolid truth and reaſonable diſcourſes. And the ſame fate ſoon after befel Calviniſm in both univerſities, though defended by the public profeſſors, COLLINS and PRIDEAUX, by ſwarms of writers and diſputants, the noiſe of pulpits, all pretences of zeal, and the juncture of many foreign and national correſpondencies [m]. Mr. BEAL ſpent ſome time in his travels abroad, being at Orleans in France in 1636, when he was thirty three years of age [n]. His love of learning and zeal for the promotion of all the moſt uſeful parts of it engaged him in a correſpondence with Mr. SAMUEL HARTLIB, and afterwards with Mr. BOYLE, many of his letters to the latter being publiſhed in the fifth volume of the works of that great man.

His zeal for the plantation of orchards for the making of cider was hereditary, his great grandfather and father being eminent for the ſame [p]. In conſequence of this he wrote two letters addreſſed to Mr. HARTLIB, which were printed by ROGER DANIEL the printer, in 1656, with the title of *Herefordſhire Orchards a Pattern for England*; within a few years after which, that county gained ſome hundred thouſand pounds ſtirling by the fame of their orchards [q]. He reſided chiefly at Hereford till the year 1660, when [r] he became rector of Yeovil in Somerſetſhire, where he reſided till his death.

He was an early member of the Royal Society, being declared an honorary one, January 7, 166$\frac{2}{3}$, and elected a fellow of it on the 21ſt of the ſame month. He was promoted to be chaplain to King CHARLES in 1665 [s], and was likewiſe doctor of divinity. Several of his papers are printed in the *Philoſophical Tranſactions*. He was a man of excellent parts, extenſive learning, and great public ſpirit; and the character, which his friend Mr. HARTLIB, gave of him in a letter to Mr. BOYLE [t], was, that there was not the like man in this iſland or continent, who could be made more univerſally uſeful.

Decemb. 5. Sir CYRIL WYCHE preſident in the chair.

Dr. VINCENT was admitted fellow.

[f] BOYLE's works, vol. v. p. 440.
[g] Ibid. p. 429.
[h] In a letter of his to Mr. BOYLE, dated July 1, 1682, p. 508, he mentions his being then entering into his eightieth year.
[i] P. 459.
[k] P. 426.
[l] Ibid.
[m] P. 483.
[n] P. 441, 464.
[p] Mr. BEAL's letter to Mr. EVELYN, Decemb. 12, 1662: Supplement to the letter-books, vol. i. p. 158.
[q] Ibid. p. 476.
[r] Ibid. p. 468.
[s] Life of Mr. BOYLE, p. 115, edit. 1744, 8vo.
[t] Of April 27, 1658. BOYLE's work, vol. v. p. 275.

Upon mentioning Dr. HATLEY's letter, read at the meeting of November 28, it was desired, that some of the turbinated and bivalvous shells might be sent up and considered of.

Some magnetical experiments being mentioned as made at Oxford, it was required, that the three following should be tried at the next meeting.

1. To strike a load-stone with a hammer, and to see the *rameuta* hang upon the stone.
2. To file a touched iron, to try whether the polarity be lost.
3. To see whether a needle begins to turn just at the center of gravity.

Mr. HALLEY queried, in a ship's passing the line towards the Indies about what place the southol became strongest? The inquiry was recommended to be made by Mr. BAILEY.

Upon Mr. HEVELIUS's letter concerning the printing his *Uranographia*, &c. it was ordered, that Dr GALE or the secretary should speak to Mr. CHISWELL, to know whether he would undertake the doing it on the conditions offered.

Upon mentioning Dr. WALLIS's account of the numeral figures, Dr. GALE remarked, that these figures had been used in France above 100 years sooner, in about 1005, having been introduced by GERBERTUS.

A letter of Mr. MUSGRAVE to Dr. TYSON, dated at New-college, Oxford, December 1, 1683[u], was read, containing some observations made by a friend of his on the lumbricus latus; that in the middle of the joint on one side was a foramen, and from that place downwards a body like an ant, seeming to be inclosed in the skin, &c. Dr. TYSON was desired to procure, if he could, some of the worm, and report how he finds it agree with this account.

Mr. HOOKE brought in a model of a balance for finding any desired part of a weight given. The beam was suspended, and poised in a part, from which one arm was ten times as long as the other. The scales also were one to the other as ten to one[x].

Decemb. 12, at a meeting of the COUNCIL were present

Sir CYRIL WYCH president

Sir JOHN HOSKYNS	Mr. HILL
Sir ROBERT REDDING	Mr. MEREDITH
Dr. BROWN	Dr. PLOT
Dr. TYSON	Mr. FLAMSTEAD
Dr. GREW	Mr. ASTON.
Dr. LISTER.	

[u] Letter-book, vol. ix. p. 50.
[x] It is entered in the Register, vol. vi. p. 85. and printed in his *Philos. Experiments*, &c. p. 113.

The council debating the legality of holding a council without a ſecretary cauſed the minutes of the three preceding councils to be read over, and made the following alterations:

Whereas November 27th one CRAMER was choſen clerk in Mr. WICKS's place, that election was declared void; becauſe, according to the charter, the clerk ought to be choſen by the whole Society, in the ſame manner as the treaſurer and ſecretaries.

It was ordered, that the preſident, Sir JOHN HOSKYNS, Mr. COLWALL, Mr. MEREDITH, and Mr. ASTON, do meet as a committee for the ſpeedy auditing the treaſurer's accounts.

Mr. HOOKE being ſent for in, and required to deliver to the ſecretaries the written account of the experiments made by him as curator during the laſt half year, he promiſed to deliver the ſaid account to Mr. ASTON by Chriſtmaſs-day.

The council recommended to Mr. HOOKE the retrieving and delivering to be entered ſuch other experiments, as had been made by him as curator during the laſt ſeven years.

Mr. HOOKE was deſired, when he ſhould make any experiment at the Society's charge, to acquaint them with it the week before, and to have their conſents; ſome perſons, if it ſhould be thought neceſſary, being appointed to be preſent at the making of the experiment.

At a meeting of the SOCIETY on the ſame day, Sir CYRIL WYCHE preſident in the chair.

A letter was read from Dr. HATLEY to Mr. ASTON, dated at Maidſtone Decemb. 10, 1683[1]; promiſing to ſend ſome of the figured ſtones found at Hunton in Kent.

In the mean time Dr. GREW having had ſome of them formerly ſent him, offered them to the Society. The turbinites was declared by Dr. LISTER to be a ſtone undeſcribed either by himſelf or Dr. PLOT. The bivalve was ſo imperfect, as not to ſuffer a judgment to be made of it. The inner part of the ſtones ſeemed to partake of the nature of the marl, where they were found, as being diſſolvable in water. The outward part of the ſtone being more hard, was judged by Dr. LISTER to be a ſelenites; but Mr. HOOKE took it to be a ſhell.

To this Dr. LISTER anſwered, that there was no ſhell-fiſh known, that anſwered either this ſtone, or any one of the cochlites of England, whereof there are forty or fifty ſorts.

[1] Letter-book, vol. ix. p. 95.

Mr.

Mr. HOOKE mentioned a place, where ſhells falling upon a ſhore were petrified, ſome more ſome leſs, as they lay more or longer in the water.

Dr. LISTER did not deny the petrification of ſhells, but he denied any alteration, which might make them like the cochlites found in England. He appealed alſo to any trial to be made in petrifying water. He ſaid, that ſome petrifications left the ſhell quite intire, but incruſted with ſtone within and without, as one, which he ſhewed, belonging to the repoſitory. Other petrifications increaſe the weight of a ſhell; but it appears ſtill the ſame it was formerly, without any outward alteration.

Mr. HOOKE having mentioned ſeveral ſorts of petrified oiſters, Dr. LISTER ſeemed to allow but two ſorts of oiſters in Europe, with either of which the rock oiſter-ſhells had no ſimilitude, as having no ſtriæ on the outſide going from the valve to the rim.

Upon viewing a ſnail-ſhell incruſted with ſtone within and without, Dr. VINCENT ſaid, that there was a petrified ſkull in Sidney college in Cambridge, ſo that the ſkull might eaſily be ſcraped out from the ſtone. This had been brought out of Candia in the reign of King JAMES I.

Dr. PLOT ſhewed an experiment, how the *ramenta* ſtart out of the load-ſtone, when it is ſtruck with an hammer: and he affirmed, that ſuch *ramenta* do not appear, where a load-ſtone is ſtruck with a braſs peſtle: but this was not tried.

A piece of iron, that had been touched with a magnet, was filed; but there was yet ſome doubt, that the iron retained its polarity.

Mr. HOOKE propoſed the trial, whether grinding a loadſtone would deſtroy its polarity; though it were true, that filing would confound it.

It was alſo queried whether the touching of a needle penetrates it, and gives a virtue to the inner part of the iron.

Mr. HOOKE read a paper concerning the uſe and convenience of the beam or ſteelyard propoſed at the laſt meeting [z].

He alſo promiſed, that ſuch a beam ſhould be made, and ſhewed the Society at their next meeting.

Dr. GREW produced ſome cryſtals of talc found by Mr. STEPHENSON at Dedham in Eſſex. They lay in deep wells in a blackiſh loam. He obſerved, that the ſame are found upon the cliffs of Walton in the Naſe in the ſame ſort of earth. Half a buſhel of them may be got in a day. The water, where the talc is found, upon the firſt opening the ground, purges.

[z] This paper is entered in the regiſter, vol. vi. p. 88. and printed in his *Philoſ. Experiments*, p. 116.

He

He alſo produced a hard ſpar, that will cut glaſs cluſtered in little pieces like gum ammoniac, found in the ſame place. This he took to be a ſilver ore, but poor; and not worth the working.

Mr. HOOKE ſhewed a ſort of gliſtering ore, which, Dr. LISTER ſaid, was called *throſtle-breaſt*; and that it yielded its ſilver eaſily, but that the quantity was not great.

Mr. EVELYN remarked, that he had been lately informed of a ſilver mine in Norway, that was 600 fathoms deep.

Mr. HOOKE ſhewed a way to weigh gold, &c. and at the ſame time to examine the bulk. The body to be weighed in water was hung from an helical coil of wire. The weight was to be judged from a body placed within the wire, and divided conveniently. The trial hereof was not made, the apparatus being only contrived to ſhew the manner how the thing was to be done.

A treatiſe of Dr. SLARE on the [a] *calculus humanus* was read, wherein not only ſeveral received opinions concerning it were refuted, but the true nature of it was ſubſtantially examined by the help of chemiſtry and hydroſtatics.

The calculus was found to partake more of the nature of bone than of ſtone.

He ſhewed the *offa alba* of VAN HELMONT.

Dr. LISTER having formerly found the *caput mortuum* of the ſtone applied to the magnet, found, that ſome of it did ſo now, though it had not been above an hour in the fire. He therefore deſired, that the calcination of the *caput mortuum* might be longer continued, whereby it would yet become more magnetical.

It was objected, that moſt bodies would turn magnetical by the fire.

Dr. LISTER was of the opinion, that the pyrites only did ſo: and he obſerved, that he had ſeen two ſorts of *calculi urinæ*, one opake, and another tranſparent, which had been brought in by Dr. GREW, and was very like the ſhooting of the pyrites.

Dr. GREW remarked with regard to that part of the ſtone not being made by acids, that a rigor uſually preceded a fit; that the drinking of March beer often occaſioned a fit, which beer is allowed to have an acidity: and that things correcting acidity were good for the ſtone.

He took notice of the confirming an experiment tried by himſelf, that ſtones were wrought on by no acid, but nitrous.

[a] It is entered in the regiſter, vol. VI. p. 1. and printed in the *Philoſ. Tranſact.* N°. 157. p. 523.

Dr. SLARE.

Dr. SLARE ſaid, that he had weighed the ſtone brought from the D. of N. by Sir THEODORE DE VAUX, and found it to be four ounces and ſeven drachms.

December 19, Sir CYRIL WYCHE preſident in the chair.

Mr. BAILEY ſubſcribed the charter-book, and was admitted, promiſing to give bond at the next meeting.

The minutes of the preceding meeting were read.

Two letters from Oxford were read, the latter whereof contained ſome aſtronomical and geographical obſervations of Mr. JOHN GREAVES, tranſcribed from his own manuſcript, and ſent by Dr. THOMAS SMITH; which were ordered to be put into the hands of Mr. HALLEY to be conſidered, and an account of them to be given to the Society at the next meeting. They are as follow[b]:

" Declinatio acus magneticæ a meridiano Alexandriæ occidentem verſus, & " multis obſervationibus iiſque accuratis 5° 45′.

" Altitudo poli Alexandriæ 31° 10′, licet in iiſdem ephemeridibus alibi dicit " 31° 5′, alibi tantum 3′ minut.

" The ſun's meridian altitude taken at Galata by Conſtantinople 11th March, " 1637, O. S. 49° $\frac{31}{100}$. 49° 18′ 36″ Sun in Aries 1° 5′ Decl. Bor. 0° 26′ Al- " titudo poli Conſtantinopolis 41° 7$\frac{1}{2}$′.

" SNELLIUS ſuppoſes the alti- " tude of the æquinoctial at A- " lexandria to be 58° 58′, and ſo " the pole to be raiſed there but " 31° 2′.

At Rhodes Sept 11th, 1638. 53 : $\frac{53}{60}$: 53 : 53
At Alexandria 19th Dec. 1638, 35 : $\frac{201}{300}$.
35° 40′ 12″.

" The variation of the needle at Rome, March 17th N. S. $\frac{3}{4}$ of a degree eaſt.
" Of Leghorn March 14, O. S. 50′ to the eaſt.
" The obliquity of the Zodiack 1639, 23° 30′ 15″.

" The colours of the planets and of the ſtars in Ægypt not different at all " from what the antient aſtronomers obſerve, and from what we ſee in England.

" At the riſing and ſetting of the ſun in Ægypt, eſpecially about Alexandria, " there is great ſtore of vapours. At a good diſtance from the horizon the body " of the ſun grows ruddy, and appears bigger than is uſually ſeems to be in " England.

" Few nights, and thoſe without wind, that he could ſee the ſtars near the ho- " rizon. For which he alledgeth this reaſon, becauſe when the winds blow they

[b] Letter-book, Vol. ix. p. 81.

" raiſe

" raiſe a great quantity of ſand, which oftentimes makes the ſky to look as when " it is hazy weather in England.

" He could obſerve no ſpots in the ſun for ſeveral weeks together in the latter " end of January, February and March. On the 5th of April, three little ſpots in " the ſun, two cloſe together.

" The diameter of the ſun taken Jan. 25, O. S. 2 hours $\frac{1}{11}$ p. m. and ſo " again 4 hours p. m. was $35' 25''$.

" Jan. 29, O. S. 1638, about 5 hours p. m. he found the ſame diameter.

" His eyes were hurt with gazing upon the ſun; ſo that for ſeveral days after " there appeared to the eye, with which he had obſerved, as it were a company of " crows, flying together in the air at a good diſtance.

" POSIDONIUS, as CLEOMEDES writes, obſerved the altitude of Canopus at " Alexandria to be $7\frac{1}{2}$: he obſerved it to be but 6 and almoſt $\frac{1}{2}$.

" The Jewiſh paſſover began on Monday night 8th April, O. S. 1639, at A- " lexandria; ſo that Tueſday the 9th of April was the 15th of Niſan.

" At this day, he ſays, there be but four channels or oſtia of Nilus, two natu- " ral, Damiata and Roſetto, which make the Delta, and part ſome 20 miles below " Cairo; and two artificial, the one on the ſouth ſide of Alexandria, and hath " its beginning ſouth thirty miles above Roſetto. By this all merchandize was " antiently brought to Alexandria, which now comes from Roſetto to Giermas " with great uncertainty, by reaſon that bocca of Nile is very dangerous; both " becauſe of the NW. and NNW. winds, which bar in all thoſe ſhips and veſſels, " as alſo for the ſands and ſhallows, which at the overflowing of the Nile good " ſhips may paſs. The other artificial channel is at Boulas, where it falls (into " the Delta) into a ſinus of the ſea, that is in the mid-way between Roſetto and " Damiata, and like to that at Madiga, which is in the mid-way between Alex- " andria and Roſetto, between theſe two places about forty miles Engliſh.

" Roſetto lies from Alexandria E by S.

" The courſes of Nilus, allowing for the ſeveral turnings, SSE. Wherefore Mem- " phis and Alexandria cannot be in the ſame meridian, nor Rhodus. For from " Rhodus they ſail SSE to Alexandria.

" On land, about three miles from Shiemon, you may ſee the pyramids, which " lie W. of it at the diſtance of between fifty and ſixty miles.

" PTOLOMY's pillar at Alexandria, as it is commonly called, is of Corinthian " work. He ſays, that he had ſeen two or three Greek characters on the plin- " thus to the ſea-ſide. On the weſt ſide of the plinthus ΔΙΟ ΟΣ.

" At Cairo, where they hatch chickens by an artificial warmth, they know by " looking on a new laid egg, of what colour the chicken will be; as alſo whether " it be a cock or a hen.

In a paper containing an account of the mountains of the earth, according to the Arabians, he has this note :

" That Mount Sina reaches to the Red Sea, is confirmed by the geographers " and travellers of our times. One thing is remarkable, which neither hiſto- " rian, nor any other, that I know of, make mention of, and that is this : " That the rocks are there of a goodly ſpeckled kind of marble, the colour being " red, with ſome mixture of black and white. From whence almoſt all the " choiceſt pillars, and huge vaſt ſtones, that are now in the world, have been " brought down the Red Sea, and ſo conveyed to the Nilus, by which they have been " carried up to Thebes, or down to Alexandria, and other places. I have ſeen won- " derful fair and great ſtones, that have been brought antiently from Mount Sina, " whereof ſome of them are in the pyramids, others are made into obeliſks and pil- " lars: thoſe pieces both at Conſtantinple and Rome, which are ſo huge and vaſt, " thoſe goodly pillars, which are in the pantheon built by Agrippa; as alſo the " aguglias full of Ægyptian hieroglyphics, have all had their original from hence. " This I may the more confidently aver, becauſe a learned man, a Venetian, who " had been ſome pretty while at Mount Sina, and whom I knew to be very curi- " ous, aſſured me, that he had ſeen ſome pillars there, which were almoſt finiſhed, " but by caſualty had been left imperfect, and not brought away: and that for " many miles there were huge rocks and mountains of this red marble ſpeckled " with black and white. Of which kind all the antient fabrics of Ægypt conſiſted. " And beſides this place of Mount Sina, all their other quarries and hills are of " a kind of white free ſtone, like ours : wherefore they could not have of them " from theſe, but from thoſe of Mount Sina."[a]

Mr. HOOKE produced a ſteelyard, whoſe beam was to a third proportion; whereby he ſhewed the conveniency of weighing of bodies with a leſs number of weights, than uſually is done any other way, and declared, that he deſigned no more by this ſteelyard than the giving of an aliquot part of any aſſigned weight; ſo that for any different diviſion of weight there muſt be a different ſteelyard. His account of it was as follows [c] :

" I ſhewed a pair of *ſcales and weights* made by order of the Society. The beam " made *for triplicating or tertiating any weight ſmall enough to be weighed by it.* " And the uſe of it was for accommodating our European weights to thoſe of " Indies. So that with a pile of weights of 21 $\frac{1}{3}$ pounds Troy weight, any body " to 64 pounds Troy could be exactly weighed. So that almoſt a ſingle cunda- " rine would turn the ſcale, when charged with that weight. Which cundarine is " but the thouſandth part of our pound Troy.

" Theſe ſort of ſcales will be of excellent uſe for weighing of great weights, be-

[c] Regiſter, vol. vi. p. 91, 92.

" cauſe

" cauſe the beam may with eaſe be ſo made, as that one twentieth part of the " weights may ſerve, and the beam and triangle need not be much more than of " half the ſtrength and weight, and yet the beam more nice and curious than the " beſt made the ordinary way. Nor is this at all the ſame with the butcher's " ſteelyard, this having ſcales as ordinary beams, and as great variety of weights, " though each of them be but one twentieth part of the weights neceſſary to be " uſed in the common way. And whereas in a tun weight there are not leſs than " forty half hundred weights neceſſary ſometimes to be removed from place to " place; in this way one pile of weights, amounting in all to one hundred weight, " will fully and more exactly perform it; and any weight may be weighed exactly " thereby, that is not leſs than a ſcruple, nor bigger or heavier than a tun, which " I think is not to be done by any beam yet uſed."

Upon producing this ſteelyard, Monſ. JUSTEL remarked, that ſteelyards were uſed in France, which would weigh bodies to the two thouſandth part of a grain.

A letter of Dr. LISTER's to Mr. ASTON was read concerning the nature of earthquakes, more particularly of the origin of the matter of them from pyrites alone [d].

Upon which a member of the Society deſired, that Dr. LISTER might be aſked, whether he could produce any hiſtory of an earthquake, wherein the vapour took fire.

Another letter from Dr. LISTER to Mr. ASTON, dated 12 December 1683, was then read, concerning the ſtone [e], purſuant to a paper of Dr. SLARE, on the ſame ſubject, read at the preceding meeting. It was as follows:

" In the year 1677, I publiſhed a notion in the preface to one of the tracts, *De* " *Cochlitis Angliæ*, that there were but two only *Succi lapideſcentes* in nature, that " I knew of, viz. the vitriolic, proceeding from the pyrites, and the ſuccus cal- " carius proceeding from that genus of foſſils: And I did there promiſe I would " further diſcourſe of them.

" Which I have ſince performed in the tract *De fontibus medicatis Angliæ*; the " deſign of that book being to fix the true characteriſtical notes of thoſe two " lapideſcent juices, and to explain the nature of them, and to ſhew the great " concern they have in almoſt all our medicinal waters. This in the firſt part.

" In the ſecond part of that tract (which is now in the preſs) I have briefly " endeavoured to ſhew, that as there are but two lapideſcent juices in nature " without us; ſo theſe two are the only material cauſes of the ſtone, whenever it " ſhall happen to be bred within us: For that the ways to diſtinguiſh them with- " out us, will ſerve alſo to demonſtrate their exiſtence, when found in our bodies, " as if vitriolic, the application of the loadſtone, &c.

[d] Letter-book, Vol. ix p. 72. It is printed in the Philoſoph. Tranſ. N° 157. p. 512. for March 1683. [e] Letter-book, Vol. ix. p. 71.

" That from these two juices not only animals of all sorts must be diseased, " but that they owe the matter of their more solid parts to them : the bones of " sanguineous animals, and the shells of testaceous being of the same nature, and " some vegetables are wholly fed and nourished by them.

" Which makes the elegant and learned discourse of Dr. SLARE, read the last " meeting to the Society, to be in my judgment so very near the explicating " the true nature of the stone, as nothing yet I know of, has appeared like it.

" He having very rationally deduced the disease of the stone from the per- " verted juices of the bones, or the abrasions of them. And I only add, that the " bones themselves are fed of petrescent juices.

" As for the reason of the disease of the stone in man, how people come some- " times to be plagued with that, which nature designed them for good, I refer " (because it would be too tedious here) to the tract itself; every body being left " to his own sense and thoughts concerning the manner of understanding the " causes of things ; which I think, however different, will never injure philoso- " phy or real friendship."

Mr. HOOKE read a paper concerning his way of weighing bodies by a helical coil, whereby not only the quantity of the weight of any body should be discovered, but likewise the quantities of it ; as in the mixture of any metal, &c. which, he said, could not be done so commodiously by any other instrument.

Mr. FLAMSTEAD's tables of the eclipses of JUPITER's Satellites were shewn; and it was desired, that they might be printed in the *Philosophical Transactions* [f].

Mons. BULLIALDUS's *Arithmetica infinitorum* was presented by him by the hands of Mons. JUSTEL.

168¾, *January* 9, Sir CYRIL WYCHE president in the chair.

Mr. HALLEY having perused the paper of observations of Mr. JOHN GREAVES, collected

	° ′
The latitude of Constantinople to be	40 : 7½ Bor.
The latitude of Rhodes	36 : 47 Bor.
The latitude of Alexandria	31 : 4

The secretary then reading over the paper of Mr. GREAVES, it was very much doubted, that the great porphyry pillars and obelisks should be dug in Mount Sina, and thence brought to the Nile.

Dr. AGLIONBY was of the opinion of a late French author, that they were brought out of Upper Egypt.

[f] They are printed there, N° 154. p. 404.

Mr. HOOKE thought, that the pyramids might be built upon a rock of ſuch ſtone in the place where they ſtand.

This diſcourſe giving occaſion to mention Mr. VERNON, Mr. HOOKE was deſired to return the copy of Mr. VERNON's papers, which the Society had cauſed to be made of them.

The Lord MONTAGU [g] being mentioned to have ſome obſervations of Mr. VERNON, Mr. HERBERT was deſired to endeavour to procure a copy of them.

Mr. AUBREY alſo undertook, that Sir WILLIAM ESCOURT ſhould be deſired to give a copy of ſome papers of Mr. VERNON, which were in his hands.

The weather in Egypt being obſerved to be very hazy near the horizon, Mr. HALLEY remarked, that it was ſo in Guinea, and that the ſun before his ſetting ſeemed to enter into a cloud, which he conceived not to be cauſed by ſand raiſed by the wind, as Mr. GREAVES aſſerts.

Mr. HILL queried, whether the ſpots in the ſun, ſeen by Mr. GREAVES, were not the ſame obſerved by GASSENDUS.

Mr. HOOKE ſhewed the contrivance of a kind of balance, which would give any deſired part of a weight [h].

The charges of one of theſe balances being but ſmall, he was deſired to get one well made by a good workman.

There were preſented by Dr. PLOT henna the flower of Cyprus, or liguſtrum dried, which being mixed with water colours red, according to his account; a piece of rude coral from the Red Sea; a piece of zaffer, and a golden marcaſite from Monmouthſhire.

January 16, at a meeting of the COUNCIL were preſent,

Sir CYRIL WYCHE preſident

Dr. GREW	Mr. MEREDITH
Dr BROWN	Mr. FLAMSTEAD
Dr. LISTER	Mr. HALLEY
Dr. AGLIONBY	Mr. ASTON.

Mr. HOOKE being ſent to, but being abſent, Mr. MEREDITH was deſired to ſpeak to him to deliver to the ſecretary the particulars of his experiments.

It was ordered, that the treaſurer Mr. HILL do pay Dr. TYSON and Dr. SLARE 20 *l.* apiece, according to an order of council made Feb. 28. 168$\frac{2}{3}$.

[g] RALPH, afterwards Earl and Duke of Montagu, whoſe ſecretary, during his embaſſy in France, Mr. VERNON had been.

[h] It is entered in the Regiſter, Vol. vi. p. 134. and printed in his Philoſophical Experiments and Obſervations, p. 118.

Some

Some propoſals being read for regulating the buſineſs of the Society were referred to the next meeting of the council.

At a meeting of the SOCIETY on the ſame day, Sir CYRIL WYCHE preſident in the chair.

Upon the reading of the minutes of the laſt meeting, it was ſaid, that the ſtone found in the place, where the pyramids ſtand, was not porphyry; and therefore that the porphyry made uſe of in the pyramids muſt be brought from another place.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at New-college, Oxford, January 12, 168$\frac{1}{2}$[1], being read, mentioning an ingot of caſt iron, which the Philoſophical Society at Oxford had made, which was not magnetical, it was queried, whether caſt iron would draw the needle as well as forged.

Dr. LISTER deſired to be ſatisfied, that the ingot, which they had made, was iron; for that more is required to make iron than barely to melt down the iron ſtone. Hereupon he alſo mentioned the difference between iron ore and ſow metal.

In Mr. MUSGRAVE's letter were alſo mentioned ſome obſervations of Dr. THOMAS SMITH in his voyage in 1668 to Conſtantinople: As 1. That it was tide and half tide in the Downs. 2. That the dolphin of the Greeks is our porpeſs. 3. That there might be an under-current in the Straits mouth. This he proved by an inſtance of ſuch a current in the Sound. The inſtance being ſtrange and but one, it was deſired, that the obſervation of it might be recommended to ſome able ſeamen upon occaſion. 4. That upon the coaſt of Greece in 35° 53′. the variation of the needle was 5° 22′ weſterly.

A letter of Dr. ROBERT HUNTINGTON, provoſt of Trinity-college in Dublin, to Dr. PLOT, dated at Dublin December 18, 1683[k], giving an account of a weekly meeting there of ſeveral ingenious men about philoſophical ſubjects, was read. It was as follows:

" I have received your letters of the 28th paſt, &c. and ſend ſomething leſs " than your minutes (ſeconds if you pleaſe) an abſtract out of them, &c. Here- " after you may expect a more accurate account from the ſecretary Mr. WILLIAM " MOLYNERX (who is writing the Atlas for this country) nigh Ormond's Gate, " in Dublin. And ſince you do ſo generouſly as well as charitably offer your aſ- " ſiſtances, I think this will be the beſt method of conveyance, to tranſmit our " notices to the ſecretary of the Royal Society, who, after he has peruſed them, " can ſend them to Oxford; as you likewiſe by him may ſend hither. After " Chriſtmas that we meet next, our ſecretary will purſue that courſe; you ſmooth- " ing our way at London once again, as it ſeems you have already done. After " a while we may perchance eaſe ourſelves of that expence, and have our in-

[1] Letter-book, Vol. ix. p. 85. [k] Ibid. p. 103.

" telligence

" telligence for nothing. However, you may be ſure we ſhall never grudge to " defray all manner of charges, that ſhall be incident to our correſpondences; and " we have raiſed a fund, of which to do it. By MOSES PIT, if not before, you " may expect one or two of their diſcourſes at large: For the way is for particu- " lar ſubjects mentioned the foregoing meeting, to be treated on by particular " perſons the next: And when they have done, every one, that has any thing to " add or object, has his time and liberty to expreſs himſelf. I don't give you the " names of our Society, becauſe you know few of them, except the Biſhop of " Fernes and Loughlin, Sir WILLIAM PETTY, and Dr. WILLUGHBY. And be- " ſides, you will receive it more authentic from the ſecretary. Several of the " number meet at five upon Sunday nights (as the whole company does on Mon- " days) to diſcourſe theologically, of GOD ſuppoſe, and his attributes, and how " to eſtabliſh religion, and confute atheiſm, by reaſon, evidence and demon- " ſtration: And when this work ſhall be well done (for all are not arguments, " that ſome men call ſo) the way to the Scriptures and Chriſtianity will be plain " and eaſy; and the end is, that men might walk therein. Amen.

" After this particular narration, you muſt be pleaſed to give me leave to be- " ſpeak you more publicly; to preſent the thanks and acknowledgments of the " perſons afore-named, and all the gentlemen, who met here yeſterday for the im- " provement of philoſophical learning; and to aſſure you, and your whole So- " ciety at the Muſæum, that as they are very ſenſible of the honour you have " been pleaſed to confer on them, by offering ſuch an advantageous correſpon- " dence; ſo will they be ready to maintain it, according to the utmoſt of their " ability, and glad upon every occaſion to approve themſelves your ſervants. " This is but part of what I was commanded to ſay; and juſt enough to inform " you, that you have a great many well-willers in Ireland, &c.

" After ſome previous meetings in tendency to the better regulation, ſettlement, " and method of future tranſactions:

" October 15th, 1683, diſcourſed Mr. WILLIAM MOLYNEUX, *De apparente* " *magnitudine ſolis, humilis et ſublimis:* wherein declaring the matter of fact, and " propounding the certain ways of trying it, he deſcended to the ſolutions hereof " given by ſeveral great authors, particularly Monſ. DES CARTES, HOBBES, " GASSENDUS, and an Abbot in the Journal des Scavans. And all theſe he found " fault with, demonſtrating their ſolutions to be diſſatisfactory and erroneous. " The Biſhop of Ferns diſcourſed the *Radiis reflexis et refractis:* wherein he " ſhewed, after a ſuccinct manner, the common appearances of refracting and " reflecting concaves and convexes, as their magnifying and diminiſhing an ob- " ject, their inverſion and erection of the ſpecies. Alſo that the reflected and re- " fracted rays together make a cylinder, if the glaſs be plain: but if concave or " convex (*ex parte corpori luminoſo obverſa*) that then they make a cone, (only al- " lowing for the refraction made within the glaſſes) yet with this difference, that " when concave, the cone's vertex is towards the luminous body, and the baſis " avers; but when convex, 'tis quite contrary. And that, whereas if theſe two " laſt are made uſe of as ſpecula or perſpicilla, their affections are quite oppoſite

" one

" one to the other: but if one be a ſpeculum, and the other a perſpicillum, " they are all together agreeing. And this was ſhewn in three plain and eaſy fi- " gures. Mr. FOLEY explained Dr. BRIGGS's theory of viſion, and confirmed it " with ſome obſervations from anatomy. And Mr. ASHE gave an account of part " of DE CHALES's book of motion.

" October 22, Mr. MOLYNEUX proceeded in his diſcourſe, for confutation of " the forementioned authors in the abovementioned appearance: And then Mr. " WILLIAM KING offered to bring in a ſatisfactory ſolution thereof at the next " meeting. Dr. LOFTUS diſcourſed concerning Pere SIMON's *Hiſtoire Critique*; " Dr. MOULIN *De Alkali et Acido*; and Mr. WALKINGTON concerning JAC- " QUET's way of demonſtrating ARCHIMEDES, with which he found fault.

" October 31, Mr. KING produced his ſolution of the phænomenon of the dif- " ferent bigneſs of the horizontal and meridional ſun, and yet its ſubtending the " ſame angle: But his account was not judged ſatisfactory. Mr. ASTON began " his animadverſions on HOBBES *de Cive*. Mr. WALKINGTON proceeded with the " former animadverſions: as alſo took an occaſion therefrom to diſcourſe in the " algebraical way of proceedings in demonſtrations mathematical, removing the " three grand objections, that HOBBES makes againſt it: but one thing not being " very clear, he was deſired to reaſſume it at the next meeting. The thing was " how negative quantities multiplied on each other, as — A on — B ſhould pro- " duce + A B; and likewiſe how the roots A — B and B — A (though diffe- " magnitudes) have the ſame powers.

November 12. The Lord Biſhop of Ferns produced a diſcourſe concerning " ſounds and hearing, and comparing them in many reſpects to images and ſee- " ing, he offered many curious propoſals for advancing one, as the other is ad- " vanced by optic glaſſes. Mr. WALKINGTON gave the company full ſatisfac- " tion in the buſineſs laſt left upon him: but Mr. FOLEY raiſed an objection " againſt the algebraical mathemathics drawn from the 27th queſtion of the 16th " chapter of KERSEY's 1ſt book of algebra, p. 117. which Mr. WALKINGTON " was deſired to anſwer at his leiſure.

November 19. Mr. MOLYNEUX explained the volution of concentric circles " after JACQUET's method. Dr. MOULIN explained the fabric of the ear, and the " bones belonging thereto. Mr. WALKINGTON diſcourſed of the objections " againſt algebra raiſed by Mr. FOLEY.

" December 3. Upon occaſion of ſome former diſcourſe, Mr. Arch-deacon " BAYNARD proved at large, that monarchy is the moſt natural government. Alſo " Mr. ASHE gave an account of part of DE CHALES's book of motion.

" December 10. Mr. MOLYNEUX explained the phænomenon of double viſion; " viz. placing, ſuppoſe, two candles directly before you, one a foot, the other " three feet diſtance from you, and looking ſtedfaſtly at the nigheſt, the fartheſt " ſeems double: alſo looking ſtedfaſtly at the fartheſt, the nigheſt ſeems double:

" then

" Then winking alternately with one and the other eye: In the firſt caſe, the " image correſpondent to the ſhut eye vaniſhes; that is, to the left eye ſhut, " the left image of the farther duplicated object vaniſhes; and to the right eye, " the right image, viz. when looking at the farther object the nigher is dupli- " cated, the image contrary to the ſhut eye vaniſhes: *i. e.* to the left eye ſhut, " the right image of the nigher duplicated object vaniſhes; and ſo the right " eye ſhut, the left image vaniſhes.

" Dr. MOULIN proſecuted his account of the ſtructure of the ear.

" Mr. FOLEY diſcourſed of the contagious communication of a ſtrong imagi- " nation; to explain and improve a notion of Monſ. MALEBRANCH's, in his *La* " *recherche de la verité*, l. 2. part 3.

" The ſame gentleman has upon the loom a very fine piece, which he calls " *Computatio univerſalis*, or *Logica rerum:* Being an eſſay attempting in a geo- " metrical method, to demonſtrate an univerſal ſtandard; whereby to judge of " the intrinſic value of every thing in the world. But of this, and Sir WILLIAM " PETTY's new invention, when they ſhall think fit to communicate them. Only " let me take notice to you of one lately found out by a gentleman in Ireland, " viz. to hang a coach ſo, that notwithſtanding the wheels of one ſide be never " ſo high, or quite overturn, yet ſhall the body ſtill hang in æquilibrio, and that " the perſons, that are therein, ſit upright ſtill, and be free from harm, &c."

Dr. PLOT was deſired to acquaint Dr. HUNTINGTON, that the Royal Society very willingly embraced the correſpondence of the Society at Dublin; and had ordered their ſecretary to write to them in the manner propoſed [k].

There were read certain obſervations of Dr. LISTER concerning the midland ſalt ſprings of Worceſter, Staffordſhire and Cheſhire: Of the crude ſalt, which grows from the ſtone-powder dejected by the ſaid brines in boiling: Of the ſpecific difference betwixt ſea-ſalt and common ſalt: A way (which ſeems to be the true method of nature) of diſtilling ſweet and freſh water from ſea-water by the breath of ſea-plants growing on it; and that this breath probably is the material cauſe of the trade or tropic wind [l].

Dr. LISTER then ſhewed the difference between the cryſtals of ſea-ſalt and common ſalt. Thoſe of ſea-ſalt (which were viewed) had been evaporated from the ſea-water taken up at Scarborough; the other from a ſpring at Knareſborough. The angles of the latter were all intire; as likewiſe thoſe of lixiviate marine ſalts, deſcribed by Dr. GREW. But the angles of ſea-ſalt were cut into triangular plains, at leaſt on one of the ſides, as plainly appeared.

[k] Mr. ASTON's letter to Mr. MOLYNEUX, ſecretary to the Dublin Society, dated Feb. 26, 168¾. is inſerted in the Letter-book, vol. ix. p. 101.

[l] Theſe obſervations are entered in the Regiſter, vol. vi. p. 29, and printed in the Philoſoph. Tranſ. N° 156, p. 489, for Feb. 168¾.

Concerning the breath of plants, there was read a paſſage in Dr. PLOT's *Natural Hiſtory of Oxfordſhire* concerning one WILLS, who experimented how 13 ounces of water were breathed out by a ſprig of mint in the time, that 10 ounces was evaporated by the ſun.

Some plants were mentioned as remarkable for this breathing.

Dr. AGLIONBY obſerved the ſenſibleneſs of this breath in a green-houſe.

Mr. HOOKE ſhewed a way how to give the proportions of two weights one to another, the apparatus being not deſigned for an accurate trial [1].

Jan. 23, at a meeting of the COUNCIL were preſent,

Sir CYRIL WYCHE preſident

Mr. HILL	Mr. FLAMSTEAD
Dr. GREW	Mr. HALLEY
Dr. AGLIONBY	Mr. ASTON.

It was ordered, that the treaſurer pay Mr. HUNT's bill, being 20 *l.* for half a year's ſalary due at Chriſtmas.

Mr. HILL read a catalogue of ſuch books, as Dr. TILLOTSON, dean of Canterbury, was willing to give the Society, if they would deliver up his bond: upon which it was ordered, that it be left to Mr. HILL to get what books he can of the dean, and then deliver up his bond, but keep the dean's name ſtill in the liſt.

It was ordered, that the treaſurer pay Mr. ASTON 40 *l.* as a preſent for his ſervices done the Society.

A propoſal being made by Dr. LISTER, that if the council would order a preſs or two to be made after the faſhion of thoſe, which are already in the Muſeum, that it might ſuit them, with drawers, as he ſhould give directions to the workmen, he would give his pains in reducing the minerals into ſuch order and method, as might facilitate the underſtanding them, and alſo preſerve them, that they might be readily had at any time for inſpection, and other uſes, that may happen: Upon which it was ordered, that Mr. HUNT ſhould get one or more preſſes made according to the directions given him by Dr. LISTER.

Dr. GREW acquainted the council, that he had almoſt finiſhed an index to the repoſitory.

He was deſired to give all help and aſſiſtance to Dr. LISTER in diſpoſing the minerals.

[1] His account of this inſtrument is entered in the regiſter, vol. vi. p 138. and printed in his *Philoſ. Experiments*, &c. p. 121.

Some

Some propoſals having been read at the laſt meeting of the council, and referred to the next, were now read again, and concluded upon in the following manner:

1. That a duplicate be tranſcribed of the regiſter-books and journal books; and that it be kept diſtinct from them for the more ſecurity.

2. That a very particular index be made of the regiſter, journal, and letter-books; and that in the ſaid index be noted with an aſteriſm what had been already publiſhed in the *Philoſophical Tranſactions*.

The method of the index was to be farther conſidered.

Dr. AGLIONBY and Mr. HILL propoſed to make the index.

3. That the index be printed, if the council think fit.

4. That no mechanical experiment be brought in by the curator without a finiſhed deſign upon paper, as uſed formerly to be done, well and circumſtantially explained in writing; which ſhall be left with one of the ſecretaries to be entered in the regiſter.

5. That whatever experiment is ordered by the Society to be tried, the order thereof being firſt drawn up, read, and approved of by the Society, ſhall be given to the curator in writing. And that the curator ſhall give an account in writing of the event, whatever it be, and deliver that paper to the ſecretary, ſubſcribing his name to it.

At a meeting of the SOCIETY on the ſame day, Sir CYRIL WYCHE preſident in the chair.

Upon occaſion of caſt iron's being doubted to be magnetical, two pieces of ſow metal ſent by Dr. LISTER were found to draw round the needle of a compaſs:

As likewiſe another piece from Mr. AUBREY.

Upon occaſion of under-currents, Mr. HOOKE mentioned an Italian book, lately written to this purpoſe about the Boſphorus of Thrace. Dr. AGLIONBY was deſired to take the trouble of peruſing the book.

A letter of Dr. LISTER to Mr. ASTON was read concerning thunder and lightning being only from pyrites[a].

It contained, 1. Some inſtances of iron having been rained at ſeveral times; but no other metal. 2. An inſtance of lightning being magnetical, mentioned in the *Philoſophical Tranſactions*, N°. 127. Which paſſage being read, it was queried, whether any one could object againſt the truth of the relation there ſet down: but nothing was ſaid againſt the truth of it.

Mr. HOOKE remarked, that by ſtriking a needle with a braſs hammer, the pole might be changed from north to ſouth. To which it was anſwered by Dr. WAL-

[a] It is inſerted in the letter-book, vol. IX. p. 89. and printed in the *Philoſ. Tranſactions*, N°. 157. p. 517.

LIS, that there was nothing of hammering mentioned in this relation, but with more probability a new touch of a magnet.

However, Mr. HOOKE was ordered to ſhew at the next meeting, how the pole of a needle is altered by ſtriking, that the applicableneſs to this caſe might the better appear.

Mr. HOOKE ſaid, that he had found a ſapphire electrical, though denied to be ſo by Dr. PLOT.

Dr. WALLIS remarked, that the individuals might differ, and ſome be electrical, though others were not ſo.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at New-college Oxford, January 20, $168\frac{3}{4}$[x] was read, mentioning ſeveral diſtillations performed by himſelf and Dr. PLOT; as brimſtone *per ſe*, brine from ſalt of tartar, brine from *calx viva*, brine from chalk, and brine from aſhes. The product was a clear water, not brackiſh; which was reſerved for farther experiments.

Mr. MUSGRAVE mentioned alſo a Latin MS. which he had met with at Leyden in 1680, by Dr. DE MAELS, in which, among other things, the author gave an account of the chemical analyſis of the ſtone of the bladder, which, he obſerved, reſolved itſelf by diſtillation into *portionem aliquam ſeroſam, pauxillum olei, cum ſalis volatilis urinoſi quantitate ſatis notabili*; and the *caput mortuum* is a mere *terra*.

Mr. HOOKE ſhewed the manner of a balance, in which the weight was not mixed, and which had a greater latitude than the common ones: and he ſhewed a pair of Japan ſcales[y]; which appeared to be not at all exact, and was ſaid by Dr. WALLIS to have the point of ſuſpenſion a great deal above the center of gravity.

Monſ. MUNCKHAUSEN preſented from two copies of a book of his *De herniis*, which Dr. AGLIONBY was deſired to peruſe.

Mr. HAAK preſented a book of ISRAEL CONRADUS *de frigoris Naturâ & Effectibus*.

Jan. 30, there was no meeting of the SOCIETY on account of the anniverſary of the death of King CHARLES I.

Feb. 6, Sir CYRIL WYCHE preſident in the chair.

Mr. BOYLE preſented to the Socieey a copy of his new book, intitled *Memoirs*

[x] Letter-book, vol. ix. p. 87.
[y] His account of the balance and Japan ſcales is entered in the regiſter, vol. vi. p. 142. and printed in his *Philoſ. Experiments*, &c. p. 123.

for

for the Natural Hiſtory of Human Blood, eſpecially the Spirit of that Liquor; with an Appendix; which book Dr. AGLIONBY was deſired by the Society to peruſe.

Mr. HAAK preſented to the Society an edition of the emperor JULIAN's *Cæſars*, publiſhed in France by Monſ. SPANHEIM.

Dr. HOLDER moved, that ſome of the ſeeds brought from Tunquin might be diſpoſed of to curious perſons, deſiring to ſet and cultivate them: which was agreed to, provided that ſome few of every ſort be left for a ſample in the repoſitory; and that the names of the perſons, to whom the ſeeds ſhould be diſtributed, were taken, that they might be inquired after.

Mr. HOOKE being called upon for the changing magnetical poles produced a drill[2], whereby the intention of the experiment appearing, it was not proceeded on; eſpecially as he declared, that it related not to the inſtances of the magneticalneſs of lightning mentioned at the laſt meeting.

Dr. LISTER having mentioned, that braſs is magnetical, promiſed to give an account of that aſſertion another time.

Dr. HOLDER ſhewed the draught of a piece of Moſaic work found in Sir EDWARD HUNGERFORD's lands near Bath, which Mr. HUNT was ordered to take a copy of for the Society.

Mr. PAGET being ſaid to have ſhewn, that the dipping needle follows the fire, was deſired to ſhew the experiment at the next meeting.

Dr. AGLIONBY having read over the book *De herniis*, declared, that there was a great deal of reading in it, but little experiment.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at New-college Oxford, February 2, 168$\frac{3}{4}$ was read, containing, among other things, ſeveral experiments about freezing; as that 2 inches of water in a tube of $\frac{1}{2}$ inch diameter expanded itſelf upon freezing $\frac{1}{6}$ higher: that a tube of 1 inch diameter filled 6 inches, roſe upon freezing $\frac{7}{8}$ of an inch: and that $\frac{1}{2}$ a pint of water upon freezing loſt in weight ℥ii. ʒii. gr. viii.

Dr. CROUNE ſaid, that having weighed 3 ounces of water, he found it after freezing to differ a ſcruple and half.

Sir CHRISTOPHER WREN remarked, that if water were ſuddenly frozen, there would be leſs difference in weight.

Dr. CROUNE ſaid, that he obſerved water, which he had put into a bolt-head, to riſe higher before there was any thing of freezing in it.

[2] His account of this is entered in the regiſter, vol. vi. p. 145. and printed in his *Philoſ. Experiments and Obſervations*, p. 128.

Mr.

Mr. HOOKE attributed the rising of the water in the neck of the bolt-head to the shrinking of the glass.

Dr. CROUNE said, that the glass had been long in the cold before, and that the water rose immediately.

Dr. WALLIS proposed, that an empty glass might be cooled well in freezing liquor, in order that it might have its contraction before the water be put into it.

This was done immediately by Mr. HUNT; and the water being put into a small bolt-head rose about of an * * inch in the neck, though the air at that time was very warm.

Mr. HOOKE gave an account, that himself, Dr. AGLIONBY, and Mr. MEREDITH had made a trial of the strength of ice[a]: and that a piece of ice $3\frac{1}{4}$ inches thick, 4 inches broad, and having a foot clear between the places of bearing an iron-rod in the middle, bore 300 weight very well, but 350 being laid on, it broke after some time, this weight with the two beams making near 400 pounds.

Dr. CROUNE said, that a piece of ice like a coffee-dish bore about $\frac{1}{2}$ of an ounce in water without sinking.

Mr. HOOKE said, that ice was $\frac{1}{8}$ lighter than water.

Dr. LISTER took notice, that frost makes inanimate things flaccid, and animate stiff; the leaves of laurel hanging down probably from a stoppage of the nourishment.

Upon mentioning rusma, it was doubted, whether it were a mixture or mere orpiment.

Dr. LISTER observed, that it might easily be tried; for if it were orpiment, when it is burnt upon silver, it turns it.

February 13, Sir JOSEPH WILLIAMSON in the chair.

Mr. HUNT shewed the draught of the Mosaic floor, which was ordered to be hung up in the repository.

A book of Mr. DENIS concerning a strange fountain in Poland was presented from Monsr. LUDOLFUS, to whom thanks were ordered to be returned by his nephew.

An extract of a letter for Mr. LEEWENHOECK, dated at Delft December 28,

[a] This account is entered in the register, vol. vi. p. 146. and printed in Mr. HOOKE's *Philos. Experiments and Observations*, p. 130.

1683 [b] was read, containing ſome farther obſervations of the ſcales growing upon men as they do on fiſhes: of the ſcales on the middle of the lips: of a ſcaly child: alſo an examination of the ſlimy matter or woolly ſubſtance within the guts: and an experiment, that water paſſes through a bladder, when wine will not.

This experiment was not looked upon as new, though the truth of it was not doubted of.

Mr. HOOKE made a trial of the different weights of ice and water [c].

An extract of a letter of HENRY GYLES to Dr. LISTER [d] was read, concerning a ſtrange ſort of field-mice, which had done much miſchief in Holderneſs for four months paſt, eating up the graſs and corn; and that they had now ſpread themſelves as far as Hull.

Mr. HAAK reported from a letter of Mr. CLUVERUS, that Monſ. KERCKRINGIUS, reſident at Hamburgh for the Grand Duke, intended to publiſh a treatiſe *De Motu Muſculorum & Origine Nervorum*, in oppoſition to ſeveral received opinions *circa principia motûs in animalibus*.

The ſecretary was ordered to write to Monſ. KERCKRINGIUS as being a member of the Society.

Dr. TYSON propoſed Monſ. PECKLINIUS, livng about Hamburgh alſo, as a correſpondent.

Mr. HAAK obſerved, that Monſ. BRAND, who made the phoſphorus, affirmed, that he could make a liquor, that would keep flowers in their preſent hue and colour; but that each flower muſt have a peculiar matter.

A letter of Monſ. MUSGRAVE to Mr. ASTON, dated at New-college Oxford, February 9, 168$\frac{3}{4}$ [e], was read, mentioning, that pump-water expanded in freezing in a glaſs tube of an inch diameter from 6 inches to $\frac{7}{8}$ of an inch more: and that pump-water boiled to $\frac{6}{8}$; river-water but to $\frac{5}{8}$:

That lumps found in marl-pits in Staffordſhire, and a ſtone in a boar's bladder after calcination, applied to a magnet:

That a ſharp ſtone had been found between the *proceſſus mamillares* of a hog:

And that Mr. MOLYNEUX had ſent to the Philoſophical Society ſome of the

[b] It is printed in the *Philoſ. Tranſact.* N°. 160. p. 58. for June 1684.

[c] His account of theſe experiments is entered in the regiſter, vol. vi. p. 149. and printed in Mr. HOOKE's *Philoſ Exper. and Obſervat.* p. 134.

[d] Letter-book, vol. ix. p. 93.

[e] Ibid. p. 95.

Lough

Lough Neagh ſtone originally holly (for Lough Neagh turns nothing but holly into ſtone) and a black ſtone full of golden ſtars, and ſome Iriſh rock cryſtal.

Dr. LISTER conceived, that he had two ſorts of theſe Lough Neagh ſtones, one from holly, and another from aſh; one a lime-ſtone, and another an iron-ſtone. He added, that holly might turn ſuddenly by reaſon of its viſcouſneſs and tenacity.

Dr. LISTER ſhewed a piece of this ſtone in the Muſeum, which was ſtone, iron, and wood.

Mr. PAGET gave in a paper of experiments of the force of heat upon magnetical bodies; as follows [f].

Day	Hour	Inclination	Attraction	Retraction	
Feb. 04	1a.m.	72°5′	65		" The ſouth pole of the inclinatory needle was " drawn with half a ſheet of the lighted paper, as " in the margin.
05	10p.m.	72 2	69 5′		" The ſame pole with the flame of a candle " applied to the ring.
06	10p.m.	72 2	68	76	" With the flames of two half ſheets of paper " ſucceſſively applied to the north and ſouth ſides " of the ſame pole: and half an hour paſt twelve " the ſame night I find it returned to 63.8
08	11¼p.m.	70 5	68 5		" This experiment was tried as the former: but " about half an hour paſt twelve changing the plain " of the inſtrument to north-weſt and ſouth-eaſt " (which in the former obſervations had continued " in the plain of meridian) that ſo the needle coin- " ciding with the horizontal axe, might reſtrain the " force of the terreſtrial attraction, I found, what
09	15′a.m.	90	80	80	" I expected, that the ſouth pole did comply much " more with the influence of heat, as appears in " the margin.
12	01a.m.	72	74		" Having a mind to try, whether the heat " would not have a contrary effect on the north " pole, I placed the inſtrument in the meridian, " and after that itſelf and the needle were ſetled, I

[f] Regiſter, vol. vi. p. 40.

" applied two half ſheets at the ſame time on each
" ſide of the inſtrument parallel to the ſouthern
" chord of 60°, keeping the flames up to the north
" pole, and I found it to chaſe that pole in the
" ſame manner as the unfriendly poles of magnets
" uſe to do. I tried the ſame thing three or four
" times the ſame day, and ſtill the north pole ſhun-
" ned the flame."

An inclinatory needle was hung up in the gallery, and it appeared, that the ſouth pole of the needle followed the flame 5°, but the north pole ſhunned the flame.

Mr. PAGET was deſired to proſecute his obſervations on this ſubject.

Feb. 20, Sir CYRIL WYCHE preſident in the chair.

A paper of Dr. LISTER was read concerning the riſing and falling of the quick-ſilver in the barometer, and what may be gathered from its great riſe in froſty weather as to a healthy or ſickly ſeaſon [s].

In this diſcourſe a new opinion was offered for explaining ſome things in the barometer (beſides the weight of the air) as, 1. why the quickſilver ſometimes flutters, when it is fallen very low, as Mr. LISTER had obſerved. 2. why the quickſilver varies very little between the tropics. This was confirmed by Mr. HALLEY's obſervations, that in St. Helena in two months time, in diverſity of weather, the quickſilver did not differ $\frac{1}{4}$ of an inch; beſides other inſtances at Barbados and Tangier. It was therefore ſuppoſed by Dr. LISTER, that the quickſilver is ſometimes expanded, and then is in a natural ſtate and high; ſometimes contracted or ſqueezed together, as when it is low; this appearing by the concavity of its ſurface both in the tube and the box.

For the healthineſs of cold weather was urged the great age of men in the mountains of England; the natural coldneſs of the blood of animals; for the ſpecies of birds and beaſts are but about 300, in which the blood is warm. But the ſpecies of the fiſhes, wherein the blood is cold, are above three times the number; the ſpecies of inſects almoſt innumerable; Mr. WILLUGHBY in one collection having had above 2000: That inſects, when they are frozen, and flung againſt a glaſs, have been ready to break the glaſs, as if they were ice: and the ſame inſects afterwards warmed, have crawled away.

Mr HALLEY remarked, that he had found the blood of a ſea-tortoiſe new killed as cold as water.

[s] It is regiſtered vol. vi. p. 48. It is printed in the *Philoſ. Tranſactions* N°. 165. p. 790. for November 1684.

Dr. TYSON obſerved the blood of an hedge-hog to be ſo.

The plague was ſaid to be natural in Aſia, and conſequently not bred here: the ſmall-pox to be firſt mentioned by the Arabians 500 years ſince; and the new griping of the guts to be natural to India.

Dr. AGLIONBY ſuppoſed, that this laſt diſeaſe might be occaſioned by the planting much fruit in England within the laſt twenty years.

Dr. LISTER remarked, that peaches and apricots were as plentiful in the North as in any place of England; and yet that this griping of the guts was not yet at all among the people there.

Dr. SLARE brought in an account of ſome trials made with ſea-ice; brought from Harwich harbour as follows[h]:

" When it was diſſolved to water in the common thaw, we found it quite " taſteleſs, for ſo it was, when ice.

" By dropping ſeveral ſolutions of fixed ſalts upon it, there ſubſided nothing to " the bottom, but it remained clear.

" Nor did ſpirit of harts-horns or of ſal armoniac diſturb this liquor, or precipi- " tate any thing out of it.

" We dropt into the ſame ſea-water acid ſpirits, particularly that of vitriol " and of ſalt; but it made no alteration.

" We dropt alſo ſome claret-wine into a wine glaſs of this water, which, accord- " ing to a lately printed experiment, makes waters, that contain any proportion " of ſalt in them, turbid; but it gave to this a bright red; much better than to a " certain pump-water, which is very ſoft, for people waſh with it; yet even this " took a more dull or darker red.

" A waſh-ball did readily diſſolve in this water, and felt very ſoft to the touch, " and raiſed a froth like the beſt river-water.

" A pint is now diſtilling, but being not perfectly dry, 'tis reſerved to the next " meeting. But ſince as follows:

" There was found at the bottom of the retort, which was brought to the So- " ciety, ſo very thin a cruſt, of a whitiſh ſubſtance, which ſeemed uneaſy to be " weighed; diſtilled water itſelf, after repeated diſtillations, leaves behind it " a ſubſtance as to quantity and quality much like to this."

[h] Regiſter, vol. vi. p. 102.

Dr.

Dr. SLARE brought in likewiſe an account of a trial, which he had made of the experiment of Dr. CROUNE, that water expands itſelf in a glaſs before any part of it be frozen; as alſo ſome obſervations on the freezing of oil of olives and oil of anniſeeds.

With regard to the freſhneſs of ſea-ice, Dr. AGLIONBY ſaid, that ſome parts of the ſea-water might be frozen, which are freſher than others, as in ſome places the bottom of the ſea has been found freſh.

Mr. HOOKE remarked, that this was not general, but cauſed in ſome particular places by accident: that capt. KNOX being to go to the Indies, might make trial of it, if one of the engines, formerly invented by himſelf for taking up water at the bottom of the ſea, were ordered to be made for the captain.

Dr. LISTER moved, that ſea-water might be ſent for; but obſerved, that wiches, if you take out of the bottom, are ſalter than at the top; and if they ſtand, grow ſalter and heavier.

Mr. HOOKE ſaid, that the ſea-ice being ſomething thawed before we had it, the ſalter part of the ice might be gone.

Dr. LISTER obſerved, that the freſhneſs of ice was no new remark, ſince BORRICHIUS had affirmed ſalt-water frozen to be freſh to the taſte.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at New-college Oxford, February 17, 168$\frac{3}{4}$[i], was read, tranſmitting a diſcourſe of Dr. NARCISSUS MARSH, Lord Biſhop of Ferns and Leighlin in Ireland, being an introductory Eſſay to the Doctrine of Sounds, containing ſome propoſals for the improvement of acouſtics[k], which had been preſented to the Dublin Society, November 12, 1683. This diſcourſe was referred to the next meeting.

An optical problem of WILLIAM MOLYNEUX, Eſq; ſecretary to the Dublin Society, ſent by Mr. MUSGRAVE to Mr. ASTON in a letter of February 9, 168$\frac{3}{4}$[l], was alſo read, and referred to Mr. HALLEY to be conſidered by him, and to give in a report of it at next meeting.

There was mentioned in Mr. MUSGRAVE's letter of February 17, 168$\frac{3}{4}$, an obſervation communicated to him, that a good quantity of iron ore is contained in ſea-coal, which appeared not only by its fuſion in a hot forge-fire, and the cinder lying protuberant and round at the bottom of the fire, as metals, that have been in fuſion, but by the cinders moving the needle more ſtrongly than ordinary ores, when they are calcined.

Dr. VINCENT ſhewed a ſort of golden talc, which Dr. LISTER had found

[i] Letter-book, vol. ix. p. 97.
[k] Ibid. p. 109. It is printed in the *Philoſ. Tranſact.* N°. 156. p. 472. for February 168$\frac{4}{5}$.
[l] Letter-book, vol. ix p. 96.

in ſeveral parts of England; and that it is this, which gives the gliſtering to the ventorino, which is accidentally made and found in the bottom of the glaſs furnaces at Venice; ſome of this talc being in the ſtone uſed for making glaſs, and falling to the bottom of the veſſel by reaſon of its weight.

Mr. HOOKE ſhewed ſome farther experiments concerning the phænomena of ice [m].

February 27, at a meeting of the COUNCIL were preſent,

Sir CYRIL WYCHE preſident

Dr. CROUNE	Mr. HILL
Dr. AGLIONBY	Mr. HALLEY
Dr. GREW	Mr. ASTON.
Dr. LISTER	

The books in the ſecretary's keeping were viewed, and found to be as follow:

Five books of minutes bound in leather, taken by Mr. OLDENBURG, beginning December 5, 1660, and ending May 24, 1677.

Three ſtitcht paper-books of minutes taken by Mr. HOOKE, beginning October 25, 1677, and ending February 23, 168$\frac{0}{1}$. Another bound book of Mr. HOOKE's minutes, about one fourth full, beginning March 2, 168$\frac{0}{1}$, and ending July 26, 1682.

One book of minutes current, taken moſtly by Mr. ASTON, beginning October 25, 1682, and coming down to the laſt meeting, February 20, 168$\frac{3}{4}$.

It was reſolved, that the minutes of Mr. HOOKE be written in books ſuiting with the reſt.

Five books bound in leather, containing regiſters of experiments entered by Mr. OLDENBURG; in the laſt of which books are about five leaves entered ſince his death.

One more regiſter-book current, begun by Mr ASTON.

Seven books of letters bound in leather, entered by Mr. OLDENBURG.

One more letter-book bound in leather, entered by Mr. ASTON.

Another letter-book current, bound in leather.

One book of minutes of the councils.

Another of the minutes current.

Three books of originals of the regiſter-books; two of them bound in paſte-board, and the other ordered to be ſo.

Several bundles of letters ſorted alphabetically.

Other bundles of papers, of which no account was taken.

Mr. WILLIAM MUSGRAVE was propoſed a candidate, and allowed.

Mr. HALLEY was deſired to bring in experiments at the meetings of the Society in the manner of a curator; and he was informed, that he ſhould be conſidered for

[m] There is no minute of this in the journal-book, vol vii. p. 210—213. but Mr. HOOKE's account of theſe experiments is entered in the regiſter, vol. vi. p. 154. and printed in his *Philoſ. Experiments and Obſervations*, p. 138.

it,

it, as others had been. He was desired to proceed first upon magnetism, which he promised to do.

At a meeting of the Society on the same day, Sir Cyril Wyche president in the chair:

Dr. Mapletoft presented to the Society the picture of William Harvey, M. D. for which Mr. Hill was desired to return him their thanks.

Mr. Haak presented the picture of professor Sturmius.

These two pictures were ordered to be hung up in the Society's meeting-room.

Dr. Aglionby having perused Mr. Boyle's *Memoirs for a Natural History of Human Blood*, delivered in an account thereof in writing, which was read.

The secretary read *An Introductory Essay to the Doctrine of Sounds* by the Lord Bishop of Ferns and Leighlin, member of the Dublin Society. It contained a curious comparison of the faculties of seeing and hearing in their different ways, as direct, refracted, and reflected vision and hearing; and also the various improvements of each by instruments and other contrivances already made, or probably to be made: together with a proposal of three desiderata or problems in acoustics:

1. *Sonum intendere quousque velis*; or *sonum ad datum gradum intendere.*
2. *Sonum extendere quousque velis*; or *datum sonum ad datam distantiam extendere seu propagare.*
3. *Sonum transire ab extremo ad extremum, et non per medium.*

It was accompanied with a figure of a semiplane of an acoustic or phonical sphere.

A paper of Dr. Lister on magnetism was read, as follows[n]:

"The magnetic philosophers agree upon this experiment, that if a drill be "used in the boring of iron, it will acquire a vigorous polarity. This I have "often observed, that if you take up any common drill used in a smith's shop; "where we will suppose no load-stone to have ever been; that it will, applied to "the needle, take the south end thereof, though the drill be held in any posture. "Also a simple iron or steel of the same shape changes its poles as oft as it is in-"verted; the end downwards being ever the north pole, as is observed in all the "iron bars of windows.

"This, I say, agrees with the doctrine of these philosophers, that nothing either "gives or receives a magnetism, but what is in its own nature truly magnetic, "and such is all iron only.

[n] Letter-book, Vol. ix. p. 140.

"But

" But it is ſaid again, that if a drill be uſed in the boring of braſs, it will " have its north pole in like manner fixed and determined. This I never tried or " obſerved; and becauſe I am therefore uncertain what to think of it, I therefore " recommend it to the Society to have it tried before them; whether braſs, that " is, the compounded metal of copper and lapis calaminaris (which is in part " iron-ſtone) will affect the drill: again that it may be tried, if that ſucceed, " whether alſo ſimple and pure copper will do the like. This I recommend to " be done before them.

" I ſhall now ſay what I have tried. I ordered Mr. HUNT to provide a new " drill; which he did: this drill was indifferent to either pole, but ſtill the end " downwards was the north pole: this north end, or drill end, which bites in " the boring, we touched with the north pole of a magnet, which immediately " gave it a ſouth pole. I then cauſed Mr. HUNT to work this drill in the boring " of iron, which he did ſoundly, until the end was very hot; and then having " applied it to the needle, it ſtill had its ſouth polarity, rather more vigorous " than altered or deſtroyed by drilling.

" Mr. HUNT then uſed the ſame drill in boring fine copper, long and much, " till it was again well heated; but all to no purpoſe; for it ſtill kept its ſouth " polarity, which the load-ſtone had given it.

" From theſe experiments I conclude, that the end on the bit of a drill is na- " turally a north pole, and that drilling or uſing it excites only the natural " and inherent virtue; but gives it no new polarity; and that a ſouth polarity " cannot be given to the bit of a drill by boring.

" 2. That if a ſouth pole be given to the bit of a drill by a magnetic touch, " that even drilling cannot take it away, or change it to a north: which (if true) " is a convincing argument, that drilling alone indifferently into any body (as " was affirmed) gives no new magnetiſms.

" 3. That if magnetic bodies, as iron and braſs, (which is in ſome meaſure " alſo a magnetic, as I ſhall ſome time ſhew) can affect no change upon a mag- " netically touched drill; much leſs can we expect, that glaſs or flint, or hard " wood ſhould do it: which I recommend again to farther trial, becauſe " Mr. HOOKE owned he could not make them ſucceed in private trials, accuſing " the too ſoft temper of the drill; and therefore he is deſired to order better " (if it can be) to be made, that we may not break off in uncertainties, but have " the experiments tried before us."

Dr. LISTER deſired, that this experiment might be tried before the Society, becauſe Mr. HOOKE conceived, that the ſoftneſs of the temper of drills hindered it from ſucceeding in ſome private trials, which he had made.

A letter of Mr. BEAUMONT of Whiteley-hall near Wakefield in Yorkſhire was read, mentioning, that the weather-glaſs upon Tueſday, February 5, $168\frac{3}{4}$, on which day the thaw began, was a 10th under 28, which was lower than he had ever ſeen it.

In

In a letter from Mr. GALE of Kighly in Craven in Yorkſhire to Dr. LISTER it was obſerved, that the weather-glaſs had ſtood at $\frac{3}{10}$ above changeable for a long time during the froſt till Monday, February 4, on which day it fell $\frac{5}{10}$; on the next day it fell $\frac{5}{10}$ more, and on the day after $\frac{5}{10}$ more, ſo that it was within $\frac{3}{10}$ of the loweſt line.

Mr. HOOKE remarked, that before the wind, which began the 7th at night, the quickſilver fell lower than it had been in ſeven years before: and that the wheel-barometer almoſt made a full turn in leſs than three days.

Upon queſtioning what was the higheſt riſe and loweſt fall of the quickſilver here, Mr. HAINES ſaid, that 28 and $\frac{4}{10}$ was as low as had been ordinarily obſerved here, and 30 inches and 2 or $\frac{3}{10}$ as high.

Mr. HALLEY reported, that he had read over Mr. MOLYNEUX's optical problem, which he approved of and thought, there were few now, that were not ſatisfied, that objects were ſeen with both eyes together, and not one alone.

The ſecretary was ordered to take a copy of this problem.

Dr. CROUNE delivered in an account of his experiments made on the dilatation of water by cold before it becomes ice, which was read and ordered to be regiſtered [o] as follows:

EXPERIMENT 1ſt.

" I filled a ſtrong bolt-head about half way up the ſtem with water, a day or " two before the great froſt went off, marking the place where the water ſtood; " and placing it in the ſnow on my leads, while I went to put ſome ſalt to the " ſnow, I found it above the mark ſo ſoon, that I thought the mark had ſlipt " down, which I preſently raiſed to the water, and as ſoon as ever I mixt " the ſalt with the ſnow, the water roſe very faſt, about $1\frac{1}{4}$ inch above it. I took " up then the glaſs and found the water all fluid ſtill: it was again ſet down in " the ſalt and ſnow, but when I came about an hour after to view it, the ball was " broke, and the water turned to hard ice, both in the ball and ſtem.

EXPERIMENT 2d.

" Upon mention of this experiment in the Society, Mr. HOOKE objected, " that it was the contraction of the glaſs, that raiſed the water, and that likewiſe " a quantity of the water in pouring in ſtuck to the ſides of the ſtem, which by " little and little falling helped to make the water riſe in it; therefore firſt ano- " ther bolt-head was taken, and put empty into a frigorific mixture of ſalt and " ice (for now the froſt and ſnow were juſt gone) that it might firſt ſhrink and " contract there as much as it could; likewiſe another bolt-head at the ſame time " was filled half way with water, and ſet in another veſſel of the ſame mixture, " and when it had roſe about two inches, and was thought near freezing, this

[o] Regiſter, vol. vi. p. 42.

" infri-

" infrigidated water was inſtantly poured into the firſt bolt-head to prevent ano-
" ther objection, that it might of itſelf have been ſo warm as to have relaxed
" again the empty glaſs when it was poured in; and alſo to cut off the
" other part of the former objection, that ſome part of the water poured in
" ſliding after down the ſides of the ſtem, might help to raiſe the water there,
" a long glaſs funnel was provided, that reached down to a mark ſet on the ſtem
" of the empty bolt-head, into which the water was to be poured: after all, the
" effect was, that the water began inſtantly to riſe as before, and when it was got
" up about $\frac{1}{4}$ of an inch, we took it out, to ſee if there were no ice, fearing it
" might have begun to freeze in the ball, but it was ſtill all fluid.

EXPERIMENT 3d.

" At the ſame time we put another very thin ball of glaſs with a long ſlender
" ſtem filled about three inches up the ſtem with tinged ſpirit of wine, and
" ſealed into the ſame veſſel of the frigorific mixture juſt by the former bolt-
" head, and all the while the water roſe in this, the ſpirit of wine fell in that.
" We broke off the top of the ſtem, and the ſpirit continued falling as it did be-
" fore when it was ſealed. It is to be obſerved, this ſlender bolt-head with the
" ſpirit of wine had not been placed before in any frigorific to ſhrink it, and
" therefore if the glaſs had at all ſhrunk with cold, the ſpirit of wine muſt needs
" have riſen.

EXPERIMENT 4th.

" And leſt it might be thought, that the ſpirit's warmth might keep the glaſs
" from ſhrinking in ſpite of the frigorific mixture, another juſt like it was
" filled to the ſame hight with ☿; and inſtead of riſing, it manifeſtly and ſud-
" denly fell the thickneſs of the packthread, which was tied about it for a mark,
" and its former protuberant ſurface was become hollow: and farther it would
" certainly have fallen (as Mr. BOYLE long ſince had ſeen) if the great relenting
" of the cold had not hindered it."

Dr. CROUNE ſaid, that the water continued to move in the neck of the glaſs four inches and a half, and never fell back again, as in the Florentine experiment; and that when it began to freeze, the ice ſhot from the ſides of the glaſs.

Mr. HALLEY remarked, that the Florentine experiment might be true as made in a warmer ſeaſon, the frigorific mixture being ſpent; and yet the glaſs being once ſhrunk here might not relax by reaſon of the ſharpneſs of the froſt.

Dr CROUNE ſaid, that the experiment was tried here in the froſt and after the thaw: that the Florentine experiment did not contradict him, though he could not find that aſſertion to be true, that the water ſhould fall below the place where it was at firſt.

The Society being ſenſible of their obligations to the Norfolk family, ordered, that the preſident, Sir JOSEPH WILLIAMSON, Sir ROBERT REDDING, Sir

THEODORE DE VAUX, Mr. EVELYN, &c. ſhould be deſired to wait upon the preſent duke of Norfolk [q], Earl Marſhal of England.

Mr. HOOKE ſhewed the way, which he took to examine the limits of heat and cold, that water will indure in the guiſe of a liquor, beyond which degrees, if the heat were increaſed, it turned to the ſpirituous body of air, and both by a kind of inſtantaneous ſtarting or fulmination; the one to a prodigious expanſion of ſome hundred of times its watery guiſe; but not ſo powerful ſuffering condenſation as well as air; the other only ſtarting about an eighth or ſeventh part, but ſo powerful, as to induce no compreſſing from almoſt the ſtrongeſt body. He examined then by weighing an iron ball in it, both when it was juſt freezing, and when it was juſt boiling; and by that he certainly found, that in the ſtate of water it was capable but of one thirtieth part of its bulk to be extended; that is, that the ſame quantity of water boiling hot, and ſo ready to turn into the form of air, was but a one and thirtieth part lighter than the ſame bulk of water, when it was ready to turn to ice.

He then tried ſeveral magnetical experiments about the quenching of red-hot rods of ſteel [r].

March 5, Sir CYRIL WYCHE preſident in the chair.

Some magnetical experiments having been appointed to be tried by Mr. HOOKE before the Society, the effect was as follows [s].

There were three drills made of ſteel, and well hardened, and then fitted with pulleys for drilling.

Each of theſe, before they were uſed, were examined by a ſmall magnetical needle in a box, to ſee, whether by their hardening they had acquired a fixed magnetical virtue, but by often repeated trials they were found not to have any ſuch virtue; but which end ſoever was downward attracted the ſouth end of the needle, and the upper end always attracted the north.

Each of theſe drills were ſeverally tried, one of them by drilling of braſs; a ſecond by drilling of copper; and a third by drilling of marble; in every one of which in the drilling the edged point of the drill was turned dipping towards the north.

Theſe drills being afterwards examined by the ſame needle in the box, they were found not to have any ſenſible polarity more than they had before the drilling; but which end ſoever of any one of them was turned downward,

[q] HENRY who ſucceeded his father HENRY, in his titles on the death of the latter January 11, 168¾.

[r] There is no entry of theſe two ſets of experiments of Mr. HOOKE in the journal of February 27, 168¾. but his account of them is regiſtered in the regiſter. vol. vi. p. 153.

[s] Ibid. p. 92.

that was found to attract the south end of the needle in the box, and to chace away the north; and which end soever was uppermost, had the contrary effect.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at New-college, Oxford, March 1, 1683/4 [d], was read, containing several queries concerning trees split with the frost [e]: An observation, that the water of a frozen pump opened by salt is not found serviceable as at other times, and will not bear soap as before: An account of the effects of calcining some okers; and of some other things communicated to the Philosophical Societies at Oxford and Dublin.

This letter was accompanied with a copy of a report of the Lord BURGHLEY, Lord High Treasurer to Queen ELIZABETH, concerning the examination of Dr. JOHN DEE, about the altering of the Calendar [f], taken from a manuscript of Dr. DEE in Corpus Christi-college at Oxford; together with the reflections of Mr. JOHN GREAVES upon that report [g].

A letter of Monsr. JUSTEL to Mr. ASTON, dated February 3, 1683/4 [h], was read, giving an account of the philosophical occurrences at Paris, and Monsr. THEVENOT's opinion of ice being fresh above, and salt underneath.

Sir ROBERT SOUTHWELL gave in a paper communicated by Mr. EDWARD RANDOLPH concerning the effect of a thunder-clap on the compasses of a ship on the coast of New-England [i]: The north poles of several compasses were changed south, and always continued so. The north pole of one compas was turned west, but lost its virtue in some time after.

Sir ROBERT SOUTHWELL was desired to procure such particulars, as were to be had relating to that account.

March 12, Sir CYRIL WYCHE president in the chair.

The president gave an account, that himself and the other members deputed by the meeting of the Society of February 27, had been to wait upon the Duke of Norfolk in the Society's name: That the Duke had received them very kindly, and said some words to this effect, "That he was sorry, that his father had prevented "him in presenting to them the Norfolk library, because he had taken from him "the opportunity of doing it himself."

A letter from Sir ROBERT SOUTHWELL to Mr. ASTON, dated at London March 8, 1683/4 [k] concerning the information, which had been given at the last meeting, about several compasses in a ship having had their poles changed from north to south by a thunder storm.

[d] Letter-book, Vol. ix. p 131.
[e] See Philosophical Transactions, N° 165. p. 766, 767.
[f] Letter-book, vol. ix. p. 133. It is printed in the Philosoph. Transf. N° 257, for October 1699.
[g] Letter-book, vol. ix. p. 135. It is printed in the Philosoph. Transf. *ubi supra*, p. 356.
[h] Letter-book, vol. ix. p. 128.
[i] Ibid. p. 129. It is printed in the Philosoph. Transf. N° 157. p. 520.
[k] Ibid. p. 139. It is printed in the Philosoph. Transf. N° 157. p. 521.

Mr.

Mr. HENSHAW queried, whether any uſe of gunpowder would change the polarity of a needle; and ſaid, that fire or ſulphureous matter often fell with thunder.

It was alſo queried, whether pulvis fulminans would have any effect on the needle.

Mr. WILLIAM MUSGRAVE of Oxford having been approved of by the council, was propoſed candidate by Mr. ASTON.

The ſecretary preſented from Dr. [1] LISTER two ſchemes of the ſands and clays in England, as he had obſerved them ſeveral years before; together with an introductory diſcourſe, recommending the uſe of a ſoil or mineral map, repreſenting the principal ſoils, which are naturally found, and moſt obvious in ſeveral parts of the country [m].

In this diſcourſe ſome reaſons were offered, why ſand might have formerly been the moſt exterior and general cover of that ſurface of the earth, from ſeveral places whereof it has been ſince waſhed away, and differently bedded, et only on the ſea-ſhore and bars of rivers, but likewiſe in places under ground.

The characters of ſand were repreſented by Dr. LISTER to be durableneſs and hardneſs, as being compoſed of ſmall tranſparent pebble, an unalterableneſs by fire, as the Italian jarſo; which, he ſaid, might be abundantly ſupplied from ſeveral parts of England.

The clays he ſuppoſed to be another more inward cover or coat of the terreſtrial globe. This mixed with ſand is uſually called earth, tho' earth, as it is in the ſurface, has uſually with it a mixture of the rotten parts of plants and animals.

Mr. HOOKE examined ſeveral drills, ſome of which had been long uſed in ſhips. The bit was a ſtrong north pole; the ſhank of ſome drew indifferently both poles of a needle very weakly.

Mr. PAGET remarked, that he had a drill, the bit of which was a ſtrong ſouth pole.

March 19, Sir CYRIL WYCHE peſident in the chair.

Mr. MUSGRAVE was elected fellow.

Upon the mentioning in the minutes of Dr. LISTER's ſchemes of ſands and clays, he remarked, that they were drawn up in a method, which he had propoſed himſelf ſeveral years before; but that they were capable of farther improvement: That

[1] He was created Dr. of phyſic by the univerſity of Oxford, March 5, 168¾. WOOD *Faſti Oxon.* vol. ii. fol. 224.

[m] Printed in the Philoſoph. Tranſ. N° 164. p. 739. It is inſerted in the Regiſter, vol. vi. p. 55.

they contained a general character, together with one or two notes or diſtinguiſhing marks for every particular.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at New-college, Oxford, March 15, 1683/4[n], was read, mentioning *Alumen plumoſum*, or ſalamander's wool to be ſeparated from the earthy parts by calcining and powdering: That Dr. PLOT had ſent his queries about the ſplitting of trees by the late froſt into ſeveral countries: That it had been queried at the Philoſophical Society at Oxford, whether any trees beſides oaks had been ſplit by that froſt: And that great quantities of dead congers had been caſt up by the ſea at Dun-church wall along the coaſt of Kent during that froſt, as had happenned at the ſame place about eight years before, and on the Severn ſhore in Somerſetſhire twenty-ſix years before.

Dr. LISTER obſerved, that congers were often caſt up dead in Lincolnſhire, ſeldom ſeen alive, as being a high-ſea fiſh, and therefore little eaten.

Mr. HOOKE remarked, that they were taken in pots off the Iſle of Wight, and the Scilly iſlands.

Mr. HOOKE ſhewed how a piece of iron heated red-hot drew the ſouth pole of a needle more ſtrongly than if it were cool, and repelled the north pole: And that the end of a piece of iron quenched downwards was a ſtrong north pole; and quenched upwards a ſouth pole.

Mr. PAGET declared, that he had ſome ſteel, which being cooled in the air drew more vigorouſly than if it had been quenched in water; but being cooled in moiſt clay drew more than when cooled in the air.

As to the poſition of the iron to give it a polarity, he ſaid, that iron cooled in the poſition of the dipping needle was more vigorous, than if it were held perpendicular or horizontal:

That iron cooled in the magnetical eaſt and weſt had an abſolutely indifferency to either pole, there remaining nothing but the magnetiſm of the iron, as to the length of it: as to the breadth, he could not ſay what there was: That he thought, that a piece of iron of a foot long, by heating and cooling differently the ends, might be made two north poles, one at each end.

He was deſired to put down in writing what he had obſerved on this ſubject.

Upon the obſerving the attractiveneſs of hot iron, it was queried, whether the ſame thing might not be done with a wood coal? But trial being made of it, it did not appear to be ſo.

Theſe trials being made upon a needle horizontally placed, Mr. PAGET conceived that poſition alone not to be exact enough for magnetical experiments.

[n] Letter-book, vol. ix. p. 148.

Upon.

Upon a query, whether iron red hot would retain the touch of a magnet?

Dr. LISTER cauſed an iron to be heated red-hot, and then touched it with the north pole of a magnet: but the iron received no virtue from it. He then touched an iron growing cold, and it was a good ſouth pole.

Mr. HOOKE declared, how he had taken half an iron ring, and quenched it perpendicularly with the ends downward; and that the ends were two weak north poles, and the middle a weak ſouth pole.

It being deſired to know what effect gunpowder would have on a needle, there was a needle in its box placed on the floor, and ſhot upon with a ſmall gun charged with powder; but the needle was not altered in its polarity.

A needle was alſo placed ſo, as to receive the action of pulvis fulminans; but could not be found afterwards.

Dr. LISTER remarked, that this experiment did not come to the point of altering a compaſs by lightning; for though all ſulphur, and conſequently lightning, comes from pyrites, yet very few pyrites are loadſtones, and lightning is magnetical.

Sir JOHN HOSKYNS deſired, that it might be inquired of Mr. HENSHAW, how he had ſaid a loadſtone might be roaſted, and afterwards put into water, ſo as to omit a ſubſtance, whereby the water becomes black, and as it were full of hairs, the loadſtone remaining afterwards effete, and of no virtue.

The experiments appointed for the next meeting were about drills; a note whereof was delivered to Mr. HUNT to be put up in the repoſitory.

The account drawn up by Mr. HOOKE of his magnetical experiments tried with ſeveral rods of ſteel without touching them on the loadſtone, as exhibited at this and three preceding meetings of the Society, was as follows *.

"I ſhewed the way I took to examine the limits of heat and cold, that water "ſhould indure in the guiſe of a liquor, beyond which degrees if the cold was "increaſed, it turned to the ſolid body of ice; if the heat was increaſed, it turned "to the ſpirituous body of air, and both by a kind of inſtantaneous ſtarting or "fulmination, the one to a prodigious expanſion of ſome hundred of times its "watery guiſe, but not ſo powerful, ſuffering condenſation as well as air, the other "only ſtarting about an 8th or 7th part, but ſo powerful as to indure no com-"preſſion from almoſt theſtrongeſt body. I examined then by weighing an iron "ball in it, both when it was juſt freezing, and when it was juſt boiling; and "by that I certainly found, that in the ſtate of water it was capable but of one "thirthieth part of its bulk to be extended; that is, that the ſame quantity of "water boiling hot, and ſo ready to turn into the form of air, was but a one and

* Regiſter, Vol. vi. p. 158.

" thirtieth part lighter than the ſame bulk of water when it was ready to turn to " ice. After which I tried ſeveral magnetical experiments about the quenching " of red hot rods of ſteel: as I did alſo March the 5th, 12th and 19th, the ac- " count of which follows:

" Magnetical experiments tried with ſeveral rods of ſteel without touching " them on the loadſtone.

" They were of three ſorts, 1ſt, on rods heated; 2d, on rods quenched; 3d, " on rods hammered.

" Firſt, I found, that ſmall rods of ſteel about $\frac{1}{5}$ of an inch ſquare, and ſix or " eight inches long being heated red hot in a fire were much more receptive and " communicative of the magnetical virtue of the earth than the ſame when cold; " that is being held perpendicular, or rather in the true dipping poſture, the mag- " netical virtue did more powerfully actuate a needle, the lower end attracting " the ſouth, and the upper end the north part of a magnetical needle applied " near to either of them; and that the ſame rod red hot being inverted performed " the ſame effect. And that the virtue continued of the ſame nature, though " more weak, when they were grown cold.

" 2. That a polarity acquired by hammering or drilling would be deſtroyed " by a heating of the rod all over red hot; and when ſuffered to become cold, " they retained the ſame indifferency without their former determined polarity.

" 3. That heat abſtracted from ſteel was not the cauſe of this effect, for that " a red hot tobacco pipe heated and applied in the ſame manner had not ſuch " effect, nor burning wood coals, nor the flame of a candle applied very near.

" 4. That I heated one of thoſe rods red hot, after it had been touched by the " magnet, and ſo had a ſtrong polarity, which would be whilſt red hot reduced " to its natural indifferency, and the lower end would attract the ſouth end of " the needle, and the upper, the north; and this indifferency it did retain when " cold, being ſuffered to cool leiſurely.

" 5. That I found the magnet did as powerfully attract and hold the rod when " red hot as when cold.

" Secondly, I found, that theſe rods of ſteel being heated red hot, and then quench- " ed in a perpendicular poſture, or in the poſture proper for the dipping needle, " the lower end, which was the quenched end, would acquire a polarity, and attract " the ſouth end of the needle; but the other end of the rod ſeemed almoſt indiffe- " rent to either pole, when inverted and turned downwards; but the quenched end, " though it were turned upwards, would attract the ſouth end of the needle.

" Next I took a veſſel full of water, the bottom of which was nothing but a " thin piece of parchment: then I heated a rod of ſteel, and when glowing hot I " run the upper end of it placed in the dipping poſture through the parchment " bottom into the water, and thereby hardened the upper end of the rod; then " I applied a needle to it, and found, that the quenched end had acquired a pola- " rity, and attracted the north end of the needle, whether it were held upwards or " downwards, but the other end ſeemed to have acquired not near ſo much, but

" ſeemed

" ſeemed almoſt indifferent, in attracting the ſouth when held downwards, and " the north when held upwards.

" 3. I heated one of theſe rods of ſteel glowing hot, and through the parch- " ment now made the ſide of the veſſel, I run it into the water directly point- " ing towards the eaſt in a horizontal poſture, to ſee whether the quenching " of the end abſtractedly conſidered, as ſudden cooling, would give any polarity " to it; but I found, that the quenched end had now no more virtue or polarity " than the other end, but the rod remained indifferent in both its ends; that " which was downwards attracted the ſouth, that which was upwards attracted " the north.

" 4. I heated the rod again glowing hot, and quenching it flat ways in " the water as near as I could in the eaſt and weſt poſture; and examining the " ſame by a needle, I found it had not acquired any fixed polarity at either end, " but each of them remained indifferent.

" 4. I heated a rod of ſteel as before, glowing hot, and quenched it with " an inclination in the plane of the meridian at right angles with the dipping line, " and examining it by the needle I found, that neither the quenched end nor the " other had acquired any fixed polarity, but remained indifferent as before.

" Thirdly, I tried ſeveral rods of ſteel, which had been thoroughly heated, and " then ſuffered it to cool leiſurely, lying eaſt and weſt, and having found them " indifferent without polarity, I put one of them in the poſture of the dipping " needle pretty near the plane of the meridian: I hammered it at the upper end " with a hammer, the lower end reſting in a hole in an anvil: then examining " it with a needle, I found, that both its ends had acquired a pretty ſenſible pola- " rity; the under end a north, and the upper end a ſouth; but the upper end " ſeemed ſomewhat the ſtronger.

" 2. I inverted the rod by turning the north end upwards and the ſouth " end downwards, and hammering it in this dipping poſture a good while, I " found, that it had acquired a quite contrary polarity to what it had before; that " end, which was before the north end, being now the ſouth, and the ſouth end " was now the north.

" 3. I took another rod of ſteel, which was indifferent, and having plac- " ed an anvil ſo, that the upper face of it reſpected the north with an inclina- " tion pretty near the poſture of the dipping needle, I laid the rod upon the ſame " pretty near in the plain of the meridian, and then hammered the middle of the " ſaid rod with a hammer for a good while, and examining the rod afterwards " with a needle, I found the rod had acquired a polarity, the lower end a north, " and the upper end a ſouth.

" 4. I hammered another rod of ſteel at right angles to the former poſition, " the ends thereof reſpecting the eaſt and weſt; and I found after this hammer- " ing, that neither end had acquired any fixed polarity, but they both ſeemed to " remain indifferent as before."

March 26, Sir CYRIL WYCHE preſident in the chair.

Upon mentioning in the minutes the ſplitting of trees, the preſident remarked,

that he had been informed by the Lord Weymouth, that the ſplitting began at the root.

Mr. HENSHAW ſuppoſed, that the reaſon of that might be becauſe the root contains a great deal of juice. which upon the freezing might cauſe the tree firſt to ſplit.

Mr. PAYNE ſaid, that at Croyden there ran many pails full of water from trees, that had been ſplit with the froſt.

Sir. ROBERT SOUTHWELL obſerved, that ſeveral of the trees, which had been ſplit, grew together again, and cloſed ſo, that then the chinks and clefts were ſcarce diſcernible.

With reſpect to the water running out of the trees, Mr. HENSHAW ſaid, that the moiſture lying at the bottom of the tree might be preſſed and forced out by the froſt.

It was deſired, that Mr. PAGET would try, whether he could make two north poles in a bar of ſteel.

Mr. HENSHAW queried, whether iron heated till it is red hot, and cooled in a right poſition, would not acquire a polarity, as well as when heated with fire.

He likewiſe, in anſwer to a query at the laſt meeting, obſerved, that to take away the virtue of a loadſtone, it muſt be made red hot, and then quenched in water and vinegar.

A letter from WILLIAM MOLYNEUX, Eſq; ſecretary to the ſociety at Dublin, to Mr. ASTON, dated at Dublin March 15, $168\frac{3}{4}$ [p]. was read, accompanying the minutes of that Society from Feb. 10 to March 10, $168\frac{3}{4}$ [q], in which ſeveral conſiderable ſubjects were handled, the particulars of ſome of which Mr. ASTON was ordered to deſire to be communicated. The minutes were as follow :

" Mr. WILLIAM MOLYNEUX diſcourſed of teleſcopic ſights, as adapted to " aſtronomical and other inſtruments; wherein he ſhewed their convenience and " manner of performance from the principles of dioptric, and alſo demonſtrated " their exactneſs, being chiefly induced thereto, becauſe the ingenious Mr. " HOOKE in his animadverſions on HEVELIUS's ouranography, had omitted the " chief objection HEVELIUS makes againſt theſe kind of ſights, p. 296, of his " firſt *Mich. Celeſt.* wherein HEVELIUS imagines that the line of * * * * * is " no longer than between the eye and croſs hairs; whereas 'tis plain, that 'tis as " long as between the object glaſs and croſs hairs.

" Mr. KING propoſed ſome queries relating to the acceleration of deſcending " weights and force of percuſſion, particularly a given weight A being in one

[p] Letter-book, vol. ix. p. 147. [q] Ibid. p. 143.

" ſcale,

" ſcale, and a weight B being given, it is required to determine the higth from " whence B falling ſhall raiſe A.. Diſcourſe upon theſe took up the whole time " of our meeting.

" *February* 18, 168$\frac{3}{4}$, Mr. BAYNARD began a diſcourſe (which he deſigns to " continue) concerning the inſtruction of youth for the univerſities. Ordered, " that Sir WILLIAM PETTY bring in a ſcheme of experiments to be made with " the magnet. Mr. PATTERSON is alſo to bring in at our next meeting his ob- " ſervations in the laſt diſſection of the malefactor.

" *February* 25, 168$\frac{3}{4}$, The Biſhop of Ferns produced a paper of queries re- " lating to the loadſtone; but not having finiſhed them, his Lordſhip was de- " ſired to bring them complete at our next meeting.

" Dr. MULLEN produced the ear of a calf, in the drum of which he diſcovered " ſome cavities not taken notice of by the anatomiſts of that part: he likewiſe " explained how the malleus, incus and ſtapes by means of a ſmall muſcle braced " the tympanum. Mr. PATTERSON gave an account of what he obſerved re- " markable in the late diſſected malefactor; the chief of which were a very firm " coheſion between the diaphragm and all the upper convex ſide of the liver; " the right ſpermatic vein ariſing out of the emulgent vein, and ſo likewiſe the " left from the left emulgent vein: the latter is natural, the former unuſual; an " unuſual depreſſure in the inſide of the ſcull. He could not diſcover PYERUS's " glandules in the guts.

" *March* 3, 168$\frac{3}{4}$. The Biſhop of Ferns proceeded in his queries relating to " the magnet. Dr. MULLEN expoſed ſome experiments about the magnet, " which he was ordered to put in writing, that they may be regiſtered. He alſo " diſcourſed of ſome diſcoveries in the ear of a pullet, ſurmiſing, that it wants the " incus and ſtapes; but that a muſcle and the malleus performs their office: " likewiſe, that there are two communications between the two ears, one over, " the other under the brain: alſo, that on the outſide of the ear there is a ſort of " valve to make the paſſage cloſer or wider. Mr. BULKLEY gave an account of " ſome experiments made by him on venal and arterial blood; as alſo of ſome " obſervations made on a diſſected dog; likewiſe ſome experiments of percolation, " all which are regiſtered.

" *March* 10, 168$\frac{3}{4}$, A letter from Mr. ASTON, S.R.S. was read, which con- " tained ſome experiments lately made before the Royal Society. Ordered, that the " thanks of this Society be returned to him for the favour of his correſpondence, " and that he would be pleaſed to offer our humble ſervice to the Royal Society, " intreating their favour and good-will towards us. He is likewiſe deſired to " let us know in ſhort the reſult of what was offered in explaining thoſe two ſur- " priſing phænomena of the mercurial barometer, viz. Its little or no variation " about the line, and the fluttering of the quickſilver at its loweſt ebbs in ſtormy " weather in England.

" A letter from Mr. MUSGRAVE was read, containing the minutes of the Oxford Society. Ordered, That the thanks of this Society be returned them for the favour of their correſpondence: and that they be deſired to tranſmit to us Dr. LISTER's compendious way of obſerving the barometer, if come to their hands. Ordered, that Dr. HUNTINGTON give an account of the porphyry pillars in Ægypt, that accordingly it may be tranſmitted to the Oxford Society. Mr. MOLYNEUX gave an account of the petrifying quality of Lough Neagh (which is regiſtered) and was ordered to tranſmit it to the Oxford Society. It was aſſerted likewiſe, that the water of Lough Neagh cures the ulcers of the King's evil.

" A letter from Dr. PLOT to Dr. HUNTINGTON was read, wherein the Doctor is pleaſed to promiſe, that he will procure for this Society all the duplicates, that can be ſpared from among the rarities of the Royal Society's Repoſitory and *Muſeum Aſhmolianum* at Oxford. Ordered, that the moſt humble thanks of this Society be returned to Dr. PLOT for his generous promiſe; and that our grateful acknowledgments be returned to the ſaid Society, for the favour they are pleaſed to ſhew us therein.

" Dr. MULLEN gave an account of ſome magnetical experiments he had lately made, which are regiſtered. Mr. FOLEY gave an account of ſome experiments he had made on beans, in relation to their texture and vegetation, after Dr. GREW's method. This is regiſtered. He likewiſe produced a pretty figurate ſtone, found in the chapel yard of the college. And expoſed a pot, wherein were ſeen the curious ſhootings of ſalt of vitriol into various regular figures, as triangular, quadrilateral and pentagonal.

" Mr. BULKLEY produced the honourable Mr. BOYLE's book of human blood, and read the heads of it, promiſing to try ſome of the experiments therein mentioned, and not yet tried.

" Mr. PATTERSON gave an account of ſome very obſervables in the body of a young man twenty years of age, who died of the ſtone in the bladder, and was opened by him. This was regiſtered. The ſtone he took out of him was of an oval figure, three inches round, and above an inch and an half long; half of it was of a white and ſpungy conſiſtence, the other half of a red and more ſolid body. He was ordered to try ſome experiments on the ſtone, and report them. Some diſcourſe paſſed concerning the keeping a diary of the weather, which was looked upon by Sir WILLIAM PETTY as very difficult to perform, ſo as to make it uſeful and inſtructive without a great apparatus of barometers, thermometers, hygroſcopes, inſtruments for telling the point of the wind, the force of the wind, the quantity of rain that falls, the times of the ſun's ſhining and being overcaſt. As to the common thermometers, of ſpirits and hygroſcopes of oat beards, wooden planks, &c. hitherto invented; it was objected, that they loſe their quality by keeping; and that they are not conſtant ſtandards; and if we have new ones every year, we can make no eſtimate of the weather by them, in relation to what was obſerved by others laſt year."

With

With regard to Sir WILLIAM PETTY's experiments relating to land-carriage, he was ſaid by Sir JOHN HOSKYNS to have lately made above twenty new models for ſhip-building.

As to waters curing the ulcers of the King's evil, Dr. LISTER ſaid, that the antients had ſcarce any medicines to cure that diſeaſe, wherein the pyrites was not one ingredient, which works upon an open ulcer by way of cauſtic.

With regard to the ſhooting of ſalt of vitriol into ſeveral regular figures, as triangular, quadrangular, and pentangular, Dr. LISTER diſtinguiſhed the growing of ſalt and its cryſtallizing. The cryſtals were of determinate figures; but ſalts, according to their growth and age, will have ſeveral figured cryſtals, till they come to their full growth. This growth of ſalt is never under water, being waſhed off as faſt as it grows.

Mr. HOOKE ſaid, that ſnow had a growth like a plant; that he had obſerved it in ſtems with branches and leaves like that of a trefoil.

Dr. GREW remarked, that ſnow had a reſemblance of plants, as a mallow-flower, a ſpike of lavender, and ſeveral others; but he attributed that growing to the froſt.

Mr. HOOKE agreed, that it was not a vegetation, but an accretion.

Dr. LISTER preſented to the Society a ſpunge-coral, hollow about a foot long, found 100 fathom under water, upon the coaſt of Norway, and taken up with the deep ſea-line. It was at firſt as thick as his arm and ſoft, but now ſhrunk as it is.

As to the inconſtancy of the ſtandards of heat and moiſture, as ſpirits, oat-beards, wooden planks, &c. the two laſt were looked upon as moſt alterable by time.

Mr. HOOKE ſaid, that oaken-boards might continue an hundred years.

Sir JOHN HOSKYNS ſaid, that by the ſound of the ſtring of a croſs-bow, it might be known for forty years together, whether the air were altered.

Dr. LISTER remarked, that oak might probably have a life in it after an hundred years, becauſe muſhrooms grow on it, after it has been felled many years, all ſorts of plants having their own muſhrooms, he having formerly diſtinguiſhed at leaſt twenty ſeven ſpecies of them.

Mr. HOOKE obſerved, that there had been ſome hundreds of ſpecies mentioned, and that there was no doubt of their having ſeed.

Dr. GREW ſaid, that Dr. MERRET affirmed, that he had the ſeed of ſome muſhrooms.

Muſhrooms being mentioned to grow from poplar chopt, and from ſome Italian ſtones, the truth of this was much queſtioned.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at New-college, Oxford, March 19, 168¾[a], was read, mentioning, that it had been queried at the philoſophical Society there, in what ſenſe the word *unalterableneſs*, uſed by Dr. LISTER in his characteriſtic of ſand, is to be underſtood, ſince ſand may be melted down into glaſs.

It was anſwered by Dr. LISTER, that ſand is not naturally alterable as to the weather, becauſe of its hardneſs above any other foſſile in England: that an Engliſh pebble was as hard as porphyry, and as fit for grinding colours, if it were not too little: and that no tool will touch it but a wheel and emery.

Mr. MUSGRAVE's letter mentioned likewiſe, that Iriſh ſlate was not affected by the magnet after four hours calcination, but became a yellow oker, and would ſcore like it: that it very much reſembled the ſediment found at the bottom of Aſtrop, Tunbridge, &c. waters commonly eſteemed vitriolic: and that an infuſion of this ſlate made with common water will turn galls to a faint reddiſh colour.

Dr. LISTER obſerved, that ſome ſlate would require twelve or twenty four hours before it were ſufficiently calcined to make it apply to the magnet.

Upon mentioning the miſtake committed by the Italians in making our glaſſes with flint, inſtead of tarſo, Dr. LISTER remarked, that our flint is a lime-ſtone, and makes the glaſſes fly; and that there is no true flint in the Northern mountains of England, whatever had been ſaid by Mr. WEBSTER to the contrary.

Sir JOHN HOSKYNS obſerved, that he had brought the cuogolo into England, which he found to be a white pebble.

The making of glaſs being farther diſcourſed of, Mr. HOOKE ſaid, that manganeſe is iron ore.

Dr. LISTER ſaid, that it is called magneſia from magnes, the load-ſtone: that any iron ore will do it: that it takes away the foulneſs of glaſs: that the Romans not knowing it, their glaſs and urns are therefore all of a different colour from our modern glaſs: and that it had been lately found on Mendip hills.

Mr. HOOKE remarked, that the Roman glaſs hath this colour by age, becauſe the glaſs in old abbies ſeemed to be of the ſame colour.

Dr. LISTER remarked, that that glaſs had been nealed.

[a] Letter-book, Vol. ix. p. 149.

Mr. HENSHAW obſerved, that ſalts are uſed in glaſs only to flux it, and that if they are not afterwards ſeparated, they cauſe a crizoling.

Dr. LISTER mentioned, that jet for glaſs-painting is made of litharge and pebble.

Mr. HOOKE ſaid, that it might be made by lead alone, but that it is very troubleſome, running through all the pots.

The experiments were about changing the polarity of an iron by knocking the ends.

April 2, at a meeting of the COUNCIL were preſent,

Sir CYRIL WYCHE preſident

Sir JOHN HOSKYNS	Dr. CROUNE
Sir ROBERT REDDING	Mr. FLAMSTEAD
Dr. BROWN	Mr. HALLEY
Dr. LISTER	Mr. ASTON.

It was ordered, that Mr. HOOKE be deſired to put into writing a deſcription of the weather-clock and all its parts; and that it be delivered to the ſecretaty to be entered in the regiſter-book:

That Mr. HOOKE give his directions and aſſiſtance to Mr. HUNT, to reduce into writing ſome of the firſt papers marked by the weather-clock, that thereby the Society might have a ſpecimen of the weather-clock's performances before they proceed to the repairing it.

Mr. FLAMSTEAD deſired, that the journal-book in 1682 might be altered as to ſome expreſſions reflecting upon him entered by Mr. HOOKE.

It was referred to another time.

It was ordered, that Mr. WICKS ſhould before every meeting of the Society be ready to take out two or three of the books in the ſecretary's keeping, whereof the laſt journal ſhould always be one, to be expoſed in the room during the meeting: and that he take care of them ſo as to deliver them into the ſecretary's hands after every meeting is ended.

LEWIS VAN HAMMEN, M. D. of Dantzick was propoſed by Dr. BROWN.

Upon a propoſal made to the council, that Dr. DENIS PAPIN was willing to execute the office of a temporary curator, by bringing in at every meeting experiments during a whole year to end at that time twelve-months, and to aſſiſt the ſecretary, if it be required; it was ordered, that Dr. PAPIN ſhould have thirty pounds *per ann.* paid him by the treaſurer upon the foregoing conſiderations.

At

At a meeting of the SOCIETY on the ſame day, Sir CYRIL WYCHE preſident in the chair.

Dr. VINCENT obſerved, that beating an iron in the middle takes away the polarity of the ends. It was ordered to be tried immediately.

Upon mentioning the growing of ſalts in the air, Mr. HENSHAW queried, whether they did not take ſomething nitrous out of the air.

Dr. LISTER ſaid, that ſalts were fed as plants are, which grow upon the earth.

Mr. HOOKE mentioned the ſhooting of ice near a mixen, and urine on the ſide of a glaſs (filled with ſnow and ſalt) in hexangular figures.

Upon mentioning corals and the ſeveral ſorts of them, Dr. LISTER ſaid, that ſome trees or rocks of them in the Weſt-Indies were ſo hard as to ſplit a ſhip; particularly one, that accompanied the Lord VAUGHAN to Jamaica; the greateſt part of the men of the ſhip being afterwards ſaved upon the ſame rock till they could be relieved.

Upon mentioning the ſeeds of muſhrooms, it was ſaid, that muſhrooms upon trees might be the matrixes of inſects, and not come from a ſeed of their own.

Mr. HOOKE thought, that they had ſeed; and it was inſtanced in the filex kind, which was formerly thought to be without ſeed.

Mr. HENSHAW ſaid, that muſhrooms were obſerved to grow moſt in places where ſheep go, and on the borders of muck-heaps.

He remarked likewiſe, that ſtar-ſlime is found where cattle go, as conceived to come from the females.

Dr. LISTER conceived, that ſtar-ſlime is nothing but frogs diſſolved and putrified in the air, being taken out of the water in the winter-time by the crows, and loſt upon the ground; and he obſerved, that he had often found the bones of frogs in them.

He remarked, that fairy-circles were made by the moles running round after one another under-ground in a circle, at the time of their coupling, not unlike bucks going round the females in the time that they rut.

Mr. HOOKE obſerved, that he had ſeen ſuch circles on chalky hills, where he thought there was not ground enough for the moles to hide themſelves.

Upon mentioning the unalterableneſs of ſand, Sir JOHN HOSKYNS ſaid, that there was ſuch a ſort of durable ſand-ſtone found on the mountains near Dartmouth of the ſame kind with the cuogolo.

Dr.

Dr. LISTER obſerved, that the Romans made uſe of that ſtone for door-poſts, altars, and places expoſed much to the weather: that the pyramids of Borough-bridge were of it, but were ſomething channelled or waſhed with the water.

Upon mentioning the difference of glaſs-urns from modern glaſs, Mr. HOOKE conceived, that they were altered by lying.

The urn given by Sir CHRISTOPHER WREN being called for and viewed, was found very ſmooth, but in ſome places had a bluiſh ſhining.

Mr. HOOKE obſerved, that this was a ſign of its readineſs to ſcale: that he had formerly ſeen ſeveral ſcales, that came out of it: and that Sir CHRISTOPHER WREN thought, that the mark of the puntillion might be fallen off with the ſcurf.

Mr. HENSHAW ſaid, that colours on glaſſes, like pigeons necks, were often cauſed by volatile ſalts.

Dr. LISTER thought, that the Romans might make their glaſſes in a different manner, ſo as not to ſhew the mark of the puntillion.

Dr. PAPIN mentioned, that at Maran a glaſs blown was often claſpt at the other end with four irons, and ſo finiſhed.

Dr. LISTER obſerved, that there was a man living at York as ſkilful in glaſs-painting, as any, in his opinion, had been in former ages.

A paper of queries concerning the ſplitting of trees, ſent by Dr. PLOT to the Lord Viſcount Weymouth, and his Lordſhip's anſwers to them, were read, and ordered to be regiſtered [b]; as follow:

1. "Whether other ſorts of trees were ſplit beſides oaks?
Anſ. "Elm and aſh; Mr. LANGLEY's the miniſter of Tamworth's elms by "his houſe; and POTTER a wheel-wright in Wigington, who had bought a con-"ſiderable parcel of aſh, and had felled ſome before the froſt, affirms, that thoſe, "which were felled, as well as thoſe ſtanding, were many of them ſplit.

2. "Whether any did ſplit with a noiſe?
Anſ. "In many places with great cracks, as in Bramcott wood Mr. WAG-"STAFF's ſon coming through it was ſo affrighted, that he thought the trees "were all falling, the noiſe of the cracks were ſo great.

3. "Whether the trees did ſplit towards the ſame point of the compaſs.
Anſ. "They ſplit on all points of the compaſs, for in Drayton park and "walks I ſaw ſeveral, that were ſplit, ſome in two, ſome three, ſome four places "in every quarter of the trees.

[b] Regiſter, vol. vi. p. 104.

4. "Whe-

4. " Whether the ſplitting were common in the trunk or in the boughs ?
Anſ. " In the trunk altogether; not any bough ſplit.

5. " Whether any ice be found ſince, in the veſſels of wood ?
Anſ. " Not any I can hear of.

6. " Whether the trees ſplit be any of them dead ?
Anſ. " That is not diſcernible, for all things look now as in the hard time of " the froſt; but I verily believe they art not dead.

7. " Whether any of the trees ſplit have cloſed ſince ?
Anſ. " Very much cloſed, and I believe the barks will cement again; but ne- " ver the tree itſelf.

8. " Whether they art ſplit through or only on one ſide ?
Anſ. " They were many (as I have ſaid before to the 3d query) on all ſides, " but whether through or not is uncertain, though it is believed the crack is to " the heart.

9. " Whether the bark by ſplitting be looſened from the wood ?
Anſ. " Not the leaſt.

10. " Whether the roots be any way affected as well as the body of the " trees ?
Anſ. " The great ſpruns of many trees, ſome are ſplit as well as the trunk of " the trees, and that of old trees, that are knotted and nurled, which was impoſſi- " ble to be cloven by wedges; headed trees were ſplit as well as clear timber " trees ?

" Mr. ANTROBUS, ſcoolmaſter of Tamworth, diſcourſing lately with an Hun- " garian, did queſtion him, if it were uſual in their country in hard froſts, to have " the timber crack: he did affirm it to be uſual, and that they all did cloſe again, " and that the timber was not the worſe, but we credit not the laſt; and now " many are of opinion, that lagged trees have been occaſioned by ſuch cracks."

As to the cloſing of trees, which had been ſplit, Dr. LISTER ſaid, that ingrafting is a kind of ſplitting, after which the trees cloſe again.

Mr. HOOKE obſerved, that a new circle of wood being added every year, the trees might be cloſed on the outſide, however they were looſe and open within.

Upon mentioning the lag-wind ſhake and quag-ſhake, Sir ANTHONY DEAN ſaid, that it happens to trees growing in a light ground, and not a clayey, ſtiff ground, from the ſhaking them when they are little: that the timber of them is never good; and as ſoon as the air takes it, falls in pieces: that ſuch trees, though of fair ſhew, are diſcernible to experienced men by the bark.

With

With regard to the decaying of timber, he ſaid, that the but-end of a tree decayed in half the time, that the top does; the reaſon of which he thought to be, that the veſſels in the bottom of the tree being of like number with the top, thoſe in the bottom are larger and more full of moiſture, which being exhaled, the moiſt air comes in the place of it, and cauſes the timber to rot: and that upon this account the bread-room of a ſhip being very hot, decays ſooner than any other part of it.

He mentioned alſo, that a ſlit deal lying in pitch and tar for two years grew ſo hard, as not to be cut by a chizzel, when the ſame ſort of deal, that was expoſed to the air, was all rotten.

Mr. HOOKE thought, that the trunk being the older part might die before the top.

Dr. LISTER judged, that the decay of timber was principally cauſed by the worms; and that charcoal was not apt to decay, becauſe it was not a food for them.

Mr. HOOKE thought, that the proper menſtruum, which decays it, was taken away, and that therefore it laſted.

Dr. PAPIN preſented a book of Signor MONTANARI printed in 1682, and intitled, *Il manuelletto di bombiſti.*

The experiments were concerning the taking away the polarity of iron by knocking in the middle; which did not ſucceed.

April 9. Sir CYRIL WYCHE preſident in the chair.

Upon mentioning the matrixes of inſects breeding in plants, it was queried, what was the efficient cauſe of theſe matrixes, whether the mother inſect, the egg, or the worm.

Upon mentioning fairy-circles, Dr. LISTER ſaid, that he had obſerved, that wherever a mole went, the graſs growing over it was ranker than in other places: but this is not to be underſtood the firſt year, for then the graſs is deſtroyed; but the ſecond year, when the ground is fallen in.

Upon mentioning the ſplitting of trees, Dr. WALLIS remarked, that the vines had ſplit from the bottom to the top ſince the froſt, upon the coming in of the warm weather: and that they did not bleed, though the ſplitting reached often beyond the heart.

Mr. HENSHAW obſerved, that it was in old ſtocks chiefly, that the evergreens, figs, roſemary, and cypreſs, were generally deſtroyed: but that broad laurel was not damaged: that the preceding winter was like that in Denmark, where the roſemaries are all deſtroyed, if they be not houſed.

Dr. AGLIONBY ſaid, that the trees ſtanding to the ſouth had fared worſe than thoſe to the north: and that the ſun had done the greateſt damage.

Dr. WALLIS confirmed it, that the vines were ſplit on the ſide towards the ſun: but that vines ſtanding to the north were not ſplit.

Upon mentioning the hardening of deal by lying in pitch and tar, Mr. HENSHAW ſaid, that probably the ſame thing might be done ſooner by heating and rubbing it in.

Mr. HOOKE remarked, that turpentine in knots was one cauſe of making them hard; and that white deal, ſoakt in turpentine, becomes very hard.

Dr. PAPIN mentioned, that he had made turpentine go through plaiſter of Paris by the compreſſing engine: and that the plaiſter was tranſparent, but not hard.

The experiment ordered to be ſhewn at the next meeting was concerning the generation of inſects. It was ſaid, that it ſeemed improbable, that it ſhould be univocal and equivocal both. Mr. HENSHAW inſtanced in ſeveral generations ſeeming equivocal, as a ſort of lice unlike the common ſorts found in a corps; worms found in ſeveral parts of the body, and the ſtomach and guts, which ſeem too hot for a natural generation.

Dr. LISTER thought the ſtomach and guts but moderately hot compared with other parts; and that they might be reckoned as an outſide of the body.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at New-college, Oxford, March 27, 1684[c], was read, giving thanks for his election. It was ordered, that he ſhould have leave till the latter end of the year to come for his admiſſion.

In this letter he mentioned, that their young Society at Oxford had of late paſſed ſeveral orders tending to the regulating of their proceedings, and making themſelves a laſting body.

It was queried, on occaſion of a paſſage of this letter, whether muckambey (or tithymal) purges, outwardly applied.

The Biſhop of Cork ſaid, that he had cauſed it to be carried in a ſervant's pocket, and that it had no ſuch effect.

Sir JOHN HOSKYNS doubted, whether it might not be neceſſary to have an immediate contact.

Monſ. JUSTEL remarked, that antimonium diaphoreticum diſſolved in water gave five or ſix ſtools to the perſon, who waſhed his hands in it.

[c] Letter-book, vol. ix. p. 150.

A French.

A French leathern heel of a ſhoe being mentioned in Mr. MUSGRAVE's letter as petrified, it was doubted, whether it were not a real ſtone. Dr. WALLIS obſerved, that he had ſeen it, and that it ſeemed a petrifaction: that it conſiſted of two pieces, then ſhavings, afterwards other pieces, and holes at the bottom, where pegs were put in: and he promiſed, that at his return to Oxford, he would get it bored.

Dr. AGLIONBY mentioned, that the Tunbridge wells did not ſpring in their uſual place ſince the late great froſt; but that it was hoped they would be found by digging.

An account of Lough Neagh in Ireland, and its petrifying qualities, by WILLIAM MOLYNEUX, Eſq; ſecretary to the Dublin Society [d], was read.

It being aſſerted in that account, that one part of the wood was never ſtone, and another iron, Dr. LISTER thought, that the contrary appeared from a piece in the Society's repoſitory: And it being doubted, whether the ruſty part of that ſtone was iron, it was ordered, that a little piece ſhould be broken off, and examined.

Dr. LISTER obſerved, that near the wells at Knareſborough wood was turned into an iron-ſtone: that he had two pieces ſent him from a gentleman at Sir GEORGE RAWDY's, as from Lough Neagh, one aſh, the other holly, which was pyrites, and magnetical, though the like had not been obſerved by Mr. MOLYNEUX. And with regard to petrifications made in the ſand near the Lough, he thought them very probable from the ſteams ariſing from the earth.

He alſo remarked, that copperas might be turned into a golden pyrites; of which the Society deſired the trial at their next meeting.

Dr. LISTER preſented to the Society his two exercitations *De fontibus medicatis Angliæ*.

Sir ROBERT SOUTHWELL preſented a ſmall bottle of liquor from a tree, as was ſaid by Mr. RANDOLPH, who brought it from Boſton in New-England. The Indians uſed it for the curing of wounds, and found relief by it. It ſeemed to be a ſort of turpentine.

Mr. HOOKE brought in a ſhort deſcription of the weather-clock, to which he was deſired to add the figures of ſuch parts, as could not be well underſtood by the words, and to put down the key for expounding the papers marked by the engine.

Dr. PAPIN ſhewed an alteration or improvement, which he had made of

[d] Letter-book, vol. ix. p. 152. It is printed in the *Philoſ. Tranſact.* N°. 158. p. 552. for April 1684.

his pneumatic engine, by placing two valves inſtead of a turn-cock, for letting the air out of the receiver into the pump, and from the pump into the open air.

He alſo ſhewed the experiment how the air driving ſome water into an exhauſted bolt-head makes it repreſent a cylinder lying athwart the bolt-head [c].

This appeared ſo in an oval head, and not in a round one.

April 16, at a meeting of the COUNCIL were preſent,

Sir CYRIL WYCHE preſident

Sir JOHN HOSKYNS	Dr. AGLIONBY
Sir ROBERT REDDING	Dr. BROWN
Mr. HILL	Dr. TYSON
Mr. HENSHAW	Mr. ASTON.

It was ordered, that Mr. HOOKE be paid ſeven pounds ten ſhillings for the experiments brought in by him as curator till Chriſtmas laſt.

That he bring in a written account of the experiments made by him ſince Chriſtmas; and that then the council would order his payment accordingly: and

That the remainder of the money due for Mr. COLLINS's books be paid by the treaſurer.

Monſ. MUNICKHAUSEN was propoſed by Dr. BROWN, and Mr. MONSON by Dr. TYSON.

At a meeting of the SOCIETY on the ſame day, Sir CYRIL WYCHE preſident in the chair.

Upon mentioning the ſplitting of old vines, Dr. AGLIONBY remarked, that the old vines were not yet budded, but the young ones were.

Sir ROBERT SOUTHWELL ſaid, that he had been informed, that in a quarry of ſtone the cold had pierced five yards deep from the ſurface.

Dr. LISTER remarked, that in quarries cold went down by the ſeams.

Mr. HENSHAW obſerved, that in mines the rain ſunk down in holes; but that the gravemakers in new ground never found the cold above four or 5 feet in Denmark.

A French gentleman being admitted to be preſent ſaid, that an engine for drawing water had been frozen this year at la Fleſche in France, which had not happened ſince 1603.

In ſpeaking of magnetiſm, Mr. HENSHAW queried, why an iron bar or anchor hanging at a loadſtone for many days acquired no fixt polarity: but if the

[c] Regiſter, vol. vi. p. 170.

load-ſtone

load-ſtone be ſtroked on the iron, the latter acquires that property? It was recommended to be again obſerved.

Dr. PAPIN's account of an examination of a piece of the iron broken off from the petrified wood in Lough Neagh was read, as follows[e].

"Having been commanded by the Society to make ſome experiments upon "the petrified wood, whoſe bark looks like iron ore, and to calcine ſome part of "the wood, and ſome part of the bark, for to try whether any of them would "be wrought upon by the load-ſtone; I did, according to this order, "break off ſome part of the bark, which was done very eaſily: but when I "came to break the wood, I found it much harder, ſo that being forced to give "a great blow, I broke more than I had a mind to. Having thus found ſome "difference, as for hardneſs, between the bark, and the wood, I was willing to "try alſo, whether they would differ as for ſpecific gravity: and, for that pur-"poſe, I went to Mr. BOYLE, but he being in the country, was not provided "with ſcales good enough, for ſuch an experiment; and inſtead of it, I took a "good load-ſtone, and ſaw, that it did no effect upon the bark before it was cal-"cined: then having put part of it into the fire, I took it off when it was red "hot, and we found it already calcined: this being cooled, it was found, that a "good load-ſtone would work very much upon the powder of the bark; and a "little upon the powder of the wood.

"The next day I went to Dr. KING, who would try the ſame thing by ano-"ther way: having reduced thirteen grains of the uncalcined bark to a fine "powder, we did mingle it with near two ounces of water, and ſome powder of "galls being put in that mixture, we did not ſee, that it did effect any change of "colour therein. Then we made the ſame experiment with only three grains of "iron ruſt, and we ſaw, that the powder of galls did ſomewhat alter the colour "of the mixture: and the reaſon of it, according to the doctor's opinion, was, "that the body of the iron being opened by the ruſt, its vitriolic parts may be "wrought upon by the galls, from whence he concluded, that our petrified bark "looking ruſty, ſhould contain very little of iron, ſince the galls did no effect up-"on it. On this occaſion, the ſaid Dr. KING ſhewed me another experiment, "which I hope the Royal Society will not be diſpleaſed to hear of: for to prove, "that the ruſt is not the beſt way for opening the body of iron or ſteel, as ſome "people do believe, he had ſeveral preparations of ſteel, both liquid and ſolid, "of his own making, that did all of them much more effect than iron ruſt "doth: and there was a powder amongſt the reſt, which being mingled with near "two ounces of water, and galls, would give a viſible tincture, although the "ſaid powder did not weigh above the twelfth part of a grain: ſo that we did "reckon, that ſuch a powder could effect more, than thirty times as much of the "iron ruſt. I can ſay no more of this, but that the wood is a great deal harder "to be calcined, than the bark is, and I have brought ſome of each, reduced to "a powder by the fire."

[e] Regiſter, vol. vi. p. 174.

Dr.

Dr. PAPIN had not let the iron calcine half an hour, which Dr. LISTER ſuppoſed might probably be too little for ſuch a work. Nevertheleſs it appeared, that the calcined body applied to the magnet, as well as filings.

Dr. LISTER produced a letter, which had been written by Mr. THOMAS MACHELL of Kirkby-thore in Weſtmoreland to Sir WILLIAM DUGDALE, dated March 25, 1684, concerning ſome antiquities lately found there[f]; as ſome old earthen veſſels with pieces of urns, one piece of a drinking-glaſs, and ſeveral ſorts of ſandals. The figures of all theſe were carefully delineated, together with the inſcriptions. There was alſo a piece of a broken veſſel ſhewn, of a reddiſh colour; the relief upon it being greyhounds in purſuit of ſtags.

Dr. LISTER obſerved three ſorts of materials uſed for urns in the North country. 1. A red fine earth like a bolus. 2. A blue clay mixt with coarſe ſand. 3. A blue clay with finer ſand and micæ: ſpecimens of which were ſhewn.

He obſerved, that one inſcription in the margin might be *Paulini*, probably the potter's name, being the ſame, which he had found upon other pots. This conjecture was confirmed by Mr. RICHARD WALLER from a book written at Nimeguen by SMETIUS on the antiquities of that place.

Dr. VINCENT mentioned the head of an urn inſcribed *Ricinus F.* for *fecit*. Sir JOHN HOSKYNS took notice of another with *Satur F.*

Dr. LISTER ſaid, that the blue urns muſt be baked in a pot, ſince the open fire makes them preſently turn red; and that leading pots is a modern invention.

An extract of a letter of Dr. WOOD to Sir PETER PETT was read concerning Sir WILLIAM PETTY's late model of ſhips; which extract was as follows[g]:

" Sir WILLIAM PETTY hath diſcovered a new * * of ſhipping; which will " as much tranſcend the old, as guns did outgo bows. If we conſider the ſtrength " (in every veſſel) the burden, ballaſt, draught of water, ſailing, ſteering, keep- " ing to a wind, and as many more properties of a good ſhip, his excels the beſt " the world has yet produced in all theſe, and yet after all, the coſt and " charge ſhall be conſiderably leſs. But to give a particular inſtance, let us take " for example one of the beſt ſailing veſſels of England, of the old built, viz. " the Conſtant Warwick or Fubbs Yacht, and another of Sir WILLIAM's new ones " of equal draught of water and ſtrength, but double the coſt: call the former " Fubbs and the laſt Buny, and comparing them together as to farther qualifi- " cations, I ſay Buny ſhall carry four times the burden that Fubbs can, ballaſt " included, and bear ſail in proportion as three to two; or thus, a common ſin- " gle body being given, ſuppoſe of ſeventy tuns neat burthen, with thirty tuns " of ballaſt, we offer to make a double body, which needs no ballaſt, viz. carry- " ing as much ſail light, as the other loaden of the ſame or more neat burden,

[f] It is printed in the *Philoſ. Tranſact.* N°. 158. p. 555. for April 1684.
[g] Letter book, vol. ix. p. 174.

" but

" but its draught of water ſhall be as four to ſeven, and the coſt as ſeven to eleven, " and ſhall bear ſail as eleven to ſeven.

" *N. B.* Demonſtrated upon great variety of bodies, at leaſt twenty veſſels by " him built here."

Dr. LISTER having no preſent convenience of turning copperas into the golden pyrites, as had been appointed at the laſt meeting, delivered in the following method for doing it.

" Take vitriol grown green upon the pyrites, and not cryſtallized: waſh it off " with a little fair water. Take the ſtrongeſt lye of the ſoap-boilers, which is " made of quick-lime and pot-aſhes: drop this latter upon the diſſolution of the " former; and the precipitation will fall in gilt particles like the pyrites.

" *N. B.* that the experiment will not ſucceed well, if the lye be weak of lime, " of chalk, and common vitriol made with iron."

Dr. LISTER produced the way of making an excellent cement, as it is uſed at York, for ciſterns and other conſervatories of water; which being read, was ordered to be regiſtered[s] as follows:

" Firſt of all the bricks you make your ciſtern of muſt be choice, and clear " from marl or ſalt; they muſt be rubbed even with ſharp ſand upon an even " flat ſtone without water. And when they are wrought in the cement, they muſt " be well dipt in water (immediately before they be ſet:) it is alſo requiſite they " be as new as poſſible from the kiln after they are burnt.

" Your old tile ſcares would alſo be burnt anew red hot, then beat ſmall, and " put through a very fine riddle: as alſo your lime the ſame, which muſt alſo be " new from the kiln, and ſo ſifted after it is quenched.

" The making of the cement is thus. That, wherewithal you ſet your bricks, " muſt be three parts of new lime, and two parts of tile-duſt; and that, which you " coat your bricks withal, muſt be two parts of lime and two parts of tile-duſt. " Let it be tempered like common mortar with good ſtore of elbow greaſe: and " temper no more at a time than you uſe; for after two or three days it loſes of " its ſtrength. Though to let it lie half a day or a night after it is tempered is not " amiſs. After your ciſtern is coted, for a week after, you muſt every day " twice or thrice with linnen cloths wipe away the ſweat from the cement, till " you find it has done ſweating. Good bricks ſet well with the coating cement, " and jointed ſmooth, will need no coating; but then the walls of your ciſtern had " need be twice as thick as when you coat them.

" One rood of wall of a brick a length thick will require ten buſhels of this " cement."

[s] Regiſter, Vol. vi. p. 116.

Dr. VINCENT preſented for the repoſitory the following particulars; talcum aureum; belliculus; a ſtæchas flower gathered ten years before in Turky; and the horns of a cervus volans.

The preſident gave in an extract of a letter from Liege, dated there April 9, 1684 [h], giving an account, that on the $\frac{4}{14}$ February preceding ſome colliers at Herſtol near Liege, by the accidental guſhing out of waters in the pit, were hindered from going out for twenty-five days; at the end of which time four of them were yet alive, who had received no ſuſtenance but from the water of a ſmall ſpring, which roſe hard by. The water of it upon evaporation left only a ſmall calx like common water. A further account of the particulars was deſired.

A paper from Monſ. JUSTEL [i] was read, giving an account of a new barometer made at Roan in France, having no communication with the air but what muſt be through the wood; and yet having all the motions of the ordinary barometer. It was ſaid to be portable in a coach and otherwiſe.

Dr. PAPIN ſhewed the way of making plaiſter of Paris tranſparent, by ſinking turpentine through it: but the experiment, by ſome accident in the making had not all its perfection. His account of the method of doing this was as follows [k]:

"To the pneumatic engine I do apply a pipe, open at both ends, and having "ſhut the upper part of it with a piece of plaiſter, I lay turpentine all over the "ſame: then I overwhelm a broader pipe about the firſt, and pouring very hot "oil into this laſt pipe, the turpentine laid over the plaiſter is melted, and pene-"trating into the ſame, makes it tranſparent; but no harder than before. Me-"thinks, that by the help of the preſſure of the air, pitch, or roſin, might be "thus driven into all the pores of wood, to keep it from rotting, or worm eating: "and ſeveral other materials might by the ſame way get ſome new properties: "but how far the thing may be improved, I refer to the judgment of the Royal "Society."

Monſ. MUNICKHAUSEN was propoſed candidate by Dr. BROWN.

Mr. FLAMSTEAD communicated a letter to himſelf from Mr. HEATHCOTE, dated from Cabo Corſe Caſtle on the coaſt of Guinea, December 14, 1683, concerning the tide on that coaſt; variation of the needle, &c. [l] According to this letter, the tide runs there continually eaſtward, except at full and change; and flows about ſix feet: The variation was 3 degrees 49 minutes to the weſtward. The barometer was found at 29 inches, and in a tornado 29 $\frac{1}{10}$ inches.

At a meeting of the COUNCIL were preſent,

[h] It is printed in the Philoſoph. Tranſ. N° 158. p. 577.
[i] Letter-book, Vol. ix. p 195.
[k] Regiſter, vol. vi. p. 176.
[l] Letter-book, vol. ix. p. 156. An extract of this letter is printed in the Philoſoph. Tranſ. N° 158. p. 578. for April 1684.

Sir CYRIL WYCHE preſident

Sir JOHN HOSKYNS	Mr. HILL
Sir ROBERT REDDING	Mr. FLAMSTEAD
Mr. MEREDITH	Mr. ASTON.

It was ordered, that the treaſurer pay ten pounds to Mr. HOOKE in full for his experiments brought in between Chriſtmas and Lady-day laſt

At a meeting of the SOCIETY on the ſame day, Sir CYRIL WYCHE preſident in the chair.

A letter from Mr. EVELYN to Mr. ASTON, dated at Say Court, Deptford, 14 April 1684 [m], was read, concerning the damage done to his gardens there by the preceding winter.

The ſecretary was ordered to return the Society thanks to Mr. EVELYN, and to deſire, that this letter might be printed, there being many curious remarks in it, by which the public might be inſtructed and receive benefit at that time.

It was alſo propoſed, that there might be mentioned to him the finiſhing of his *Elyſium, or Pandects*, a book very much deſired.

A letter of Mr. JOHN DAVIS, miniſter of Little Leak in Nottinghamſhire, to Mr. ASTON, dated there April 1684 [n], was read concerning a weaving engine invented by himſelf, by which he had woven the pattern incloſed in his letter. It mentioned likewiſe others of his contrivances of muſical inſtruments, and lamps not ſpoken of by Mr. HOOKE; a method of making a balance clock go longer than uſual without altering the inward work; a ſort of pump fit for ſhips, no bigger than the engines uſed for quenching of fires, but raiſing a great deal of water. The woven pattern ſent by him ſeemed to be loom knit like a ſtocking.

The ſecretary was deſired to return an anſwer, and to know, whether Mr. DAVIS would think fit to communicate his method of raiſing water, and new lamps.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at New-college, Oxford, April 19, 1684 [o], was read, concerning the ſplitting of trees by the late hard froſt, and a piece of black Britiſh marble ſpotted white, uſed by Mr. WOGAN of Bolſton in Pembrokeſhire as a limeſtone.

Mr. BAILEY having delivered in an account of the tides at Tonquin, procured from perſons, who had lived long in the place; it was ordered to be regiſtered [p].

[m] Letter-book, vol. ix. p. 158. It is printed in the Philoſoph. Tranſ. N° 158, p. 959.

[n] Letter-book, vol. ix. p. 165.

[o] Ibid. p. 167.

[p] It does not appear in the Regiſter. A letter of Mr. FRANCIS DAVENPORT, dated July 17, 1678, on this ſubject, is printed in the Philoſoph. Tranſ. N° 162, p. 677, for Aug. 1684.

It was very remarkable, that there was at Tonquin but one flood and ebb in twenty-four hours; and, as Mr. HOOKE obſerved, that when the moon is in the north of the æquator, the floods begin in the morning: When ſhe is in the ſouth ſide of the æquator, they begin in the afternoon.

Mr. HOOKE remarked likewiſe, that Captain KNOX had made ſeveral obſervations confirming the truth of this account, as would appear from his journal in the hands of the Earl of CLARENDON, if it were conſulted.

Mr. HUNT preſented from one Mr. BAGFORD living in Holbourn,

1. A piece of cabbage ſtalk from Northamptonſhire, being perfect wood, and having a grain like box.
2. A Derbyſhire wooden calendar.
3. A piece of jaſpar dug up in the gravel pits at Iſlington, ſeeming to have been the handle of a ſword, or ſome ſuch inſtrument.
4. A Morocco boy's ſhoe.
5. A ſort of ſpur.

Dr. PAPIN, by a ſmall alteration in his apparatus, made turpentine to paſs through plaiſter of Paris, ſo as to make the plaiſter tranſparent [q]; the ſame method being applicable to wood, and other things.

He alſo propoſed, and it was agreed upon for the next meeting, that a kidney, or ſome other body to be anatomized, might be very much ſwelled in the exhauſting engine, and afterwards more dilated by the driving in of ſome convenient liquor.

April 30, Sir CYRIL WYCHE preſident in the chair.

The preſident related, that Mr. FLAMSTEAD had ſeen a ſpot in the ſun on the 25th of April, and ſince as often as the weather would permit. The line, which it had deſcribed, was drawn on paper, and the places marked, that it would be in, every day till the 7th of May; after which time it would get behind the body of the ſun [r].

Upon mentioning the bay-tree to be the laurel of the antients, it was added, that great uſe was made of the berries for cookery, till ſuch time as Eaſt-India ſpices were brought in.

A letter of Signor MALPIGHI to Mr. ASTON, dated at Bologna November 9, 1683 [s], was read; accompanying his diſcourſe *De cornuum generatione et uteri fabrica*, written about three years before, and addreſſed to Dr. SPON, but never

[q] Regiſter-book, vol. vi. p. 178.
[r] Mr. FLAMSTEAD's account of this ſpot is printed in the Philoſophical Tranſactions, N° 157. p. 535 for March 1684.
[s] Letter-book, vol. ix. p. 177.

2 printed.

printed [t]. It being too long to be read at preſent, Dr. AGLIONBY was deſired to peruſe it, and give ſome account of it.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at New-college Oxford, Apr. 22, 1684 [u], was read, concerning a mathemathical engine lately invented at Paris, made very commodious for travelling, and ſo light, that it might be carried in the pocket, ſerving for a ſemicircle, ſector, or ſquare, meaſuring all ſort of angles whatever, taking the weight of bullets, the declination from the north, the inclination or reclination of any wall, &c.

This letter mentioned likewiſe one of Monſ. AUZOUT to Dr. THOMAS SMITH, in which he affirmed, that he had ſeen in Italy little loadſtones, which raiſed 80, and ſome 140 times their weight: that in Nova Francia there is a vaſt quantity of ſalt petre in the fields: that in the Weſt-Indies there are bees without ſtings.

Mr. MUSGRAVE added an account of the effects of the late hard froſt in the garden of the univerſity of Oxford; and of a light reſembling the ſun, ſeen by ſeveral carriers in Staffordſhire going for ſalt at three o'clock in the morning on the 18th of March, probably the ſame with that mentioned in the news letters to have been ſeen at Deal.

Upon reading of Mr. MUSGRAVE's letter, Mr. HOOKE remarked, that a ſector with ſights might perform whatever the new mathematical engine at Paris was ſaid to do.

Concerning the ſalt petre in Nova Francia, the fact was much doubted, becauſe it is a moiſt country, and northerly, and poor; whereas that commodity would have made it rich.

As to the bees without ſtings, Dr. LISTER ſaid, that in England there was a little white noſed bee without a ſting.

It being ſaid in Mr. MUSGRAVE's letter, that trees of active juices had ſuffered moſt by the froſt, Dr. LISTER anſwered, that the maple and ſycamore will bleed all winter, and yet they had not ſuffered. Mr. EVELYN remarked, that ſplitting was often from want of juice; and he obſerved occaſionally, that the platanus of Zinnar, a kind of myrtle, grows here very well in moiſt places.

Dr. LISTER acquainted the Society, that Sir WILLIAM DUGDALE having ſeveral Roman antiquities in his books not yet made public was willing, that the Society might peruſe them, and take draughts of them: Upon which the Doctor was deſired to return the Society's thanks to Sir WILLIAM DUGDALE, and to take the trouble of giving directions to Mr. HUNT what he ſhould copy.

An account of the weather kept for three or four years by the laſt Archbiſhop of York [x], was preſented, and thanks returned to his ſon by Dr. LISTER.

[t] It is printed afterwards in the Philoſophical Tranſact. N° 160 p. 601 for June 1684.

[u] Letter-book, vol. ix. p. 169.

[x] Dr. RICH. STERNE who died June 18, 1683.

An account was read of Dr. LISTER's book of mineral waters, eſpecially of the ſecond exercitation, drawn up by the author himſelf, which was very acceptable, as being not only a ſummary, but an explanation of the treatiſe.

The Geometrical Key of Mr. THOMAS BAKER, rector of Biſhop Nympton in Devonſhire, was preſented to the Society.

Dr. PAPIN finding, that the lungs of a rabbit ſunk upon the readmiſſion of air in the exhauſting engine, propoſed, that they might be filled with plaiſter of Paris, wax, &c. or elſe be left *in vacuo* to dry[y].

May 7, Sir CYRIL WYCHE preſident in the chair.

Upon reading the minutes of the laſt meeting, Dr. LISTER remarked, that the hive-bee of England was a foreign bee, as wheat and rye were foreign corn.

Mr. HOUGHTON mentioning a perſon, who was giving a horſe a vomit, Dr. LISTER ſaid, that a horſe did not naturally vomit as a dog does: that probably a vomit would not work upwards with him, of which the want of a gall-bladder perhaps might be the cauſe: and that even a purge does not work kindly with him, but often puts him in danger.

Mr. HENSHAW ſaid, that purges were given for the greaſe in horſes with good ſucceſs.

Dr. LISTER obſerved, that it might not be greaſe, which was called ſo: that a horſe's blood was different from that of other animals, as being gellied as ſoon as cold; whereas a ſerum may be poured off from other blood.

A letter from Mr. WILLIAM MOLYNEUX to Mr. ASTON, dated at Dublin, April 22, 1684[z], was read, as follows:

" I had before now anſwered yours of the 3d inſtant, but that I was unexpect-
" edly prevented by ſome urgencies, which I have not yet ſo compleatly van-
" quiſhed, as to return you at preſent ſo full an anſwer, as in time I may, to the
" demands of your laſt: for, beſides the hindrances on my own ſide, our clerk
" has not tranſcribed our minutes to be ſent you; and the gentleman, that promiſed
" experiments on blood, deſires ſome time for repeated trials; and ſo likewiſe
" does Dr. MULLEN, who gave us formerly ſome magnetical experiments. But
" for theſe laſt, we may be for a while excuſed, ſeeing the Biſhop of Ferns has
" not yet compleated his ſcheme of queries relating to the magnet: he is lately
" gone down to his dioceſe about thirty miles off, but he writes us word, that he is
" yet upon theſe papers, and will ſuddenly finiſh them, and ſend them to us: when
" we have them, I ſhall ſend you a copy. In the mean time I here ſend you what
" Sir WILLIAM PETTY brought in relating to land-carriages. We had, accord-
" ing to the directions of this paper, a fire-log mounted on wheels, ſleds and

[y] Regiſter, vol. vi. p. 177. [z] Letter-book, vol. ix. p. 169.

" points,

" points, with which we tried ſome experiments, but we found them ſo very in-
" conſtant, that we could hardly rely upon them, till further trial, by a more
" compleat engine. If the Royal Society think this matter worth the proſecuting,
" we ſhall again ſet about it. As to Sir WILLIAM PETTY's ſhips I cannot at
" preſent ſay ſo much, as perhaps in three or four months hence I may; yet that I
" may give you ſome ſatisfaction, I will let you know, that Sir WILLIAM has
" ever ſince he laſt came into Ireland been much incumbent on that matter, and
" has brought it (for as much as may be judged by models, of which he has a
" vaſt and various apparatus) to a very great perfection: his veſſels now are not
" ſo much double-bottomed as his former; for as you ſee them ſunk in the
" water, you would not know them but by their lowneſs and breadth behind
" from a common built; for now he calls them ſluice-bottomed, for their keel is
" inverted, and a large ſluice or *crena* runs alongſt their back. Amongſt other
" models, he has one repreſenting the common built Fubb's-yacht (which we
" hear is the beſt ſailer in England) and he has another likewiſe, which he calls
" the Sluice-Fubbs, in bulk, weight, &c. agreeing with the common built, and
" different only in his additional ſluice. Between theſe two, he makes compariſon
" in many particulars, as burden, draught of water, ballaſt, ſwift ſailing, &c.
" in all which the ſluice bottom has wonderfully the advantage. In fine, hereby
" he is incouraged to aſſert, that he will be bound to make a paſſage-boat between
" this and Cheſter of about 80 or 100 tun, that ſhall be as it were a ſtage-boat,
" and ſhall be as conſtant in her going out, and returning upon her ſet days, let
" whatever weather happen, as the ſtage-coaches between London and any other
" country-town. There was a motion between ſome perſons of quality and figure
" in this place (amongſt which I had the honour to be one) to join purſes for the
" building of a veſſel of that burthen, merely to try the experiment; but upon ſe-
" cond thoughts, it was reputed more adviſable to begin with a barge of the
" ſame bulk and burthen with a barge, that belongs to our cuſtom-houſe: for if
" our ſluice-barge do outſail conſiderably the other (which is now a building, and
" much expected from her) the advantage of Sir WILLIAM PETTY's contri-
" vance will be ſo manifeſt, that it will ſuddenly be put in practice in a greater
" model. In order to the accompliſhing of this, there is a company of us to meet
" to-morrow at Sir WILLIAM's, and to agree about the matter; the ſucceſs
" whereof you ſhall certainly know.

" And now from the water I will take you on ſhore, and let you know, that
" there is here a gentleman, one Mr. CLIGNET, a Dutchman by birth: he re-
" ſides conſtantly at Limerick, who has invented a way for hindering coaches,
" chariots, and calaſhes, from all poſſibility of over-turning; and withal they are
" of as plain and cheap a building, as the common ones. I have had ſome im-
" perfect relations of the contrivance from thoſe, that have ſeen the model, but I
" will not thereupon venture to deſcribe it to you. We would fain have had him
" expoſe it to our Society, promiſing him to put him into a way of making con-
" ſiderable advantage of it; but he was ſhy, and will not expoſe it further till he
" get a patent for the monopoly: but how little men uſually get by theſe, I leave you
" to judge; whereas we would certainly have put him into a way of advantaging
" himſelf

" himſelf thereby; for of himſelf he will hardly be able to ſtruggle with ſome " difficulties he will meet with, &c.

" According to my promiſe in my laſt, I here ſend you our minutes, deſiring " you to ſend them forward to Oxford. I promiſed likewiſe to give you ſome " further account of our progreſs towards putting into practice Sir WILLIAM " PETTY's contrivance of ſhips. We are now reſolved to build two veſſels, one " a barge, as I mentioned to you in my laſt, which (with the charges of experi- " ments, that are to be made with it) will ſtand us in about 60 *l.* The other will " be a veſſel between 90 and 100 tuns, deſigned for a paſſage-boat between this " and Cheſter: for the carrying on of this, there are ſeveral, that do join purſes, " each putting in 20 *l.* When we have more nicely agreed about the dimenſions " of this latter, I will give you a fuller account, and ſo of the contrivance, bur- " then and charge of building, which we reckon will be about 400 *l.* In the " mean time be pleaſed to approve of and accept our good intentions, &c."

This letter incloſed the minutes of the Dublin Society from March 17, 168$\frac{3}{4}$, to April 21, 1684, as follows [a].

" *March* 17, 168$\frac{3}{4}$, Sir WILLIAM PETTY produced a paper of experiments " relating to land-carriages. Theſe are regiſtered.

" Dr. MULLEN related an experiment he had lately made on a dog, which is " as follows: he injected into his thorax about eighteen ounces of water, and " found in four or five days the dog to grow ſhort-winded; but giving him an " ounce and half of crocus metallorum, though it wrought only by ſiege, yet " he was recovered perfectly thereby. He alſo confirmed his former obſervations " in the ear of a pullet.

" *March* 24, 168$\frac{3}{4}$, Sir WILLIAM PETTY produced an engine for trying ex- " periments relating to land-carriages, and diſcourſed of ſome experiments he " had made therewith, in order to the anſwering ſome of the quæries he had for- " merly propoſed. The inſtrument was a ſolid parallelopiped of fir five inches " thick and 10 inches long, weighing ninety-nine ounces, being ſo ordered, that " it may be put on wheels, either one ſet, or two ſets, of equal or unequal dia- " meters, or it may be made a ſled, or to be drawn on four, or two dragging " wheels, or on the full flat. Ordered, that the experiments be tried before the " company, that the particulars may be regiſtered. Wedneſday next appointed " to begin theſe experiments at Sir WILLIAM PETTY's houſe. Dr. MULLEN " ſhewed ſome experiments upon runnet, or diſſolved coagulum, viz. mixing " ſpirit of hartſhorn and coagulum together, and pouring milk to them, the milk " was not turned. So likewiſe ſalt of tartar mixt with the coagulum hinders its " effects in curdling of milk. But ſpirit of wine mixt with the coagulum does not " hinder the coagulum from turning the milk. He alſo mixt ſalt of tartar and coagu- " lum in a ſpoon, thereby converting the ſalt of tartar into a greaſy unctuous conſiſ- " tence like ſoft ſoap. He likewiſe related to us an experiment he had lately made

[a] Letter-book, Vol. ix. p. 172.

" by

" by injecting at ſeveral times about three ounces of diſſolved coagulum into the " jugular vein of a dog, who, in a ſhort time of about two or three minutes after " the injection, had all the ſymptoms of a woman in mother-fits, ſhort and diffi- " cult breathing, whining, &c. but would recover out of them in about two or " three minutes more: he perceived alſo, that the coagulum made the venal " blood as florid as that of the arteries. Mr. BULKLEY produced the body of a " bat or veſpertilio, which he had lately diſſected, and thereupon read an ac- " count of the diſſection of the like animal by Mr. THOMAS MOLYNEUX in the " year 1682; containing many obſervable particulars relating to that animal, " omitted by authors. Mr. BULKLEY likewiſe ſhewed us, as obſerved by him- " ſelf, that the curious wings of that flying beaſt are double, conſiſting of two " moſt thin membranes. Ordered, that the thanks of the Society be returned to " Mr. THOMAS MOLYNEUX for communicating to us his diſſection of the veſ- " pertilio; and that the account thereof be regiſtered.

" *April* 7, 1684, Dr. HUNTINGTON entertained the company with ſome diſ- " courſe on the porhyry pillars in Ægypt, producing the pictures of them as " taken upon the place: he promiſed to draw up his thoughts on them more at " large in writing, that accordingly they may be tranſmitted over to the Oxford " Society. Mr. PATTERSON produced an account of ſome experiments he had " made for diſſolving the calculus humanus by various menſtrua. Ordered, " that he put them into writing, that they may be regiſtered. The remaining " time was taken up in promiſcuous diſcourſe on the late experiments had been " tried relating to land-carriages, and ordered, that ſome further experiments " ſhould be made therein: next Wedneſday appointed for the trial thereof at Sir " WILLIAM PETTY's houſe.

" Likewiſe there was a paper produced, containing a catalogue of the diſcove- " ries and inventions of this and the laſt age.

" *April* 14, 1684, we firſt met in the room we had taken in Crow's-neſt. Mr. " WILLIAM MOLYNEUX ſhewed the company an experiment of viewing pictures " in miniature with a teleſcope; and afterwards read a paper of the theory and " uſes thereof. This is regiſtered.

" Mr. ST. GEORGE ASHE read a diſcourſe concerning the evidence of mathema- " tical demonſtration, and the reaſon thereof, above other ſciences: likewiſe he " propoſed, that any propoſition of EUCLID may be proved independent from " all other propoſitions of the elements, meerly by firſt ſettling the definitions of " the names you deſign to uſe in ſuch a demonſtration: this he illuſtrated inge- " niouſly in Prop. 47. 1. El. and in Prop. 16. 6. El. EUCL. This is regiſtered. " He alſo produced a ſtone curiouſly wreathed like a ſcrew of a very fine thread, " promiſing to procure more figured ſtones for us from a place he had lately vi- " ſited in the country. Dr. MULLEN gave us an account of ſome experiments " he had lately made on dogs, and on blood, and runnet. Theſe are to be re- " giſtered at large. Dr. HUNTINGTON read an account he had writ of the por- " phyry pillars in Ægypt to Dr. PLOT. A letter was read from Mr. ASTON, S.R.S. " It contained Dr. LISTER's account of the baroſcope. " *April*

April 21, 1684, Mr. MOLYNEUX produced a letter, which he received from "Mr. MUSGRAVE, containing the minutes of ſix meetings of the Oxford Society: "theſe were ſo very curious and acceptable, that diſcourſe thereon took up almoſt "our whole time of meeting. Dr. SMITH's ingenious and probable conjecture "about the under current in the Straits was read. Ordered, that the thanks of "the Society be returned the learned Doctor, for communicating to us this "account.

"Dr. LISTER's compendious method for obſerving the altitudes of the quick-"ſilver in the baroſcope was expoſed, and highly approved of. Mr. WILLIAM "MOLYNEUX promiſed, that he would put this into practice, by obſerving the "weather accordingly. Dr. MULLEN produced an hen's egg, wherein he ſhewed "the company very plainly the punctum ſaliens. A letter was produced from "Mr. WILLIAM HODDER of London to WILLIAM ELLIS, Eſq; ſecretary to his "Excellency the Lord Deputy, which contained a ſcheme of three ſuns and "two rainbows, that were ſeen off the ſouth ſands head at ſeven in the morning "on March 18, 168$\frac{1}{4}$. Ordered, that the thanks of this Society be returned to "WILLIAM ELLIS, Eſq; for communicating to us this curioſity."

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at New-college, Oxford, May 2, 1684 [b], concerning the ſuppoſed petrified heel of a ſhoe; which being broken in boring, was judged to have been always ſtone.

This letter accompanied one of Dr. HUNTINGTON to Dr. PLOT, dated at Trinity-college, Dublin, April 14, 1684 [c], concerning the porphyry pillars in Ægypt, and the queries, whence they were probably taken. There were alſo ſhewn the figure of an aguglia at Alexandria, and of another at Matarea.

Dr. GALE ſhewed a paſſage in a manuſcript in his poſſeſſion concerning the *Ignis Græcus*, deſcribing punctually the way of making fire-works with gun-powder. This manuſcript ſeemed to have been written in the time of King HENRY III. ſince the hand-writing reſembled that of that age, and the hiſtory containing it was of that time.

Mr. AUBREY preſented a bundle of mathematical papers, written by Mr. THOMAS MERRY; for which he was deſired to return the Society's thanks to the widow; and the papers were put into Mr. PAGET's hands, to ſuperviſe, and make an inventory.

In the experiment made by Dr. PAPIN, the plaiſter of Paris was driven as low as needed to be into the wind-veſſels; but upon the intermiſſion of the air into the receiver, all the other veſſels ſhrunk; ſo that it ſeemed, that the veins and arteries too ſhould be filled one after another with different compoſitions, that in diſſecting they might be diſtinguiſhed [d].

[b] Letter-book, vol. ix. p. 177.
[c] Ibid. p. 178. It is printed in the Philoſoph. Tranſ. N° 161. p. 624.
[d] Regiſter, vol. vi. p. 178.

May 14, Sir CYRIL WYCHE preſident in the chair.

An account was read of the firſt appearance of the late ſpot in the ſun by Mr. FLAMSTEAD: and a ſcheme was ſhewn, not only of the paſſage of that ſpot over the ſun, but, if the ſpot be not in the mean time conſumed, its line of return; and the places of appearances every day were marked from the 22d of May to the 3d of June, incluſive.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at New-college, Oxford, May 7, 1684 [e], was read, giving an account of ſome ſtones reſembling a pullet's heart and partridge's egg, and the ſhining of glow-worms.

Mr. HENSHAW remarked, that a glow-worm with the heat of the hand loſes its ſhining, and in the cold recovers it again.

Dr. LISTER obſerved, that in the Weſt-Indies there are glow-worms as long as one's thumb: that they are of a beetle-kind: and that he had met with ſome of that kind here in England.

A letter of Monſ. JUSTEL to Mr. ASTON [f] was read, mentioning, that he had been informed by a letter from Monſ. AUZOUT, that at Roan had been made a barometer of glaſs ſealed hermetically at both ends, ſo as to have no communication with the air; and that it was as ſerviceable as another barometer: that CASSINI had ſeen the ſpot in the ſun; and that it was thought, that he had obſerved a new ſatellite about Saturn.

A letter of Signor MALPIGHI to Mr. ASTON, dated Bologna, March 23, $168\frac{3}{4}$, N. S. [g], was read, returning thanks for the books laſt ſent him by the Society, and mentioning the burning of his houſe in the preceding month, whereby he had loſt all his *adverſaria* and microſcopes.

A paper of experiments propoſed by Sir WILLIAM PETTY to be made with relation to land-carriage [h], and tranſmitted to the Society from Dublin, was read; and ordered to be regiſtered [i].

Part of a letter of Mr. LEEWENHOECK, dated April 14, 1684 [k], was read; and the other part reſerved till the next meeting. It was concerning the ſtructure of the cryſtalline humour of the eye, which he deſcribed as conſiſting of many ſcales lying upon one another, and the ſcales as made of threads lying by one another in a very curious manner, as appeared from the figures.

In diſcourſing of the hermetically ſealed barometer made at Roan, Mr. PIGOT

[e] Letter-book, vol. ix. p. 185.
[f] Ibid. p. 195.
[g] Ibid. p. 187.
[h] Printed in the *Philoſ. Tranſact.* N°. 161. p. 666. for July 1684.
[i] Regiſter, vol. vi. p. 123.
[k] It is printed in the *Philoſ. Tranſact.* N°. 165. p. 790. for November 1684.

ſaid, that in the upper part of the barometer, thought generally to be void of air there was contained a body capable of dilatation by heat.

A barometer being brought, he held the flame of the candle to the upper part of the quickſilver, and after a little time the quickſilver ſunk $\frac{1}{4}$ of an inch or $\frac{2}{10}$ $\frac{1}{5}$.

Mr. HOOKE thought, that the glaſs might not be well cleanſed of the air, and proffered to get one better cleanſed againſt the next meeting.

Dr. PAPIN intending to examine the ſpecific gravity of the air comparatively to water, the receiver broke in exhauſting, and hindered the experiment.

He propoſed another experiment, which was to know how much a certain degree of moiſture will increaſe the gravity of the air.

An account of the ancient uſe of gun-powder having been read at the laſt meeting, there was now produced by Dr. GALE a parallel paſſage of ROGER BACON.

May 21. Upon mentioning the ſhining beetle or flying glow-worm, Dr. LISTER ſaid, that the characteriſtic of it was, whether it ſhines, or does not ſhine. If a perſon puts his finger on the back of it, it ſtrikes with a ſtrong ſpring, or gives a jerk.

Upon mentioning Mr. LEEWENHOECK's letter on the cryſtalline humour of the eye, Dr. GREW remarked, that this humour, if it were only boiled, ſhewed ſeveral parallel lines or threads running on the ſurface.

There was communicated from the Philoſophical Society at Oxford a diſcourſe read before that Society, May 7, 1684, by ROBERT PLOT, LL. D. director of experiments to the ſaid Society, concerning the ſepulchral lamps of the antients, ſhewing the poſſibility of their being made divers ways [q].

Dr. PAPIN having exhauſted the air out of a Florence flaſk, and counterpoiſed it, found the returning air equal to $41\frac{1}{4}$ grains.

It was farther obſerved, that the baroſcope, hygroſcope, and thermoſcope, at the time of the experiment, ſtood in the Muſeum at the following hights, viz.

Baroſcope	$29\frac{7}{10}$ inches
Hygroſcope	20 deg.
Thermoſcope	65.

This was obſerved, to the end, that upon repeating this experiment, when two of theſe inſtruments are in the ſame degree, the different weight of the air may be attributed to the third. The account hereof was entered in the regiſter as follows [r]:

[q] Regiſter, vol. vi. p. 127. It is printed in the *Philoſ. Tranſactions* N°. 166. p. 806. for December 1684

[r] Vol. vi. p. 181.

" There

" There was counterpoiſed in a balance a Florence flaſk well exhauſted of " air, as did appear by the gage included therein: then having let the air into " the ſame, its weight was found increaſed by 41½ grains: having afterwards " weighed the water, that could fill the ſame flaſk, it was found to weigh five " pounds wanting an ounce averdupois, which being reduced to grains, made " 33735: from whence it was concluded, that the ſpecific gravity of water, to " the ſpecific gravity of air, was at that time, as 33735 to 41¼, or as 817 to 1 " thereabout, and at the ſame time the baroſcope was at 29 inches $\frac{7}{10}$, the ther- " moſcope at 65, and the hygroſcope at 20.

" The deſign of this experiment was to know, how much a certain degree of " heat, and a certain degree of moiſture, will increaſe the gravity of the air: for it " will be eaſy in winter-time, when the baroſcope and hygroſcope ſtand in the " ſame degree, to repeat the ſame experiment, with the ſame veſſel, and the ſame " gage: ſo we may be ſure, that all the increaſe, that will be found in the weight " of the air, muſt proceed meerly from its being contracted by the cold; whoſe " degree may eaſily be obſerved in the weather-glaſs. In like manner, when " the thermoſcope and baroſcope will ſtand in the ſame degree, but the moiſture " of the air ſhall be differing, the ſame experiment may alſo be repeated, with " the ſame veſſel, and the ſame gage: ſo we may be ſure, that all the difference " in the gravity of the air muſt come from the differing moiſture."

The ſecond experiment of Dr. PAPIN was thus: There were taken two pieces of iron, weighing each 13½ grains. Theſe pieces were each put at the ſame time into an equal portion of aqua fortis in a like glaſs; but one glaſs was put *in vacuo*, the other expoſed to the air: after a convenient time, the remainder of the iron *in vacuo* was found 12½ grains. The remainder of that in the air was but 2½ grains.

Upon mentioning the phoſphorus, Dr. LISTER ſaid, that there was a place in the Macchabees, book II. ver. 9. concerning the fire hid in the pit, which had a great reſemblance to it.

It was alſo obſerved, from a paſſage in JULIUS SOLINUS, that the veſtal fires of the Romans kept at the Bath were ſupplied with ſea-coal: *Perpetui ignes nunquam caneſcunt in favellas, ſed ubi ignis tabuit, vertitur in globos ſaxeos* [r].

Mr. HOOKE read a diſcourſe ſhewing the way how to communicate one's mind at great diſtances [s].

May 28. A letter of Mr. MUSGRAVE to Mr. ASTON, dated at New-college Oxford, May 13, 1684 [u], was read, mentioning from a letter from Paris a new ſort of thermometer not above three inches long, and four or five lines in diameter, the inner pipe containing the refined quickſilver not half a line, uſeful for ſhewing the duration, increaſe and diminution of fevers.

[r] SOLINI POLYHISTOR, c. 25.

[s] It is printed in his *Philoſ. Experiments and Obſervations*, p. 142.

[u] Letter-book, vol. ix. p. 196.

This letter mentioned likewiſe, that CUTHBERT's beads were found not to be properly *ſcrew ſtones*, as they were commonly termed, but a conjunction of amulets, which may be looſened from each other by lying a night in vinegar.

Mr. HOOKE read a paper concerning the reaſon of the quickſilver's ſtanding ſometimes far above the uſual hight in the Torricellian experiment.

He alſo ſhewed, that a glaſs pipe cloſed at the top with a great many very ſmall pipes, when it was put in water up to the top, and there raiſed, kept the water ſuſpended a good way above the level.

An account of the experiments made at the laſt meeting by Dr. PAPIN was read, and ordered to be regiſtered [x].

The diſſolution of iron by aqua fortis *in aere* having been found at the laſt meeting to that *in vacuo* as $12\frac{1}{2}$ to $2\frac{1}{4}$, upon a repeated trial at this meeting it was found but as $10\frac{3}{4}$ grains to $3\frac{3}{4}$.

But two equal pieces of iron having been put in a mixture of equal parts of aqua fortis and ſpirit of wine, the diſſolution *in vacuo* was $1\frac{1}{2}$ gr. in the open air but $\frac{1}{2}$ a grain.

June 4, Sir CYRIL WYCHE preſident in the chair.

There was read the latter part of Mr. LEEWENHOECK's letter of April 14, 1684, concerning the cryſtalline humour of the eyes of birds and fiſhes; the vitreous humour; the cornea tunica; and the colour of a Blackamore.

As to the moiſtneſs of the cornea, Dr. GREW ſaid, that it proceeded only from the glandules in the eye; and that no part of it tranſudated through the cornea, as Mr. LEEWENHOECK thought might be probable, upon obſerving the eye parched with the fire.

With regard to the colour of Blackamores, Dr. LISTER remarked, that it had been affirmed to be from a blackneſs in the blood, which he deſired might be carefully inquired into, there being ſo much opportunity of doing it.

He ſaid, that there was an ape in the Indies, whoſe blood died a purple colour.

A letter from Mr. JOSHUA WALKER to Mr. ASTON, dated at Brazen-noſe college at Oxford, May 28, 1684 [y], was read, mentioning, that Mr. MUSGRAVE going out of town had deſired the writer of this letter to ſupply his place in writing; that at the meeting of the Philoſophical Society at Oxford in the day before it had been mentioned, that there was an account of Ignis Græcus in an Arabic manuſcript in St. John's college library in that univerſity, and in JULIUS AFRICANUS's ceſti: that Dr. PLOT had ſhewed the experiment of holding a

[x] Regiſter, vol. vi. p. 182. [y] Letter-book, vol. ix. p. 199.

live coal to the lower part of an hour-glaſs, which immediately ſtopped the running of the ſand: and that there had been produced at the ſaid Philoſophical Society a model of the roof of a church, which might be built ſeventy feet wide without a pillar, with a paper ſhewing, that ſuch a roof would be ſtrong enough for uſe.

On occaſion of the paſſage relating the hour-glaſs's ſtopping its running upon holding a live coal to the under-part, Mr. RICHARD WALLER obſerved, that the ſame thing happens by putting the warm hand to it; and that this might be occaſioned by the rarefaction of the air.

Dr. LISTER ſhewed ſome ore, which had been ſent by Dr. PLOT, as copper-ore of Staffordſhire: but upon trial he found it to contain nothing but iron; and ſome of it calcined applied to the magnet, as was then ſeen.

Dr. LISTER ſhewed alſo ſome viviparous ſnails, which he had taken up in the Thames.

One of theſe ſnails being anatomiſed by Dr. TYSON, the womb was found very full of little ſnails.

The ſcarlet ſnails upon touching them with ſalt yielded in a baſon of water a great quantity of very florid juice.

An extract of a letter of Monſ. AUZOUT to Monſ. JUSTEL, dated at Paris, June 3, 1684, N. S.[z] was read, concerning a diſcourſe of Monſ. HUYGENS lately printed about the uſe of long teleſcope-glaſſes without tubes.

Mr. FLAMSTEAD remarked, that he had ſeen the ſpot in the ſun ſince its return; and that there were two other ſpots newly added.

Dr. PAPIN, upon occaſion of an experiment made at the laſt meeting, ſhewed how water, well purged of air, remained ſuſpended at the top of a pipe cloſed at the upper-end, and ſtanding with the other end in a veſſel of the ſame water *in vacuo*.

Upon ſhaking the engine, the water in the pipe fell within a little of the level of the water in the veſſel. But upon working the engine, it roſe a little. His account of this experiment was as follows[a]:

" A glaſs pipe being exactly filled with water, purged of air (becauſe it had " been kept twenty four hours *in vacuo*) the aperture of the ſaid pipe was im- " merſed in a veſſel, containing ſome of the ſame water: theſe being put *in vacuo*, " the water did ſtill remain ſuſpended, to the very top of the pipe, ten inches " higher than the air could counterpoiſe it: but by ſhaking the engine, the ſame " water was cauſed to fall on a ſudden, and it remained in the pipe, about half an " inch higher than the ſurface of the water in the veſſel. So that it was plain,

[z] Letter-book, vol. ix. p. 200.

[a] Regiſter, vol. vi p. 183.

" that

" that the ſuſpenſion of the water, to the top of the pipe, could not in this occa-
" ſion, be adſcribed to the preſſure of the air."

June 11. A letter of Mr. JOSHUA WALKER [c] to Mr. ASTON, dated at Oxford, June 4, 1684 [b], was read, giving an account of the proceedings of the Philoſophical Society there; that it had been remarked, that there is an antient account of Ignis Græcus in CONSTANTINUS PORPHYROGENITUS's advice to his ſon, and that it is mentioned by MATTHEW PARIS in the Life of King HENRY III. That a deſcription had been given in by Mr. WHEELER [c], of a watch, which was to move upon a declivity like that at Greenwich: that Dr. PLOT had communicated an account of vines: and that it had been obſerved, that white grapes had ſuffered more by the laſt great froſt than the red.

Two braſs half globes joined together and exhauſted of air being ſaid to ſuſtain a great weight, Dr. PAPIN made a trial with a ſmall glaſs-receiver ſhut with a glaſs cover, and exhauſted of air. There being ſome water in the receiver, it was ſhaked till it was diſperſed all about the receiver; but the fear of vacuum did not keep it from condenſing and falling down again. The glaſs receiver bore up a weight of twenty eight pounds, and afterwards of ten pounds more added to it. Dr. PAPIN's account of it was as follows [d].

" We took a glaſs receiver, ſhut with a glaſs cover, and exhauſted of air: but
" there was a ſmall quantity of water included in the ſame: and ſhaking the ſaid
" receiver, all the water was diſperſed through the whole capacity; but it fell
" down again, ſo ſoon as we left off ſhaking: ſo that it did appear, that the va-
" cuum in the middle of the receiver is not able by its attraction to keep the wa-
" tery particles from condenſing and falling down: nevertheleſs having hung
" twenty eight pounds weight to the cover, it lifted up rather than ſeparated the
" ſaid cover from the receiver: but having made a ſmall hole to let the air into
" the receiver, the cover did ſeparate and fall down of itſelf, though there was
" no more weight to draw it: ſo it ſeemed plain enough, that it was only the want
" of the ordinary preſſure of the air within the receiver, that gave occaſion to that
" ſtrong adheſion of the cover to the receiver."

Dr. LISTER ſhewed the experiment, that ſpirit of wine and oil of vitriol, though they ſeparately diſſolve ſanguis draconis and oil of vitriol, yet being mixed equal parts, they diſſolve neither the one nor the other.

A plough was ſhewn from Mr. HOUGHTON, ſuch as was uſed in many parts of France, and at Barking in Eſſex, having two ſide-boards, whereby the earth is thrown both ways, and going but once to make a ridge, ſuch as in Eſſex was done at four times. This, as it was of great diſpatch, ſo its being drawn by but

[b] Letter-book, vol. ix. p. 202.

[c] MAURICE WHEELER, M A. rector of Sibbertoft in Northamptonſhire. His letter to Dr. PLOT dated May 22, 1684, concerning his watch, is printed in the *Philoſ. Tranſact.* N°. 161. p. 647.

[d] Regiſter, vol. vi. p. 183, 184.

two

two oxen fastened at the horns and with but one man, saves much expence in the second and third ploughing.

A book, intitled, *Dialogue de la santé*, was presented by Monsr. JUSTEL from the author Monsr. D'ABLANCOURT; and referred to Dr. AGLIONBY to be perused.

June 18, Dr. GALE gave an account of a great earthen urn, found lately at Peckham in Surrey. He inferred, that it might probably direct to the Roman way, which had been thought to pass near that place.

He produced a copy of an inscription of an old Roman altar, dug up at Westchester in 1683, which had not yet been printed. It was ordered to be preserved [e], and was as follows:

" I. O. M. TANARO.
" T. ELUPIUS GALER.
" PRÆSENS GVNTA.
" PRI. LEG XX:V.
" COMMODO ET
" LATERANO
" Coss.
" V. S. L. M.

Dr. GALE was desired to procure the urn found at Peckham to be brought to the Society as soon as he conveniently could.

Monsr. JUSTEL communicated in a letter to Mr. ASTON [f] the figure of a knife belonging to one Monsr. QUINOT of Troyes in France, but supposed to be brought from Constantinople. The blade was of damasked steel; and if it were bent one way upon the hand, or a soft body, there came from one part of it near the point a kind of a doleful noise. If the blade were struck upon a hard body (as a table) it sounded as if it were broken.

A letter of Mr. MOLYNEUX to Mr. ASTON, dated at Dublin, June 7, 1683, and the minutes of the Society at Dublin, from April 28 to June 2, 1684, were read [g]; which minutes were as follow:

" *April* 28, 1684, Several of the Society being absent, there was little done " of any moment.

" *May* 5, 1684, A letter from the bishop of Ferns was read, wherein he pro- " mised suddenly to send us the continuation of his magnetical quæries. Ordered, " that the thanks of the Society be returned his lordship for this favour. An eclipse " of the sun being expected next July 2, it was ordered, that it should be calcu- " lated from several of the best modern tables, and observed accordingly. Mr. " MOLYNEUX and Mr. ASHE took upon them this task. Mr. BULKLEY read

[e] Letter-book, vol. ix. p. 204. [f] Ibid. p. 205. [g] Ibid. p. 187.

" and

" and ſhewed ſome experiments of the luctation of divers alcali's and acids, in " purſuance of Dr. GREW's experiments of that kind. Dr. MULLEN gave an " account of a perſon lately dying of a conſumption. This is regiſtered. He " and Mr. MOLYNEUX report, that the account and figures of the Sirones, or " Acari, given in the Leipſick acts, *anno* 1682, are very genuine and true, as " they find by lately viewing them with a microſcope. Dr. MULLEN gave a " dog a die, and he kept it in his body twenty-four hours; when it came out, it " had loſt half its weight, but retained its cubical figure moſt accurately, and " every point on each ſide.

" *May* 12, 1684, Dr. MULLEN added to his laſt account many obſervables he " lately met with in the body of a man dying of a conſumption. On this occa- " ſion, Sir WILLIAM PETTY was pleaſed to entertain the company with ſome in- " formations of the like nature Mr. ASHE exemplified his laſt mathematical " diſcourſe by ſeveral other inſtances in EUCLID's propoſitions. It was obſerved, " that our Iriſh mortar is much more hard than that of England; our lime being " all made of a marble ſtone; whereas the lime of England is generally made " of a chalky ſtone, and is therefore more apt to moulder away, unleſs pre- " ſerved from the wet. It was therefore to be wiſhed, that the builders of St. " Paul's had taken this into conſideration, and uſed Itiſh lime. From a French " gentleman in the country a letter was read, containing his thoughts of the trees, " which are frequently found deep under ground. Theſe he thinks to be trees " *ſui generis*, and that they there ſeed and grow, for which he offers ſeveral rea- " ſons, with a confutation of that opinion, that makes them the effects of deluges " or inundations, overwhelming the places where theſe are found. Next Mon- " day, being Whitſun-monday, adjourned to this day fortnight, being May 26.

" *May* 26, Mr. MOLYNEUX opened before the company a water-newt, which " he takes to be the ſalamandra aquatica. In the body of this animal there " are two long *ſacculi aerei*, on which the blood veſſels are curiouſly rami- " fied: to theſe blood veſſels applying a microſcope, he ſhewed the circula- " tion of the blood *ad oculum* as plainly as water running in a river, and more ra- " pidly than any common ſtream. Likewiſe the pulſation of the heart was very " manifeſt.

" A letter was read from Mr. J. K. containing many remarkables; as, 1. Of a " pit bottomleſs, becauſe often attempted to be filled up, but in vain, in the mid- " dle of a plain large field. 2. Of a hen's egg he lately ſaw of this ſhape. 3. " Of the ſtones, which the country people call elf-darts, or fairy darts, in this " ſhape. 4. Of a deſtructive thunder, that lately happened about Tuam. 5. " *Meſolabium quo duæ mediæ inter duas datas inveniri poſſunt.* Ordered, that " the thanks of this Society be returned to Mr. J. K. for his ingenious communi- " cations. Ordered, that Mr. ASHE do conſider this *Meſolabium*, and report " his thoughts thereof at our next meeting. Mr. MOLYNEUX ſhewed the com- " pany the ſcheme of the ſolar ſpot, as it was tranſmitted to him by Mr. FLAM- " STEAD, Aſtronom. Regius, informing them, that the ſpot did not ſuffer a ſe-

" cond

"cond revolution; for it was not ſeen upon or after the 22d of May, as it ought "to have been, had it been conſiſtent enough. Dr. MULLEN reports theſe two "experiments to have been lately made by him. 1ſt. A dog having about two "inches in depth and between three and four in breadth cut off from one of "the lobes, in the left ſide of his lungs, and the effuſion of blood being hin-"dered by a ligature of thread, the dog recovered perfectly, having the free uſe "of his lungs, and particularly that of barking with a freedom from coughing. "2d experiment: the external jugular vein of a dog being about ſix weeks ago "ſo tied, that no blood could paſs, the dog continues very well, and perfectly "free from all diſorders, that may be aſcribed to that ligature.

"*June* 2, 1684, Mr. MOLYNEUX did again ſhew the company the circulation "of the blood in a diſſected water-newt. Likewiſe he produced a paper contain-"ing the obſervations of the weather for the laſt month of May, with the "winds, and the hight of the quickſilver in the baroſcope, noted according to "Dr. LISTER's ingenious and compendious method. Dr. HUNTINGTON pre-"ſented two bottles of mineral waters, brought from two ſeveral wells, lately "diſcovered in Connaught, that experiments may be made on them. Ordered, "that Dr. MULLEN do make what experiments he thinks fit to diſcover their "nature, and that he reports them to the Society. Mr. KING being ſuddenly to "go down to the wells at Clenuf, deſired the Society to draw up a paper of quæ-"ries relating to them. Ordered, that Dr. MULLEN be pleaſed to draw up ſuch "a ſcheme of quæries. Sir WILLIAM PETTY was pleaſed likewiſe to promiſe "ſomething to that purpoſe. Mr. KING read a large diſcourſe he had lately "written on hydraulics, and the moſt uſual inſtruments uſed therein, ſhewing "the conveniencies and inconveniencies of each, and concluding with an inge-"nious propoſal of his own. Sir WILLIAM PETTY was pleaſed on this occa-"ſion to inform the company of an hydraulic engine he had contrived to be moved "by fire, and of the unſucceſsfulneſs thereof."

Dr. GREW communicated part of a letter to himſelf from Mr. MOLYNEUX, dated at Dublin June 7, 1684[h], wherein the anatomy of a water-newt or ſalamandra aquatica was mentioned more particularly than in the preceding minutes of the Dublin Society. It was as follows:

"About the middle of May, 1683, I ſought in the ditches about this town "ſeveral water-newts, which I take to be the ſalamandra aquatica of the natura-"liſts: ſeveral of theſe I diſſected, and made many obſervations upon them; "all which I then communicated in a letter to my brother then in London. But "the only particular I will trouble you at preſent is, that in them there are two "long ſlender tranſparent air bladders, lying all along their back: on theſe air blad-"ders the blood veſſels are moſt curiouſly ramified: to which applying a mi-"croſcope, it is admirable to behold with what a prodigious ſwiftneſs their blood "circulates, and this as plain as ever water was ſeen running in a channel. This "I look upon to be the circulation of the blood, demonſtrated *ad oculum*; and "that after this ſight it is impoſſible for the moſt perverſe to deny it: for if we

[h] Letter-book, vol. ix. p. 192.

" make an eſtimate of the whole maſs of blood in this animal, which we ſhall hardly " find amount to the quantity of ſix drops from a man's noſe, we may well com- " pute, that all that may paſs in one of the channels, that the glaſs will diſcover, in " two minutes or leſs. To this I will add, that the heart of this creature will " continue its pulſation for eight or nine hours after the thorax is opened, and it " may be ſeen as plainly as any object whatever, at every ſyſtole to whiten, and " at every diaſtole to redden: as alſo to have various motions therein, according " to its ventricles and auricles.

" This experiment has been dormant ever ſince, till this year the coming in " of theſe animals gave me opportunity of repeating it, and repreſenting it at " our meetings, to the great ſatisfaction of all, that have ſeen it; and particularly " Sir WILLIAM PETTY, though incapable of enjoying the ſight, by reaſon of " his eyes (to which I cannot fit the microſcope, ſo as to ſee any thing diſtinctly) " is pleaſed to think it a very uſeful diſcovery, &c."

The circulation of the blood being ſaid to be viſible in newts, Dr. LISTER affirmed the ſame to be viſible in frogs, and ſome ſnails at ſome times, even through their ſhells. Mr. HUNT was ordered to provide ſome frogs againſt the next meeting.

Iriſh mortar being ſaid to be harder than Engliſh, it was interpreted as meant only of that made of chalk, and not of hard ſtones, as is uſed in many places of the ſouth of England, and all the north.

Upon mentioning Puzzuolane uſed in the mole of Tangier, Dr. LISTER ſaid, that it might be had in England, it being nothing but the pyrites burnt: and that he had lately examined in the Society's *Muſeum* ſome of the duſt from mount Veſuvius rained into a ſhip in the Levant, which applied to the magnet.

He likewiſe obſerved, that in pulling down the houſes in Tangier the laſt year there were found many buſhels of ſwallows, which had hid themſelves.

Mention being made in the Iriſh minutes of ſubterraneous trees ſuppoſed to be *arbores ſui generis*, Dr. LISTER remarked, that he had found of thoſe trees ſtanding upright, but covered, in the Pinna moſs upon the top of Craven: that the tops of the trees were often wanting, as being conſumed by the firing of the moſs; and that the trees might be the betula, as had formerly been ſaid.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford June 12, 1684[i] being read, mentioning a MS. diſcourſe of Dr. BAINBRIDGE concerning the ſeveral ways of finding the longitude, the ſecretary was ordered to write, that it might be communicated.

Dr. PAPIN made an experiment towards finding the quantity of air contained in iron; his account of which was as follows[k].

[i] Letter-book, Vol. ix. p. 206.

[k] Regiſter, vol. vi. p. 185.

" In a Florence flask, that contains 41½ grains of ordinary air, was included 29 " grains of iron, with a sufficient quantity of *aqua fortis* to dissolve them, and a " mercurial gage. The said flask was evacuated till the remaining air could sustain " no more than seven inches of mercury: then the iron was caused to fall into the " *aqua fortis*, which began to work but slowly, and caused but little alteration in the " hight of the quicksilver; but after a while it wrought so briskly, that the mer- " cury in the gage was seen to rise very sensibly, near to the hight of fifteen " inches, but after the dissolution was ended, the mercury descended a little, and " at last it remained in the hight of fourteen inches; so that, by the said dissolu- " tion, there was produced of constant air as much as will counterpoise seven " inches of quick-silver: which quantity of air, in proportion to the ordinary air " contained in the same flask, must weigh 9½ grains, or little more: and so it " was about the third part of the weight of the iron, that had been dissolved.

" As for the knowing, whether so much air doth proceed from the dissolving " or from the dissolved body, the hon^ble^ Mr. BOYLE intends to make several ex- " periments, and to give an account of their success to the Royal Society."

Mr. HENSHAW queried, whether the acquired air might not rather come from the aqua fortis than the iron.

Dr. PAPIN answered, that there might be other experiments made to shew whence the air comes.

He also reported an experiment made at Mr. BOYLE's about suspending water in a bolt-head, which was ordered to be registered [m], as follows:

" On Tuesday the 10th of this month, a bolt-head full of water purged of air " was inverted in a vessel containing some of the same water; and so being put *in* " *vacuo*, the water rested suspended in the bolt-head; but by shaking the engine, it " fell down, as such water useth to do: then, by letting the air into the receiver, " the water ascended again into the bolt-head, only there was a small bubble of " air at the top of it. This being left so in the open air, the bubble in three days " time disappeared; so that the water without filling the bolt-head any more ex- " actly remained suspended *in vacuo*, though it had been three days exposed to " the external air. The same water having been caused to fall down by shaking " the engine, and then remaining exposed to the external air four days together, " did again imbibe, and make disappear a bubble of air, that was at the top of " it: so that without filling the bolt-head any more exactly, the said water remain- " ed yesterday suspended *in vacuo*, as well as any water purged of air; though it " had not been kept *in vacuo* above a quarter of an hour in seven days time."

June 25, Sir CYRIL WYCHE president in the chair.

The specimen of Monsr. MORELLI, in order to the printing his general work on medals, was presented by Monsr. JUSTEL in the author's name.

[m] Register, vol. vi. p. 184.

Mr. HOOKE read a paper of remarks about the manner of obſerving with long teleſcope-glaſſes without a tube.

Dr. LISTER, who had promiſed to ſhew the circulation of the blood in frogs, being abſent, it was deferred till the next meeting.

He having mentioned, that Puzzuolane might be found in England, it was deſired, that he would order ſome trials to be made before the Society.

Subterraneous trees being ſuppoſed to be *betulæ*, Dr. PLOT ſaid, that he had known ſome of them fir, having ſix branches growing regularly at due diſtances; and that a great many firs grew naturally in Staffordſhire to the hight ſometimes of forty ſeven yards. He inſtanced in Norbury of that county.

There was ſhewn an account of the weather during the month of May laſt, as it was obſerved at Dublin by Mr. WILLIAM MOLYNEUX.

This introduced a diſcourſe about repairing the weather-engine, which was referred to farther conſideration.

Dr. PAPIN ſhewed the experiment of diſſolving ſoap in ſalt-water by means of his digeſting engine; which he ſuppoſed might be ſerviceable for waſhing linnen at ſea. The brine lathered well, and was ſmooth, though it had been half a quarter of an hour in preparing. His account of this experiment was as follows[a]:

"The cleanneſs of the linnen cloth at ſea being a great help to keep men in "good health, and the waſhing of it requiring a great deal of freſh water, I "thought it would be an uſeful thing to find a way to waſh with ſalt-water. I "have therefore put ſome ſoap, with ſalt-water, in two veſſels, and having left "one in the open air, I have included the other in the digeſter, and put fire to "it, till a drop of water at the top of it would evaporate in thirty ſeconds: and "then having put out the fire, I have found, that the ſoap in the open air was "not at all diſſolved; but that in the digeſter was very well diſſolved, and even "more than other ſoap, that I had put at the ſame time in freſh-water: ſo it is "likely, that ſoap ſo well diſſolved would fetch out all the greaſe and dirt "from linnen-cloth, as well as can be. Nevertheleſs, I muſt confeſs, that ſuch "ſoap doth not look ſo white as the other doth: and yet I am apt to think, "that it would be, for all that, as good for health, which is the main thing at "ſea. I have to day repeated the ſame experiment, to ſhew it to the Royal "Society."

It was ordered, that at the next meeting it ſhould be reported, how the water proved in the waſhing of linnen.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, June 18, 1684[b],

[a] Regiſter. vol. vi. p. 186. [b] Letter-book, vol. ix. 257.

was

was read, mentioning, that Dr. TURBERVILLE of Salisbury had not long before met with a distemper of the eye, till then perhaps undescribed and without a name. It was a bag of matter prominent from the tunica adnata. The doctor cured his patient, and called the disease *bursa oculi*.

July 2. Sir CYRIL WYCHE president in the chair.

Monsr. HUYGENS's *astroscopia compendaria* was presented by Monsr. JUSTEL, and referred to the perusal of Mr. CLUVERUS.

Mr HOOKE read a discourse concerning the manner of rowing used by the antients in their gallies; which he was desired to deliver in writing with a draught.

Sir ANTHONY DEAN presented for the repository an agate-like stone, consisting of large pebbles, lying in a very hard cement, which he had found in Hertfordshire in Sir CHARLES CÆSAR's grounds.

Mr. CLUVERUS delivered in a description of a monstrous child born February 29, 1684, at a village called Heisagger in South Jutland[p].

A Letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, June 27, 1684[q], chiefly concerning his success in tying up the jugular veins of a dog:

"As to the tying of the jugular vein, as mentioned in the same minutes, I "will acquaint you with what I have done of late in that kind. Some time in "March last I tied the two external jugulars of a dog, and cut off the veins on "this side of their respective ligatures, *i. e.* towards the heart; after which I ex- "pected, that the dog should have evacuated more plentifully than ordinary by "way of spittle and tears, (as Dr. LOWER tells us the dog, on which he tried this "experiment, did in a very considerable measure) but the event was quite other- "wise; for I could not find, after diligent observation, that the dog, which I "made use of, was any way concerned, otherwise than at the wound. I found no "alteration in him at all, that I could impute to the stoppage of the circulation "in the veins before mentioned. About three weeks after this, I tried another ex- "periment on the same dog, under which he died. I examined him as to the ju- "gulars I had cut asunder, and found them now almost dried up. When I have "any leisure I will try this experiment once more, partly because my success in it "was so very differing from that of Dr. LOWER, and partly also because if it "succeeds with me a second time, as it did at first, and if the jugulars in men com- "municate one with another in so great measure, as by that time it will appear they "do frequently in dogs; then (I say) we may hence conclude, that bleeding in "the jugulars is more proper in many diseases of the head, than several physicians, "who suppose no considerable communication betwixt the external jugulars and "the brain, will allow: but of this more hereafter: only I desire you to observe, "that if what I have written concerning the cutting off the jugulars, &c. be any

[p] It is printed in the *Philos. Transact.* N°. 160. p. 599. for June 1684.
[q] Letter-book, vol. ix. p. 258.

"way

" way queſtioned, the truth of it can be atteſted by Mr. PAINE of New-college, " who ſaw the operation. I think Dr. PLOT heard me diſcourſe of this experi- " ment, with the ſucceſs of it, about that time I did it.

Two papers were communicated by Dr. HUGH CHAMBERLAYNE; the one printed, being a propoſal of one VILLEBRIESSIESENT of Grenoble, to raiſe water by a new cheap engine of wood or oil-cloth, tranſportable by one man, &c. It bore no date.

The other was a propoſal in a Dutch letter to Monſ. COLBERT for finding the longitude by an hour-glaſs running complete twenty four hours, and having a pipe for communication of the air between the lower and upper glaſs. It was ordered, that this letter be tranſlated, and a copy of it kept.

Two papers were ſhewn from Mr. HOUGHTON, being the number and ages of perſons in two pariſhes, Hartley-Row in Hampſhire and Holyrood in Southampton.

A diſcourſe was communicated from Oxford concerning the making a watch to move upon a declivity, ſuch as had formerly been contrived by EDWARD Marquis of Worceſter, though never ſeen by the author, Mr. MAURICE WHEELER. The diſcourſe being long, it was not read, but a copy ordered to be kept [r].

Another diſcourſe was communicated from Oxford by Mr. JOSHUA WALKER concerning the figure of a church, which may be built ſeventy feet wide, without any pillar in it [s]. This alſo being long was not read, but ordered to be tranſcribed.

A diſcourſe concerning the natron of Egypt by Mr. CHARLES LEIGH of Brazen-noſe college, Oxford [t], was part of it read, the other part being referred to the next meeting.

Dr. PAPIN made a trial of ſoftening a piece of box in the digeſting engine to ſuch a degree, as to make it capable of an impreſſion from any hard body; which ſucceeded. His account of it was as follows [u]:

" A piece of box being put in the digeſter with water, and the fire being in- " creaſed, till a drop of water at the top of the digeſter did evaporate in two " ſeconds, the box was found ſo well ſoftened, that it did take an exact impreſ- " ſion of a farthing; and it was judged, that by this means, the hardeſt wood " might be ſoftened enough to be printed, not only with ſeveral mathematical " inſtruments, but even with the biggeſt medaillon, that ever was made: and

[r] It is entered in the letter-book, vol. ix. p. 243. and printed in the *Philoſ. Tranſact.* N°. 161. p. 647. for July 1684.

[s] Letter-book, vol. ix. p. 236.

[t] Ibid. p. 216. It is printed in the *Philoſ. Tranſact.* N°. 160. p. 609.

[u] Regiſter, vol. 6. p. 187.

" ſuch

" ſuch wood in two or three days time comes to be at leaſt as hard as ever " it was."

A paper was produced, communicated from Dublin, being a new and eaſy way of demonſtrating ſome propoſitions in EUCLID by Mr. ST. GEORGE ASH, member of the Philoſophical Society of Dublin for promoting natural knowledge [x].

A tranſcript of part of a manuſcript of Dr. BAINBRIDGE concerning the ways of finding the longitude was produced, as follows [y]:

" Nullum eſt in totâ ferè matheſi problema, quod mathematicorum ingenia " magis exercet, nullum, quod aſtronomiæ et geographiæ magis conducit, quam " problema inveniendi meridianorum ſive longitudinum differentias. Hoc pro- " blemate aſtronomi motuum cœleſtium epochas a meridiano radicali ad quemvis " alium transferunt: ejuſdem radiis geographi totum terrarum orbem luſtrant et " deſcribunt. Hoc eſt problema illud πολυθρύλλητον, in quo ſolvendo mathematici " non minus laborant, quam in duplicatione cubi aut quadraturâ circuli, nec mi- " nus deſudant quam chryſopæi chymiſtæ in lapide ſuo excoquendo. Varia igitur " hujus problematis ſolvendi ἐπιχειρήματα breviter referre viſum fuit, et de ſingulis " quid ſentiam dicere.

" Primum epicheirema aſtronomicum et tenebris lucem profert, et ex umbrâ " radios, obſervando eclipſes lunares, quæ tranſeunte lunâ per opacam terræ um- " bram univerſales fiunt: hoc eſt, omnibus terreni globi incolis, a quibus ſpec- " tari poſſunt, eodem modo videntur, eâdem obſcurationis quantitate et dura- " tione, ſed non iiſdem horis. Idem enim lunaris eclipſis momentum, quod nobis " incidit in mediam noctem, aliis, qui magis orientales ſunt, poſt mediam noctem " putatur, aliis vero, qui magis occidentales ſunt, ante mediam noctem nume- " ratur; ſemperque horarum differentia proportionalis eſt differentiæ meridiano- " rum ſive longitudinum.

" Hoc epicheiremate PTOLOMÆUS lib. 1°. geographiæ cap. 4°. ſtatuit Cartha- " ginem occidentaliorem Arbelis Aſſyriæ gradibus 45. Siquidem idem eclipſis " momentum, quod Carthagine contigit horâ noctis ſecundâ, Arbelis accidit ho- " râ noctis quintâ; ubi monendum, horas noctis temporales in hâc eclipſi quam " proxime æquales fuiſſe horis æquinoctialibus. Hæc enim fuit inſignis illa lunæ " eclipſis, quæ facta eſt undecim diebus ante fatale prælium inter ALEXANDRUM " magnum et DARIUM ultimum Perſarum monarcham, anno ante vulgarem " CHRISTI epocham labente trecenteſimo trigeſimo primo nocte poſt vigeſi- " mum diem Septembris Juliani προληπτικῶς aſſumpti, paucis diebus ante æqui- " noctium autumnale, nocte vero poſt decimum quintum diem Boedromionis, " ultimi menſis Attici æſtivi, περὶ τὴν τῶν μυστηριῶν τῶν Αθήνησιν ἀρχὴν circa initium my- " ſteriorum Athenienſium. Undecimo vero die poſt eclipſim commiſſum fuit præ- " lium inter ALEXANDRUM et DARIUM, h. e. ut refert PLUTARCHUS in ALEXAN-

[x] This paper is printed in the *Philoſ. Tranſact.* N°. 162. p. 672. for Auguſt 1684.
[y] Letter-book, vol. ix. p. 228.

" DRO-

" DRO πέμπτη φθίνοντος Βοηδρομίωνος vigesimo sexto die Boedromionis, ut testatur idem " PLUTARCHUS in CAMILLO. Quibus PLUTARCHI locis magnus ille temporum " emendator abutitur ad suam egregiam sed fictitiam periodum Atticam confir- " mandam. Sed redeo ad propositum.

" Epicheirema hoc eclipticum, ut omnium est facillimum, ita certissimum. " Singula enim eclipsium lunarium momenta facile observari possunt in horis et " horarum minutis: et proinde meridianorum differentia accuratissime sciri po- " test in gradibus eorumque partibus. Sed cum eclipses lunares rarò contingant, " et rarius videantur, alia nostri problematis solvendi epicheiremata proferam, et " ad incudem mathematicam sigillatim tuditabo.

" Secundum epicheirema astronomicum meridianorum differentias quærit per " momenta transitûs lunaris sub utroque meridiano. Nam primo, luna propter " motum ἀποχῆς a sole in consequentia signorum contra motum primum, ad me- " ridianum eundem non accedit iisdem semper horis, sed accessum suum quotidie " retardat μελαπλώσις, quadraginta plus minus minutorum unius horæ, pro variâ " motûs lunaris ἀνωμαλία et variâ ascensionum rectarum differentiâ. Secundò, " propter eundem ἀπυχῆς in consequentia signorum motum, luna sub meridiano " orientali ocyus, sub occidentali serius transit; utriusque vero transitus differen- " tia horaria collata cum metaptosi illâ diurnâ meridianorum differentiam indicat. " Hoc epicheirema multi, qui mathematici audiunt egregii, summopere prædi- " cant, et naucleris maximè commendant; quam rectè, paucis ostendam.

" Primo, difficillimum est, præsertim inter oceani fluctus navigantibus, lunæ " sub meridiano transitum accuratissimè (quod tamen hoc epicheirema postulat) " observare. Si verò minimus in observando contingat error, maximus tandem " fiet in quæsitâ meridianorum differentiâ; triginta plus minus graduum, si in " meridiano situ aberratum fuerit uno tantum gradu, aut in transitus lunaris mo- " mento quatuor tantum horariis minutis. Secundo, cum in altero loco transitus " lunæ sub meridiano, non ex observatione, sed calculo astronomico sumatur, " opus erit tabulis lunaribus ipsi cœlo συμφώνοις, quales quam proximè sunt Tycho- " nicæ, qualesque suas esse gloriatur novæ astronomiæ instaurator Landsbergius, " quem tamen falsi redarguunt accuratissimæ observationes Tychonicæ, a quibus " tabulæ Landsbergianæ alicubi discrepant integro ferè gradu.

" Qualescunque vero fuerint tabulæ lunares, loci lunaris ἐπιλογισμὸν dubium " reddit dierum naturalium æquatio; tabulæ enim lunares æqualia suppponunt " nycthemera, quæ tamen inæqualia sunt: quanta autem est dierum æquatio, " non satìs constat: aliam statuit PTOLEMÆUS, aliam BRAHEUS, aliamque " KEPLERUS, qui dum mirâ ingenii sagacitate dierum inæqualitatis causas scru- " tabatur, in paradoxum incidit παραδοξότατον motus primi ab ortu in occasum pe- " riodos inæquales esse. Quam vera sit hæc KEPLERI sive assertio sive suspicio " testabitur μάρτυς σοφώτατος καὶ ἔλεγχος σαφέστατος ipsum tempus. Interea dubia " erit dierum vulgaris æquatio, dubius lunæ epilogismus, dubiumque hoc epi- " cheirema.

" Nec

" Nec minus dubium et perplexum eſt epicheirema tertium per diſtantiam " lunæ a ſtellâ fixâ circa eclipticam poſitâ: quæ diſtantia in altero loco obſervanda " eſt, in altero vero ex tabulis lunaribus ad eandem horam derivanda. Hoc epi- " cheirema prioribus difficultatibus novas addit, a modo obſervandi et parallaxi " lunæ. Nam radius geometricus, qui huic obſervationi maximè idoneus cenſe- " tur, diſtantiam juſto majorem exhibet, ſi non caveatur oculi eccentricitas, quod " olim primus animadvertit ARCHIMEDES in ſuo ψαμμίτη et ante annos ſexaginta " monuit doctiſſimus noſter DIGGESIUS in alis mathematicis. Parallaxis vero lu- " naris, niſi luna fuerit in nonageſimo gradu eclipticæ diſtantiam obſervatam majo- " rem aut minorem faciet, pro varia lunæ ad gradum nonageſimum et ſtellam " fixam ſitu. Hoc tamen epicheirema imperitis naucleris venditare non deſinunt " triviales Πινακιδαὶ e circo mathematici: inter quos meritò numerandus ille, qui " novas hypotheſes lunares, eaſque abſurdiſſimas, hujuſque epicheirematis gratiâ " confertas, Maximo Cardinali dicare pro ſuâ audaciâ non erubuit.

" Ad epicheirema quartum jam tranſeo per αὐτόματον, quod motu æquabili perpe- " tuo, ſaltem ad aliquot multos dies aut menſes, horas æquinoctiales tranſactas " accuratiſſime indicabit. In diſceſſu a primo meridiano, ſummâ diligentiâ per " ſolem aut ſtellam fixam invenienda eſt hora æquinoctialis, ad quam index Au- " tomati transferendus: deinde facto tranſitu ad alium quemvis meridianum, " eâdem ſolertiâ quærendum, quot horæ tranſactæ fuerint a meridie aut mediâ " nocte; quæ ſi pauciores fuerint horis ab Automato indicatis, meridianus ſe- " cundus occidentalior eſt; ſin plures, orientalior, ſemperque meridianorum diffe- " rentia ἀνάλογος eſt differentiæ horarum.

" Hoc epicheirema a multis propoſitum fuit, inter quos ille, quem honoris causâ " nominò, JOHANNES FERNELIUS, qui in præfatione ad libros de abditis rerum cau- " ſis, HENRICO ſecundo Francorum regi profitetur, ſe excogitaſſe horarum æqui- " noctialium obſervatione, quâ ratione in quacunque orbis terrarum regione, " illius internoſci poſſit longitudo: quod quidem aſſerit ſe de fontibus antiquorum " non hauſiſſe, ſed de ſuis rivulis primum protuliſſe. Divinum FERNELII ingenium " demonſtrant monumenta ejus medica et mathematica, non tam cedro quam æter- " nitate digna: puto tamen, imo dico (quod ſalvo tanti viri honore dictum volo) " FERNELIUM ſibi aliiſque hic impoſuiſſe. Nam primò, ut PTOLOMÆI noſtri " verbis utar, ἃ μόνον δύσκολον, ἀλλὰ καὶ παντελῶς ἀδύνατόν ἐστι hujuſmodi ἀυτόματον com- " parare propter varias cum materiæ ἀνωμαλίας, tum aeris ambientis mutationes. " Mira quidem prædicantur de ſphæris ARCHIMEDIS, POSIDONII, et DREBELII, " noſtrorum temporum mechanici ſolertiſſimi: at motum perpetuò æquabilem " nec illi fecerunt, nec facient poſteri; hunc ſolum efficiet ſapientiſſimus mundi " δημιουργος primuſque cœlorum motor DEUS o. m. Secundò, quod prius monui, " nucthemera ſunt inæqualia, eorumque æquatio nondum ſatis explorata.

" Quintum proponam epicheirema, illudque magneticum, per acûs magneti- " cæ a vero meridiano declinationem. Compertum eſt, acum magneticam circa " inſulam Corvo, quæ una eſt Azorum, recta ſpectare ſeptentrionem: ſed extra " illum meridianum in hanc vel illam partem deflectere. Hinc mathematici non- " nulli, ad pauca reſpicientes, meridianum illum primarium ſtatuerunt, et in illo

" Polos (neſcio quos) magneticos, eorumque a Polis terræ diſtantiam invene-
" runt: quibus poſitis, et datis ubique terrarum latitudine et declinatione mag-
" neticâ, dari poſſe putarunt meridiani cujuſlibet a primario illo diſtantiam.
" Sed hoc epicheirema lubricum et incertum eſſe demonſtrant obſervationes mag-
" neticæ, quibus ſatis ſuperque liquet, meridianum illum per inſulam Corvo non
" eſſe primarium; ſiquidem ſub eodem meridiano navigandi ultra citrave illius
" inſulæ parallelum acus magnetica nunc in hanc nunc in illam partem deflectit;
" ideoque in illo meridiano non ſunt Poli magnetici.

" Præterea in aliis etiam meridianis nulla eſt χαλυβόκλισις ſive cuſpidis
" magneticæ declinatio, quod teſtantur obſervationes circa Promontorium Bonæ
" Spei multoties factæ. Magnetem verò nullos certos Polos reſpicere, ſed a magnis
" terræ continentibus huc et illuc trahi et librari, rectè docet GILBERTUS noſter,
" primus idemque doctiſſimus magneticæ philoſophiæ magiſter; e cujus fontibus
" CABEUS ſuos deduxit rivulos. Totum denique hoc epicheirema magneticam
" ſuſpectum reddit nova ſuſpicio, declinationem magneticam in eodem equidem
" loco eſſe mutabilem. Siquidem declinatio magnetica, quæ ante annos quin-
" quaginta quinque Londini comperta fuit graduum $11\frac{1}{4}$, nunc vix 4 gradus ſu-
" perat, ſi nullus obſervationibus irrepſerit error. Ego quidem ἐπέχω, et ad alias
" alorum locorum obſervationes provoco.

" Sextum et ultimum noſtri problematis ſolvendi epicheirema ab hydrographi-
" câ nautarum chartâ deſumitur, quam mirâ arte et ſolertiâ neoterici mathematici
" adornarunt: inter quos longè clariſſimus noſter WRIGHTUS, de cujus lumine
" STEVENUS, SNELLIUS, multique alii ſuas accenderunt faculas. Chartæ illius ad-
" miniculo, naucleri triplici medio meridianorum differentias exquirunt. In pri-
" mo dantur latitudinum differentia et rumbus, (ut loquuntur nautæ) in ſecundo
" latitudinum differentia et diſtantia itineraria; in tertio altera latitudo, rumbus
" et diſtantia.

" Horum datorum primum εὐπόριστον eſt; facile enim et ſatis accuratè ubique ter-
" rarum inveniri poterit latitudo. Secundum et tertium dubia ſunt et inconſtan-
" tia. Rumbus enim ὁλοσχερῶς ab acu magneticâ indicatus, corrigendus eſt per
" declinationem magneticam, quæ in aliis locis alia eſt, et in eodem loco (ſi no-
" vis obſervationibus credendum) non ſemper eadem. Diſtantia vero non ſolum
" leucis aut milliaribus nobis cognoſcenda, ſed etiam ad gradus maximi circuli
" terreſtris reducenda. Hic autem nautarum conjecturas ſemper incertas ma-
" gis adhuc turbant varii ventorum impetus et patentes oceani fluxus.

" Sex jam recenſui problematis noſtri epicheiremata, e quibus quinque poſterio-
" ra dubia et incerta dico, neque tamen prorſus rejicienda; ſuum enim habent
" uſum, et quæ non proſunt ſingula, multa juvant. Primum vero per eclipſes
" lunares facillimum et accuratiſſimum iterum pronuncio. Hic verò objurgatio-
" nibus non ſunt digni mercatores et naucleri, qui in tot orbis terrarum periodis,
" in tot oceani περίπλοις nullas aut paucas eaſque παχυμερῶς factas eclipſium ob-
" ſervationes retulerunt? Parum enim refert referre viſam fuiſſe lunæ eclipſin in
" freto Magellanico aut ſinu Mexicano, in Mari Rubro aut Caſpio, in Sinarum

" regione aut insulâ Japonicâ, nisi simul addatur momenti hora, non ὑλοσχερῶς per " fallaces conjecturas æstimata, sed accuratissimè per centissimos characteres astro- " nomicos designata.

" Sed quid culpo mercatores, qui solem et lunam non in cœlo inter planetas, " sed in subterraneis PLUTI cryptis inter metalla quærunt? Quid naucleros? " qui præter instrumenta nautica nihil ferè sciunt aut curant amplius. Quid hos " aut illos culpo? cum in tot literati orbis florentissimis academiis, in tanto ma- " thematicorum numero, vix unus aut alter, reperiatur hac facillimâ et utilissimâ " eclipses observandi πραγμάτια sedulò versatus. Vos vero divinæ matheseos " mystæ, macti estote, favete et valete."

July 9, Sir CYRIL WYCHE president in the chair.

Mr. HOOKE read a discourse concerning the form of PORSENNA's tomb, described in PLINY. He also shewed a scheme of it different from that of Mr. GREAVES, of which he was desired to leave a copy.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, July 2, 1684[z], was read, containing some account of the spots seen in the sun at Oxford, June 27.

Mr. FLAMSTEAD agreed with this account, and said, that he doubted not of its return in four days time.

The latter part of the discourse concerning natron was read.

A paper of Dr. PAPIN, concerning the softening of lignum vitæ in the digester so as to receive an impression, was read; and the experiment was tried. The paper was as follows[a].

" A piece of *lignum vitæ* being put with water in the digester, the fire was in- " creased, till the drop of water would evaporate in two seconds: it was kept so " for about half an hour, and afterwards, the fire being put out, the wood was " found soft enough to receive easily an exact impression of a new three pence; " though the *lignum vitæ* be the hardest wood, that can be found. If you boil the " same wood in turpentine, or oil of turpentine instead of water, you cannot " soften it."

A paper was communicated from Oxford concerning a digestive liquor turning several meats into a chyly substance. The secretary was ordered to desire some of the menstruum for a trial.

Some of the sea-water sweetned by the patentees was accidentally shewn and tasted.

[a] Letter-book, vol. ix. p. 260. [z] Register, vol. vi. p. 187.

It was propoſed, that the Society might the next Wedneſday adjourn their weekly meetings till toward the term.

July 16, at a meeting of the COUNCIL were preſent,

Mr. COLWALL	Dr. GALE
Mr. HENSHAW	Dr. TYSON
Dr. CROUNE	Mr. HILL
Dr. AGLIONBY	Mr. ASTON.
Dr. LISTER	

Mr. COLWALL took the oaths of ſupremacy and allegiance, and the oath of office as vice-preſident.

At a meeting of the SOCIETY on the ſame day, Mr. COLWALL vice-preſident in the chair.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford July 9, 1684 [b], was read, concerning the damage done to the peaſe and beans in Somerſetſhire by caterpillars. Mr. HENSHAW remarked, that the beans about London had ſuffered moſt where they grew near barley.

Dr. LISTER obſerved, that the caterpillar turned into a night moth; and that in the year 1666 he had given an account of one ſort of them in a letter to Mr. OLDENBURG from Cambridgeſhire.

Mr. MUSGRAVE's letter likewiſe mentioned, that an account had been given to the Philoſophical Society at Oxford of a deſign carried on by ſeveral of the moſt learned men in Somerſetſhire of writing the natural, civil, and eccleſiaſtical hiſtory of that county; the whole to be proſecuted by ſeveral hands, but the matter to be digeſted by ſome one of them: that Mr. PASCHAL, who lived near Bridgewater, was the chief undertaker; and that they would be glad of any aſſiſtance or direction from the Royal Society.

There was read a tranſlation of a Dutch paper about finding the longitude by a twenty four hour-glaſs.

Mr. HOOKE remarked, that that ſort of time-meaſurers had been found very uncertain by ſeveral trials; and therefore laid aſide.

Dr. PAPIN obſerved, that he had found water in a clepſydra run faſter in hot weather than in cold.

Mr. HOOKE read a farther explanation of his opinion about the gallies of the antients, which he confirmed by a figure ingraved on TRAJAN's pillar repreſenting the manner of rowing.

[b] Letter-book, Vol. ix. p. 260.

Dr. PAPIN, in purſuit of the laſt experiment, ſoftened cow's horn and tortoiſe-ſhell in the digeſter, and found the tortoiſe-ſhell to take a better impreſſion than wood, and to be a fit material for taking off the impreſſion of medals. His account of this was as follows [c]:

" Having been commanded to try, whether ſoftened wood would take an im-
" preſſion in relief, as well as a concave one; I have ſoftened *lignum vitæ*, and
" *box*, and with a ſeal, that is engraven very deep, I have given them a very exact
" impreſſion, ſo that ſome ſmall ſtrokes in the deepeſt part of the ſeal, are printed
" upon the wood; and I have brought them to the Royal Society.

" Being about to try, how to make impreſſions in hard bodies, with the help of
" the digeſter, I would not leave it off, without making ſome experiments of the
" ſame kind upon cow's horn, and tortoiſe-ſhell: having then put ſome of them
" together in the digeſter with water, I increaſed the fire, till the drop of water
" would evaporate in two ſeconds, and left it ſo, for near a quarter of an hour.
" Then having put out the fire, and let the engine cool, I found, that tortoiſe-ſhell
" could very eaſily take a moſt exact impreſſion of the ſame ſeal: ſo that I
" look upon tortoiſe-ſhell as one of the beſt materials to keep exact impreſſions
" of any medals, or engraving, that we have a mind to. The cow's horn was
" yet a great deal ſofter. and more ſwelled, and it could be folded like a piece of
" buff; ſo that I ſtand in ſome hopes, that either by a ſtronger boiling, or with
" ſome other *menſtruum* more efficacious than water, theſe materials may be
" melted down quite, and be caſt in a mold. I have brought all theſe things to
" the Royal Society, that they may be pleaſed to look upon them, and give me
" ſome directions upon that matter."

July 23, at a meeting of the COUNCIL were preſent,

Mr. COLWALL vice-preſident

Mr. HENSHAW	Mr. HILL
Dr. GREW	Mr. FLAMSTEAD
Dr. LISTER	Mr. ASTON.

It was ordered, that the treaſurer pay Dr. PAPIN one fourth of a year's ſalary, being ſeven pounds ten ſhillings:

That Mr. HOUGHTON be acquitted of his weekly payments for one half year, in conſideration of his expences about the Society's buſineſs:

That the perſon, who copies the Society's books, be paid fifteen pounds upon account till the books are finiſhed: and

That the operator be paid half a year's ſalary from January 4 to July 14, 1684.

[c] Regiſter-book, vol. vi. p. 188.

Monſ.

Monſ. D'ABLANCOURT and Mr. MONSON were propoſed and approved.

Upon a complaint of Mr. FLAMSTEAD, that he had been reflected upon by Mr. HOOKE in the minutes of the Society, it was ordered, that a line ſhould be drawn through the places complained of, and that there ſhould be written on the ſide, *cancelled by order of council:* and that the journal-book ſhould be brought to the next meeting of the council, who ſhould ſee it done.

At a meeting of the SOCIETY on the ſame day, Mr. COLWALL vice-preſident in the chair.

Mr. CLUVERUS gave an account in writing of the *aſtroſcopia compendiaria* of Monſ. HUYGENS, and of a paper tranſmitted from Dublin, containing a new manner of demonſtrating EUCLID.

Dr. PAPIN, after an endeavour to melt down cow's horn, and make it run, which would not ſucceed, found, that the powder or ſhavings of horn preſſed together received a good impreſſion (as appeared) and would make a kind of hard tranſparent paſteboard. His account of it was as follows [d].

" In proſecution of the experiment about ſoftening cow's horn, I have endea-
" voured to melt it quite down, and to caſt it in a mold; but I have not been
" able yet to effect it; although the ſame horn reduced almoſt to a powder hath
" been put three times in the digeſter, and kept there for near half an hour, with
" a heat, that will evaporate the drop of water in two ſeconds. The horn's parti-
" cles will thereby ſwell very much, and ſtick to one another; but never run in
" a mold: nevertheleſs, we may from thence get almoſt the ſame advantage; be-
" cauſe ſuch particles may eaſily be put in what form we pleaſe, and being well
" preſt, they will unite ſo perfectly, that they will look like a continued body;
" and ſo do the ſame effect, as if they had been caſt in a mold: as may be ſeen
" upon a farthing, which I have with me, part of which is overlaid with horns
" particles, ſo well united, that they have endured poliſhing, and look like a fine
" piece of tortoiſe-ſhell. I have alſo uſed ſuch horn-ſhavings, as are thrown
" away by thoſe, that make horn-combs, and having kept them in the digeſter,
" till the drop of water would evaporate in two ſeconds, I took away the fire;
" and I was ſurprized to ſee, that the ſaid ſhavings did not ſeem to be ſwelled at
" all. Nevertheleſs, having preſt ſome of them between two farthings, I found,
" that the ſhavings were ſo well united, that they made a kind of a hard and
" tranſparent paſteboard; which I believe may be uſeful for the making of ſe-
" veral diſhes, tables, cabinets and other goods. I have brought ſome ſpeci-
" mens of it to the Royal Society, that they may be pleaſed to give me their di-
" rections."

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, July 22, 1684 [e], was read, concerning a ſal gemmæ found in the Leeward Iſlands and the coaſt of Scotland; and Neapolitan black writing ſand being magnetical.

[d] Regiſter, vol. vi. p. 189. [e] Letter-book, vol. ix. p. 269.

The

The pneumatical engine being in good order, it was desired, that Dr. PAPIN would try some experiments, which require the air to be kept out for a long time.

Mons. FREMONT D'ABLANCOURT was proposed candidate as from Mr. BOYLE; and Mr. WILLIAM MONSON as from Dr. TYSON.

The Society adjourned themselves till towards *Michaelmas* term; at which time a summons was to be issued out by the president for their meeting.

During the Society's recess, Dr. PAPIN made the following experiments[f]:

" *July* 30, 1684. Observations on a frog, and a fly *in vacuo*.

" Some trials were made upon frogs *in vacuo*, which lived well there: they " did only seem a little uneasy, and their legs swimmed near the top of the wa- " ter; but letting in the air, the same legs sunk. Some flies looked like dead " *in vacuo*, but a while after the air was let in, they did recover very well; one " of them shot out a long sting from his mouth; but as soon as the air was let in, " the sting withdrew again.

" *August* 6, Observations on warm water, cold water, and warm beer *in vacuo*.

" Some warm water was put *in vacuo*, where it did boil very much; but cold " water did only make a great many small bubbles; and beer swelled like froth " over the brims of the glass, that contained it: but warm beer did boil with " great violence to the top of the receiver, that was four or five inches above its " surface.

" *August* 13, Observations on a pear *in vacuo*.

" A pear was shut up *in vacuo*, with intention to make some trials in the facti- " tious air, that would come out from the said pear; but since that time the re- " ceiver holds still, and is not yet filled with factitious air.

" *August* 20, thermoscope with vacua.

" Mr. HENSHAW having propounded to try, whether a thermoscope, exhaust- " ed of air, with the liquor in it, exhausted of air too, might be sensible of cold " and heat, as ordinary thermoscopes are; the thing was tried, and found, that the " effect was not sensibly altered by the absence of the air.

" *August* 27, Experiment with cork in water.

" An experiment against positive levity was tried with good success: for we " caused a cork to remain in the bottom of the water, nor could its levity raise it

[f] Register, Vol. vi. p. 190.

" to

" to the top of the water: but as ſoon as the water, that preſt it underneath, was " as high, as that, which did preſs upon it, preſently the cork was raiſed to the top " of the water. We had an *apparatus* very fit for that experiment.

" *September* 17. A bottle full of air in an exhauſted receiver.

" A ſquare bottle full of air, and exactly ſhut up, was put under water in a " great glaſs: and a great receiver being whelmed over it, the air was exhauſted: " and after ſome ſuctions, the air included in the bottle under water had " ſo much force, that notwithſtanding the water, that was above it, it broke the " bottle, and the glaſs containing the water, and the outward receiver, though " every one of them was of a pretty good ſtrength.

" *September* 20. Dr. PAPIN's experiment with the muſcle of a man *in vacuo*, " and a mercury gage to find the quantity of air produced.

" Dr. CROUNE ſent the muſcle of a man to be ſhut in a great receiver *in vacuo*, " with a gage to know what quantity of air would be produced by the ſaid muſ- " cle: but the Wedneſday following there was found a crack at the top of the " receiver, whereby the air had got in. The crack being ſtopt, and the re- " ceiver exhauſted again, it hath been kept ſo ever ſince, and the mercury in the " gage is not yet got to the hight of ten inches: but becauſe there is ſtill ſome " air produced, though very ſlowly, I intend to keep the ſame a little longer, till " I ſee the gage will conſtantly keep the ſame hight."

Mr. ASTON received likewiſe the minutes of the Dublin Society from June 9, to July 24, 1684, as follows[s]:

" *June* 9, 1684. Mr. FOLEY read a diſcourſe, which he calls *Computatio univerſalis* " *ſeu logica rerum*, wherein he endeavours to bring the value of all things to a cer- " tain ſtandard, and to lay down ſome mathematical rules for good huſbandry.

" Dr. MULLEN gave an account of what experiments he had made on the mi- " neral waters laſt committed to him, producing likewiſe bottles of two other " waters lately diſcovered nigh Chappel-Izod within three miles of Dublin. The " method, by which he proceeds in theſe experiments, was by infuſing galls in the " ſeveral mineral waters, and then impregnating common water with various ſalts; " and in theſe infuſing galls likewiſe, he obſerved, which of thoſe artificial im- " pregnations came nigheſt in colour to the colour reſulting from the infuſion of " galls in the natural mineral waters: ſeveral of theſe experiments he ſhewed be- " fore the company.

" Sir WILLIAM PETTY produced a paper containing a ſcheme of experiments " for examining mineral waters: theſe are regiſtered.

[s] Letter-book, vol. ix. p. 261.

Mr.

" Mr. ASHE gave us at large his opinion of Mr. K.'s meſolabe, which he " finds as mechanical as others propounded by ſeveral to this purpoſe. Likewiſe " he propoſed an ingenious method of his own, for dividing a line in extreme " and mean proportion, much eaſier than EUCLID's and far ſhorter. This is " regiſtered.

" Mr. KING gave in three lines his opinion of Mr. K.'s meſolabe. A letter " was read from Mr. K. containing ſome additions to be made to his meſolabe.

" *June* 16. At this meeting his Lordſhip the Biſhop of Cork, lately returned " from London, was pleaſed to give us his company, and to compliment us from " the Royal Society, for which our thanks were returned to the ſaid Society, " and to his Lordſhip for the favour of the meſſage. A letter from Mr. MUS- " GRAVE was read, which contained the reſult of ſome experiments he had made " by injecting water into the thorax of a dog, which recovered perfectly without " any application or medicine. It brought us likewiſe the minutes of the Oxford " Society from April 13 to May the 13th. Theſe contained many curioſities, and " particularly Dr. PLOT's diſcourſe of lamps, if not ſuddenly to be printed, was " earneſtly deſired.

" Mr. ASHE produced ſome figured ſtones reſembling petrified ſhells: theſe, " we hear, are thought of late by ſome to be *lapides ſui generis.*

" Mr. MOLYNEUX likewiſe produced ſome curiouſly figured rock-cryſtal, " found near Catherlagh in a field; but how poſited, the party, that brought them, " could not tell: they are hexagonal priſms determined at one end by an hexa- " gonal pyramis, as curiouſly edged, as if cut by art; on the other end they ſeem " to determine in a root, as if fixt thereby to another ſtone, for this end is " opaque, whitiſh and ragged.

" He alſo preſented a ſtony ſubſtance bigger than a large white peaſe, of an " irregular ſhape, and yellowiſh ſubſtance: of theſe ſtones there is a perſon of " quality of a very ſickly conſtitution in this town, that has voided at ſeveral " times above an hundred by ſiege, and ſeveral as big as the end of ones finger.

" SCHELHAMMEOR's book *de Auditu* was alſo preſented by him, and an account " thereof promiſed at our next meeting.

" There were two bottles of Clonuf Spaw-water brought to us from Mr. KING; " but theſe having been kept from the fountain a week, had loſt their mineral " taſte.

" *June* 23. At the deſire of his Lordſhip the Biſhop of Corke, Mr. MOLY- " NEUX did again expoſe a diſſected water-newt, and ſhewed therein the circu- " lation of the blood: alſo he gave an account of SCHELHAMMEOR's book " *de Auditu.*

" A letter was read from Mr. K. relating farther to his meſolabe, and ſome " other propoſitions under his conſideration: therein alſo he propoſed this pro- " blem, *Invenire quatuor figuras planas ordinatas continuè proportionales, quæ ſin- " gulæ inter ſe ſint heterogeneæ et iſoperimetræ, vel quæ ſingulæ inter ſe ſint hetero- " geneæ et iſodiametræ (id eſt, eidem circulo circumſcriptæ)* Mr. ASHE and Mr. KING " undertook to do ſomething therein.

" A letter was read from Mr. KING, dated from Clonuf waters, therewith he " ſent us a bottle of Edenderry water, as alſo ſome of the ſediments of both Clo- " nuf and Edenderry waters dried to powder, exactly reſembling *rubigo ferri:* " theſe will not apply to the magnet, but it was moved, that they ſhould be cal- " cined, and then tried again with the magnet. Mr. MOLYNEUX undertook " that taſk. Mr. KING read an accurate and ingenious account of Clonuf wa- " ters according to the experiments Sir WILLIAM PETTY propoſed to be tried on " mineral waters.

" *June* 30. Mr. ASHE preſented ſome formed ſtones, found in the country " of Weſtmeath: likewiſe he produced the calculation of the next ſolar eclipſe " from ſeveral tables.

" Mr. FOLEY preſented alſo a formed ſtone found in the college chapel-yard, " and thereon read an ingenious diſcourſe, wherein he ſummed up the opinions of " others concerning theſe formations, and was very particular in giving an account " of Dr. PLOT's ſentiments, adding withal ſome obſervations and thoughts of " his own.

" Upon occaſion of the *Philoſophical Tranſactions* of January laſt, num. 155. " and the account therein given by the ingenious and learned Dr. SMITH of the " Turks, and of their profound ignorance in all polite literature, it was moved " by Mr. MOLYNEUX, that this may be compared with what Sir GEORGE WHEE- " LER relates of them in his travels, pag. 199 and 200, as being informed there- " in by one Mr. WATSON, a Scotchman, whoſe credit, upon the learned doctor's " account, was ſomething queſtioned. Dr. SMITH's thoughts hereon are deſired.

" *July* 7. Mr. ASHE and Mr. MOLYNEUX gave an account of their obſerva- " tion of the laſt ſolar eclipſe: the day being much overcaſt hindered them from " taking any thing accurately, but towards the middle of the eclipſe they had a " ſhort view of the ſun, as much as to eſtimate, that about eight digits were co- " vered: at the ending alſo they had a faint view thereof, and aſſigned its end at " h. 3. 56 min. p. m.

" A letter was read from his Lordſhip, the Biſhop of Fernes, wherein his Lord- " ſhip informs us of theſe particulars, that he will ſuddenly tranſmit to us the " queries relating to the magnet: that he has had a long time in his thoughts a " contrivance to make one ſingle candle thoroughly enlighten any the largeſt " room, yea, even church itſelf, and that uniformly, and as ſoon as he can viſit " the glaſs-houſe, he hopes to effect it: that the rarity of inſects in the country

" he

" he is in, especially of those, that are uncommon, and of curious flies, has hi-
" therto hindered him from compleating the history of the generation of those ani-
" mals, which he has had a while under his thoughts: that lately he found a nest
" of fifty full grown bruthi on a plum-tree: that the country about him affords
" a curious gravel, delicately mixt with spar, which looks very pleasantly on the
" rolled walks of gardens, when the sun shines on them: that the earth all there-
" abouts is mixt with the same sort of spar.

" Sir WILLIAM PETTY gave an account of a commodious land-carriage he
" had lately contrived, which, drawn by an ordinary horse of 10 *l.* price, carries
" one that sits in it with ease, and a driver on the coach-box, with a portman-
" teau of twenty or thirty pounds weight, twenty five or thirty miles Irish a day:
" this carriage is likewise very easy for the traveller, and far more secure than any
" coach, not being overturnable by any hight, on which the wheels can possibly
" move. It is likewise contrived to be drawn about the streets by one man with
" one in it, and that with less pains than one of the sedan bearers does undergo.
" It is very cheap, an ordinary one not costing above six or seven pounds, the four
" wheels being above half the money.

" Mr. MOLYNEUX explained a contrivance of his own for demonstrating to
" the eye the figure, wherein projects do move.

" Mr. ASHE having in his possession one of Sir SAMUEL MORELAND's speak-
" ing trumpets, it was moved by Sir WILLIAM PETTY, that a striking watch
" may be put into it, and tried how much farther than ordinary it would trans-
" mit its sound.

" Next Monday being the Comitia Philologica in the college towards the
" commencement on the day following, adjourned till Monday, July 21.

" *July* 21. A letter was read from Mr. MUSGRAVE, containing the minutes
" of the Oxford Society from May the 27th to June the 24th, inclusive; as
" also some experiments of his own on the jugulars of a dog. In the former it
" being observed by Dr. PLOT, that the natron, he has, did not melt all the win-
" ter, or thaw, but about the time of the overflowing of the river Nile; Dr. HUN-
" TINGTON assures us, that some natron, he keeps, did melt in the last winter.

" A letter from Mr. KING was read containing some experiments made by
" him and Dr. DUN on the mineral waters of Clonuf; among others it being
" hinted herein, that the sediment of these waters, with oak leaves, yield a good
" black die to cloth, &c. It was ordered, that some experiments should be tried
" hereby to help our dying black, wherein we are so deficient in this kingdom;
" and also, perhaps, the dying with these waters may prevent the rottenness of
" black, proceeding from the corrosiveness of the vitriol. Mr. PLEYDALL was
" pleased to take upon him this province.

" Mr. STANLEY read a discourse about the motion of water.

" Mr. ASHE produced ſome formed ſtones, almoſt exactly ſpherical: theſe are " found in great quantity nigh Londonderry, in a bed of ſandy earth: there are of " them from a quarter of an inch to two inches diameter, they are very heavy " and gritty, of a light brown colour, and in the late rebellion, the inhabitants " thereabouts uſed them for bullets.

" Ordered, that the thanks of this Society be returned to Mr. SMITH for the " honour he did us in the public act in the college on this *lemma* paradoxon vetus " Ægyptiacum, *quod ſol nonnunquam oritur in occidente.* Demonſtratur ſe Socie- " tate ad promovendam ſcientiam naturalem Dublinii nuper inſtituta."

Octob. 29. The Society reſumed their meetings, having been ſummoned by Mr. COLWALL vice-preſident.

The ſecretary preſented in the name of Mr. BOYLE, a book of his, intitled, *Experiments and Conſiderations about the Poroſity of Bodies, in two Eſſays*; of which Dr. AGLIONBY promiſed to give an account.

A book was preſented by Monſ. JUSTEL, intitled, *Traitté du nivellement par Monſ.* PICARDI *mis en lumiere par Monſ.* DE LA HIRE: of which Mr. FLAMSTEAD promiſed to give an account.

The ſecretary having, during the receſs of the Society, received by Dr MARCK as from the hands of the reſident of the Elector of Brandenburg, a ſmall book in High Dutch, called the chemical touchſtone of J. KUNCKEL *de acido & urinoſo Sale calido & frigido contra* D. VOIGHT *ſpiritum vini vindicatum* [h], dedicated to the Society; the book was immediately put into the hands of Mr. BOYLE to be peruſed by him, who now tranſmitted an abſtract of it in Latin.

The ſame book having alſo been ſeen by Dr. SLARE he gave an account of it in Engliſh; part of which was read, and the reſt reſerved for the next meeting.

A letter in Latin was read, directed to Dr. GREW, as ſecretary of the Society from Dr. SOLOMON REISELIUS, chief phyſician to the Duke of Wirtemberg, dated at Stutgard, July 25, 1684 [i], in which he complained, that he had three times before this written to the Society, but had received no anſwer; and therefore now deſired to have a correſpondence with, and to preſent to the Society a book of his, intitled, *Inventum rarum et hydroſtaticis omnibus hactenus impoſſible:* which was delivered to Mr. HOOKE to be peruſed.

Sir JOSEPH WILLIAMSON, who was mentioned to have been written to when preſident, and the ſecretaries preſent, affirmed, that they had ſeen no other of Dr. REISELIUS's letters.

Mr. ASTON was ordered to write an anſwer to them.

[h] A tranſlation of it printed in the *Philoſ. Tranſact.* N°. 168. p. 896. for Feb 168⅘.
[i] Letter-book, vol. ix. p. 270.

Three letters of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, September 10 [k], Sept. 18 [l], and Octob. 10 [m], 1684, were read, mentioning a woman troubled with epileptical fits, which returned every Sunday: a new inſtrument for taking an account of the increaſe and decreaſe of oil of vitriol expoſed to the air; that the late eclipſe of the ſun began at Tredagh in Ireland, latitude 43 deg. 40 min. at 1 h 37 min. 30 ſec. and ended at 3 h. 56 min. 20 ſec. Some obſervations of Dr. TURBERVILLE relating to the eyes [n].

An account was read of ſome experiments made by Dr. PAPIN at Greſham-college during the Society's receſs [o].

Dr. PAPIN ſhewed, how a pipe being ſtopped with an apple, and kept *in vacuo*, the apple will not ſtir; but as ſoon as the air is let into the receiver, the apple being preſt upon by the air will be driven into the pipe with great violence. His account of it was as follows [p]:

" It hath been tried long ago by the hon. Mr. BOYLE, that ſeveral effects " aſcribed to ſuction do meerly proceed from the preſſure of the air, becauſe, if " you draw the plug of a pump *in vacuo*, it will ſuck no water: and the water will " not aſcend into the pump, but when the external air comes to preſs upon it. I " have therefore thought it would not be amiſs to confirn the ſame thing by ano- " ther experiment; that is to ſtop a pipe with an apple, and draw the air out of " the ſaid pipe: it will come to paſs, that as long as the pipe is in an exhauſted " receiver, the apple will not ſtir: but as ſoon as the air is let in to preſs upon the " apple, it will be driven into the pipe with a great violence."

He promiſed to ſhew at the next meeting how the quickſilver may be made to riſe above the ordinary counterpoiſe.

Nov. 5. Mr. RICHARD WALLER preſented to the Society his Engliſh tranſlation from the Italian of *Eſſays of natural Experiments made in the Academy* del Cimento *under the Protection of the moſt ſerene Prince*, LEOPOLD *of Tuſcany:* which book was put into the hands of Dr. PAPIN to peruſe, and ſee what improvements or other trials might be made upon the ſubjects there treated of.

The ſecretary read the other part of Dr. SLARE's account of Monſ. KUNCKEL's book, *De acido & urinoſo Sale calido et frigido*, &c.

The Society conſidering, that Mr. BOYLE had favoured them with an abſtract of the ſame book, ordered the ſecretary to wait on him with their thanks, and to deſire his opinion about the controverſy [q].

A let-

[k] Letter-book, vol. ix. p. 270.
[l] Ibid. p. 272.
[m] Ibid. p. 273.
[n] His letter dated Octob. 5, 1684, is printed in the *Philoſ. Tranſact.* N°. 164. p. 737.
[o] See above.
[p] Regiſter, vol. vi. p. 192.
[q] Mr. BOYLE's anſwer to Mr. ASTON, according to a minute of the latter, was to this effect; that

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, Novemb. 2, 1684[r], was read, mentioning a viſcous flegm found in a ſhell-fiſh of the Severne, which being laid on linnen firſt turns it greeniſh, afterwards by lying in the ſun it becomes of a deep red. This red grows ſomewhat lighter upon the firſt waſhing, but afterwards does not ſenſibly decay.

Mr. MUSGRAVE having offered to ſend up the patterns of theſe colours, it was deſired, that he would do it, and tranſmit ſuch farther accounts thereof as ſhould come to his hands.

Dr. PAPIN made the quickſilver ſtand higher than the poiſe, by clearing it of the air: and wetting it with water. His account of this experiment was as follows[t].

" Having been commanded to make the experiment of the mercury purged of " air, that remains ſuſpended in a tube higher than the air can ſuſtain it, I have " found it here a great deal more difficult, than I have found it at Venice, which " I cannot aſcribe but to the foulneſs of the mercury, that I have uſed here. " I included it *in vacuo* on Thurſday laſt, and I could never get it purged enough " till Monday, and even that day (though it could remain ſuſpended a little " higher than the air could ſuſtain it in a tube half full of water and half of " mercury) yet it fell before the receiver that covered it was quite empty of air: " but at Venice in twenty four hours time, mercury might be ſo well purged, " that a tube quite full of it did remain ſo, not only till the air was quite drawn " out of the receiver; but even by great ſhakings I could hardly make it fall. I " can ſhew at preſent, what may be done with foul mercury: and if the Royal " Society bids me to try the ſame thing with better mercury, and with variety " of other circumſtances, that will perhaps give ſome light to the odd experiment, " the cauſe of which is not yet known enough, although it is many years " ſince the hon. Mr. BOYLE hath made it for the firſt time."

Dr. PAPIN was hereupon deſired to provide a long glaſs, and try the greateſt hight, which he could make the quickſilver ſtand at for the next meeting.

Mr. PAGET having been deſired, May 7, to ſort the mathematical papers of Mr. THOMAS MERRY, which had been given to the Society, he now returned the ſaid papers, which were put into Mr. PERRY's hands with the catalogue, to be kept in the library: part of them were thought fit to be bound up. The catalogue was as follows:

that Monſ. KUNCKEL's book being written in High Dutch, which he did not underſtand, he had uſed an interpreter, whoſe miſtaking a word might be of conſequence; and that therefore he ſhould determine nothing: that the Society had not been uſed to judge in theſe caſes: that they were now making experiments, and were not come ſo far as to frame ſyſtems; that he was glad to ſee a controverſy managed with ſo many good experiments, and by ſo able men.

[r] Letter-book, vol. ix. p. 274.

[t] Regiſter, vol. vi. p. 193.

TRACTATUS

TRACTATUS.

1. GELLIBRANDI (*ut videtur*) *Problema pro Longitudine inveniendâ, cujus datur Latitudo et Altitudo affixæ momento culminationis Lunæ.*

Ad calcem habetur Epiſtola HENRICI BRIGGII *ad Longomontanum.*

2. *Annotationes cujuſdam anonymi in Copernici Revolutiones. Videtur hoc eſſe manuſcriptum* BRIGGII.

3. BRIGGII παρέργα *quædam circa Conſtructiones horologiorum in Area & Ædibus Mertonenſibus Oxon.*

4. GELLIBRANDI *Inveſtigatio differentiæ Longitudinis Londinum inter et Charletonum in Freto* HUDSONII *ex Obſervationibus* THOMÆ JAMES *habitis è tribus fixarum altitudinibus et Luna culminante. Tractatus perfectus.*

5. *Ejuſdem integra eclipſium Doctrina ex mente* TYCHONIS BRAHE.

6. *Ejuſdem Collectanea quædam in eandem materiam.*

7. BRIGGII (*ut videtur*) *Tentamina quædam in Eutocianos numeros Cyclometricos:*

8. *Epiſtola* HENRICI BRIGGII *ad Longomontanum, anno* 1627.

6. *Tempus viſe ó ⊙ et ☽ inveſtigare.*

10. *Annotata (puto)* GELLIBRANDI *in lunæ appulſum et lucidam Pleiadum, et ejuſdem congruentiam cum theoriâ Tychonicâ, et diſcrepante cum aliis.*

11. *Catalogus Librorum mathematicorum noviſſimè editorum a* JOHANNE COLLINS.

Treatiſes of Mr. MERRY's own.

12. *Trigonometria Oughtrediana plurimis locis aucta & explicata.*

13. *Inventio & Demonſtratio regularum* HUDDENII *de reductionibus Æquationum.*

14. *Schediaſmata in libros nonnullos Elementorum* EUCLIDIS *novâ methodo demonſtrandis.*

15. *Caſuum trianguli rectanguli Diſquiſitio analytica.*

16. *Problemata quædam de ſortibus & variis Electionibus.*

17. *Miſcellanea.*

Nov. 12. At a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN	Dr. AGLIONBY
Sir JOHN HOSKYNS	Mr. FLAMSTEAD
Mr. HILL	Mr. HALLEY
Dr. LISTER	Mr. ASTON.

Mr. COLWALL the vice-preſident being ſick, Sir CHRISTOPHER WREN and Sir JOHN HOSKYNS were ſeverally ſworn vice-preſidents, according to a deputation of the preſident under his hand then produced by the ſecretary, having likewiſe the oaths of allegiance and ſupremacy, &c. then adminiſtered to them.

There were propoſed as candidates, and approved of, Mr. JOHN BEAUMONT, Mr. CHARLETON, Mr. TANCRED ROBINSON, Dr. WILLIAM BRIGGS, and Mr. ALEXANDER PITFIELD.

At a meeting of the SOCIETY on the ſame day, Sir CHRISTOPHER WREN, vice-preſident in the chair.

Monſ.

Monſ. FREMONT D'ABLANCOURT was elected a fellow.

Mr. WILLIAM MONSON was likewiſe elected.

There were propoſed candidates

Mr. THOMAS BAKER by Mr. PAGET.
Mr. RICHARD BEAUMONT
Dr. TANCRED ROBINSON
Mr. WILLIAM CHARLETON
Dr. WILLIAM BRIGGS } by Dr. LISTER.
Mr. ALEXANDER PITFIELD by Mr. RICHARD WALLER.

A piece of Aſbeſtus linnen having been brought from China by Mr. NICHOLAS WAITE, merchant of London, he gave the Society a proof of its reſiſting the fire, as he had formerly done to ſome of the members.

The linnen was meaſured, being in length nine inches to the taſſels; the taſſels at each end being three inches more: the breadth was full half a foot.

The weight of the linnen before it was put into the fire was an ounce, three drachms and eighteen grains.

The linnen being put into a clear charcoal fire, continued in it red hot for ſeveral minutes. Upon its being taken out of the fire, though the linnen was then red-hot, it did not conſume a piece of paper, upon which it was laid. It was preſently cool; and upon weighing, it was found to have diminiſhed a drachm and ſix grains, or a tenth part and almoſt a quarter.

A paper was read containing ſome obſervations of Dr. SLARE upon reading Monſ. KUNCKEL's book.

Dr. SLARE then ſhewed three of the experiments mentioned in the book, to prove the acidity of ſpirit of wine.

1. That ſpirit of wine and milk being mixt in about equal proportions coagulates. This was found true.
2. That ſpirit of wine having a little water dropt into it grows hot. This appears diſtinctly; for a thermometer being put into plain ſpirit of wine grew preſently higher: but being at a ſtand, it was raiſed an inch higher by mixing a little water with the ſpirit of wine, in which it ſtood.
3. That ſyrup of violets having ſpirit of wine dropt in it, turned green. This did not appear well by candle light, and therefore was left to Dr. PAPIN to examine.

Dr. SLARE alſo took notice of ſeveral curious and uncommon operations mentioned by Dr. KUNCKEL.

Mr.

Mr. ASTON reported, that Mr. BOYLE was not willing to paſs any judgment on Monſ. KUNCKEL's book: that he ſeemed glad to ſee controverſies managed by experiments: that the Society had been hitherto making experiments; till they had done with which, he thought they would not preſcribe to others.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, November 8, 1684[t], was read, tranſmitting one from Mr. WILLIAM COLE of Briſtol to Dr. PLOT, dated at Minehead, October 17, 1684, concerning the liquor of a fiſh ſtaining firſt green, which afterwards by heat becomes a purple. Mr. COLE's letter was as follows[u]:

" Among the many obſervations I have made, I here ſend you incloſed two " rags, which is one of the greateſt rarities I have met withal. About a month " ſince here was a lady of my acquaintance arrived from Ireland, bound to her " uncle, Sir ROBERT SOUTHWELL, at King's Weſton, who informed me, that " many ladies and perſons of quality do often ſend to a port town (as I remember " Cork) to have their handkerchiefs and other linen marked by one, who under- " ſtands how to do it. She told me, that it was with a ſmall ſhell-fiſh, in which " is found a humour, that being taken out whilſt living, and with a pen or other- " wiſe any linen marked with it would yield ſuch a tincture, as never to decay by " often waſhing. Upon which I made experiments of ſeveral ſorts, found on the " ſhores here (St. Donnets) and tried ſeveral parts of them, but could make no- " thing of it, thinking the matter to lie in thoſe parts, that were of either black, " yellow, or reddiſh colour; but at length, to my admiration, found it in a little " white humour lying incloſed in a ſmall cavity covered with a thin ſkin, which is " of a ſubſtance like unto white viſcous phlegm, but ſo thick and ſlimy, that it " would not, without difficulty, be laid on with a pen; but with a ſmall ſharp " pointed pencil, made of horſe-hair, I could make out of one of the biggeſt " ſix or eight large letters. At its laying on it is white, within a minute it turns " greeniſh, and ſo grows deeper; then put out a little while in the ſun turns of a " deep red; as that rag, in which are the two firſt letters of yours and my name, " and which hath not been waſhed ſince I wrote on it. The other, nullius, &c. " hath been waſhed in ſcalding water. After you have conſidered them both, you " may cauſe the firſt to be boiled and waſhed with ſoap, and yet it will retain the " colour, firſt lighter, but never after to decay by often waſhing. I have " marked ſome handkerchiefs and other fine linen, and find it fairer than on this " coarſe (being what I could get at preſent.) At my return, GOD willing, to " Briſtol, I will ſend you ſome of the ſhells the biggeſt and ſmalleſt, and a " more particular account of it, and in what part it lies. I have ſeveral other " things, which I ſhall ſend you by carrier, among them ſome of the figured ſtones " found plentiful nigh St. Donnets, which are ſomewhat like the nautilus, and, as " I remember, much differing from that figured and deſcribed in the hiſtory of " Oxfordſhire; I am ſure ſo much unlike either of the kinds of the nautilus's, " that they were never ſuch ſhells, and then they muſt be of a ſpecies loſt, which " can never be without diſhonour to the great Creator of all. I have ſeen above " twenty of them in a ſolid very hard rock, (appearing half out of the ſuperficies)

[t] Letter-book, vol. ix. p. 281. [u] Ibid. p. 281.

" within the breadth of two feet. But I could not by maſons hired get them out " whole; but on the ſides of the cliff, being climbed by them, they between the " ſhelves of rocks in a marly earth digged many whole ones out for me, ſome " of which I ſhall ſend you. I have not room to communicate the leaſt part of " my obſervations here, and in Wales. One thing I forget of the ſhells, that " the aforeſaid tincture ſmells ſo grievouſly fetid, the other parts of the fiſh not ſo, " that it will not come out till ſeveral waſhings, and my fingers have retained the " ſmell after waſhing with ſoap, &c."

Several patterns of the ſtaining upon linen-rags and papers were ſhewn, both green and purple, and lighter coloured, very well agreeing with the account given of them.

It was ſaid, that Mr. BOYLE took the ſhell-fiſh to be the limpit: and Dr. LISTER remarked, that it was ſome of the atramentous kinds, of which formerly uſe had been made in writing, whereby counterfeiting was rendered very difficult.

Dr. PAPIN ſhewed again the experiments of the laſt meeting.

He made likewiſe the following report concerning the experiments of the academy *Del Cimento* referred to him[x]:

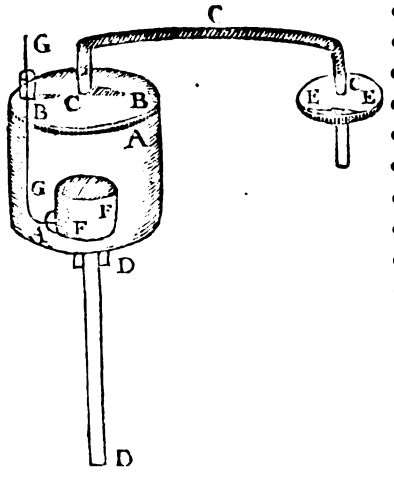
" Not being able to give the due praiſe to the book of experiments of the Floren- " tine academy, nor to its tranſlation, that hath been put in my hands, I will quite " forbear to ſay any thing to that purpoſe: but in obedience to the order of the " Society, I ſhall only obſerve ſome particulars, that might be carried farther, " by help of better inſtruments, which could not be got by the learned members " of that academy. The firſt of theſe particulars begins page 22, where is de- " ſcribed a very good and ingenious way to diſcover, how far the air may be " expanded, before it will ceaſe to make a ſenſible effect by its elaſticity: and by " three ſeveral trials they find, that when the air is expanded to a ſpace about " 200 times greater than its ordinary dilatation, it will no more be ſenſibly elaſtic. " Nevertheleſs I have a rule to calculate in the Torricellian experiment, how much " the mercury will be depreſt, by the elaſticity of any quantity of air, that may " be left at the top of the glaſs-pipe: which rule I have found true, in ſo many " repeated trials, that I don't queſtion but it will hold alſo, in the preſent caſe: " and by that rule I find, that in a baroſcope but fifty inches long, and of an " equal bigneſs, ſome quantity of air being left at the top of the mercury, and " expanded 200 times more than uſually it is, ſuch air muſt depreſs the mer- " cury near a ſixth of an inch below its due hight, which is a difference ſenſible " enough, and ſhould have been obſerved by ſuch nice experimenters as thoſe " gentlemen were. This makes me believe, that the baroſcope, which was their " ſtandard in this experiment, had alſo ſome air at the top of the mercury, and " ſo they could not with it diſcover, whether the mercury kept its due hight in " another tube: and indeed it hath been tried in the Society laſt ſummer, that " ordinary baroſcopes are ſubject to heat and cold, which ſhews, that there is ſome

[x] Regiſter, vol. vi. p. 194.

" air

" air at the top of them. Therefore to perform the design of the Florentine " academy, it is necessary to make the Torricellian experiment, so that there may " be no air above the mercury in the glass tube: and I have thought of a way fit " for that purpose, which I do the less scruple to submit to the examination of the " Royal Society, because I believe by the same way, the aforementioned defect " of ordinary baroscopes may be prevented.

" AA is a receiver with his great aperture upwards.
" BB is a plate applied to the said aperture to shut it exactly.
" CCC is a pipe soddered to a hole in the said plate, and reaching to the pneu-
" matic engine, so that through this pipe the receiver AA may be exhausted.
" DD is a glass-pipe for a baroscope having its aperture upwards, and cemented
" in a hole at the bottom of the receiver AA.
" EE is the plate of the pneumatic engine.
" FF is a vessel full of mercury, included in the receiver AA.
" GG is a wire passing through the hole in the plate BB, without giving any access
" to the outward air, and reaching to a hook fastened to the vessel FF, so that
" lifting up the wire, the vessel must incline on one side, and spill its mercury.



" Supposing then that the receiver AA hath " been kept exhausted of air for a good while, " that all the particles of air lurking in the mer- " cury FF, or sticking to the sides of the tube " DD, may have time to get away. It is plain " that drawing up the wire GG, the mercury be- " ing spilt out of the vessel FF, must fall into the " pipe DD, and so fill it exactly without any air " intermixed with it: so it remains only to be " careful not to include any bubble of air, when " we stop the tube with our fingers, for to merit " it, and make the Torricellian experiment: " and by that means, I don't question, but we " may have a baroscope not at all subject to heat " and cold, and fit to be a true standard in mak- " ing the experiment attempted in the Florentine " academy. Thus much I do submit to the " judgment of the Royal Society, and being so tedious upon this subject, I shall " keep the rest of the book for another day."

Novemb.r 19. Sir JOHN HOSKYNS vice-president in the chair.

Dr. LISTER presented his edition of JOHANNES GOEDARTIUS *de Insectis*, with his own notes and an appendix *Ad historiam animalium Angliæ*, lately printed.

There was also a paper read, giving an account of this new edition and its differences from the English, as 1. That it contains another edition of the appendix to the history of the animals of England, to which are added two new plates,

with a new deſcription of the genus of the *muſculi fluviatiles* and the pholas kind. 2. That there are ſubjoined four tables about the beetle kind in England, without any deſcription.

Dr. PLOT preſented his book intitled *Tentamen philoſophicum de Origine fontium*, which was recommended to be peruſed.

Mr. RICHARD BEAUMONT, Mr. THOMAS BAKER, Mr. ALEXANDER PITFIELD, Mr. TANCRED ROBINSON were elected fellows.

Dr. PAPIN ſhewed the quickſilver ſtanding at forty two inches by the help of water, and very ſubject to fall.

He reported the ſucceſs of his experiments made in conjunction with Dr. KING, of the effects of ſpirit of wine mixed with the ſyrup of violets, his account being as follows[y]:

" Having been commanded to give an account of the effect of ſpirit of wine mixed with ſyrup of violets, I carried the vial to Dr. KING, that did not perceive any other colour but that of the ſyrup much diluted. But for greater ſecurity, he took ſome parcels of it, and having tried them with ſpirit of vitriol, he made a very fine purple; and with ſalt of tartar he made a very fine green; ſo that it was plain enough, that the ſpirit of wine doth not alter the colour, but only dilutes it. Upon this occaſion the doctor would try the ſame mixture with other preparations, not ſo common as the two aforementioned, and he found, that tincture of antimony makes a more intenſe green than any ſalt:

" Tincture of ſteel makes a dark green.
" A ſtrong tincture of tartar doth but dilute like ſpirit of wine.
" Salt of ſteel doth nothing.
" Volatile ſalts of urine, hartſhorn, or ſal armoniac turn it green."

A committee of five perſons not of the council was nominated and elected by ballot, according to the ſtatute, to meet that week for auditing the treaſurer's accounts, viz. Mr. CLUVERUS, Mr. HOOKE, Mr. RICHARD WALLER, Mr. PERRY, and Mr. LODWICK, or any three of them.

Dr. PAPIN, upon occaſion of the Florentine experiments, pag. 22, propoſed a way for filling a barometer ſo, as to be ſure there will be no air left on the top of it. The manner being well conſidered of in the draught, he was deſired to make trial of it at the next meeting.

Dr. PLOT read part of a letter, which he had received from Mr. COLE of Briſtol, dated at Minehead, October 31, 1684[z], concerning the tincture of the ſhell-fiſh before mentioned, and mentioning, that the ſhells were to be gathered at neap tides, after which they lived a week or more in ſea-water: that the colour at laying

[y] Regiſter, vol. vi. p. 196. [z] Ibid. p. 250.

is

is white, and in leſs than two minutes turns greeniſh, and then more green as ſoon as it is dry; but being carried out into the ſun, as it begins to grow green, that colour preſently comes to its hight, and in two or three minutes more becomes of a dark red, and ſo remains, if kept from the ſun or fire.

Sir CHRISTOPHER WREN obſerved, that calicoes ſtained in the Indies have a fiſh ſmell; and he ſuppoſed, that being a cold die, it might be capable of great changes by ſalts.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, Nov. 7, 1684 [a], and accompanied with an account of a large glandulous ſubſtance growing between the pericardium and heart of an ox, as it had been examined at a meeting of the Philoſophical Society at Oxford [b].

Dr. PLOT gave the following account of an experiment made at Oxford. Upon the 8th inſtant the operator being about to prepare tartarum vitriolatum, upon pouring the dephlegmed ſpirit of vitriol upon the tartar, in the conflict between them was conceived a viſible flame; and in the coagulum afterwards there continued a light much like thoſe of the phoſphori, for a great part of that evening; and if held to the fire, ſo as to be a little excited for two days after, ſome little ſtar-like brightneſs would appear up and down, here and there, in the coagulum.

It was deſired, that Dr. PLOT would charge himſelf to be curator for the preceding experiment, and take to his aſſiſtance Dr. SLARE and Dr. PAPIN, if their time permitted.

November 26, Dr. KING preſented to the Society the model of a ſtone taken out of the bladder of Mr. ADONIRAM BYFIELD, which he had cauſed to be made in plaiſter of Paris.

The ſtone itſelf, when taken out of the body, weighed thirty two ounces. It was remarkable, that Mr. BYFIELD had no pain till two hours before he died.

There was part of a letter of profeſſor JOHN CHRISTOPHER STURMIUS to Mr. HAAK [c] concerning Mr. HALLEY's hypotheſis of four magnetical poles of the globe of the earth, which he explained, as if the influxes at the north and ſouth poles met in the earth like two contrary winds, whereby each influx is divided into two branches.

Dr. PLOT read the following letter to himſelf from Mr. CHARLES LEIGH, who was then in Lancaſhire with a deſign of writing the natural hiſtory of that country [d]:

" After the tedious fatigues of a cold, but ſatisfactory journey in the north, I " met with both yours at Preſton, and ſhall, according to your deſire, give you " an account of ſome curioſities, which I have obſerved there; but I muſt confeſs

[a] Letter-book, vol. ix. p. 296.
[b] Ibid. It is printed in the *Philoſ. Tranſact.* N°. 167. p. 860. for January 168$\frac{4}{5}$.
[c] Letter-book, vol. ix. p. 297.
[d] Ibid. p. 301.

" the

" the deſcriptions of them, which I have hence ſent you, are not ſo full as I could " wiſh them, being forced out of the northern iſlands by the extremity of froſt " and ſnow. I have, according to my promiſe, taken notice of the generation of " barnacles, the manner of which, as 'tis commonly believed, I look upon to be " very erroneous. It is ſuppoſed by ſeamen, that when any ſhips come from the " Indies, their veſſels produce ſome unctuous matter, which is the cauſe of bar- " nacles, for they always obſerve as they come from thence, that an infinite num- " ber of theſe ſtick to the ſides of their ſhips. But were this a ſufficient argument " to prove the generation of barnacles after this manner, they might as well infer, " that oiſters and muſcles are generated after the ſame manner; for at the ſame " time that they ſaw thoſe, which they term barnacles, ſticking to their ſhips, there " were at the ſame time likewiſe oiſters and muſcles hanging at it. That there- " fore, which they call a barnacle, I look upon to be a ſhell-fiſh, and not a bird, " for theſe reaſons, 1ſt, Becauſe, when not covered with water, they immediately " die. 2dly, The fleſh and ſmell of them is exactly like that of fiſhes. 3dly, " That, which reſembles the head and neck of a barnacle, and which by the ſea- " men is looked upon to be ſuch, is, I am well ſatisfied, (becauſe it is not joined " to the body) not any ſuch thing. 4thly, Thoſe, which by them are eſteemed " wings, are only little claws wound up in ſpiral lines. And laſtly, there cannot " any ſeaman ſay, that he ever ſaw any of theſe turn into any kind of bird, and " ſwim in the water; though ſome do confidently affirm, that they have ſeen them " with feathers coloured like thoſe of the barnacles: as for my part, I have not yet " ſeen any ſuch thing, and ſhall therefore, till I do ſee it, think they have better fan- " cies than judgments, that affirm it. We have this winter had great number of " caterpillars, in which I have obſerved this remarkable, and I think new; upon " the cabbages I ſaw a great number of ſmall eggs covered with a yellow cotton: " theſe in a few days time did all of them turn into young caterpillars; the young " caterpillars faſtened upon the old one, and in ten little holes above the feet " crept within her, inſomuch that out of one old caterpillar I took forty two " young ones. I do therefore think, that the old caterpillars are deſtroyed by their " young ones, for wherever I found a neſt of theſe, I found an old one dead by them.

" In ſeveral apples this winter, though they ſeem to be as ſound as ever I ſaw " them in my life, yet in the pippins I have very often found a maggot as large " as the pippin itſelf; and the ſkin of the pippin intirely whole. If all inſects " come from an egg, I cannot imagine how this came there, unleſs the egg of a " maggot be ſo ſmall, that it can riſe along with the juice, that nouriſhes the pippin. " I ſhall now give you an account of ſome things in the mineral kingdom: we " have a white marl, which lyes about a yard under the ſoil, and in this an infi- " nite number of ſmall ſhells: how theſe ſhells ſhould come from any other but " the plaſtic nature of the earth, I cannot imagine, this lying ſo remote from ei- " ther river or ſea We have likewiſe fullers earth, tobacco-pipe clay, potters " clay, alabaſter, talc, plaiſter of Paris, yellow oker, and a black chalk, which, if " put into water, hiſſes more than quick lime. I have a piece of chalk by me, " which was taken out of the bladder of a hog: it is ſhaped like a muſcle-ſhell and " is about the ſame bigneſs: under this chalk there are two perfect ſhells as large as " the chalk tied together by a ligament. We have roch allum, vitriol, ſulphur,

" diamonds, which are caſt up by the moles in April; theſe are not to be diſcover-
" ed though you dig never ſo deep. We have ſilver ore, lead ore, iron ore, cop-
" per, and ſome copper-ore we have in our coal-pits. We have waters im-
" pregnated with the natrôn, others from iron, ſome with aphronitrum and iron,
" which have done very wonderful cures. Some we have ſeen like tincture of
ſulphur, ſome which are a little brackiſh, and vomit extremely, ſome which
" by falling upon wood turns into a ſubſtance, that rings like a bell. We have
" two ſprings, which petrify, and a water, which comes from white marl, that
" is lighter than any other by two ounces in a quart. We have likewiſe a water,
" that did not freeze in the great froſt, though a ſtanding water: near the laſt it
" is farther remarkable, that there is an aſcent in the form of a pyramid, upon
" which there is always ſo calm an air, that though there be winds quite round
" about it, yet you may ſtand with a lighted candle on it. We have likewiſe
" very great varieties in ſtones, plants, ſhells, fiſhes, and accidents, which have
" here happened to men and women: it would be too tedious to inſert them in this;
" you may therefore expect to hear farther of them in my next."

Mr. MUSGRAVE ſhewed the copy of a Runic inſcription, which had been found on a font at Bridekerke in Cumberland.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Dublin, Octob. 9, 1684[e], was read, deſcribing the Connaught worm, ſaid to be the only poiſonous animal, which is bred in Ireland. But, as Mr. MOLYNEUX himſelf ſuppoſed it, itappeared from the figure to be nothing elſe than a caterpillar very like a ſilk-worm.

Dr. LISTER obſerved, that the remedy uſed by the Iriſh was much like that againſt the nurſhro or field-mice: and that naked caterpillars are ſeldom poiſonous, but that the hairy ones often are.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, Nov. 18, 1684[f], was read, mentioning cubical ſtones of the golden pyrites, found plentifully at St. David's in Pembrokeſhire, as at many other places.

This letter contained alſo ſome obſervations made in the diſſection of a woman at Reading; that a branched ſtone was found in the left kidney, and in the right kidney another ſtone of about the bigneſs of a pigeon's egg, and ſixteen or ſeventeen more like peaſe or ſmall beans.

Upon occaſion of this and chalk found in a hog's bladder, Dr. LISTER took notice, that Dr. PEARSE had found a turbinated ſtone in the kidney of a woman.

Dr. PAPIN communicated the following remarks on the Florentine experiments[g]:

" Pag. 43. The book of the Florentine academy ſpeaks of ſeveral ways,

[e] Ibid. p. 291. It is printed in the *Philoſ. Tranſact.* N°. 168. p. 876.

[f] Letter-book, vol. ix. p. 300.

[g] Regiſter, vol. vi. p. 197.

" that

" that have been all unſucceſsful, for finding whether, or not, amber will at-
" tract *in vacuo*: but I don't queſtion, but by help of the pneumatic engine, the
" experiment might be done very well: and the hon. Mr. BOYLE ſays, that he
" has found already, that amber is electric *in vacuo*, as well as in the open air.

" Pag. 50, are related the experiments of ſounds *in vacuo*, made both with a
" ſmall bell, and with an organ-pipe: from which they could conclude nothing elſe,
" but that either the air has nothing to do in the production of ſounds, or is able
" to do it alike in any ſtate. This ill ſucceſs of their experiments I cannot aſcribe
" but to the bad condition of their inſtruments: for I can ſhew very eaſily, both
" with a bell, and with an organ-pipe, that the air is neceſſary for the production
" of ſounds: and as the air grows thinner, the ſound will grow weaker and
" weaker.

" Pag. 53. They find, that the riſing of fluids in ſmall hollow canes ſucceeds *in*
" *vacuo*, as in the open air: to which I may add, that even it doth more *in vacuo*:
" for if ſuch a cane be ſealed at one end, and its aperture be immerſed in water
" *in vacuo*, preſently the water will riſe up into the ſaid cane; which would not
" ſucceed in the open air.

" Pag. 77, is related a trial to meaſure how great the force of rarefaction may
" be in water, ſhut up in cloſe veſſels to freeze: this they attempted by a very
" difficult and chargeable contrivance, and yet could diſcover nothing: ſo that
" I believe it would be a great deal better to try that by the ſame way, by which I
" have meaſured the degree of preſſure produced by heat in the digeſter, viz. by
" means of a ſmall hole at the top of the veſſel containing the water, which hole
" being ſhut outwardly with a valve, and an iron rod bearing upon the center of
" the valve, we may hang to the rod as much weight as would be neceſſary to
" reſiſt the force of the freezing water: as has been explained at large, in the
" firſt chapter of the new digeſter.

" Pag. 107. The increaſe of the ſize of a braſs ring is ſaid to have amounted
" by heat to $\frac{2}{100}$: which obſervation, I believe, might be uſeful in making
" pumps, or any other pipes, that require to be equal all along: for having a
" cylinder exactly turned, it would be eaſy to prepare the tubes ſo narrow, that
" the cylinder would not enter into them, but being diſtended by heat, they
" would admit it eaſily: ſo the pipe being afterwards contracted by cold would
" apply itſelf very cloſe to the cylinder every where, and ſo become very
" equal and good. The greateſt difficulty would be in taking out the cylinder; but
" this inconvenience might be prevented, by making the cylinder out of four ſe-
" veral pieces: or by ſome other way.

" This is all I have been able to obſerve, that might be carried farther. And I
" am ready to ſet upon any of theſe particulars, that the Royal Society will com-
" mand me.

" I have carried to the hon. Mr. BOYLE the mixture of ſyrup of violets and
" ſpirit of wine, that was put in my hands to examine, whether the heat would
" alter its colour; and having tried it, as Mr. BOYLE thought beſt, he did not
" find any ſenſible alteration in it.

" I have alſo attempted to fill a glaſs-tube with dry mercury, without any air " intermixed with it; but I have found it a great deal more difficult than I " thought: and although I have not effected it, as well as I could wish, I hope " the difference between my baroſcope and the ordinary ones will be found great " enough, that people may judge, that with a little more time and better mer- " cury a baroſcope might be made, not at all ſenſible of heat or cold."

Nov. 29, at a meeting of the COUNCIL were preſent,

Sir CHRISTOPHER WREN vice-preſident

Sir JOHN HOSKYNS
Mr. COLWALL
Mr. HILL
Dr. GREW
Mr. FLAMSTEAD
Dr. LISTER
Dr. PLOT
Dr. AGLIONBY
Mr. ASTON.

A committee was nominated for auditing the treaſurer's accounts conſiſting of Sir JOHN HOSKYNS, Mr. COLWALL, Dr. LISTER, Dr. AGLIONBY, and Mr. ASTON.

HANS SLOANE, M. D. was propoſed as a candidate and approved.

It was ordered, that Dr. PLOT ſhould have a gratuity preſented to him; but the ſum was not determined till the treaſurer's accounts were audited.

December 1, being Monday, St. Andrew's day falling this year on Sunday, Sir JOHN HOSKYNS took the chair.

HENRY Earl of Clarendon was elected and admitted a member.

Mr. PITFIELD, Mr. BEAUMONT, and Mr. MUSGRAVE were likewiſe admitted members.

The ſcrutators being drawn, Mr. HALLEY and Mr. AUBREY, the Society proceeded to the election, and retained of the old council

Sir CYRIL WYCHE
Sir JOHN HOSKYNS
GEORGE Earl of Berkley
Sir JOSEPH WILLIAMSON
Sir CHRISTOPHER WREN
Mr. COLWALL
Mr. HALLEY
Mr. HENSHAW
Mr. HILL
Dr. LISTER
Mr. ASTON.

Then were choſen out of the Society the following ten perſons to complete the new council:

HENRY Duke of Norfolk
HENRY Earl of Clarendon
Mr. PEPYS
Sir ANTHONY DEAN
Mr. EVELYN
Mr. CREED
Dr. SLARE
Mr. RICHARD WALLER
Mr. MUSGRAVE
Mr. HOOKE.

SAMUEL PEPYS was then choſen preſident by twenty nine ſuffrages out of thirty nine:
Mr. HILL treaſurer:
Mr. ASTON, Mr. MUSGRAVE. } ſecretaries.

The Duke of Norfolk and Earl of Clarendon were ſworn of the council.

Between this and the laſt anniverſary election died two very eminent members of the Society, the Lord Viſcount BROUNCKER and Dr. CROUNE.

WILLIAM BROUNCKER, Viſcount BROUNCKER of Caſtle Lyons in the kingdom of Ireland, was grandſon of Sir HENRY BROUNCKER, Lord Preſident of Munſter in that kingdom, by ANNE his wife, ſiſter of HENRY Lord Morley; and was ſon of Sir WILLIAM BROUNCKER, Knt. by WINEFRID daughter of DANIEL LEIGH, Eſq; of Newenham in Warwickſhire; which Sir WILLIAM had been Commiſſary General of the muſters in the expedition againſt the Scots in 1639, and afterwards of the privy chamber to King CHARLES I. and Vice-chamberlain to CHARLES Prince of Wales, and was advanced to the rank of a Viſcount in Ireland, under the title of Viſcount BROUNCKER of Caſtle-Lyons, Sept. 12, 1645; but did not long enjoy that honour, dying at Wadham College in Oxford, about the middle of November following, being interred on the 20th of the ſaid month in the cathedral of Chriſt-Church in that univerſity, where a monument is erected to him [h]. His eldeſt ſon WILLIAM was born about the year 1620 [i], and having received an excellent education diſcovered an early genius for mathematics, in which he afterwards became very eminent. He was created doctor of phyſic in the univerſity of Oxford, June 23d 1646 [k]. In the years 1657 and 1658 he was engaged in a correſpondence of letters on mathematical ſubjects with Dr. JOHN WALLIS, who publiſhed them in his *Commercium Epiſtolicum*, printed at Oxford in 1658, in 4to. His own as well as his father's loyalty to the Royal Family having been conſtant, he with others of the nobility and gentry, who had adhered to King CHARLES I. in and about London, ſigned the remarkable declaration publiſhed in April 1660 [l]. After the reſtoration he was made Chancellor to the Queen conſort, and one of the Commiſſioners of the navy. He was one of thoſe great men, who firſt formed the Royal Society, and by the charter of July 15th, 1662, and that of April 22d, 1663, was appointed the firſt preſident of it; which office he held with great advantage to the Society, and honour to himſelf till the anniverſary election, November 30, 1677. Beſides the offices mentioned above, he was maſter of the hoſpital of St. Catharine's near the Tower of London; his right to which poſt was, after a long conteſt between him and Sir ROBERT ATKYNS, one of the Judges, determined in his favour in November 1681. He died at his houſe in St. James's-ſtreet in Weſtminiſter, April 5, 1684, at the age of ſixty four, and was interred on the 14th of that month in the middle of the choir of the church of St. Catharine's; and was ſucceeded in his honour by his younger brother, HENRY, who died in January 1687.

[h] WOOD Faſti Oxon. vol. ii. col. 25.
WOOD ſays, that he was about twenty five years old at his father's death in 1645.

[i] Id. col. 56.

[l] KENNET's regiſter and chronicle, p. 120, 121.

WILLAM

WILLIAM CROUNE [m], M. D. was a native of London, and educated in the univerſity of Cambridge, being entered penſioner of Emanuel-college, May 13, 1647, where he took the degree of bachelor of arts in 1650, the year following was elected fellow of that college, and commenced maſter of arts in 1654. On the 8th of June, 1659, he was choſen profeſſor of rhetoric in Greſham-college [n]. Upon his ſettlement there he became a zealous promoter of the inſtitution of the Royal Society, which aſſembled in that college; and at their firſt meeting, when formed into a regular body, November 28, 1660, he, though abſent, was appointed their regiſter for taking the minutes of what paſſed at their meetings; which he continued to do till their charter was paſſed, by which Dr. WILKINS and Mr. OLDENBURG were nominated joint-ſecretaries. In 1662 he was created doctor of phyſic by the univerſity of Cambridge, in purſuance of the King's mandate, dated October 7, and read there on the 16th of that month [p]. On the 20th of May, 1663, he was choſen one of the firſt fellows of the Royal Society, after the grant of their ſecond charter, and frequently afterwards into the council. June 25th the ſame year, he was admitted candidate of the College of Phyſicians. In 1665 he travelled into France, where he contracted an acquaintance with ſeveral learned and eminent men. In 1670 he was choſen lecturer of anatomy at Surgeons-hall, by the recommendation of Sir CHARLES SCARBURGH, who reſigned that office on the 28th of Auguſt, after having read on the muſcles there one and twenty years. Dr. CROUNE held this lecture till his death, but on the 21ſt of October that year, 1670, reſigned his profeſſorſhip in Greſham-college, with a view probably of marrying, which was inconſiſtent with the holding of it: for he ſoon after married Mary, the daughter of JOHN LORIMER of London, Eſq. In the years 1674 and 1675 he read the *theory of muſcular motion* in the theatre at Surgeons-hall [q]; an abſtract of which was afterwards publiſhed by Mr. HOOKE in his *Philoſophical Collections* [r]. July 29, 1675 he was admitted a fellow of the College of Phyſicians, after he had waited for a vacancy above twelve years from the time of his being a candidate. His abilities in his profeſſion as a phyſician brought him into very conſiderable practice in the latter part of his life, ſo that the loſs of him was much regretted by the citizens of London. He died of a fever, October 12, 1684 [s], and was interred in the church of St. Mildred in the Poultry, in a vault of the LORIMER family, under the communion-table; his funeral ſermon being preached on the 23d of that month by Mr. (afterwards Dr.) JOHN SCOT, then rector of St. Peter the poor. In this ſermon, which was printed the ſame year at London in 4to, Dr. CROUNE's character is repreſented at large, and he is deſcribed as *not only a friend, but an ornament to the whole race of mankind*; a general ſcholar, an accurate linguiſt, an acute mathematician, a well-read hiſtorian, and a profound philoſopher; eminent for his generoſity and charity; amiable in his temper, prudent in his conduct, chearful and facetious in his converſation, and poſſeſſed of a juſt ſenſe of the duties of religion. He left a plan of two lectures,

[m] So his name is ſpelt by him in his laſt will; but he ſometimes wrote it CROONE. In printed books it is ſpelt variouſly, CRON, CROON, CROUN, CRONE, CROONE, and CROUNE.

[n] Dr. WARD's lives of the profeſſors of Greſham-college, p. 320.

[o] See above, vol. i. p. 4.

[p] Biſhop KENNET's regiſter and chronicle, p. 791.

[q] Dr. WARD ubi ſupra, p. 320, 321.

[r] N°. 2. ſect. 8 p. 22.

[s] Dr. WARD, p. 321.

which he designed to have founded, one of a lecture to be read in Latin on three several days at the College of Physicians, before the members of the college, upon the nerves and brain, with a sermon to be preached at the church of St. Mary Le Bow: the other of a lecture to be yearly at the Royal Society upon the nature and laws of muscular motion. This and other public designs of his were executed by his widow, who, after his death, married Sir EDWIN SADLEIR, Bart. and the lecture at the Royal Society was begun in December 1738, by ALEXANDER STUART, M. D. physician to her late Majesty, Queen CAROLINE: but the circumstances of the legacy for the support of the lecture in the College of Physicians, and of the sermon, prevented them from taking place till 1749, when the lecture was read on the 14th, 15th, and 16th of September by THOMAS LAURENCE, M. D. [t], and the sermon preached on Monday the 18th by the writer of this history [u].

December 3, Sir JOHN HOSKYNS in the chair.

Part of a letter of Mr. LEWENHOECK, dated at Delft, July 25, 1684, was read, concerning the parts of the brain of several animals, the chalk stones of the gout, the leprosy, and the scales of eels [x]. The latter part of this letter was reserved for the next meeting.

A letter of Mr. THOMAS MOLYNEUX to Mr. HAAK, dated at Leyden, November 20, 1684, N. S. [y], was read, containing an account of some new anatomical discoveries of Monsr. DU VERNEY at Paris, who judged the vesiculæ seminales not to be repositories of the semen, because they are sometimes full, though they do not communicate with the vasa deferentia: that whether they be double or treble, the insertions into the urethra are distinct from the deferentia, &c.: That, besides the ordinary prostatæ, he had observed in some beasts, at the root of the penis, two other glands, composed of several acini, very hard and firm, which send single ducts into the urethra. These he called *prostatæ succenturiatæ*, and supposed to be of the same use with the true prostatæ; because some animals have no other than them.

Dr. TYSON was desired to report what he could find of these discoveries, and one of the secretaries was ordered to give him a copy of Mr. THOMAS MOLYNEUX's letter.

[t] He continued to read this lecture till 1756, when he was succeeded by MARK AKENSIDE, M. D.

[u] The succeeding preachers were

1750. WILLIAM STUKELEY, M. D. fellow of the College of Physicians, and of the Royal Society; whose sermon is printed.

1751. STEPHEN HALES, D. D. F. R. S. whose sermon is printed.

1752. THOMAS CHURCH, D. D. whose sermon is printed.

1753. EDWARD VERNON, D. D. F. R. S. rector of St. George's Bloomsbury, whose sermon is printed.

1754. CUTS BARTON, M. A. rector of St. Andrew's Holborn, whose sermon is in print.

1755. JAMES TOWNLEY, B. D. rector of St. Bennet's Grace Church.

1756. JAMES KILNER, M. A. rector of Lexden near Colchester, Essex.

[x] It is printed in the *Philos. Transact.* N°. 168. p. 883. for February, 168$\frac{4}{5}$.

[y] Letter-book, vol. ix. p. 304.

A Latin

A Latin letter of Mr. JOHN DAVIS, miniſter of Leake in Nottinghamſhire' to Mr. ASTON, dated there, November 26, 1684 [z], was read, concerning th[e] *ſipho Wirtembergicus, ſive ſipho inverſus, cruribus æquealtis fluens et refluens.* H[e] mentioned, that he could perform ſome effect like this with a ſiphon and ſom[e] other additions of his own, which he did not diſcover. The ſecretary was ordered to return an anſwer to him.

A letter of Mr. WILLIAN MOLYNEUX to Mr. ASTON, dated at Dublin, November 25, 1684 [a], was read, remarking, that the Connaught worm, mentioned at the laſt meeting, was the elephant caterpillar of GOEDARTIUS, N°, 125: that he was convinced that Lough Neagh ſtone, well calcined applies ſtrongly to the magnet: that Sir WILLIAM PETTY's ſhip was launched on Michaelmas day, drawing fifty inches before, and forty abaft: and that ſhe bore her maſt without any ballaſt.

This letter accompanied a copy of the minutes of the Dublin Society from October 6 to November 24, incluſive; which were as follow [b]:

" *Octob.* 6, 1684. we firſt met after our adjournment, but few being preſent " nothing was done.

" *Octob.* 13. We had no meeting of the Society, but there was a meeting " about the building of the ſluice veſſel.

" *Octob.* 20. The minutes of the Oxford Society from to were read " and conſidered. A letter from Mr. THOMAS MOLYNEUX at Leyden was read, " which gave an account of a curious movement ſhewed to him by Monſ. " HUYGENS at the Hague, in his own cloſet: it ſhewed the month, day, hour, " and minute, with the poſture of all the planets correſponding, and by a key it " was to be ſet to any time paſt or future. The ſame letter gave an account " of his ſeeing the whole contrivance of the ſame ingenious perſon's aſtroſcopia " compendiaria.

" *Octob.* 27. Nothing paſſed but ſome orders about the method of our ap- " proaching election.

" *Nov.* 1. This being All-Saints day, our anniverſary day of election, we " proceeded therein according to the method of the Royal Society of London. " Sir WILLIAM PETTY, Knt. was choſen preſident, WILLIAM MOLYNEUX, " Eſq; ſecretary, and WILLIAM PLEDALL, Eſq; treaſurer.

" *Nov.* 3. Sir WILLIAM PETTY, our new preſident, brought in a paper of ad- " vertiſements to the Dublin Society, containing ſome propoſals for modelling our " future progreſs. Theſe were ſo well approved of, that they were readily

[z] Letter-book, vol ix. p. 305. An extract of it is printed in the *Philoſ. Tranſact.* N°. 167. p. 846.

[a] Letter-book, vol. ix. p. 312.

[b] Ibid. p. 307.

" ſub-

" ſubmitted to by the whole company. At this meeting the hon. Sir CYRIL " WYCHE, Knt. principal Secretary to the Lord Lieutenant, and preſident of " the Royal Society, was pleaſed to be admitted into our Society; and ſo like- " wiſe was Sir ROBERT REDDING, Bart. one of the council of the ſaid Society " Royal. Mr. ST. GEORGE ASHE read a diſcourſe concerning the ſquaring of " the circle, &c. not offering therein to do it, but endeavouring to demon- " ſtrate it poſſible; and likewiſe a diſcourſe, whether any real advantages or " compendiums in mathematics might be expected therefrom, if effected. The " reſidue of this diſcourſe he promiſes at the next meeting. Dr. MULLEN gave " an account of the following experiments: The expreſſed juice of a Connaught " worm given to a dog did no perceivable harm; but another dog, who had " taken the ſkin, was found dead two days after. The root of *filipendula aquatica* " *cicutæ facie* given to a dog, killed him in three days. A ſalt taken from a " ground conſiſting of earth and ſea-ſand coagulated milk, yet could not be " cryſtalliſed. He alſo produced a ſtone, ſaid to be an elf dart, but it was " agreed to be nothing but the head of an arrow, or ſpear of the antients. He " ſhewed likewiſe a ſtone curiouſly reſembling a wrought button; as alſo a ſmall " ſtone, that moves being put into vinegar, by reaſon of the little bubbles on " which it ſlides, which ariſe from the luctation between it and the acid.

" *Nov.* 10. A letter was read from Mr. MUSGRAVE, containing the minutes " of the Oxford Society from to October 21, incluſive. Our preſident " was pleaſed to expatiate upon ſeveral heads he lately preſented us for our future " regulation. Mr. MOLYNEUX ſhewed the company an experiment in hydro- " ſtatics, tending to the reſolution of an hydroſtatical problem propoſed to him. " A letter was read from RICHARD BULKELEY, Eſq; at Old-Baun containing " the deſcription of a machine lately contrived by him, for regiſtering the force " of the wind. Mr. SMITH read a diſcourſe *De Angulo contactus*. He pro- " poſed alſo, that ſome queries may be given to him, relating to the petrifying of " Lough Neagh; for that ſuddenly he intended a journey down there. Mr. " MOLYNEUX promiſed to draw up ſome queries. Dr. MULLEN gave an account " of the following experiment: A vintner in this town being troubled with a con- " ſumption, complained much of a trouble in the left ſide of his thorax, and would " often, with ſome confidence and perſuaſion, aſſert, that he was ſure he ſhould " do well enough, could the thorax be opened, and a certain piece of his lungs " be cut out with impunity. But this deſperate remedy was not hearkened to " by any one; ſo the ſick man died. Notwithſtanding Dr. MULLEN reſolved " to try the experiment on a dog, and opening his thorax he cut off from one " lobe of his lungs a piece three inches long and two broad, and making a li- " gature to hinder the effuſion of blood, he cloſed the wound. The dog reco- " vered perfectly well, and ſhewed no manner of want of what he had loſt. " About ſix months after, the doctor hanged the dog, and opening him, found " the end of the lobe, where the wound was made, firmly united to the inter- " coſtal muſcles, where the thorax was opened, and the thread, that made the " ligature, was vaniſhed, and ſuppoſed diſcharged at the wound in the breaſt.

" *Nov.* 17. A letter was read from Mr. BULKELEY at Old-Baun, containing

" the deſcription of a pump, contrived by him for ſhips : it is moved by the " wind, and ſo requires no hands from other work in the ſhip. An account of " ſome obſervables in the body of a woman, lately dying with ſome odd ſym- " ptoms, as taken by Mr. TULLERSON in the preſence of ſome phyſicians, was " read. Dr. MULLEN preſented an hexagonal piece of rock-cryſtal from the " county of Kerry, where they are found in great plenty, and all curiouſly fi- " gured in this ſhape. Mr. ASHE finiſhed his diſcourſe concerning the advan- " tages, that may be expected from the ſquaring the circle, doubling the cube, " &c. which he thought ſufficiently attained for all uſes by the approximations " and mechanical methods already known.

" *Nov.* 24. A letter was read from Mr. ASTON, F.R.S. It informed us of " a conteſt between KUNCKELIUS and Dr. VOIGHT, whether common ſpirit of " wine be acid or oleous ; and of a letter from STURMIUS about Mr. HALLEY's " hypotheſis of the magnetical poles. A letter was read from Mr. MUSGRAVE " giving an account of a large preternatural glandulous ſubſtance, growing be- " tween the pericardium and heart of an ox. Ordered, that the thanks of this " Society be returned to Mr. MUSGRAVE for his extraordinary communication. " Sir WILLIAM PETTY, our preſident, brought in a paper of ſixty three miſcel- " laneous experiments to be proſecuted by this Society. Mr. KING read an ac- " curate and uſeful diſcourſe of the bogs and loughs of Ireland, ſhewing their ori- " gin, and the ways and methods for reducing them to profitable land. A " paper of queries relating to the petrifying of Lough Neagh, as drawn by Mr. " MOLYNEUX, was read, and committed to the care of Mr. SMITH, who ſud- " denly intends a journey down thither. Sir ROBERT REDDING gave an account " of the ſucceſs of an experiment in the Royal Society for altering the verticity of " a needle by pulvis fulminans."

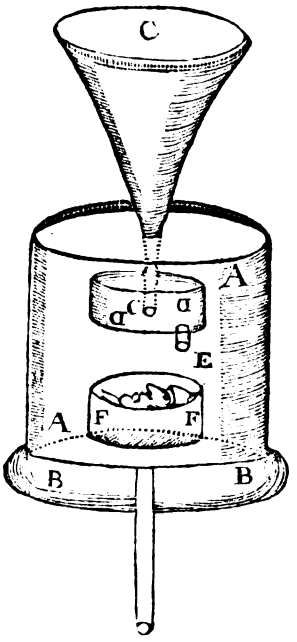
Dr. PAPIN brought in a draught of the manner of caſting medals *in vacuo*, as follows[c] :

" The art of caſting metals is ſo uſeful in the world, that I hope the Royal " Society will not diſlike my endeavours to improve it by the following con- " trivance.

" AA is a receiver, the great aperture of which is applied to the pneumatic " engine.
" CC is a funnel, the ſhank whereof is ſoddered in a hole at the top of the re- " ceiver AA, and reacheth into a little veſſel DD, included in the receiver " AA.
" DD is a little veſſel to receive the melted metal from the funnel CC, and to let " it out through the hole E.
" FF is the mold to receive the melted metal from the hole E.
" BB is the plate of the pneumatic engine.

[c] Regiſter, vol. 6. p. 200.

" The



" The ſhank of the funnel CC, ought to be ſtopt " with wax or cement, and the receiver being well ex- " hauſted of air, the melted metal is to be poured quick- " ly into the funnel CC, ſo it will melt the wax, and run " into the veſſel DD, and falling through the hole E it " will fill the mold FF. Then the outward air following " the metal immediately, will preſs it into the mold with " ſuch a force, that it muſt take the impreſſion of any " little ſtroke that is printed therein better much than if " the mold had not been exhauſted of air. I have there- " fore caſt two medals, one in the open air, and the " other *in vacuo*, and I find much difference between " them: becauſe that in the open air is ſmooth, and the " ſtrokes of the relievo are roundiſh and blunt: but the " medal caſt *in vacuo* hath its ſtrokes ſharper, and the " metal hath been ſo cloſe applied to the ſandy mold, " that it hath taken the impreſſion of the roughneſs of " the ſand, as may be ſeen in the medals I have brought " with me. It was receſſary to receive the metal from " the funnel in a cloſe veſſel as DD: becauſe if it ſhould " fall from the funnel directly into the mold, being " driven by the whole preſſure of the atmoſphere, it would fly about with a great " violence, and might do ſome miſchief. If the Society pleaſeth to give me " directions to follow this experiment, I hope it will prove uſeful on many " occaſions."

He was ordered at the next meeting to make the trial.

Mr. BAILEY preſented, in the name of Mr. NICHOLAS WAITE, a piece of the aſbeſtus linen, which had been burnt before the Society.

Mr. BAILEY preſented likewiſe a pair of a Chineſe woman's ſhoes, with a piece of Calambo wood.

Mr. HOUGHTON ſhewed a very ſmall and very big walnut, both perfect; which were ordered to be meaſured.

The ſecretaries were ordered to wait upon the new preſident in the Society's name.

Decem. 10, at a meeting of the COUNCIL were preſent,

SAMUEL PEPYS, Eſq; preſident

Sir ANTHONY Dean	Dr. LISTER
Mr. HENSHAW	Mr. HOOKE
Mr. HILL	Mr. HALLEY
Dr. GALE	Mr. RICHARD WALLER
Mr. CREED	Mr. ASTON
Dr. SLARE	Mr. MUSGRAVE.
Mr. MEREDITH	

The preſident was ſworn, and ſuch of the council preſent as had not taken their oaths.

The treaſurer's account being not yet audited, a committee was named for that purpoſe, conſiſting of the preſident, Sir JOHN HOSKYNS, Mr. COLWALL, Dr. LISTER, and Mr. ASTON.

At a meeting of the SOCIETY on the ſame day, SAMUEL PEPYS, Eſq; preſident in the chair.

The Society having received the picture of Sir JOSEPH WILLIAMSON, formerly their preſident, ordered it to be placed in their meeting room, and deſired Mr. HILL and Dr. GALE to wait upon him with their thanks.

A letter from Monſ. JUSTEL to Mr. ASTON[d] was read, mentioning, that Monſ. FREMONT D'ABLANCOURT had written to him, that he had ſeen theſe two experiments: 1. That ſpirit of wine burning with a flame, the flame caught in fit veſſels would leave about half the quantity of a water almoſt inſipid, but having a faint peppery taſte in the throat. 2. The blood or milk, by different expoſitions to the air, and different impreſſions from the air, would appear ſometimes red, and at other times green.

Dr. PAPIN remarked, that theſe experiments had been often tried.

A letter from Monſ. FREMONT D'ABLANCOURT to Mr. ASTON, dated at Paris December 20, 1684, N. S.[e], was read, expreſſing his acknowledgments to the Society for the honour of his election into it, and offering to promote the ends of it, as he ſhould be directed.

The ſecretary was ordered this letter, and to deſire Monſ. D'ABLANCOURT to write ſometimes to the Society.

The minutes of the Dublin Society from October 6 to November 24, 1684, were read; and upon the mention in them of a paper of advertiſements of Sir WILLIAM PETTY for regulating and modelling the future progreſs of that Society, the ſecretary was ordered to deſire a communication of it.

There being likewiſe mentioned an engine to ſhew the force of the wind, and a ſea-pump to go with the wind, it was likewiſe deſired to know the ſucceſs upon their trials.

With regard to the cutting off a piece of the lungs, Mr. MUSGRAVE obſerved, that this had been done about ſix years before by Mr. FRY a chirurgeon at Oxford.

[d] Letter-book, vol. ix. p. 316. [e] Ibid. p. 317.

Cryſtals of an hexagonal figure being mentioned to be found in the county of Kerry, Dr. LISTER ſaid, that he conceived, that moſt ſorts of ſtones had their peculiar cryſtals belonging to them, and that he had ſeen eleven or twelve ſorts diverſely figured. He was deſired to give an account of the ſhapes of ſuch as he had obſerved.

A paper about draining bogs being mentioned, Mr. PACKER remarked, that he had been informed of one way now uſed, which was by digging all the peat in a canal; and that by this way a bog was ſaid to have ſunk thirty feet.

Upon mentioning ſixty three miſcellaneous experiments propoſed by Sir WILLIAM PETTY as *deſiderata*, a paper containing them, which had lately been printed at Dublin, was read, and being very well approved of, was ordered to be reprinted here, in order that the members of the Society might have copies, and conſider of the particulars, which they would chooſe to examine.

The preſident ſelected thoſe more immediately relating to navigation.

Dr. PAPIN gave the following account of the book, intitled *Sypho Wurtembergicus* [f]:

"The account I can give of the book called *Sypho Wurtembergicus*, is, that "it doth promiſe very great and extraordinary things, viz. 1. That a ſyphon "will work with equal legs. 2dly. That it will work, though neither of its "apertures are quite under water. 3dly, That after a long dry weather, when "the water comes again to the ſyphon, it will begin again to work without any "attraction, preſſion, or rarefaction of any engine: and Mr. DAVYS writes, that "he hath done the ſame effects: ſo that I muſt not queſtion the truth of the thing, "although I don't well conceive how it may be performed. Nevertheleſs, I have "fulfilled all their conditions, by filling the ſyphon with long pieces of flannel; but "the effect is very ſlow, and far from reaching to the hight theſe gentlemen pretend "to. I can alſo perform all the effects deſcribed in the book, by putting two ſy-"phons within one another; but then it will be more chargeable than an ordinary "ſyphon, and of no advantage, which yet theſe gentlemen affirm to be great in "their invention: ſo I cannot pretend to have made the diſcovery of their ſecret. "Nevertheleſs, if the Royal Society thinks it worth while, to ſee what I have done "about it, I will perfect it a little more, and bring it hither: it may perhaps "give better thoughts to ſome body elſe."

Dr. PAPIN was ordered to ſhew at the next meeting what he could do in this experiment.

He proſecuted likewiſe the experiment of caſting medals *in vacuo*; his account of which was as follows [g]:

[f] Regiſter-book, vol. vi. p. 201.

[g] Ibid. p. 202.

"By

" By profecuting the experiment of caſting in mould *in vacuo*, I have found the " way given in the laſt week liable to an inconvenience, viz. That the metal " being driven into the little veſſel with great violence, will fly in drops, ſome " of which may fall through the great hole into the mold, and ſo ſometimes " ſpoil it. I have therefore tried to receive the melted metal, that comes from " without, in a ſmall crucible full of the ſame melted metal, from whence it runs " gently into the mold: ſo I may try at preſent the difference between metal caſt " *in vacuo*, or in the open air, upon a ſmooth plate: for if the metal, caſt *in va-* " *cuo*, will take the ſmoothneſs of the plate, as well as it takes the roughneſs of " the ſand, that may be uſeful for caſting ſeveral works, that require to be " poliſhed."

In performing this experiment, ſome of the lead running over, and falling upon the ſide of the glaſs-receiver, broke it. Upon which it was ordered, that the experiment ſhould be again made at the next meeting.

Mr. HOOKE ſhewed the draught of a new level invented by himſelf, which, he ſaid, exceeded all thoſe lately mentioned in the book publiſhed by Monſ. DE LA HIRE.

It was ordered, that Mr. HUNT take directions from Mr. HOOKE for the making that level againſt the next meeting, that it might be then tried.

Mr. HALLEY gave an account, that he had lately ſeen Mr. NEWTON at Cambridge, who had ſhewed him a curious treatiſe, *De Motu*; which, upon Mr. HALLEY's deſire, was, he ſaid, promiſed to be ſent to the Society to be entered upon their regiſter.

Mr. HALLEY was deſired to put Mr. NEWTON in mind of his promiſe for the ſecuring his invention to himſelf till ſuch time as he could be at leiſure to publiſh it.

Mr. PAGET was deſired to join with Mr. HALLEY.

December 17. It being queried what might be the difference between cryſtal and Briſtol ſtones, Dr. LISTER ſaid, one difference might be, that cryſtals ſtrike fire, and Briſtol ſtones do not.

Upon mentioning the level ordered to be made at the laſt meeting, Mr. HOOKE ſaid, that, inſtead of that, which would only have been for a trial, he would cauſe an exact one to be made in braſs, which ſhould be brought to the Society.

Sir ANTHONY DEAN gave an account, that Sir WILLIAM PETTY had ſent over a challenge or wager in fifteen propoſitions, wherein were aſſerted the virtues of the ſluice-bottomed veſſels beyond any veſſels of the common make. To this challenge Sir ANTHONY DEAN produced an anſwer in writing, ſigned by himſelf and Mr. PEPYS[s]: which being read, was found to contain the conditions of the ſeveral

[s] The preſident of the Royal Society.

wagers, and the ſums offered to be laid upon each propoſition. This, Sir ANTHONY ſaid, was not done out of any enmity to Sir WILLIAM PETTY, for whom he had a great eſteem; but that Sir WILLIAM might be provoked to a full proof of his aſſertions, which would not fail to produce many good experiments.

A copy of this paper was deſired, which Sir ANTHONY DEAN promiſed to permit it to be taken, as ſoon as the paper could be ſpared.

Mr. HOOKE read a paper of obſervations concerning Dr. VOSSIUS's late book [h]; and upon this occaſion mentioned ſome reaſons, why the moon had no atmoſphere.

Dr. GALE took notice, that Dr. VOSSIUS had ſaid, that JULIUS AFRICANUS made mention of ignis Græcus compounded of ſal foſſile, ſulphur vivum, and pulvis pyritis, inſtead of charcoal. He deſired therefore, that the manuſcript in the Baroccian library at Oxford might be examined in this particular, to the end it might be known, whether it be the firſt JULIUS AFRICANUS, who was contemporary with ORIGEN, or ſome one later.

Mr. AUBREY related an obſervation made by colonel JOHN WINDHAM, about the different hight of the barometer in the cathedral of Saliſbury: that the ſteeple is 404 feet high: that the weather-door of the cathedral is 4280 inches: and that the mercury ſubſided in that hight $\frac{42}{100}$ of an inch.

Mr. MUSGRAVE read a letter to himſelf from Mr. JOHN BALLARD [i], dated at Oxford, December 10, 1684 [k], mentioning the trial made there of ſome of the experiments of Monſ. KUNCKEL: which letter was as follows:

" Our preſident being returned, we had again yeſterday a meeting, where we " had read this account Mr. DES-MESTERS gave me of thoſe experiments of " KUNCKEL's, Mr. ASTON mentioned in a letter a little before, wherein ſome " things ſeemed not a little ſurpriſing, as that in § the 3d, which ſhews a meer al- " kali does coagulate, and in § the 6th, where the ſublimate ſal armoniaci encreaſes " coagulation. As to the colour of ſyrup of violets, mixt with ſpirit of wine, it was " thought impoſſible there could be any judgment made of it in that trial, which " Mr. ASTON ſays was made but by candlelight. As to the ſenſible heat of wa- " ter and ſpirit of wine mixt, we cannot conclude from what DES-MESTERS here " ſays, but that it may be true, ſince certainly the perceiving ſo nice a warmth " by the hand muſt very much depend upon the temper the hand at that time is in, " which, if colder than ordinary, feels an heat in a luke-warm liquor; if very " warm itſelf, feels that very ſame liquor ſenſibly cold. We in recompence for " your handkerchief have ſent you a piece of paper of the ſame matter. It was " preſented us by Mr. LLOYD (the regiſter of the laboratory beneath) who at- " tending to what paſſed among us about the abeſtus, and having received ſince

[h] *Variæ Obſervationes*, printed at London, 1685. in 4to.

[i] Of New-College, Oxford, afterwards doctor of phyſic.

[k] Letter-book, vol. ix. p. 327.

" ſome

" ſome quantity of it from the iſle of Angleſey, he pounded ſome of it in a mor-
" tar, which the paper maker mixing with water in his trough, took up like
" common papers, and the linteous parts ran eaſily together on the inſtrument like
" other paper, only the weight of this lint cauſing it quickly to ſubſide, forced
" them to often ſtir it, and be very nimble in their taking it up. It might, (it is
" thought) if to any purpoſe, be made much finer and whiter, but being ſo very
" brittle before, and much more ſo after burning, it is ſcarce likely to be of any
" uſe. As to the ſtone you ſpeak of, Dr. WALLIS thinks to have ſeen the very
" ſtone, which if true, he ſays, it was taken out of the father of Mr. ADONIRAM
" BYFIELD, and not out of himſelf; and that he lived with great pain till the
" day ſevennight after the falling down of the ſtone into the bottom of his blad-
" der, and did not die, as you ſay, within two hours. He ſays the ſtone had
" another looſe in a cavity within it, like what we call eagle-ſtones, and that af-
" terward, being broken by an accidental fall, diſcovered its contexture, which
" was very hollow, ſpungy and light, &c."

Mr. MUSGRAVE read alſo a particular account of the trials made by Mr. DES-MESTERS upon occaſion of the forementioned experiments found in Monſ. KUNCKEL: which account was as follows[1]:

" Mr. ASTON in his letter, dated November 13, 1684, making mention of
" the trial of ſome experiments found in KUNCKEL, viz. That ſpirit of wine and
" ſyrup of violets make a green: That ſpirit of wine and milk in equal parts
" curdle: That a few drops of water and ſpirit of wine heat perceptibly; it was
" ordered, that the ſame experiments ſhould be tried here, which was done in the
" following method:

" 1. We mixt ſpirit of wine with ſyrup of violets, but found no other change
" in the colour, than that the ſyrup became of a paler blue upon its being di-
" luted by the ſpirit of wine; there being not the leaſt change toward a green
" as Mr. ASTON obſerved.

" This experiment was tried both with plain and tartariſed ſpirit of wine with
" equal ſucceſs.

" 2. We mixt ſpirit of wine and milk, of each equal parts, which coagulated
" conſiderably in leſs than a minute of time; but making the like trial with ſpirit
" of wine tartariſed and milk, no coagulation followed.

" Query, Whether the coagulative virtue in ſimple ſpirit of wine be not to be
" aſcribed to the common ſalt from which 'tis diſtilled?

" We then tried ſome other experiments upon milk, not mentioned by Mr.
" ASTON, viz.

" 3. We mixt arena tartari per deliquium and milk, of each equal parts, which
" coagulated, but not ſo conſiderably, nor altogether ſo ſoon as ſimple ſpirit of
" wine and milk.

" 4. Arena tartari per deliquium poured upon the uncoagulated mixture of
" milk and ſpirit of wine tartariſed, quickly coagulated.

[1] Letter-book, Vol. ix. p. 328.

" Sub-

" 5. Sublimate armoniaci poured upon milk made not the leaſt coagulation, " though it was ſuffered to ſtand a good while; we then poured ſimple ſpirit of " wine upon this mixture, but no coagulation followed.

" 6. We then poured ſublimate tartarici upon the coagulation made with " equal parts of milk and ſpirit of wine, which was ſo far from reſtoring it to its " fluidity, that it increaſed the coagulation.

" 7. The forementioned experiments made upon cold milk were at the ſame " time made upon hot milk, with the ſame ſucceſs, excepting that arena tartari " per deliquium being poured upon warm milk, the coagulation was not diſcernible " till the milk was almoſt cold, neither did the coagulation appear ſo hard as with " cold milk.

" 8. In order to the third experiment mentioned by Mr. ASTON, viz. " that water poured upon ſpirit of wine heat perceptibly, we firſt made trial " what operation water and wine ſeparately would have upon the thermometer, " and we found, that a thermometer being put into pump water (and the ſame " experiment afterward held good with rain water) the incloſed tincture roſe $\frac{1}{10}$ " of an inch above the mark; being thence removed into ſpirit of wine, it roſe " about ſo much higher, and being thence removed into ſpirit of wine and water, " it roſe an inch higher than the mark it ſtood at before, yet the heat was not " diſcernible by the hand.

" 9. We then tried the ſame experiment with ſpirit of wine and milk, " and found, that a thermometer being put into cold milk the tinged ſpirit " contained in the thermometer roſe a little, as it did with water; but when an " equal quantity of ſpirit of wine was poured upon the milk, it roſe to the ſame " hight as when put into ſpirit of wine and water.

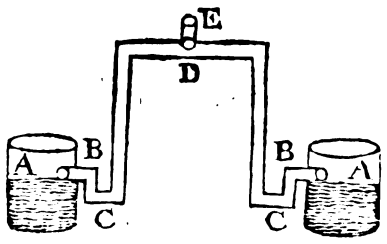
Dr. LISTER queried, whether ſpirit of wine, drawn from Nants wine, being a ſharp raw wine, will not coagulate more than ſpirit of wine drawn from ripe Languedoc wines; as from acid things there always riſes an acid ſpirit.

Dr. PAPIN ſhewed a way, by joining two ſyphons together, to work all the effects ſaid in the book to be proper for the *Sypho Wurtembergicus*. He alſo propoſed another way to do the ſame things by one ſyphon bent at the ends, as in the figure then produced. His account was as follows[m]:

" Being commanded to make up a ſyphon fit to perform all the effects de- " ſcribed in the book called *Sypho Wurtembergicus*, I have perfected the double " ſyphon ſpoken of in the laſt meeting, and, if the Royal Society pleaſeth, I can " ſhew at preſent, that it hath them ſix marks, which the author doth pretend to " be peculiar to his ſyphon, and whereby it ought to be diſtinguiſhed from any " other. Nevertheleſs if I was to do the ſame again, I would uſe no other art, " but to make both of the legs of the ſyphon crooked at the end, as is repreſent- " ed in the ſcheme: becauſe this is more ſimple and eaſy than the double ſy- " phon, and yet will do the ſame effects. So if the author will give any more ad- " miration for his contrivance, he muſt diſcover ſomething farther of its proprie- " ties and uſes, ſince all he hath hitherto ſaid of it may be ſo eaſily performed.

[m] Regiſter, vol. vi. p. 202.

" AA:



" AA: the two veſſels ſituated in the ſame
" level.
" BCDBC: the ſyphon crooked at both ends,
" whoſe apertures muſt lie in the ſame
" level.
" E: A ſmall pipe to fill up the ſyphon exactly,
" and to be ſhut afterwards.

" It is plain, that ſuch a ſyphon will always remain full though neither of its " apertures lieth quite under water, becauſe the water contained in the ſpace BC " will keep the outward air from getting towards the upper part D. So this ſy- " phon will always be ready to work, as ſoon as the water comes to reach ſome " part of either of its apertures, and by the ſame means it will perform all the " effects deſcribed in the book."

The Society adjourned till after the Chriſtmas holy-days.

1684, *January* 7, Mr. PEPYS preſident in the chair.

The preſident communicated a copy of a letter, which had been written by Sir WILLIAM PETTY to Sir J. W. dated at Dublin, December 18, 1684, concerning the miſcarriage of his new veſſel in the ſeveral trials made with it on the 15th and 16th of December, 1684. The letter was as follows[n]:

" I have troubled you with ſeveral accounts of my naval experiments; per- " haps, you may think, becauſe I expected your applauſe for them: but I do now " with the ſame candor and ingenuity acquaint you, that upon the 15th and 16th " days of this month we have made an experiment upon the ſea; in which were " ſo many complicated and perplexed circumſtances, as to make me ſtagger in " much of what I formerly ſaid, but not in the leaſt concerning the ſtrength of " our fabric. Our principal diſappointment was in the bearing of ſail, which, all " the world allows, will be eaſily remedied by virtue of our principle. We " thought to have remedied our ſhip's tenderneſs for the preſent by ballaſt, upon " the advice of good common ſeamen; but find, that (as our models had for- " merly told me) it had not the ſame effect to ſtiffen our ſort of ſhipping as the " common: ſo as this uſe of ballaſt did but bring new miſchiefs upon us, that " is to ſay, did damp the ſhip's motion, and diſturb her working. The cauſe " of the tenderneſs was an endeavour, beſides the introducing a new principle, " to make a ſmall paſſage boat of twelve foot broad high enough to carry horſes, " hoping to have gotten ſome ſmall matter thereby, to have defrayed our charges. " But ſo it is, that we are now to begin again, all men believing, that the princi- " ple will be good. For my own part, I intend to ſpend my life in examining " the greateſt and nobleſt of all machines, a ſhip: and, as I have always told " you, I ſhall content myſelf in that I have to this purpoſe uſed more effectual " means, and with leſs by-ends, than the generality of other men; and I promiſe

[n] Letter-book, vol. ix. p. 326.

" you,

" you, if I can find juſt cauſe for it, will write and publiſh a book againſt my-
" ſelf. So much do I prefer truth before vanity and impoſture, &c."

A letter from Mr. WILLIAM MOLYNEUX to Mr. ASTON, from Dublin was read, giving likewiſe an account of the failure of Sir WILLIAM PETTY's new ſhip; which letter was as follows [o]:

" I promiſed to give you an account of the performances of Sir WILLIAM
" PETTY's ſhip, and I am glad of an opportunity of writing to you, and ſerving
" you in any thing; but I am heartily ſorry at the occaſion, that at preſent offers
" itſelf, and would therefore willingly be ſilent. But 'tis a matter ſo public, and
" of too univerſal concern to be concealed, and withal 'twas ſo probably and
" fairly offered at, that human frailty need not be aſhamed of miſcarrying therein.

" Sir WILLIAM PETTY's ſhip was tried this day ſevennight in our harbour
" between Rings-End and the bar; but ſhe performed ſo abominably, as if built
" on purpoſe to diſappoint in the higheſt degree every particular, that was ex-
" pected from her: ſhe had ſpread but a third of the ſail ſhe was to carry, the
" wind did but juſt fill her ſails, and yet ſhe ſtooped ſo, that ſhe was in danger
" of being overſet every moment; a blaſt from a ſmith's bellows ſuperadded had
" overturned her. She was propoſed not to want an ounce of ballaſt, and yet
" ſhe had in her ten tun of paving ſtones, and all would not do; the ſeamen
" ſwear they would not venture over the bar in her for 1000 pounds a piece.
" Even right before the wind ſhe does nothing. So that the whole deſign is
" blown up. What meaſures Sir WILLIAM will take to redeem his credit,
" I know not, but I am ſure a greater trouble could hardly have fallen up-
" on him.

" When I was juſt cloſing my letter, yours of the 11th inſtant was brought
" me. I am very glad the Royal Society has continued you ſecretary. Sir WIL-
" LIAM PETTY ſays, that had he thought his catalogue would come before you,
" he ſhould have been more careful in it; but ſuch as 'tis, he freely gives it up
" to your diſpoſal. As to his modelling our Society, I ſhall ſend you his paper
" as ſoon as I can, by the next poſt or two at fartheſt. I here ſend you a cata-
" logue of our members. We have adjourned till the Monday next after
" Twelfth-day. I ſhall ſoon tranſmit you our minutes.

" A liſt of the Dublin Societry, December 23, 1684.

" RICHARD ACTON, B. D.
" ST. GEORGE ASHE, A. M.
" MARK BAGGOT, Eſq;
" JOHN BARNARD, A. M.
" RICHARD BULKELEY, Eſq;
" JOHN BULKELEY, Eſq;
" PAUL CHAMBERLAIN, M. D.
" R. CLEMENTS, Eſq;
" FRANCIS CUFF, Eſq;
" CHRISTOPHER DOMINICK, M. D.
" NARCISSUS Lord Biſhop Fernes and
" Leighlin.
" HENRY FERNELEY, Eſq;
" J. FINGLASS, M. A.

[o] Letter-book, vol. ix. p. 334.

" SAMUEL

" SAMUEL FOLEY, M. A.
" ROBERT HUNTINGTON, D. D.
" DANIEL HUOLAGHAN, M. D.
" JOHN KEOGH, M. A.
" WILLIAM KING, M. A.
" JOHN MADEN, M. D.
" WILLIAM MOLYNEUX, Eſq; ſecret.
" WILLIAM Lord Viſcount Montjoy.
" ALLEN MULLEN, M. D.
" WILLIAM PALLISER, D. D.
" Sir WILLIAM PETTY, Knt. preſident.
" WILLIAM PLEYDALL, Eſq; treaſurer.
" Sir ROBERT REDDING, Bart.
" EDWARD SMITH, M. A.
" JOHN STANLEY, M. A.
" JACOBUS SYLVIUS, M. D.
" GEORGE TOLLET, prof. mathem.
" Sir CYRIL WYCHE, Knt.
" CHARLES WILLUGHBY, M. D.
" JOHN WORTH, D. D. D. of St. Pat.

Another letter of Mr. WILLIAM MOLYNEUX to Mr. ASTON, dated at Dublin, December 27, 1684, was read, containing the advertiſements to the Dublin Society by Sir WILLIAM PETTY, preſident of the ſaid Society: which advertiſements were as follow[n]:

" 1. That they chiefly apply themſelves to the making of experiments, and " prefer the ſame to the beſt diſcourſes, letters, and books, they can make or read, " even concerning experiments.

" 2. That they do not contemn and neglect common, trivial, and cheap ex- " periments and obſervations; not contenting themſelves without ſuch, as may " ſurpriſe and aſtoniſh the vulgar.

" 3. That they provide themſelves with rules of number, weight, and mea- " ſure; not only how to meaſure the plus and minus of the qualities and ſchemes " of matter; but to provide themſelves with ſcales and tables, whereby to mea- " ſure and compute ſuch qualities and ſchemes in their exact proportions.

" 4. That they divide and analyſe complicate matters into their integral parts, " and compute the proportions, which one part bears to another.

" 5. That they be ready with inſtruments and other apparatus to make ſuch " obſervations, as do rarely offer themſelves, and do depend upon taking op- " portunities.

" 6. That they provide themſelves with correſpondents in ſeveral places, to " make ſuch obſervations as do depend upon the compariſon of many experiments, " and not upon ſingle and ſolitary remarks.

" 7. That they be ready to entertain ſtrangers and perſons of quality with " great and ſurprifing experiments of wonder and oſtentation.

" 8. That they carefully compute their ability to defray the charge of ordi- " nary experiments, forty times per annum out of their weekly contributions, " and to procure the aſſiſtance of benefactors for what ſhall be extraordinary, " and not peſter the Society with uſeleſs or troubleſome members for the lucre of " their pecuniary contribution.

" 9. That whoever makes experiments at the public charge, do firſt aſk leave " for the ſame.

" 10. That the ſecretary do neither write nor receive any letters on the public " accouut of the Society, but what he communicateth to the Society.

[n] Letter-book, vol. ix. p. 337.

" 11. That perſons (though not of the Society) may be aſſiſted by the Socie-
" ty, to make experiments at their charge upon leave granted.

" 12. That for want of experiments there ſhall be a review and rehearſal of ex-
" periments formerly made.

" Since theſe we have another order.

" 13. That the preſident at the preſent meeting ſhall order what experiments
" ſhall be tried at the following meeting, that accordingly a fit apparatus may be
" made for it."

Theſe advertiſements were referred to the council, to conſider how far they might be uſeful to the Royal Society.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at New-college Oxford, December 23, 1684[o], was read, relating to the two following cures of Dr. TURBERVILLE.

" Whatever is communicated by Dr. TURBERVILLE muſt certainly be very
" welcome to you: in a letter he lately ſent me I find theſe obſervations.

" He had a gentlewoman his patient, who was very much troubled with the
" falling ſickneſs; ſhe brought her water to the doctor, in which he perceived
" many ſhort worms, full of legs, of the likeneſs of millepedes: he gave her
" two or three purges, firſt with pil agarici and rhubarb: but the worms ſtill
" continued to be ſeen in the water, and the fits returned every day. At laſt he
" gave her an ounce of oxymel helleboratum in tanſy-water, which wrought well,
" and was ſucceſsful, ſo that ſhe was perfectly cured.

" He had another patient, whoſe eye was as big as a hen's egg; yet was very
" fair, without blemiſh, rheum or redneſs: the perſon had his ſight pretty
" well: the doctor judged the diſtemper to proceed from thin humours falling
" on the eye, and cauſing the extenſion of the coats, and therefore made uſe of
" drying medecines applied to the head and eye; which, with an iſſue in the neck,
" cured the patient; the diſtemper the doctor names oculus bovinus or oculi
" hydrops."

Mr. HOOKE remarked, that Mr. WHITE the chemiſt at Oxford had been troubled with the falling ſickneſs, and by a vomit had brought up ſeveral worms; but he could not tell the ſort, referring himſelf to the perſon living at Oxford.

A letter from Mr. THOMAS MOLYNEUX to Mr. ASTON, dated at Leyden, December 29, 1684, O. S.[p], was read, intimating his readineſs to ſend the Society a catalogue of the natural curioſities preſerved by Dr. HERMAN, profeſſor of botany at Leyden in his peculiar ſort of balſam; as alſo ſome account of the rarities in Dr. SWAMMERDAM's collection in the cuſtody of a perſon in that city.

[o] Letter-book, vol. ix. p. 336. [p] Ibid. p. 331.

In

In this letter was contained an account of a prodigiouſly large *os frontis* belonging to the ſchool of phyſic at Leyden [q]. From its juncture with the naſal bones to the terminating by the ſutura ſagittalis, it was the convex way nine inches $\frac{1}{10}$; from ſide to ſide twelve inches $\frac{1}{3}$; in thickneſs $\frac{1}{2}$ an inch. Mr. MOLYNEUX ſuppoſed, that the man, to whom it belonged, muſt be double the hight of ordinary men.

The latter part of Mr. LEEWENHOECK's letter of July 25, 1684, was read, being obſervations on the brain of an ox and ſparrow; on moxa, and that cotton is the fitteſt ſuccedaneum for it; on the chalk bred in men, who have long had the gout: on the leproſy, as far as people are ſaid to have it in Holland: on eels, in which he diſcovered both ſcales and fins [r].

Dr. PAPIN made the following experiment. He took a bottle half full of lime-juice, and exhauſted of air, which he heated at the fire, but not ſo much as to make it boil. Nevertheleſs the ſame bottle, when it was taken from the fire, and ſhaked, or turned upſide-down, and then put into freezing water, boiled with great violence. Upon taking it from the ice, it ceaſed to boil, and began again, when it was put into the ice.

He ſaid, that he had done the ſame thing with ſpirit of wine, and alſo with fair water, and that the bottle would boil by putting it into the ice, though it were neither ſhaked nor turned upſide-down.

He was ordered to make the experiment with water at the next meeting, bringing his pneumatic engine with him, and exhauſting the bottle before the Society.

January. 14. At a meeting of the COUNCIL were preſent,

SAMUEL PEPYS, Eſq; preſident

Dr. LISTER	Mr. WALLER
Mr. HILL	Mr. HALLEY
Mr. HOOKE	Mr. ASTON.
Dr. SLARE	

Dr. LISTER was ſworn vice-preſident.

It was ordered, that the treaſurer pay the following ſums:

To Dr. PAPIN eighteen pounds, whereof fifteen pounds is for ſalary, and the other three pounds for a pneumatic engine, which he had made for the Society:

To Mr. WICKS fifteen pounds for a year and a half's ſalary:

To Mr. HUNT twenty pounds for half a year's ſalary: and

To the porter two pounds.

[q] This account is printed in the *Philoſ. Tranſ.* N°. 168. p. 880.

[r] This letter of Mr. LEEWENHOECK is printed in the *Philoſ. Tranſact.* N°. 168, p. 883.

It was ordered likewiſe, that the treaſurer ſend for Mr. FOSTER, the perſon, who catalogued the books in the library, and adviſe him to be more moderate in his demands, and to attend at the next meeting of the council.

At a meeting of the SOCIETY on the ſame day, Dr. LISTER vice-preſident in the chair.

Dr. SLOANE was propoſed a candidate by Dr. LISTER.

Mr. RICHARD WALLER preſented a curious figure of the *cicindela volans*, or flying glow-worm, which he had drawn by the microſcope; and a box of the flies themſelves, which had been taken the preceding ſummer at Northaw in Hertfordſhire.

There were alſo read ſome obſervations by Mr. WALLER on the ſaid flying glow-worm; which were ordered to be regiſtered [f]:

Concerning the light's expiring when the inſect is dead, Dr. LISTER thought, that the contracting of the body might obſcure the light.

Dr. SLARE ſaid, that he had kept a glow-worm ſix days after it was dead, during which time the ſhining was diſcernible, but gradually decreaſed: and that the liquor ſeparated from the body ſhined four or five hours.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, January 12, 168$\frac{4}{5}$, was read, mentioning, that there had been read at the laſt meeting of the Philoſophical Society at Oxford Dr. LISTER's anſwer to a letter written ſome time before to him, concerning the colour of the liquor conveyed by the lacteals; in which anſwer he was willing to think, that the *humor refluus* might be partly of the nature of lymph; but that the greateſt part of what fills the lacteals in ſickly and empty animals ſeemed to be pituita, and ſometimes bile: that he propoſed a farther examination of the pellucid liquor contained in theſe veſſels, particularly whether it be *lympha*, *pituita*, or water; which two latter are, he ſaid, of leſs body and ſubſtance, and not ſo coagulable by the heat as the firſt, *lympha*; and he urged, that this *humor refluus* might be examined in icteric dogs or horſes, where, he ſuppoſed, the gall was continually emptying itſelf no otherwiſe than the *ductus pituitarii* are in catarrhs; though indeed the *lympha* in ſuch caſes is, as he ſaid, yellow: but he thought, that it would be found much yellower, becauſe more immediately tinged, and with leſs mixture.

In this letter of Mr. MUSGRAVE was incloſed a paper, found in the ſtudy of Dr. SPEED [u], late of Chriſt-church, Oxford, and ſaid to have been written by his father to Mr. BRIGGS [x]. It ſeemed to be a deſcription of one of CORNELIUS DREBBEL's inventions, and was as follows:

[f] They are printed in the *Philoſ. Tranſact.* N°. 167. p. 841. for January 168$\frac{4}{5}$.

[t] Letter-book, vol. ix. p. 340.

[u] SAMUEL SPEED, inſtalled canon of Chriſt-church in May 1674, and vicar of Godalmin in Surry, where he died, January 22d, 1681.

[x] Mr. HENRY BRIGGS, profeſſor of geometry at Greſham-college.

Mr.

" Mr BRIGGS, Notwithſtanding my much buſineſs and troubleſome obſerva-
" tions, I have here ſent you the under draught of the moſt ſtrange work, that
" ever my eyes beheld. A gentleman being Dutch born, and dwelling at Ipſ-
" wich, hath made a continual motion of this bigneſs and ſize as near as I could
" gueſs: the work is this, a ball or round globe, ever ſtanding without moving,
" and upon the north and ſouth ſides a dial, within like unto a clock or ſome
" dial, both which moving and ſhewing the courſes of the heavens, round about
" the eaſt and weſt parts doth a ring or hollow trunk of cryſtal ſtand, and
" that without moving, and the ſame filled to half with fair water, which
" without any inforcement, that can be perceived, doth ebb and flow with the
" ſeas in every part of the world. Myſelf ſtaid ſo long, that I ſaw it aſcend up
" the trunk a great hight, and left the lower compaſs of the ring empty. The
" man is very religious, and of an exceeding good repute of the inhabitants;
" and himſelf to me affirmed upon his faith, that it ſhould ſo evermore, without
" any more help of man for hundreds of years, if it were not broken, and that
" both conjunctions and eclipſes for many hundreds or thouſands of years, if the
" world ſhould continue, ſhould be, and are therein ſeen now. This in great
" haſte I remit thee to GOD. Shew this to Mr. LEEVEN, Mr. LUDWELL. From
" Ely this Sunday, June 3."

There was read a paper of experiments by Dr. LISTER about the freezing of ſeveral liquors and the difference between common freſh-water ice and that of ſea-water: as alſo a probable conjecture about the original of the nitre of Egypt: which paper was ordered to be regiſtered[y].

Dr. LISTER preſented the figure of a calculus grown upon a bodkin, drawn from the original in the King's cloſet, cut out of a child's bladder by Monſ. COLO[z]:

Sir CHRISTOPHER WREN remarked, that according to the account of the ſeamen, who went northward, the ice is freſh.

He attributed the ſudden growth of the ſtone to the magnetiſm of the iron.

Dr. ROBINSON remarked, that SISERUS mentioned a ſtone grown to an ivory bodkin.

There was alſo mentioned a caſe of a ſtone in the bladder growing about a piece of an iron nail.

Sir CHRISTOPHER WREN queſtioning, whether ſapphires apply to the magnet, ſome pieces, that were in the repoſitory, were tried, and applied, but others did not.

It was ſuppoſed by Sir CHRISTOPHER WREN, that the ſapphire-ſtone is the rock, and the ſapphire-gem the fluor.

[y] Regiſter, vol. vi. p. 165. It is printed in *Philoſ. Tranſact.* N°. 167. p. 836. for Jan. 1684.

[z] An account of this is printed in the *Philoſ. Tranſact.* N°. 168. p. 882. for Feb. 1683.

Dr. LISTER obſerved, that Briſtol ſtones are the effluvia of iron mines.

Upon mentioning the different natures of iron, it was ſaid, that the preſent iron would not cut porphyry.

Sir CHRISTOPHER WREN affirmed, that porphyry was to be cut now as well as formerly; but that it would wear out a great many tools, and that the workmen muſt take but little ſtrokes.

He ſaid likewiſe, that he had made gravers of damaſk ſteel: that if it have a white end, it ſputters away like gun-powder: that it muſt have a red given it like copper, and be ſuffered to cool in the air.

Dr. PAPIN ſhut up water and ſpirit of wine *in vacuo*, and ſhewed the boiling of them, when put in ice. His account of this experiment was as follows [a]:

" The muſty lime-juice ſhut up *in vacuo*, that was ſeen in the laſt meeting, " having been kept ſo for ſix days together, and ſet a boiling ſeveral times, " to know whether by this means, it might loſe its muſty taſte, it hath been " taken out, and found nothing better than before: ſo that the beſt way to " have lime-juice always freſh and good would be to ſhut it up *in vacuo*, as " ſoon as it is drawn: for ſo it will keep for ſeveral years, without any muſti- " neſs or corruption, far beyond all that, which is commonly ſold in the ſhops.

" Being commanded to ſhew my way for ſhutting up lime-juice, or other li- " quors *in vacuo*, either to keep them freſh, or to ſet them a boiling with ice in- " ſtead of fire, I have brought all neceſſaries to ſhut up water in a pint bottle; " and I have alſo brought ſome ſpirit of wine already ſhut up *in vacuo* in a glaſs " bolt-head, that the Society may obſerve the different effects of theſe two li- " quors, when they ſhall be ſet a-boiling, with ice inſtead of fire; but if I were " to ſhut up liquors *in vacuo* in great quantities, and in great veſſels, to make a " trade of it, I would uſe another contrivance, which I will ſhew to the Society " another time, if they pleaſe."

January 21, Dr LISTER vice-preſident in the chair.

Upon mentioning the light of the glow-worm ſituated at the end of the tail, Dr. LISTER ſaid, that it might be akin to the phoſphorus, which is made of urine: and that the ſhining of rotten fiſh might be the fiſh turning urinous. He mentioned likewiſe, that the King made Dr. GODDARD's drops of ſilk.

There was read the former part of a letter of Mr. LEEWENHOECK to the Society, dated at Delft, January 5, 1685, N. S. It contained the figures and deſcriptions of ſeveral ſalts found in vinegar and in a ſort of French wine called *vin de*

[a] Regiſter, vol. 6. p. 211.

damoiſelle;

damoiſelle; the figure of an eel in vinegar; the figure of the ſalts found in vinegar mixt with crabs eyes and chalk [b].

There was preſented from Mr. JOHN BEAUMONT a ſet of the iron inſtruments uſed then in Somerſetſhire for the ſplitting rocks with gun-powder, viz. the borer, the gun, and the wedge, together with a deſcription in writing of the uſe of them [c].

Mr. CRISP remarked, that the inſtruments uſed at Civita Vecchia were twice as big.

He likewiſe deſcribed the alum works there; and obſerved, that they had no need of kelp or urine: that their alum was different from ours, that which was uſed in their wines being white: that the iron uſed in England in copperas is only to anſwer the ſtirring it about: and that it makes copperas fouler, and bear a leſs price.

Dr. LISTER ſaid, that there were ſeveral ſorts of alum: that the Roman exceeded ours: that ours would not anſwer the uſes, for which it was preſcribed by the antient phyſicians.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, January 17, 168$\frac{4}{5}$ [d], was read, mentioning, that he had received a letter from Mr. CHARLES LEIGH containing an account of ſome remarkable things in Lancaſhire, as an earth preſerving ſeveral things, that lie in it, from rotting; a fiſh with a prickle on the back, making the parts wounded with it to gangrene; which fiſh wasthought to be the draco marinus; and golden marcaſites, each about a quarter of a yard in length.

Mr. MUSGRAVE's letter mentioned likewiſe, that there had been ſome diſcourſe at the Philoſophical Society at Oxford concerning the barometer's being uſed as a level, to diſcover the difference between the ſeveral hights of places diſtant from each other.

This letter was accompanied with the extract of another, ſent from Niſmes in France by THOMAS BENT, M. A. lately of Lincoln-college in Oxford, to STEPHEN WELSTEAD, M. A. of Merton-college, containing an account of the manner of making turpentine, diſtilling oil of turpentine, making tar, roſin, and pitch near Marſeilles. The extract of Mr. BENT's letter was as follows [e]:

" Five leagues from Marſeilles are very high mountains, which are (for the moſt " part) covered with foreſts of pine-trees, which there grow wild: half a league " out of the road, you ſee the making of pitch, tar, roſin, and turpentine, which " is thus, viz. In the ſpring-time, when the ſap runs moſt, they pare off the

[b] This letter is printed in the *Philoſ. Tranſact.* N°. 170. p. 963. for April, 1685.

[c] Ibid. N°. 167. p. 854. for January 168$\frac{4}{5}$.

[d] Letter-book, vol. ix. p. 343.

[e] Ibid. p. 344.

" bark

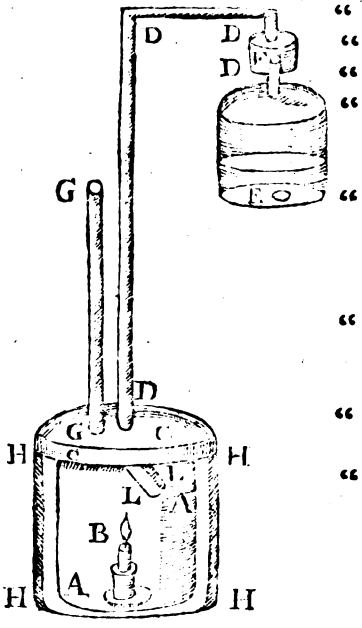
" bark of the pine, to make the ſap run down into an hole, which they cut at the " bottom to receive it. As it runs, it leaves a crain or cruſt behind it, which they " take and temper in water, and vend by a cheat for white bees-wax, that they " make flambeaux of, and is a great deal dearer: then they take up the juice in " ſpoons from the bottom, and after they have ſo got a good quantity, they " ſtrain it through a grocer's baſket, ſuch as they put up their Malaga raiſins in; " that, which runs through eaſily, is the common *turpentine*. Then they take that, " which remains above, and adding a ſufficient quantity of water, diſtilled in an " alembic, that which is ſo diſtilled is *oil* of *turpentine*, and the calx, that remains, " is common *roſin*: then they cut the ſtock of the tree into large chips, and pile " them hollow in a cave, covering it on the top with tiles, but ſo as to let ſome " air come in to feed the fire: then burning them there runs a thick juice down " to the bottom, where they make a ſmall hole for it to run out at (a larger hole " would ſet it all in a flame;) and that which ſo runs out is *tar*: then they take " off that, and boiling it gently over again to conſume more of the moiſture, they " ſet it to cool, which when cool is pitch."

It was conceived to be a miſtake, that any part of the turpentine could be ſold for white bees-wax, the ſmell being ſo different, though it was ſaid to be uſed by the wax-chandlers in making up their candles.

Dr. ROBINSON remarked, that he had ſeen in France a gum or pitch made of the juniper tree, which is the oxycydrus.

Dr. PAPIN ſhewed a convenient way of keeping a candle burning under water. His account of it was as follows[f]:

" Having newly tried a very convenient way to keep a candle burning un- " der water, I make bold to preſent it to the Royal Society, becauſe I believe it " may be uſeful for ſeveral experiments.



" AA is a glaſs veſſel.
" B is a candle burning in the ſame.
" CC is a cover exactly fitted to the ſaid veſſel.
" DDDD is a crooked pipe, that makes the com- " munication between the ſaid veſſel and a pair " of bellows.
" FF is a pair of bellows, with two valves, one in " E, and the other in F, fitted to let the air " paſs from the bellows into the veſſel AA, " and keep it from returning back.
" GG is a ſtrait pipe to let out the air from the " veſſel AA, when new air comes in from " the bellows.
" HHHH is a metal plate to faſten the cover CC " to the veſſel AA.
" LL is a plate to keep the wind, that comes " thorough the pipe DDD from blowing out " the candle.

[f] Regiſter, vol. vi. p. 204.

" Now

" Now it is plain, that a man may with one hand hold the pipes DD GG, " and let the veſſel AA into the ſea, with the candle burning in the ſame: and " though the pipes be very long for to let the veſſel to a great depth into the wa- " ter; yet the flame ſhall never want freſh air, as long as the man plays the bel- " lows with his other hand. This engine may ſerve for moſt of the uſes, that the " hon. Mr. BOYLE has aſcribed to the *phoſphorus* in his book about the aereal " noctiluca, as for to avoid the blowing of a ſhip, or for drawing fiſhes together in " the night-time: but it may alſo be very uſeful to try what bodies are apt to cor- " rupt the air. I have brought the inſtrument ready made, that the Royal So- " ciety may ſee how well the candle doth burn under water, when I play the " bellows, and how quick the ſame will go out, when I leave off blowing."

The Lord Vaughan was unanimouſly elected a fellow of the Society.

Dr. SLOANE was likewiſe elected fellow.

January 28. Dr. LISTER vice-preſident in the chair.

The latter part of Mr. LEEWENHOECK's letter to the Society of January 5, 1685 was read, concerning the various figures of ſalt in Moſelle wine, Sherry, Hockamore, Pincow, Garence, Goteau, Touſain, Citereuſe, and high Country wines: as alſo the figures reſulting from the mixtures of tartar, crabs eyes, or chalk with ſeveral wines; the difference of the figures of the ſalts found in wines from the ſalts found in chalk ſtones bred by the gout, &c.

Dr. LISTER remarked, that Mr. LEEWENHOECK gave a new explication of the effects of chalk on vinegar, viz. by making the ſalts go together, which were before diſperſed: and that ſome ſalts were made flexible, which he had never ſeen.

A letter of Dr. TANCRED ROBINSON was read, containing ſome obſervations on ſome boiling fountains at Peroul in Languedoc, cauſed by ſome ſteams riſing out of the ground, which were not inflammable: as alſo upon the variety of exhalations in other places, as well cauſed by the pyrites and lapis calcarius, as at ſome places in the kingdom of Naples, or by other ſubterraneous bodies[s]:

Dr. LISTER preſented from the Earl of Clarendon a parcel of ores from New England, viz.

1. Lead ore mixed with yellow and green copper ore.
2. Glaus ore of lead, two pieces.
3. Black lead.
4. Pyrites or marcaſite, being iron ſtone, three pieces.
5. Talc with a kind of black granites in it.
6. An earth like umber

[s] Regiſter, vol. vi. p. 166. Theſe obſervations are printed in the *Philoſ. Tranſ.* N°. 169. p 922. for March 1685.

7. Hexagonal ſpars, three pieces.
8. Hexagonal cryſtals Iſabella coloured.
9. Pebble tranſparent.
10. A large column of ſpar doubly hexagonals, that is ſix large and equal planes, of which every edge is terminated by a ſmall plane. Theſe ſmall planes are all equal too.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, January 27, $168\frac{4}{5}$, was read, mentioning, that the Philoſophical Society there had provided a meaſure of a cubic foot for the making of experiments; and had begun a correſpondence with Dr. MIDDLETON, provoſt of King's-college in Aberdeen: that at the laſt meeting of the ſaid Society anſwers had been made to Sir WILLIAM PETTY's 39th and 20th queries, as follows:

" In anſwer to the 39th query of Sir WILLIAM PETTY's catalogue lately " printed at Dublin, (which query runs thus, viz. How many ſhoes of a certain " ſize a ſhoe-maker can make up in a time given?) it was affirmed in our laſt " meeting, that childrens ſhoes reach from *ones* to *twelves*; the five firſt of " which ſizes are called *childrens pumps*; of which a ſhoe-maker can make twelve " pair in a day: four pair of childrens *eighths* are a day's work. Womens ſhoes " and mens ſhoes begin at *ones*, and end the former at *elevens*, the latter at thir- " teens, incluſive; of women's, or men's, ſizes (ſpeaking ſtill in the ſhoe-makers " terms) three ſhoes or two pair are an ordinary day's work; taking leathern " heels with wooden heels; of which the former (viz. leathern heels) require about " an hour more in working than the latter.

" A ſhoe-maker in this city can make four pair of mens *ſizes* in a day; and " has done it frequently; which is looked upon to be a ſtrange thing.

" The twentieth query of the aforeſaid catalogue gave occaſion to the following " obſervation; 80 *lb.* of pit-coal (brought to this city from Wedgbury in " Glouceſterſhire) kindled at ſeveral firings, with $4\frac{1}{2}$ *lb.* of charcoal, gave a little " above $\frac{3}{8}$ths of a peck of aſhes, which weighed $4\frac{1}{4}$ *lb.* averdupois; beſides which " aſhes, about a pound of the pit-coal was left unburnt in the grate: ſo that a " pound of this ſort of pit-coal (well burnt) does not leave an ounce of aſhes."

A letter of Mr. DAVIS of Leake in Nottinghamſhire to Mr. ASTON., dated January 20, $168\frac{4}{5}$[1], was read, concerning the *Sypho Wirtembergicus:* which letter was delivered to Dr. PAPIN to report how far it agreed with the experiment ſhewed to the Society.

Mr. HOOKE ſhewed a piece of ſerge, which one Mr. HASKINS in Jewen-ſtreet had cauſed to be watered as ſilks uſed to be.

He ſhewed likewiſe a draught of Mr. SMETHWICK's engine for grinding

[1] Letter-book, vol. x. p. 10. [1] Ibid. p. 6.

glaſſes;

glaſſes; for which Mr. SMETHWICK had a patent granted him. This draught was delivered to Mr. HUNT in order to take a copy of it.

February 4. A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, January 31, 168⅞[k], was read, containing an anſwer to Sir WILLIAM PETTY's query about mortar and plaiſter, as follows:

" Sir WILLIAM PETTY's queries concerning the proportion of the materials " uſed in making ſeveral ſorts of mortar have given occaſion to one of our com- " pany to preſent us with the following informations: The plaiſter uſed by our " plaiſterers here in Oxford is generally of two ſorts, coarſe and fine. 1. Coarſe " mortar is made of lime, ſand and hair; the lime uſed here is of two ſorts, viz. " 1. Chalk-lime, made of a chalk-ſtone, dug at Netlebed, &c. and burnt: 2dly, " hard ſtone-lime, which is made of hard rag-ſtone burnt: this laſt ſort of lime " is much ſtronger, and will go two yards ſquare in five farther, (for it takes up " a far greater quantity of ſand and water,) than the former, which is the finer " of the two, and the more glorious to the eye. One buſhel of chalk-lime, one " buſhel of ſand, and one peck of hair, mixt all together, with water, will make " coarſe mortar: but if you uſe hard ſtone-lime, then one buſhel of lime will re- " quire a buſhel and a half or two buſhels of ſand, and a buſhel of hair. 2dly, " In the making of fine mortar, mix one buſhel of chalk-lime with half a peck " of hair, or a buſhel of hard ſtone-lime with a peck of hair, and as much water " as is neceſſary. Coarſe mortar is uſed next to the lathing, ſtone, or brick- " wall; fine mortar is drawn on the other, and makes it white and beautiful.

" Clay-mortar or loam-mortar is made with clay and as much chopt " ſtraw, as the clay will take in, by the help of water. Whiting is made by " diſſolving Spaniſh white, either in ſize, or in water; that with ſize is not eaſily " rubbed off.

" The ſubſtance commonly ſold in London for Spaniſh white is ſuppoſed to " be chalk ground, and made up into lumps with water:

" It is not affirmed, that the forementioned rules are univerſally true; but on- " ly, that they are obſerved by ſome men in this place.

" It was aſſerted, that Spaniſh white, diſſolved in ſour milk, will make whit- " ing as apt to ſtick, as if it were made with ſize."

Mr. RICAUT mentioned the goodneſs of the plaiſter uſed by the Turks, with which they line and ſmear over the inſides of their aqueducts; which, he ſaid, was the ſame, that was uſed by the Greeks 1600 years before, being a compoſition of lime, oil, and ground brick.

A paper of Mr. WALKER communicated by Mr. MUSGRAVE [l], was read,

[k] Letter-book, vol. x. p. 12.

[l] It is printed in the *Philoſ. Tranſact.* N°. 167. p. 856,

being an account of ſeveral experiments made at Oxford with the model of a waggon, whereof the leſſer wheels were $4\frac{1}{3}$ inches high, the bigger wheels $5\frac{2}{3}$ inches high. There were alſo two more wheels of $5\frac{2}{3}$ inches high to be uſed inſtead of the leſſer ſort.

The inference from the experiments was, that a waggon in a rough way might be drawn more eaſily, if it had four equally high wheels, and the thills were fixed under the axis.

It was deſired, that Sir ANTHONY DEAN and Mr. HOOKE would peruſe the paper, and give their opinions of it: and the ſecretary was ordered to communicate it to them.

Dr. PAPIN remarked, that Mr. BOYLE conceived, that the apparatus for keeping a candle under water might be uſeful for drawing of ſpirit of ſulphur, provided candle would burn, when the pipe, that is to carry out the air, was placed towards the bottom of the glaſs. Upon trial it was found, that the candle would burn very well.

He likewiſe ſhewed, that equal parts of the ſame ſpirit of wine might be put in two glaſſes, and one glaſs might boil *in vacuo*, the other not. It appeared, that the ſpirit of wine had been exhauſted in one glaſs; and that half of it being afterwards poured into another glaſs had gathered the air, which boiled out.

His account of theſe two experiments was as follows[m]:

"Having ſhewn to the hon. Mr. BOYLE the inſtrument to keep a candle "burning under water, he thought it might be very uſeful to draw the ſpirit of "ſulphur, and to receive the *effluvians* from any other body actually inflamed; "becauſe the veſſel being all ſurrounded with cold water, the ſpirits might condenſe "the ſooner, eſpecially if the tube, by which the air gets out, ſhould reach to"wards the bottom of the veſſel, becauſe then the fumes tending firſt upwards, "and afterwards going down, might be condenſed before they could find the way "to get out. I did therefore make the pipe for the air to get out ſo long, that it "reached near to the bottom of the veſſel, wherein a burning candle was includ"ed: but I found it impoſſible to keep a flame ſhut up in this manner, and the "candle went out in a very ſhort time, although I did play the bellows with all "poſſible diligence: ſo that to remedy this inconvenience, it ſhould be neceſſary "to find out the cauſe of the flames going out, whilſt it doth receive a conſtant "ſupply of new freſh air. I have brought the inſtrument to the Royal Society, "to receive their directions about it.

"I have alſo made an experiment, that may at firſt ſeem very ſurpriſing, that "two glaſs vials, like one another, containing the ſame liquor, and included "in the ſame receiver, at the ſame time, the one will boil with great violence, "and the other will not ſtir at all; and thought I might ſhew it to the Royal So-

[m] Regiſter, vol. vi. p. 206.

"ciety,

" ciety, becauſe being attentively conſidered, it may perhaps give ſome light " into the nature of the particles of ſpirit of wine."

A letter from St. Andrew's [n] was read, giving an account of ſome books printing at Edinburgh, and of a way of purifying the air in mines; which was, that the miners carried down a candle in a dark lanthern, covered with a wet cloth; and that then lying proſtrate on the ground, they in that poſture kindle and maintain a fire in the mine, which cleanſes it without injuring them, &c.

There was likewiſe read a paper of experiments made at Oxford with a cubical veſſel of well ſeaſoned oak, the meaſure of a foot being firſt examined by the univerſity ſtandard; the weights made uſe of being the univerſity ſtandards, the ſcales large, and turning with two ounces [o].

A letter of Mr. THOMAS MOLYNEUX to Mr. ASTON, dated at Leyden, Feb. 13, 168⅘, N. S. [p], was read, giving an account of Mr. LEEWENHOECK's microſcopes, as follows:

" I have hitherto delayed anſwering your laſt, becauſe I could not give you an " account of Mynheer LEEWENHOECK; but laſt week I was to wait upon him in " your name: he ſhewed me ſeveral things through his microſcopes, which 'tis " in vain to mention here, ſince he himſelf has ſent you all their deſcriptions at " large. As to his microſcopes themſelves, thoſe, which he ſhewed me, in num- " ber at leaſt a dozen, were all of one ſort, conſiſting only of one ſmall glaſs, " ground, (this I mention becauſe 'tis generally thought his microſcopes are " blown at a lamp, thoſe I ſaw, I am ſure, are not) placed between two thin flat " plates of braſs, about an inch broad, and an inch and a half long. In theſe two " plates there were two apertures, one before, the other behind the glaſs, which " were larger or ſmaller, as the glaſs was more or leſs convex, or as it magni- " fied. Juſt oppoſite to theſe apertures on one ſide was placed ſometimes a needle, " ſometimes a ſlender flat body of glaſs or opaque matter, as the occaſion required, " upon which, or to its apex, he fixes whatever object he has to look upon; then " holding it up againſt the light, by help of two ſmall ſcrews, he places it juſt in " the focus of his glaſs, and then makes his obſervations. Such were the micro- " ſcopes, which I ſaw, and theſe are they he ſhews to the curious that come and " viſit him: but beſides theſe, he told me he had another ſort, which no man liv- " ing had looked through ſetting aſide himſelf; theſe he reſerves for his own pri- " vate obſervations wholly, and he aſſured me they performed far beyond any, " that he had ſhewed me yet, but would not allow me a ſight of them, ſo all I " can do is barely to believe, for I can plead no experience in the matter. As " for the microſcopes I looked through, they do not magnify much, if any thing, " more than ſeveral glaſſes I have ſeen, both in England, and Ireland: but in " one particular, I muſt needs ſay, they far ſurpaſs them all, that is in their ex-

[n] Letter-book, vol. x. p. 15.

[o] The account of theſe experiments is printed in the *Philoſ. Tranſact.* N°. 169. p. 926. for March 1685.

[p] Letter-book, vol. x. p. 1.

" treme

" treme clearneſs, and their repreſenting all objects ſo extraordinary diſtinctly. For " I remember we were in a dark room with only one window, and the ſun too " was then off of that, yet the objects appeared more fair and clear, than any I " have ſeen through microſcopes, though the ſun ſhone full upon them, or " though they received more than ordinary light by help of reflective ſpecula or " otherwiſe: So that I imagine 'tis chiefly, if not alone in this particular, that " his glaſſes exceeds all others, which generally the more they magnify, the " more obſcure they repreſent the object; and his only ſecret, I believe, is " making clearer glaſſes, and giving them a better poliſh than others can do. I " found him a very civil complaiſant man, and doubtleſs of great natural abili- " ties; but, contrary to my expectations, quite a ſtranger to letters, maſter nei- " ther of Latin, French or Engliſh, or any other of the modern tongues beſides " his own, which is a great hinderance to him in his reaſonings upon his obſerva- " tions; for being ignorant of all other mens thoughts, he is wholly truſting to " his own, which, I obſerve, now and then lead him into extravagancies, and " ſuggeſt very odd accounts of things, nay, ſometimes ſuch, as are wholly irre- " concileable with all truth. You ſee, Sir, how freely I give you my thoughts " of him, becauſe you deſired it."

This letter contained alſo a farther account of the prodigious *os frontis* in the medicine ſchool at Leyden[q].

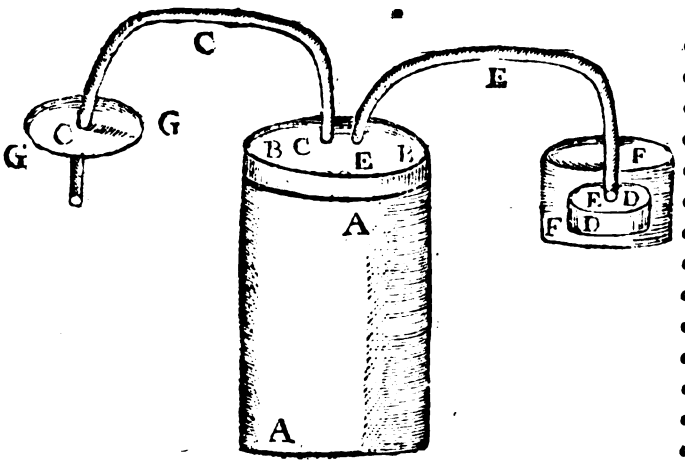
Dr. PAPIN ſhewed a way, by which filtrations through cap-paper might be made ſuddenly and with great quantities of liquor by the help of the pneumatic engine. There being a pipe from the ſtrainer to the exhauſted receiver, the liquor was driven forcibly by the weight of the air. It was tried with a ſolution of ſugar in water, which became very clear. His account of it was as follows[r]:

" Filtrations through cap-paper being of great uſe, for the clarification of ſe- " veral juices and ſolutions, but being ſo tedious, that they can hardly be applied " to great quantities, I have endeavoured to apply the pneumatic engine, to " haſten ſuch an operation, and I have ſucceeded pretty well, by the following " contrivance.

" AA is a glaſs-receiver.
" BB a cover fitted to the ſame.
" CCC is a pipe, that makes the communication between the receiver AA, and the " pneumatic engine.
" DD a ſhallow veſſel full of little holes.
" EEE a pipe, that makes the communication between the veſſel DD, and the " receiver AA.
" FF a veſſel to contain the liquor to be filtrated.
" GG the plate of the pneumatic engine.

[q] This part of Mr. THOMAS MOLYNEUX's letter is printed in the *Philoſ. Tranſact.* N°. 168. p. 881.

[r] Regiſter, vol. vi. p. 207.



" For to uſe the inſtru-
" ment, the ſhallow veſſel
" DD, ought to be tied
" about firſt with linen
" cloth, and then with cap-
" paper; ſo that no liquor
" may get into the holes
" of the ſaid veſſel, put
" thorough the cap-paper,
" and the linen cloth:
" this muſt lie all in the
" liquor to be filtrated,
" and by the help of the
" pneumatic engine, the
" air is to be extracted out
" of the veſſel AA. So the liquor in the veſſel FF, muſt neceſſarily be driven
" through the cap-paper, and the linen cloth into the ſhallow veſſel DD, and
" from thence through the pipe EEE into the veſſel AA, and this operation
" muſt be quick, becauſe of the great preſſure of the atmoſphere, that drives
" the liquor: beſides, that the ſediment of the liquor ſubſiding at the bottom
" of the veſſel FF, will not be ſo apt to ſtop the pores of the cap-paper, as
" in ordinary filtrations."

February 18. A letter of Mr. MUSGRAVE to Mr. ASTON, dated at New-college, Oxford, February 11, 168⅘[1], was read, containing an account of experiments made at Oxford on the weight of the parts of an egg, as follows:

" A hen's egg weighed	℥ij	ʒ oo	℈ j gr. xv.
" The ſkin weighed	oo	ʒ oo	℈ oo gr. xvi.
" The ſhell	oo	ʒ ij	℈ ij gr. iiij.
" The yolk	oo	ʒ v	℈ j gr. oo.
" The white	℥j	ʒ j	℈ oo gr. vi.
" Loſt in weighing	oo	ʒ oo	℈ oo gr. ix.
" Another (hen's) egg	℥ij	ʒ j	℈ j gr. xix.
" The ſkin	oo	ʒ oo	℈ oo gr. xviii.
" The ſhell	oo	ʒ j	℈ ij gr. viii.
" The yolk	oo	ʒ v	℈ j gr. xviii.
" The white	℥j	ʒ j	℈ ij gr. iiij.
" Loſt in weighing	oo	ʒ oo	℈ oo gr. xi.

" The preceding experiments were tried on raw eggs.

[1] Letter-book, vol. x. p. 14.

" Another raw egg of the ſame ſort	℥ij — ʒj — ℈ij gr. xiij.
" The ſame egg boiled	℥ij — ʒj — ℈j gr. xviij.
" Loſt in boiling	oo — oo — oo gr. xv.
" The ſkin	oo — oo — oo gr. xiii.
" The ſhell	oo — ʒj — ℈ij gr. xix.
" The yolk	oo — ʒv — oo gr. vij.
" The white	℥j — ʒij — oo gr. xiij.
" Loſt in weighing	oo — oo — oo gr. v.

" Theſe experiments were tried with a pair of ſcales, which turned with half " a grain, and are deſigned as part of an anſwer to one of Sir WILLIAN PETTY's " queries."

A diſcourſe was read, ſent by Mr. WILLIAM MOLYNEUX, concerning the bogs and loughs of Ireland, written by Mr. WILLIAM KING, fellow of the Dublin Society [t]. The cauſe aſſigned of theſe bogs was the want of induſtry, the ſprings raiſing up gradually a plexus of heath and graſs, the bottom under the water being a white clay or ſandy marl. The inconveniences of them are ſpoiling communication, deſtruction of cattle, ſheltering rogues, and corrupting the air and waters.

The ways of draining them are cutting trenches, and deepening them by degrees, till you come to the bottom.

Dr. LISTER was of opinion, that the diſcoloured water coming from the bogs might be from the flower of the heath falling into the water.

A letter of Monſ. JUSTEL to Mr. ASTON [u], concerning ſome inventions at Paris; a curious perſpective of a hall; a candleſtick ſnuffing its own candles; an invention to eſtimate the way of a ſhip; a ſtove for warming ſeveral chambers; and an account of ſeveral books printing at Paris.

Mr. PAGET preſented Dr. BARROW's poſthumous lectures.

Dr. PAPIN ſhewed ſeveral ſorts of gellies, which he had filtrated and made fine by means of the pneumatic engine, according to the method approved of at the laſt meeting. His account of theſe experiments was as follows [x]:

" Having ſhewn in the laſt meeting the good effect of the inſtrument for fil- " trations, I hope the Royal Society will be pleaſed to ſee a real and great uſe " it may be applied to, for making gellies extraordinary fine, and at a cheap " rate: I have therefore brought hither three ſorts of gellies: the firſt ſeaſoned " with ſugar, and near as fine as ordinary gellies, commonly ſold for two ſhil- " lings a pound: ard yet this may be afforded for a groat: the ſecond gelly

[t] This diſcourſe is printed in the *Philoſ. Tranſact.* N°. 170. p. 948. for April 1685.

[u] Letter-book, vol. x. p. 7.

[x] Regiſter, vol. vi. p. 203.

" ſeaſoned

" ſeaſoned with ſugar, lemon-juice, and white wine, and fully as fine as ordinary " gellies are, may be ſold for two groats a pound: the third gelly much finer " than the former, and ſeaſoned with ſack inſtead of white wine, may be afford- " ed for a ſhilling the pound, though it were aromatized with ſome eſſential oil. " So that both rich and poor, either for health or pleaſure, may receive a great " benefit from this invention."

Mr. HOOKE read a paper concerning the different ways of carriage, which there are upon land and water.

February 25. Upon reading the minutes of the laſt meeting concerning the black water running from bogs, Sir CHRISTOPHER WREN was of opinion, that the colour came from the ſand.

A letter was communicated by Dr. LISTER, written by Dr. SAMUEL THRAPLAND, and dated at Hallifax, February 2, 168⅘[7], concerning a carpenter there, having voided by ſtool two large ſtones at a fortnight's diſtance. The ſtone firſt voided was ſhewn, and appeared to conſiſt of two different ſubſtances; the one more hard, and bright, and angled; the other more black and friable, encompaſſing the former. The ſtone had been ſomething diminiſhed by being carried about, but it ſeemed about an inch and half every way. It was delivered to Mr. HUNT to take the figure of it, and keep it till it was called for.

Sir CHRISTOPHER WREN ſuppoſed it might be bred from the cyſtis fellea, deſcending into the guts; and moved, that it might be tried, whether it would diſſolve in the juice of garlic.

Dr. SLOANE ſaid, that he had ſeen 200 ſtones taken out of the gall bladder of a lawyer at Montpellier; and he judged them to be of a like ſubſtance with this. This opinion was farther confirmed by cutting a little off with a knife.

Dr. LISTER communicated another letter to himſelf from Mr. H. GYLES, dated at York, February 10, 168⅘[8], together with the form of an urn lately found at the brick-kilns without Barthant bar; the urn itſelf being ſent to Mr. WALKER of Univerſity-college in Oxford. The figure was delivered to Mr. HUNT to be copied.

A petition was read from one ROBERT COLLINSONE, a Scotchman, deſiring to ſhew the Society a very large ſtone taken out of the bladder of one FRANCIS DUGORD of Auchen-home in Aberdeen, weighing 35 ounces and ¾, being in length 5 inches $\frac{9}{10}$, diameter 3 $\frac{6}{10}$. The man, in whom it was bred, lived till he was fifty years old. It was delivered to Mr. HUNT to make a draught of it; and the man, who brought it, was ordered ten ſhillings.

[7] Letter-book, vol. x. p 4. It is printed in the *Philoſ. Tranſact.* N°. 170. p. 961.

[8] Letter-book, vol. x. p. 20. An extract of this letter is printed in the *Philoſ. Tranſact.* N°. 171. p. 1017.

Mr. BAILEY ſhewed a curious letter, which had been formerly ſent by the King of Tiwan. It was written upon yellow paper, having ſeveral gold-coloured ſpots. The characters were Chineſe, and ſome of them ſeemed to conſiſt of eighteen and twenty four different ſtrokes, or takings-off of the pen.

A petition was read from Mr. JOSHUA HASKINS, repreſenting, that whereas he had invented a new way of improving woollen manufactures by impreſſing thereon certain indented lines or creaſes reſembling the watering of tabby or mohair; he deſired the Society to take into conſideration this invention of his, and to judge of any fraudulous pretences concerning the manner of it; and upon full proof before them of the newneſs of the invention, to give him an atteſtation.

The Society taking into conſideration this petition, appointed Sir CHRISTOPHER WREN, Sir JOHN HOSKYNS, Mr. HENSHAW, Mr. EVELYN, Mr. HOOKE, and Mr. HOUGHTON, or any three of them, to be a committee for the examining the invention, and to bring their report in writing to ſome meeting of the Society.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, Feb. 21, 168$\frac{4}{5}$[a], mentioning, that wheat for twenty years paſt had been ſold at Oxford at a mean rate, 5 *s.* 4 *d.* $\frac{1}{2}$ a buſhel, and malt at 2 *s.* 11 *d.* $\frac{1}{2}$ a buſhel:

That Mr. LEIGH had written to him, that he had twelve cubical pebbles taken out of the omentum of a cow:

That Mr. COLE had written, that he had ſeven colours from the ſhell-fiſh, of which he promiſed patterns:

That Dr. BRIGGS had met with another nyctalops in Bedfordſhire.

A letter of Mr. ISAAC NEWTON to Mr. ASTON, dated at Cambridge, Feb. 23, 168$\frac{4}{5}$[b], mentioning, that the deſign of a philoſophical meeting there had been puſhed forward by Mr. PAGET, when he was laſt there; with whom himſelf had concurred, and engaged Dr. MORE to be of the Society; and that others were ſpoken to, partly by him, and partly by Mr. CHARLES MONTAGU[c]. "But "that, *added he*, which chiefly daſhed the buſineſs, was the want of perſons wil- "ling to try experiments, he, whom we chiefly relied on, refuſing to concern "himſelf in that kind. And more what to add farther about this buſineſs, I "know not, but only this, that I ſhould be very ready to concur with any per- "ſons for promoting ſuch a deſign, ſo far as I can do it without engaging the loſs "of my own time in thoſe things.

"I thank you for entering in your regiſter[d] my notions about motion. I deſign- "ed them for you before now; but the examining ſeveral things has taken a greater "part of my time than I expected, and a great deal of it to no purpoſe: and now "I am to go into Lincolnſhire for a month or ſix weeks. Afterwards I intend to "finiſh it as ſoon as I can conveniently."

[a] Letter-book, vol. vi. p. 27.
[b] Ibid. p. 28.
[c] Afterwards Earl of Hallifax.
[d] Vol. vi. p. 218.

Dr. ROBINSON acquainted the Society, that Mr. RAY having ſome time ſince finiſhed and fitted for the preſs Mr. WILLUGHBY's hiſtory of fiſhes, would put it into his hands, to be brought to the Society,

It was thought proper, that the ſecretary ſhould write to Oxford, to know how the biſhop * might be diſpoſed to take care of printing it upon the Society's taking off an hundred copies.

Dr. PAPIN conſidering the experiment of Mr. KUNCKEL, that ſpirit of wine and water grow hot by being mixt together, made trial how ſpirit of wine purged of air, and water purged of air, would do, if they were mixt *in vacuo*. It appeared, that upon the mixture there aroſe an ebullition; and he ſaid, that new air was always found in the receiver, which depreſſed the gage, though in the trial it ſeemed, the engine was not tight. This air, he ſuppoſed, was thruſt out of the mixture, by reaſon of the greater congruity between them and the aerial particles: and he concluded, that the heat in Mr. KUNCKEL's experiment might not come from an acidity in ſpirit of wine, but from expelling the air, when the two liquors unite.

March 2. Dr. LISTER vice-preſident in the chair.

Upon reading the minutes of the laſt meeting, Dr. LISTER and Dr. ROBINSON confirmed, that the erica being in the flower about the month of Auguſt, the waters running from the place are diſcoloured and ſhew like thick ale.

Concerning the ſtones voided from the inteſtines, Dr. LISTER conceived them firſt bred in the veſica fellea: that the growing or ſhooting of ſtones is inſtantaneous, as might be perceived by a ſtone in the repoſitory, preſented by Dr. GREW; which, as it was broken, ſhewed plainly ſhooting of the lines from the center to the circumference, in the ſame manner as one ſort of gypſum is radiated.

He likewiſe obſerved, that in the urn mentioned from York, the face and other parts were ſhaded or touched with a red varniſh, the colour obſervable in the beſt urns; which ſhews, that thoſe urns have been varniſhed; as is mentioned in the *Philoſophical Tranſactions*.

He alſo ſaid, that Mr. CONYERS the apothecary conjectured, that the jet-rings or bracelets found in urns were rolls to be worn on womens heads. And this was remarked to be the opinion of BARTHOLINUS in his book *De Annulis*.

Dr. ROBINSON obſerved, that Cavalier Pozzo at Rome had twenty five ſorts of theſe rings of ſeveral metals; and that they were for the head.

Upon mentioning Mr. COLE's purple fiſh, the ſecretary was deſired to write to Oxford to requeſt, that a ſhell of the fiſh might be ſent up.

* Dr. JOHN FELL.

Mr. ASTON produced a large piece of brown ſugar, delivered to him by Monſ. JUSTEL. It was ſaid to be made by the ſavages of Canada, who at the time, when the juice riſes in the maple (l'erable) let it out, and evaporated it to an eighth part; at which time it was ſaid to be as ſweet as the ſugar from the ſugar-canes.

Mr. ASTON was deſired to ſend a piece of the ſugar to Mr. RAY, and alſo to Oxford, intimating, that the Society would be glad to have the experiment made by them, this being about the time that the ſap riſes; and that if the ſap will not granulate without it, there may be uſed lime-water.

It was ſaid, that at Brockleſby in Lincolnſhire there were ſycamores planted in HENRY VII's time, which are bigger than any trees in the lordſhip, though the leaves were as ſmall as the common maple.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, Feb. 28, 168⅞[f], was read, mentioning ſome antiquities, which the Philoſophical Society there had lately received; a farther deſcription by Mr. BULKLEY of the monſter with two heads; a book written by Mr. DALGARNO, and printed ſome years before, but ſcarce yet publiſhed, περὶ ἑρμηνείας or the ſeveral ways of communicating thoughts; a man, who died mad in Cheſhire, having been bitten by a mad cat, which received its madneſs from the bite of a mad dog.

A letter of Mr. R. HOWMAN of Norwich to Dr. BRIGGS was read, concerning one Alderman PARMITER of that town, who having been bitten by a mad fox, about ſix weeks after grew paralytic, and at laſt fell into an hydrophoby, of which he died.

Dr. LISTER took notice, that this caſe differed from one, which he had deſcribed, in that here was a palſy; but he ſaid, that this did not hinder the perſon's drinking, for his patient ſwallowed quicker than another man. The intermitting of the pulſe on one ſide he took to be accidental. He remarked, that GALEN had written, that no animal was mad but the dog-kind, or what was bitten by them.

Dr. PAPIN ſhewed a ſtrong extract of liquorice and water made in his digeſter; as alſo a compoſition made with this extract and the gelly of bones, being very pleaſant, ſolid, and dry, as to be carried about, and eaſily melting in the mouth. His account of this was as follows[g]:

"Having ſeen ſeveral preparations of juice of liquorice, that ſhew the uſefulneſs of it, I thought it would be worth while to improve ſuch a preparation by means of the digeſter. I did therefore fill up a glaſs pot with liquorice roots and water: and having included it in the digeſter, I increaſed the fire, till the drop of water did evaporate in two ſeconds, and I found, that the water in the pot had acquired a red darkiſh colour, and that in five or ſix hours time,

[f] Letter-book, vol. x. p. 44. [g] Regiſter, vol vi. p. 210.

" it did coagulate, becauſe of the great quantity of glutinous juice, drawn from " the liquorice by ſuch a ſtrong operation. I have brought ſome of the ſaid " *coagulum*, that the Royal Society may be pleaſed to obſerve the nature of it. I " did afterwards mingle ſome of the ſaid juice with gelly of bones, and having " ſet it drying, it became a pretty dry tranſparent ſubſtance, that may be folded " up in a paper, and carried in one's packet, without any danger of melting or " putrifying: but being put in the mouth, it melts down, and hath a ſtrong " and pleaſing taſte of liquorice, far beyond any that hitherto hath been made: " I have therefore brought ſome of it: and I have at the ſame time brought ano- " ther ſort, which is kept as a great ſecret, and is ſold at ſix pence an ounce: ſo " the Royal Society may compare them both, and ſee the difference between that " and mine."

Mr. HOOKE read a paper about SIMON STEVIN's ſailing chariot and other ſorts of motion [h].

March 11, Dr. LISTER vice-preſident in the chair.

Monſ. DE BLEGNY, ſurgeon to the French King, being permitted to be preſent, preſented his works to the Society, containing thirteen tracts.

Monſ. DE FOURCY was permitted to be preſent at the deſire of Monſ. JUSTEL.

Dr. ROBINSON preſented Mr. WILLUGHBY's and Mr. RAY's hiſtory of fiſhes in manuſcript, ready for the preſs, which was put into his hands again till it could be printed.

Mr. ASTON read a letter to himſelf from Dr. PLOT, dated at Oxford, March 3, 168$\frac{4}{5}$[i], mentioning, that the Biſhop of Oxford would be willing to print Mr. WILLUGHBY's and Mr. RAY's hiſtory of fiſhes, provided, that the book were intire as to the matter and the figures, and that the Society would take off 100 copies.

It was deſired, that Dr. LISTER would give ſome inſtructions concerning the number of the figures, that would be neceſſary, and out of what books they might beſt be had.

A letter was read from Mr. WILLIAM MOLYNEUX to Mr. ASTON, together with the minutes of the Dublin Society from December 1, 1684, to February 23, 168$\frac{4}{5}$, incluſive; which minutes were as follow [k]:

" *Dec.* 1. A letter was read from Mr. K. concerning the triſection of an angle after " method, though mechanical, yet more plain and facile, than has yet been pro- " poſed. It alſo contained mechanicæ ſectiones anguli cujuslibet in partes " quaſlibet. As likewiſe it intimated various other curioſities, which he had under " conſideration, and ſome of them finiſhed, as a Philoſophical character, the 2d

[h] It is printed in the *Philoſ. Experiments and Obſervations*, p. 150.

[i] Letter-book, vol. x. p. 54.

[k] Ibid. p. 38.

" book

" book of EUCLID, &c. On the account of this philoſophical character, much " diſcourſe paſſed about various attempts that way. An eclipſe of the moon be- " ing expected the 11th of this month, it was ordered it ſhould be calculated and " obſerved. Mr. MOLYNEUX promiſed to do ſomething therein. Dr. MULLEN " collected the ſerum in a bliſter raiſed by a bliſtering plaſter, in which he tried " theſe experiments: it ferments not with ſpirit of wine, nor with common ſpirit " of ſal armoniac; but with a peculiar ſort of ſpirit of ſal armoniac of the doctor's " own preparation, it fermented viſibly. This ſerum turned ſyrup of violets green. " It did not coagulate milk put over a fire; three fourths of it evaporated, the re- " ſidue remaining like a gelly.

" Our preſident, Sir WILLIAM PETTY, brought in a paper, ſupellex philo- " ſophica, containing forty inſtruments requiſite to carry on the deſigns of this " Society. He likewiſe ordered, that hereafter, at every meeting, an experi- " ment in natural philoſophy ſhould be tried here before the company, and that " the preſident ſhould appoint on the foregoing Monday, what ſhould be tried " the Monday following, and the perſons to try it, that accordingly a fit appa- " ratus may be made.

" Ordered, that next Monday Mr. FOLEY expoſe the pulvis fulminans and " its effects on a touched needle.

" Mr. MOLYNEUX preſented Sir R. SIBBALD's *Scotia Illuſtrata*; the *Philoſo-* " *phical Tranſactions* from March to July laſt, incluſive, and the *Acta Eruditorum* " *Lipſiæ* from April to June laſt, incluſive.

" *December* 8, 1684. A letter was read from Mr. MUSGRAVE, containing the " minutes of the Oxford Society from October 28 to November 18. Therein " was mentioned an experiment of producing light by Dr. PLOT. Ordered, " that Dr. MULLEN try that experiment, and report it.

" Mr. MOLYNEUX produced ſome pulvis fulminans, compounded at this rate, " flores ſulphuris, 2. Tartar, 3. Niter, 6. It performed very well. A touched " needle was expoſed to its blow; but it could not well be determined, whether it " had loſt its verticity thereby, by reaſon that the needle was but weakly touched " by a weak ſtone, but it ſeemed rather not to have loſt its verticity. Ordered, " that this experiment be repeated the next meeting. Ordered alſo, that a piſtol- " barrel be charged with this powder and bullet, and the breech thruſt into the " fire (the touch-hole being firſt ſtopt) to try its effects on boards placed before it. " As alſo that it ſhould be tried, whether this pulvis fulminans in its blow will " fire gun-powder, match, ſpunk or dry linnen cloth, &c. The reſt of our " time was taken up in determining a controverſy, which two perſons had re- " ferred to our Society, concerning the lines or circles of longitude and latitude.

" *Dec.* 15. The right hon. the Lord Viſcount Montjoy was this day pleaſed " to favour us with his company, and to be admitted into our Society. His " Lordſhip propoſed, that the bleaching or whitening of linen cloth, as practiſed " in

" in this country and in Holland, ſhould be taken into conſideration and enquired " into, that a matter of that conſequence to this nation, eſpecially to the northern " parts thereof, ſhould be advanced as much as poſſible.

" The pulvis fulminans compoſed the laſt Monday, being kept cloſe in a " glaſs bottle, performed this day very well. A piece of dried paper laid over " it was only lightly ſcorched thereby, and ſuch another piece laid over a like " quantity of gun-powder was thereby ſet into a flame: the pulvis fulminans in " its going off fired gun-powder. The piſtol charged therewith was not yet tried.

" Mr. KING explained a contrivance of his for advancing Dr. PAPIN's " digeſter.

" All the time of the moon's eclipſe laſt week the ſky was thickly overcaſt, ſo " that no account thereof could be returned "

" *Dec.* 22. A letter was read from Mr. ASHE, in anſwer to a query ſent down " by the Society to him, concerning a man in his country, who had a conſtant and " periodical evacuation of blood at the end of his forefinger. From which letter " the following return is abſtracted. WALTER WALSH, an inn-keeper in Trym, " born in Ireland, of a temperate diet, ſanguine complexion, and merry hu- " mour, in the 43d year of his age, anno 1658 about Eaſter, was ſeized with a " great pain over all his right arm, a great heat and redneſs in his right hand, " and a pricking in the point of the fore-finger, wherein there appeared a ſmall " black ſpeck, as if a little thorn had run in, and ſuppoſing it ſuch he opened it, " and thereupon the blood ſpun out in a violent, but ſmall ſtream. After it had " ſpent its violence it would ceaſe for a while, and only drop, and then ſpring " out with violence again, continuing thus for twenty four hours, till at laſt he " fainted away, and then the blood ſtaunched of itſelf, and his pains left him. " From that time during his whole life (which was twelve years) he was frequently " troubled with the like fits, ſeldom having a reſpite of two months, and they " never returned oftner than in three weeks; he ſeldom bled leſs than a pottle at a " time. The oftner the fit came, the leſs he bled; and the ſeldomer it aſſaulted " him, he bled the more: whenever they endeavoured to ſtanch the blood, it " raiſed moſt exquiſite tortures in his arm; no remedies, that were ever uſed, " proved in the leaſt effectual. He had no other diſtemper, that troubled him; " the ſeaſons nor weather wrought not upon him; he had no outward accident, " that at firſt brought the bleeding: drinking more than ordinary made him " more apt to bleed. He had no child after his firſt ſeiſure. Theſe frequent fits " brought him at laſt very low, inſomuch, that towards his latter end, he bled " but little, and that too but like diluted water. He died of this diſtemper " on the 13th of February, $16\frac{6}{7}\frac{7}{8}$.

" *Jan.* 12. A letter was read from Mr. ASTON, giving an account of the laſt " elections in the Royal Society. To the other particulars of that letter this " is returned, the ſcarcity of the Connaught worm will hinder us for a long time " from making any farther experiments of its poiſoning. Mr.

" Mr. BULKELEY's anemoſcope and wine-pump were only propoſals of what " he thought may perform well in both, but the engines were never tried, or " yet made.

" A letter was read from Mr. MUSGRAVE to Dr. LISTER concerning the lim- " pidneſs of the liquor in the lacteals. Ordered, that the thanks of this Society be " returned to the ingenious and learned Mr. MUSGRAVE for his communications.

" Dr. HUOLAGHAN propoſed, that it may be enquired what is the moſt nice " way of diſcovering the acidity of liquors. Hereupon our preſident gave us " many of his thoughts, and amongſt others, propoſed a tincture of cochineel.

" On occaſion of a relation concerning one MARY PARRY in the minutes of " the Oxford Society, October 7, 1684, Mr. BULKELEY propoſed, that Mr. " POYNTER, a chirurgeon in Oxford, be deſired to communicate an account of " a bitch he opened, that contained in her the fœtus of ſeveral impregnations; as " alſo of a ſtone, which he took from under the tongue of a ſhoemaker in " Oxford.

" Order was then taken about a more commodious way for proſecuting our " experiments.

" *Jan.* 19. Dr. HUOLAGHAN preſented an account of a monſtrous kidney, " weighing forty ounces, lately taken from a perſon in this town, together with " the delineations of it and its parts, accurately drawn.

" A letter was read from Mr. MUSGRAVE concerning the minutes of the Ox- " ford Society, to which our thanks being returned, we promiſe to tranſmit " thoſe things they deſire from us. Thanks alſo were ordered for the preſent of " aſbeſtus paper, which, upon trial, ſucceeded very well. The ſame letter in- " cloſed Dr. PLOT's diſcourſe of perpetual lumps, and at this meeting we were " diverted from reading it by a perſon, who brought us in a monſtrous birth, being " a female child with two moſt compleatly formed heads on a body outwardly " ſingle in all other parts. The parties, who had the property in this monſter, " would not ſell it; otherwiſe we ſhould have diſſected it.

" *Jan.* 26. The right hon. the Lord Viſcount Montjoy at this meeting pre- " ſented an air gun, which performed very well.

" Dr. PLOT's diſcourſe of ſepulchral lamps was read. Ordered, that the " thanks of this Society be returned the doctor for this learned diſcourſe.

" A letter was read from Mr MUSGRAVE, giving an account of ſome relations " from Dr. TURBERVILLE of Saliſbury.

" There was preſented a male child with two compleat heads, one ſomething " bigger

" bigger than the othet, and three arms, the parents names PATRICK and ELI-
" BETH HOY, farmer, in the county of Meath in the barony of Kels. The
" mother about twenty four years old, this her firſt child, born this January day
" 11th. Of this we have an accurate ſketch, but the bowels had been careleſsly
" taken out as ſoon as it was born. The people, that had it, ſaid it had two hearts,
" two livers, &c.

" Dr. HUOLAGHAN ſhewed ſome experiments of changing the colours of li-
" quors tinged with cochineel, ſyrup of violets, &c. in order to what he had for-
" merly propoſed concerning an accurate criterion of acids.

" Dr. MULLEN produced part of the diaphragm of an old woman, to which
" there grew an hydatides containing about half a pint of water: this was opened
" before us; its liquor was of the colour of common ale, but it was full of fat
" unctuous particles, which, when it was poured on any thing, did ſhine like
" glittering ſand on a paper. Its ſtench was very ſtrong. It did precipitate
" with ſeveral acids.

" *February* 2. Sir ROBERT REDDING produced a fine ſhining ſand, which
" looked as if each grain had been gilded. He likewiſe gave an account of the
" catching of lampreys in the barrow nigh Monaſter-Evan. The ſand was com-
" mitted to Dr. MULLEN to try ſome experiments thereon.

" A letter was read from Mr. MUSGRAVE, containing Mr. BENT's account how
" they make turpentine, oil of turpentine, roſin, pitch, and tar, from the fir-
" trees nigh Marſeilles.

" Mr. MOLYNEUX gave an account of ſome experiments he had made with the
" pulvis fulminans in a piſtol-barrel.

" *Feb.* 9. The preſident being abſent, my Lord Montjoy was pleaſed to take
" the chair. His Lordſhip expoſed to us the whole contrivance of the wind-gun
" and all its parts.

" A letter was read from Mr. MUSGRAVE, containing an account of Mr.
" WALKER's experiments on land-carriages. Mr. MOLYNEUX thereupon moved,
" that it may be tried, whether ſmaller wheels, if fitted with proportionable ſmaller
" axle-trees, do not move as eaſily as greater.

" A letter was read of Mr. ASTON, containing (with other particulars) an ac-
" count of Dr. LISTER's experiments of freezing.

" *Feb.* 16. Mr. SMITH being lately returned from the North, brought us an
" anſwer to our queries concerning Lough Neagh. The anſwers were drawn up
" by ARTHUR BROWNLOW, Eſq; living in thoſe parts, who has made it his bu-
" ſineſs to ſearch into that matter theſe ſeveral years: theſe were very full and ſa-
" tisfactory: he concludes therein, that the water does not petrify, but that the

" earth about the Lough does moſt certainly. The thanks of the Society were " ordered to be returned Mr. BROWNLOW for this large and accurate account.

" *Feb.* 23. Dr. MULLEN preſented a monſtrous kitlin lately brought forth in " this town. He gave an account at large of the anatomy thereof, with the " ſketches taken by Mr. SANDYS. In the Journal des ſcavans pour Lundy " Juiliet 15, an. 1680, there is juſt ſuch another monſtrous cat deſcribed, and " the cuts thereof given. 'Tis very ſtrange, that two errors of nature (for ſo we " may call monſters) ſhould thus exactly agree."

Upon the mention in theſe minutes of a *ſupellex philoſophica* of forty inſtruments, propoſed by Sir WILLIAM PETTY, as neceſſary for the carrying on the work of the Society, the ſecretary was ordered to deſire a copy of it.

There being likewiſe mentioned an improvement of the digeſter, it was deſired to know of what kind it was.

Concerning the periodical bleeding of the man at Trim, it was deſired to know what remedies had been uſed, as cauſtics, ligatures, or ſtanching liquors, &c.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, March 6, 168$\frac{4}{5}$[1], was read, mentioning among other things the balſamic earth, which by the deſcription ſeemed to be petroleum.

A letter of Monſ. JUSTEL was read, mentioning two new ſatellites of Saturn, diſcovered by CASSINI with 100 feet glaſs without a tube, and making five ſatellites; an hypotheſis printing by CASSINI; and of a light ſeen after ſun-ſet.

Mr. HOOKE remarked, that the ſame thing had been mentioned by Mr. CHILDREY in his *Britannia Baconiaca*; and that it often appeared about the beginning of February.

As to the inſtrument for finding the way of a veſſel, he could not ſee, that it differed from Sir CHRISTOPHER WREN's, unleſs he had a deſcription of it more particular.

A paper of Dr. SLARE was read, concerning an uncommon concrete found in the diſtillations of ſeveral vegetables. It was as follows[m]:

" In our common methods of diſtillation, we often reſolve our vegetables into " volatile ſalts, oils, water, fixt ſalts, and ſometimes ſpirits; not that every ve- " getable does always afford all theſe, nor do even theſe (by ſome called princi- " ples of vegetable bodies) ſeem to exiſt ſo ſimple and pure, as not to be compound- " ed, if not decompounded, and ſubject to yet various alterations. This has been " ſufficiently demonſtrated at this board. In ſome late diſtillations I have found

[1] Letter-book, vol. x. p. 45.

[m] Regiſter, vol. vi. p. 216.

" an uncommon concrete, that ſeveral vegetables have afforded me, ſo that now " it ſhall paſs no longer for a contingent experiment. This product, as to its " ſubſtance, ſeems to be a ſalt ſhot into cryſtal, as chemiſts uſually term their " tranſparent and figured ſalts: in its figure is ſomewhat irregular. As to its " weight, it does not near reach the gravity of any volatile ſalt I have met with: " It juſt ſinks in water, ſo leiſurely, that it comes near it in ſpecific gravity. It " differs from moſt ſalts, and in this, from all vegetable ones, that it will not " diſſolve in water, but very eaſily in good ſpirit of wine. By its ſmell as well " as the forementioned levity, it ſeems to be a true oil ſhot into cryſtals. The che- " miſts have in their writings ſet a high value upon ſuch a preparation of an " eſſential oil, for the production of which they allow many months circulation; " but this is done with more eaſe. Finding it very differing from moſt of our ob- " ſerved products in ſpagyrical analyſes, I thought it fitting to preſent it to the " Society."

Dr. LISTER obſerved, that camphire might be ſuch a kind of production, which is an oil of the cinnamon-tree.

Dr. SLOANE ſaid, that an oil was hardly to be got out of the cinnamon here in England; for that out of twelve pound of cinnamon there came ſo little oil, that it ſcarce made a liquor milky or white.

Dr. PAPIN made a trial, whether a pipe might be made to ſound *in vacuo*, by putting a whiſtle into the hole of the pneumatic engine, ſo that the air getting in or out of the receiver muſt paſs through the whiſtle. The event was, that when the receiver had a quantity of air in it, the whiſtle ſounded; when it was void, it would not ſound at all. His account of it was as follows[n]:

" I have prepared another experiment, attempted firſt, but in vain, by the Flo- " rentine academy, and afterwards ſucceſsfully proſecuted by the hon. Mr. " BOYLE, which had a very ingenious *apparatus*, to blow into an organ-pipe *in* " *vacuo*, for to prove, that the air is neceſſary for ſounds: but the diſpoſition of " my engine affording a very great conveniency for ſuch an experiment, ſo that " it may be repeated as often, and in what degree of rarefaction you pleaſe; I " hope the Royal Society may, upon ſeveral circumſtances, make ſome new ob- " ſervations. My way is but to ſet the aperture of a whiſtle in the hole of the " pneumatic engine, ſo that the air going out, or getting in to the receiver, " muſt needs paſs through the whiſtle: for having drawn ſome air from the re- " ceiver into the pump, I muſt but keep open the communication between both, " and letting the plug be driven up, the air returning into the receiver will blow " into the whiſtle, and make it ſound as well as a pair of bellows would do. " But when the receiver is quite exhauſted of air, no ſound can be produced, " though I let the plug be driven up very faſt."

Mr. JOHN BEAUMONT preſented a draught of his deſign for writing an hiſtory of nature and arts of the county of Somerſet, which was well approved of by that

[n] Regiſter, vol. vi. p. 212.

Society, who declared, that they thought him a fit perſon for the undertaking, and would be ready to give him any aſſiſtance.

March 18. Dr. LISTER vice-preſident in the chair.

Upon mentioning the extracts of cinnamon, Mr. LODWICK remarked from BALDEN, that the Indians make an oil out of the fruit of the cinnamon-tree, being like a ſmall olive, having the ſmell and taſte of cinnamon.

It was queried, whether this might not be the oil of cinnamon, which is brought into Europe.

A letter of Mr. RAY to Dr. ROBINSON, dated at Black Notley in Eſſex [o], was read, wherein he doubted, whether our Engliſh maples would yield a ſaccharine juice;

1. Becauſe probably the Indian maple is ſpecifically diſtinct from ours:
2. Though it be the ſame, it may yield a ſaccharine juice in America, though not in England.
3. The common maple bleeding little, and but at ſome times, it would be hard to have a quantity of the juice in the place, where he then was.

As to the hiſtory of fiſhes, he ſaid, that it was as perfect as that of birds, excepting the cetaceous kind, which he deſired might be ſupplied. With reſpect to the deſigns for the cuts, he ſaid, that he had ſeveral drawn from the life, and had made references to the places in authors, where the beſt figures were extant.

The *exanguia aquatica*, he ſaid, were omitted as inſects.

Dr. ROBINSON was deſired to return thanks to Mr. RAY, and requeſt him to ſend up his draughts and the references to the figures, which he judged to be the beſt extant.

It being ſaid, that there were ſome plates of figures of fiſhes and birds made by the Biſhop of Cheſter [p], which were in Mr. HUNT's hands, Mr. HUNT was ordered to get the plates of the fiſhes rolled off againſt the next meeting, in order that the Society might judge, whether they would be uſeful to this book.

Mr. Ray having ſcrupled the account of the unicorn-fiſh in the *Hiſtory of the Antilles*, it was affirmed, that the book was of ſmall authority, as being written in Europe; and that particularly the account in it of the unicorn-fiſh was falſe.

Mr. HOOKE ſaid, that there were ſeveral ſacchariferous trees mentioned by PISO and ſome other writers.

[o] Letter-book, vol. x. p. 46. It is printed in Mr. RAY's *Philoſ. Letters*, p. 177.
[p] Dr. WILKINS.

The

The palm being mentioned, Dr. LISTER ſaid, that it might be reckoned among the canes.

Dr. SLARE preſented a man's head brought from the Eaſt-Indies dried, but having all the ſkin and fleſh ſticking upon it.

A letter of Mr. MUSGRAVE was read, concerning Mr. COLE's fiſh tinging with colours, ſaid to be a ſort of periwinckle.

An account of the ill effects of the cold on the 23d of December, 1684; another of the good effects of the Bath in the palſy and barrenneſs by Dr. PIERCE of that city[q]: and a third concerning the ſpecific weight of ſeveral bodies carefully examined by Mr. CASWELL and Mr. RICHARD WALLER[r], were produced and read.

Dr. SLARE ſhewed a parcel of the cryſtals mentioned at the laſt meeting as produced in the diſtillation of origanum. Some of theſe were delivered to Mr. HUNT to be kept in the repoſitory, he being ordered firſt to deſign their figures.

They juſt ſunk in water, being put upon a coal; they appeared to be all volatile: and ſome were put into water till the next meeting, to ſee, whether they would diſſolve.

Dr. SLOANE preſented ſome cryſtals of borax.

Dr. PAPIN ſhewed ſome juice of liquorice prepared with gum tragacanth and ſome with the gelly of bones.

He likewiſe ſhewed how ſounds would be made in factitious air.

His account of both which was as follows[s]:

" Being commanded to try, whether factitious air would be fit for the pro-
" duction of ſounds, I have prepared the engine, ſo that after the air is quite
" exhauſted, and the whiſtle in the receiver can produce no more ſound, I may
" cauſe ſome iron to fall into ſome *aqua fortis in vacuo*, from whence there will be
" ſome new air produced in the receiver; and it will be eaſy afterwards to try, by
" playing the pump, whether that new generated air, paſſing through the whiſtle,
" will produce any ſound.

" I have alſo brought ſome of the juice of liquorice prepared with gum traga-
" canth, being now dry enough to be carried about: and I have at the ſame
" time brought ſome of the ſame juice prepared with gelly, that they may be
" compared together."

[q] It is printed in the *Philoſ. Tranſact.* N°. 169. p. 944 for March, 1685.

[r] Ibid. p. 927. It is in the letter-book, vol. x. p. 60.

[s] Regiſter, vol. vi. p. 211.

Upon

Upon paſſing of air through the whiſtle, the ſound was very clear and loud.

He was ordered to try againſt the next meeting to make a gelly of the Jeſuits bark.

1685, *March* 25, Dr LISTER vice-preſident in the chair.

Dr. SLOANE preſented a piece of the bark of the root of the cinnamon-tree; ſome of the oil drawn from the bark of the root; and a piece of the camphire.

He remarked, that the way of extracting the oil and camphire was by putting the bark of the root in a copper veſica: and that the oil in the receiver, as ſoon as it cools, lets fall a camphire to the bottom: that the camphire of Japan was out of the leaves of a tree.

The oil, when it is firſt rubbed on the hands, has a ſtrong camphire ſmell; but this afterwards in a minute or two changes into a cinnamon ſmell.

A letter of Dr. PLOT to Mr. ASTON, dated at Oxford, March 18, $168\frac{4}{5}$ [t], was read, concerning Mr. WILLUGHBY's and Mr. RAY's *Hiſtory of Fiſhes*, and mentioning, that Mr. ASTON's laſt letter had much leſſened the opinion concerning that hiſtory; for it had been preſumed before, that Mr. WILLUGHBY had taken all the draughts from the life, whereas it was now found, that the cuts muſt be picked up here and there out of books; which Dr. PLOT likewiſe found by Mr. ASTON's intimation to have been done in the *Hiſtory of Birds*, by comparing ſeveral birds, which he, Dr. PLOT, had drawn from the life in Staffordſhire with Mr. WILLUGHBY's, which he had found ſo unlike, that he thought now to have ſome of them engraven anew. He remarked alſo, that the Biſhop of Oxford could not reſolve or determine any thing about printing the book there, till he had ſeen what it was; and that therefore thoſe draughts, which were ready, ſhould be ſent thither; and that his lordſhip thought, that but one hand ſhould be employed in the engraving the plates.

The Society conſidering the uncertainty of the offer, and the length of time, that one hand would require to engrave all the plates, reſolved to undertake the printing the book at their own charge, and appointed a committee for that purpoſe, conſiſting of the preſident, Dr. LISTER, Dr. ROBINSON, Mr. WALLER, Dr. TYSON, Mr. RAY, Mr. HILL, and Mr. ASTON, or any three of them.

Mr. ASTON was accordingly ordered to ſend notice thereof to Oxford, and to deſire, that the biſhop would print the book for them, the Society being at the expence of the impreſſion, and ſending down the paper, if neceſſary.

A letter of Mr. JUSTEL to Mr. ASTON dated, March 20, $168\frac{4}{5}$ [u], was read,

[t] Letter-book, vol. x. p. 54.
[u] Ibid. p. 66. It is printed in the *Philoſ. Tranſact.* N°. 172. p. 1030.

concern-

concerning a ſort of bees at Cayenne in America, obſerved by Monſ. VILLERMONT, very different from thoſe here in Europe.

The ſame letter mentioned a white cinnamon at Guadaloupe, and another at Maragnan like that of Ceylon; and that ambergiſe is a ſort of wax and honey fallen into the ſea between the tropics.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, March 21, $168\frac{4}{5}$ [x], was read, concerning the comparative weight of ſeveral bodies, as follows:

	℔	ʒ
" A Cubic foot of ſand weighed	85	4
" Of New-caſtle coal	67	12
" Of Gravel	109	5
" Of wood-aſhes	58	5

" It was affirmed, that a buſhel of corn weighs more in dry than in " wet weather: that 64 ℔ of meal makes 35 ℔ of fine flower, if it be from the " beſt wheat, and very dry. Pump-water and that of Iſis were found of equal " weight, by weighing 5 ℔ 5 ʒ of each, with ſcales, that turn with a ſmall bean " about a quarter of an ounce in weight; ſo that a difference leſs than 1 in 400 " could not hereby be diſtinguiſhed."

This letter mentioned likewiſe, that there had been communicated to the Philoſophical Society at Oxford a catalogue of ſome of the *deſiderata* in chemiſtry, and Mr. BEAUMONT's draught of his deſign of a natural hiſtory of Somerſetſhire.

Part of a letter of Mr. LEEWENHOECK to the Society, dated at Delft, January 23, $168\frac{4}{5}$ [y], was read, concerning the figures of the ſalt of carduus benedictus, of the ſalt of wormwood, of alum, ſalt-petre, and vitriol of Cyprus.

Dr. LISTER remarked, that there were figures of common ſalt and alum among the ſalts of wormwood and ſome others; and that it was to be wiſhed, that Mr. LEEWENHOECK had prepared all his ſalts himſelf. He queried, whether Mr. LEEWENHOECK had ever ſeen ſalt of nitre finiſhed at both ends, and how many ſides it had; and he deſired, that Mr. LEEWENHOECK would deſcribe a large cryſtal of alum and a large cryſtal of vitriol.

Mr. ASTON was deſired to take inſtructions from Dr. LISTER, when he ſhall next write to Mr. LEEWENHOECK.

Dr. PAPIN reported, that he had put Jeſuits bark and ſpirit of wine in the digeſting engine, and given fire enough to ſoften bones, and that the tincture was high.

[x] Letter-book, vol. x. p. 61.
[y] It is printed in the *Philoſ. Tranſact.* N°. 173. p. 1073. for July 1685.

He

He was ordered to put the bark again in the digeſter, and try to bring it to a mucilage; and to take two more quantities of bark, and put water to one, and wine to the other; and try what they will be by a long digeſtion.

He likewiſe made the experiment of the different operations of water and wine upon fleſh and bones put at the ſame time in the digeſter. The ſucceſs was, that in the water the fleſh and bones were very ſoft; in the wine the meat and bones leſs ſoft.

April 1. Dr. LISTER vice-preſident in the chair.

A letter of Mr. THOMAS MOLYNEUX to Mr. ASTON, dated at Leyden, March 14, 1685[z], was read, as follows:

" I ſhall now be as good as my promiſe, and ſend you the names of thoſe natural curioſities Dr. HERMAN preſerves here in his balſam; which are not ſo conſiderable for their number, as that ſeveral of them have not hitherto been deſcribed by any writer, either of travels or natural hiſtory. Of theſe he deſigns to give the world an accurate account, in a book he will call *Muſeum Zeylonicum*, which he has long promiſed the public; and therefore I will ſet down little more than juſt their bare names, which are as follow:

" 1. Lacerta Indica maxima, crocodili terreſtris ſpecies, Bontii Hiſtor. vid. lib. 5. cap. 4.
" 2. Vipera Indica conſpicillo notata, cobra das capellas Luſitanicè dicta.
" 3. Vipera Indica tricolor.
" 4. Crocodilus.
" 5. Lacerta Zeylanica ex gryſeo cinerea chamæliontis capite.
" 6. Loligo minor Indica.
" 7. Kahakurulla, i. e. Indicè avis crocea.
" 8. Sciurus Zeylanicus.
" 9. Felis Indica ſilvatica urſinam faciem gerens.
" 10. Simia Indica tardigrada ignota.
" 11. Lacerta Indica diverſicolor dorſo ſquammato et ſerrato.
" 12. Muſtela vulgaris.
" 13. Muſtela alba.
" 14. Ananas Acoſtæ; carduus Braſilianus foliis aloes. Bauhin. in Pina, 3 & 4.
" 15. Bananas ſeu palma humilis longis latiſque foliis Bauhin. Pin. p. 507.
" 16. Lacertus ſquamoſus Bont. l. 5. c. 8.
" 17. Serpens Indic. ex albo et lurido maculatus.
" 18. Fœtus humanus maſculus ſemeſtris.
" 19. Palakothaja, avis Zeylonica coloris ex ſpadiceo viridantis.
" 20. Priapus vegetabilis.
" 21. Cinamomi arboris ramulus cum fructibus.
" 22. alter cum floribus.

[z] Letter-book, vol. x. p. 49.

" 23.

" 23. Sandalmalam ſeu hyacynthus Indicus tuberoſus.
" 24. Sirii Bont. Hiſt. l. 6. c. 2.
" 25. Lepores gemelli monſtroſi ſibi invicem conjuncti.
" 26. Flores nucis ſaufel, Bont. Hiſt. l. 4. cap. 2.
" 27. Hydrym Markgravii, l. 4. c. 22. falsò concha anatifera dict.
" 28 Aſelli majoris partes genitales.
" 29. Uterus conchæ Malabaricæ chiancos dictæ.
" 30. Lacertus volans, Bont. lib. 5. cap. 7.
" 31. Fructus intiger cacao dict.
" 32. Halcyon Zeylonica.
" 33. Piſcis marinus maculis ex fuſco gryſeo notatus.
" 34. Piſciculus Indicus fluviatilis.
" 35. Scorpius niger Indicus.
" 36. Pſittacus nanus roſtro coccineo.
" 37. Piſcis compreſſus marinus Zeylonicus ſiſerino adfinis, ſpadiceus, albi-
" cantibus per tranſverſum lineis notatus.
" 38. Tullica; avicula Zeylonica mellivora lucida nigra, roſtro longiſſimo
" acuto et adunco.
" 39. Araneus maximus ſeu phalangium Americanum Nahamda Margrav.
" l. 7. cap. 3.
" 40. Paſſer Zeylonicus agreſtis.
" 41. Mus Indicus arboreus ſtriatus.
" 42. Sargaſto tenuifolius; ex mari viride.
" 43. Piſcis compreſſus Zeylonicus marinus ſiſerino adfinis fuſcis cancellatim
" ex currentibus lineis notatus.
" 44. Alter ejuſdem generis lineis diverſi coloribus notatus.
" 45. Serpens Indicus viridis gracilis æhætulla dict.
" 46. Chamæleo Africanus.
" 47. Eruca maxima Zeylonica flava pedibus ac dorſo piloſis.
" 48. Arumalia Margrav. l. 7. c. 5. locuſtæ ſpecies.
" 49. Locuſta Zeylonica tardigrada flebilis capite et pedibus alatis.
" 50. Locuſta Zeylonica viridis.
" 51. Locuſta Zeylonica tota foliacea, folii limonii decidui facie, ab incolis
" folium ambulans vocata, ſeu parandela.
" 52. Locuſta Zeylonica cucullata viridis.
" 53. Amphiſbena Zeylonica, cujus cauda et caput vix differunt inter ſe.
" 54. Lumbricus Zeylonicus maximus cæruleus.
" 55. Serpens Indicus viridis binis per longitudinem albicantibus lineis notatus.
" 56. Oniſius ſeu Millipes Piſon. l. 5. c. 11.
" 57. Lacertus Indicus lævis domeſticus; Americana Braſil. Marggr. l. 6. c. 12.
" 58. Coluber Zeylonicus floſculis ornatus.
" 59. Coluber Zeylonicus ex fuſco et albo maculatus.
" 60. Coluber pictorius ὀζοσόμος.
" 61. Coluber Indicus bubalinus.
" 62. Vipera Zeylonica.
" 63. Coluber viridis obeſus, multa pinguedine abundans.
" 64. Coluber φιλοκόπρος ex gryſeo et fuſco variegatus.

" 65. Lacerti ſquamoſi Cluſii embryo cum ſecundinis.
" 66. Millipes Zeylonicus niger.
" 67. Scincus.
" 68. Concha margaritifera cum piſce & margarita.
" 62. Simiæ tardigradæ Zeylonicæ abortus.
" 70. Piper rotundum nigrum, planta integra.
" 71. Avicula Zeylonica.
" 72. Bombyx Zeylonicus.
" 73. Palakothaia minor et elegantior.
" 74. Coluber Indicus viridis binis per longitudinum albicantibus lineis et " nigricantibus notatus.
" 75. Avicula Africana mellivora dulcedinem ex floribus leonuri, a Breynio " deſcripti, colligens.
" 76. Avicula Zeylonica nigra collo coccineo.
" 77. Loxia Willughbei.

" This is the collection which at preſent Dr. HERMAN has in poſſeſſion, he " daily adds to it, and tells me he ſuddenly expects from the Eaſt-Indies ſuch a " number of exotics, as will equal what he has already, ſo that at laſt it may become " as well conſiderable for its variety, as for the rarity of thoſe things it contains.

" Whether the collection of Dr. SWAMMERDAM be the ſame with that, of " which you have ſeen a printed catalogue, I cannot ſay, but I believe 'tis not. " 'Tis not poſſible for me to procure a catalogue of what it contains, ſo that all I " can do in this particular, is to ſet down what I have ſeen, as far as my memory " will help me: if this will be any way ſatisfactory to you, you may com- " mand me.

" The glaſſes Mr. LEEWENHOECK ſhewed me, magnified objects no more than " ſeveral other glaſſes I have ſeen before, and therefore diſcover nothing but " what may eaſily be ſeen by help of other microſcopes: ſo an account of them " would be no ways ſatisfactory; 'tis only his own private glaſſes, which make " thoſe more than ordinary diſcoveries. I never heard he ſold thoſe glaſſes of his " more common ſort; but I ſhall not return ſuddenly into England, for I de- " ſign to ſtay ſome while in France, and perhaps viſit Italy before that time: ſo " I cannot ſerve you in this particular; but wherever it lies in my power, you " may command, &c.

" They talk much here, at preſent, of the madman at Harlem, that as certainly " faſted forty days and forty nights. Doubtleſs by this time you have heard " of it. I deſign ſuddenly to go and ſee him."

On occaſion of the ſtory of the madman at Harlem, who faſted forty days, it was remarked, that this was no diſeaſe nor cheat: that a woman of Poictou and one in Derbyſhire had lived a year without eating; but their guts were dried up.

On the occaſion of cheats, Dr. LISTER ſaid, that Mr. WILLUGHBY had de-

tected that of the woman, who pretended to take worms out of the teeth with a quill, having forced the quill from her juſt as ſhe was putting it into his mouth, and found ſmall worms in it.

Dr. TYSON ſaid, that he had a tooth drawn at Oxford ſeveral years ago, which being put preſently into the place, where it had grown, ſtuck after four days ſo faſt, that he could eat with it; and that he had the ſame tooth now.

It was conceived by Mr. HENSHAW, that teeth drawn will not faſten again in old people.

Dr. LISTER obſerved on occaſion of the catalogue of Dr. HERMAN's curioſities, that in hot countries the ſerpent kind are numerous; whereas in England they are but three or four; as the common ſnake, the viper, and the ſlow-worm.

Dr. SLARE remarked, that a ſlow-worm had been vomited out of a man's ſtomach, and that one Mr. PLUMPTRE had kept it in a glaſs ſome months with an intention to ſend it to the Society; but that at laſt it got away from him. Dr. SLARE was deſired to procure a particular account of the matter of fact.

Upon the mention of a *concha margaritifera cum margarita*, Mr. HENSHAW remarked, that the pearl conſiſted of a multiplicity of coats like a bezoar; and that it might be bred in the ſtomach.

Dr. LISTER ſaid, that he had found ſixteen pearls in the muſcle, that adhered to the ſhell, and none in the body of the fiſh.

A letter of Mr. MUSGRAVE to Mr. ASTON [a], was read, concerning ſome old painted glaſs brought from Wooburn abbey in Bedfordſhire; the cœcum of a man dead of a conſumption, being very ſmall; Mr. DALGARNO's propoſal to deliver up his papers about the univerſal character to any worthy undertaker; a woman cured of deafneſs by a fall from a horſe, and a blind perſon, who was reſtored to ſight by bleeding at a wound; a cure by Dr. TURBERVILLE of a perſon, who could ſee in the night, and not in the day; and an account of one, who could not ſee, if he ſuffered the hair of his head to grow above an inch long.

It was conceived, that the antient glaſs-painting was but rude, as being pieces of glaſs coloured quite through, or bubbles dipt in coloured glaſs, and then blown, the colour being but on one ſide, which is often ſcratched away till you come to the white, where another colour may be laid on, or the white left for heightening.

As to ſeeing in the night, Dr. LISTER ſaid, that King CHARLES I. had a man from Louth in Lincolnſhire, who ſerved as a guide to the army in the night; and that he could read a letter in the darkeſt night

With regard to the cœcum, he obſerved, that it was often very ſmall in a man.

[a] Letter-book, vol. x. p. 64.

A paper was read containing ſome propoſals and conſiderations about the printing of the *Hiſtory of Fiſhes*.

A letter of Mr. RAY to Dr. ROBINSON was read, returning his thanks to the Society for their intentions to print his book and ſome other things relating thereto.

A paper of Mr. CASWELL was read, concerning the manner of taking the ſpecific gravity of ſeveral bodies; as that the ſolids were examined hydroſtatically by weighing them in air and water; but the fluids by weighing an equal portion of each in a glaſs holding about a quart [a].

Dr. PAPIN brought in the experiment of the Jeſuits bark boiled ſix hours together in the digeſter in three ſeveral menſtruums. The fire uſed was ſuch as evaporated a drop of water in three ſeconds.

It appeared, that the bark boiled in water was inſipid and ſoft; the water likewiſe inſipid.

The bark in white wine was not ſo ſoft, and the infuſion was ſtronger.

The bark in ſpirit of wine was much harder, and ſtronger taſted.

He likewiſe brought in a ſpecimen of another uſe of the digeſter, viz. the making of medals with the gelly of bones, which ſhall receive the exacteſt impreſſion, and be ſo hard, that they cannot be ſcratched with the nail, nor be broken by falling down.

The members preſent were very well ſatisfied with this experiment, and ordered Dr. PAPIN to take off ſome good impreſſions, which might be laid up in the repoſitory.

April. 8. **Dr. LISTER** vice-preſident in the chair.

The Earl of Pembroke was preſent.

Dr. PIT, who had been formerly choſen, and had time allowed him for his admiſſion on account of his reſidence at Oxford, was now admitted.

Upon a diſcourſe concerning the uſe of the cœcum, Dr. PIT ſaid, that it was full of glands.

Dr. PAPIN brought in ſeveral pieces of plaiſter of Paris, and ſome pieces of the ſame ſize being plaiſter, out of which the air had been exhauſted, and the cavities filled up with gelly of bones, to try whether they would become more tough. A ſcale being hung upon the plaiſter of Paris, it broke with $4\frac{1}{2}$ pounds. The ſame ſcale being hung upon the plaiſter of Paris boiled in gelly, it broke after half a minute with 6 pounds.

[a] *Philoſ. Tranſact.* N°. 169. p. 928.

A peat

A pear ſhut up *in vacuo* laſt year was viewed. It looked well, but ſome moiſture was got out, and lay in the glaſs, which was not opened.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, April 2, 1685 [b], was read, mentioning, that Dr. PEIRCE of Bath ſaid, that the ſubſtance found by him in the ureter of a man was a ſhell, and not a ſtone ſhaped like a ſhell; and that two evets or newts were found alive in a ſtone two feet thick and two feet and an half under ground, as could be well atteſted.

It was queried, why Dr. PEIRCE took the ſubſtance to be a ſhell.

With reſpect to the evets found alive in a ſtone, ſeveral things of a like nature were mentioned, as a toad found in a ſtone, as alſo in a tree in Berkſhire; a bird unperiſhed found in the middle of a tree; an olive ſtone in the middle of a tree.

A paper was communicated from the Philoſophical Society at Oxford, occaſioned by a diſcourſe read there, March 24, 168$\frac{4}{5}$, concerning the advantage, which thoſe men, who want ſight, may have as to memory, and the application thereof. It contained an arithmetical operation performed by Dr. WALLIS in the night without light, or pen and ink, being the ſquare root of 3 with 40 cyphers adjoined, and at another time the ſquare root of a number of 53 places [c].

A diſcourſe was read, which had been preſented to the Dublin Society by Mr. ST. GEORGE ASHE, fellow of Trinity-college there, and of that Society, ſtating of what uſe in mathematics the ſolution of the problems of ſquaring the circle, doubling the cube, triſecting an angle, inſcribing geometrically a regular heptagon in a circle, &c. would be; and what advantages may be reaſonably expected from ſuch diſcoveries. For inſtance, whether in the buſineſs of ſquaring the circle, the compendiums of ſines and tangents logarithmically uſed, and the infinite approximations already known, do not anſwer all uſeful ends, as fully and well: together with a demonſtration *quod cognito centro gravitatis lunulæ habeatur circuli quadratura* [d].

A printed paper of Mr. MERCATOR was communicated by Mr. HENSHAW, containing five propoſitions concerning the quadrature of the circle, which he profeſſes himſelf ready to demonſtrate.

A letter of Mr. RAY to Dr. ROBINSON, dated at Black Notley, April 1, 1685 [e], was read, concerning the lampetra and finſcale of Dr. PLOT, ſaid to be fiſhes undeſcribed, and the making of ſugar out of the juice of maple. It was as follows:

" I wrote to you by the laſt poſt, and yet I cannot let you reſt. Searching " Dr. PLOT's hiſtory, and conſidering his deſcriptions of the fiſhes named, I be-

[b] Letter-book, vol. x. p. 66.
[c] Ibid. p. 67. and *Philoſ. Tranſact.* N°. 178. p. 1269. for December 1685.
[d] Letter-book, vol. x. p. 70.
[e] Ibid. p. 62.

" gin to be in doubt, whether they be already deſcribed or no. The firſt is a ſort " of lampetra, with roded or ſtraked ſides, which whether deſcribed and entered " in our hiſtory I cannot certainly ſay; you may eaſily by comparing the deſcription " of thoſe we have entered (which are not many) reſolve that. There are alſo in " BALTNER ſome fiſhes of that kind figured and deſcribed, which we have not " admitted. The lampetra flava I take to be an accidental variety, and the lampe- " tra bicauda a monſtrous production, not a conſtant ſpecies; but there are one or " two more, which poſſibly may be new ſpecies. Not underſtanding high Dutch, " I was at a loſs, and uncertain concerning ſome ſpecies there figured. For " though it is not to be ſuppoſed, that a man of his education ſhould be able " to deſcribe animals well, yet ſo much might be gathered from the notes he " gives, as might lead an underſtanding and attentive man into the knowledge of " them, and with the figures (which are in all very exact) give him ſo much light " as to enable him to determine the ſpecies. There is next to theſe an an- " guilliform fiſh, I am in doubt of.

" As for the finſcale of Dr. PLOT, if it hath indeed, as he ſaith, teeth in the " mouth or lips, it is a ſtrange and unheard of fiſh, doubtleſs not yet deſcribed " nor mentioned by any author. But I ſuſpect the doctor was therein miſtaken, " and that it is a leather-mouthed fiſh, and carries its teeth as the roach, and all " other of that tribe doth, in the bottom of its mouth, or in its throat, " or in the mouth of its ſtomach, which you pleaſe. I remember the draught of a " fiſh in BALTNER, which, as I take it, he calls rotele, which for all the name is " not the rutilus or roch. I knew not what to make of it, nor could I find it " in other books, and therefore put no name to it, nor yet entered it in the hi- " ſtory. Dr. PLOT's deſcription anſwers ſo well to this figure, that I am per- " ſuaded the finſcale and rotele of BALTNER are the ſame fiſh (if I remember " aright, and that broad fiſh with the very red fins in BALTNER be termed rotele) " and that it is a new, and by us unſeen and undeſcribed kind. But you, that " have the picture and the deſcriptions, both of BALTNER and Dr. PLOT to com- " pare with it, will be able to make a better judgment. I have neither deſcrip- " tion of fiſhes, nor any book to help me but one, that, as I told you, is worſe " than none, more apt to confound than reſolve. I believe it is not the ballerus " of RONDELETIUS. A friend and neighbour apothecary, whom I employed, " yeſterday, brought me the effect of his boiling the juice of the greater maple. " Having boiled as high as an extract, he found a whitiſh body ſomewhat like " brown ſugar, and taſting ſweet, but withal of a woody reliſh; immerſed in a " body of the colour, and conſiſtency, and taſte too of moloſſes. Upon curing " I do not doubt we ſhall have after the moloſſes is ſeparated, a perfect ſugar; " but in very ſmall quantity, not above an ounce from a gallon of liquor. Poſſi- " bly, nay likely, afterwards, when the liquor begins to run thick near its ceaſ- " ing, it will yield a greater proportion of ſugar. When he hath cured it, I will " give you a farther account of it, &c."

Dr PAPIN repeated a former experiment. Let an exhauſted bolt-head ſtand with the neck in water *in vacuo*. If the air be admitted into the receiver, the wa-

ter

ter riſing violently into an oval bolt-head turns round into a cylinder for ſome time before it ſettles: but the ſame did not happen in a round bolt-head.

Upon a trial now with a round bolt-head, the water twined as in an oval one.

April 15. A propoſal of Dr. LISTER was read, of a new way of cutting for the ſtone in the bladder, by opening the fund of the bladder, and taking out the ſtone from above by a cut in the abdomen of men, as follows[f]:

" I was long ſince put in mind of this way, by an obſervation I chanced to " make in the diſſecting of a bitch, which had been formerly ſpayed, and the " womb cut out: but (I know not how the bunglers had ordered the matter) " I found part of the fund of the bladder grown within the lips of the wound, " and the fund itſelf a little more fleſhy than uſual. I could not find the bitch " otherwiſe was ill, though I had not had her long in keeping.

" I am, I ſay, from this obſervation forward to believe, that the fund of the " bladder may be opened, and the ſtone taken forth from above by a cut in the " abdomen of men.

" And from this way of cutting, theſe advantages ſeem to follow; that, pro- " vided it heal (which this obſervation ſhews it will,) a bare inciſion of parts without " bruiſe or other violence, ſave a few ſtitches at the cloſe of the operation, is all " that need to be done; that the ſtone may be much more readily come at, for " that the fund of the bladder is large, and may this way be handled before the " extracting the ſtone, ſo as to be certain of what is farther to be done, to pro- " portion the wound to the ſtone contained in it. Again, by this way a very " great ſtone may be moſt readily broken to pieces by the forcipes. Alſo this " way thoſe bruiſes are avoided, which neceſſarily happen from the frequent and " violent ſuccuſſion of the forcipes to catch in them the ſtone or ſtones; and " ſometimes the fatal miſtakes of taking hold of ſome folds of the flaccid and " empty bladder together with the ſtone, which, perhaps, is too often done, " and then 'tis excuſed by the growing of the ſtone to the ſides of the bladder.

" I therefore recommend the experiment to be tried expreſsly on a dog, that " it may be more circumſtantially noted, what the ſucceſs will be in the healing " up the pieced bladder, ſtitched within the lips of a wound in the abdomen, " made over againſt it."

It was recommended to be tried on a dog, that it may be circumſtantially noted what the ſucceſs will be in the healing up of the pieced bladder ſtitched within the lips of a wound in the abdomen made over againſt it.

For this experiment were nominated Dr. PIT, Dr. TYSON, Dr. AGLIONBY, and ſuch other of the phyſicians, as could attend it.

[f] Regiſter-book, vol. vi. p. 235.

A let-

A letter of Dr. SOLOMON REISELLIUS to Mr. ASTON, dated at Stutgard, March 6, 168$\frac{4}{5}$, in anſwer to Mr. ASTON's to him of December 17, 1684, was read, mentioning his having received the tables of the eclipſes of the ſatellites of Jupiter, and deſiring the *Philoſophical Tranſactions* to be ſent to the Duke of Wurtemberg, and a correſpondence with Mr. WILLIAM SCHROTER and with the Society.

Monſ. JUSTEL related, that Monſ. VILLERMONT had found out a way of perpetuating the uſe of pot-aſhes in ſoap for the waſhing of linen by filtrating the ſalt of the lye employed, and making uſe of it again with new oil for the making ſoap: and that the ſame ſalt had been uſed thirty times ſucceſſively:

That the ſame Monſ. DE VILLERMONT had a method of reducing moloſſes into fine ſugar by making it granulate: and

That Monſ. CASSINI's two ſatellites of Saturn new diſcovered were the neareſt to his body, but their motion was not yet determined.

He mentioned, that Monſ. DE VILLERMONT deſired to be of the Society, which was referred to the council.

Dr. PAPIN ſhewed ſeveral patterns of medals made with gelly of bones, that it might be judged, which appeared the beſt.

He likewiſe ſhewed a mixture of plaiſter of Paris and gelly of bones, which was difficultly dried, and then was apt to be chopped, and conſequently would be unuſeful.

The tranſcript of a part of a letter of Mr. COLE to Mr. RAY was read, mentioning his having found ſeveral ſorts of figured ſtones this winter, which he judged never were either animals or vegetables, or any parts of them:

As alſo concerning his ſort of purpura or colour-fiſh, whoſe ſtaining after paſſing through a great many colours ſucceſſively fixes into a ſcarlet purple, which is no more to be altered by waſhing.

He promiſed to communicate to the Society the ſhells of the fiſh and his obſervations.

Mr. HOUGHTON ſhewed a root of a kecks, whoſe fibres were prettily twiſted and interwoven, as that ſort naturally are.

April 22, at a meeting of the COUNCIL were preſent,

Dr. LISTER vice-preſident

The Earl of Berkley	Mr. WALLER
Mr. COLWALL	Mr. HALLEY
Mr. HILL	Mr. HOOKE
Dr. SLARE	Mr. ASTON.

[s] Letter-book, vol. x. p. 92.

Mr.

Mr. J. BEAUMONT, Mr. CHARLES LEIGH, and Monſ. DE VILLERMONT were agreed to be propoſed to the Society as candidates.

It was ordered, that a quarter of a year's ſalary be paid to Dr. PAPIN:

That Mr. FOSTER's bill for cataloguing the books in the library be paid after the rate of 4 s. *per diem:*

That the treaſurer pay for the plates and drawings of the *Hiſtory of Fiſhes:*

But that if a member of the Society pay the price of a plate and the ingraving, then his name ſhall be ſet down on the plate, with notice, that he was at the charge of it.

Dr. SLARE propoſed a perſon for a chemical operator to the Society, who ſhould attend at their meetings, and be contented with a moderate ſalary: which motion was approved.

Mr. HOOKE propoſed, that a book ſent to him from Cambridge might be encouraged in the printing.

This book was referred to Sir CHRISTOPHER WREN and Mr. HALLEY to be read over, whoſe report ſhould govern the reſolution of the council upon that affair.

At a meeting of the SOCIETY on the ſame day, Dr. LISTER vice-preſident in the chair.

Dr. GARDEN's attempt of an aeroſtatical hypotheſis of the various changes of the weather, ſent from Aberdeen to the Philoſophical Society at Oxford, and by them communicated [h], was read.

It ſuppoſes, that when the atmoſphere is heavieſt, the vapours, as lighter fluids, ariſe and ſwim at the top of it; but when the atmoſphere is light, the vapours fall down again. This is aſſerted to agree with obſervation.

It ſuppoſes likewiſe, that when the preſſure of the air is leſſened in one place (as at Edinburgh) the neighbouring parts of the atmoſphere, whoſe weight is not leſſened, run there in a current till all be reduced to an æquilibrium, and thence come winds. This is alſo aſſerted to agree with obſervation; for upon wind the quick-ſilver falls, or is in motion.

As to the different changes of the ſpecific gravity of the atmoſphere, it is ſuppoſed neceſſary to know the cauſe of gravity in general, and of the air's weight in particular, for which it is hinted,

1. What may be the nature and properties of the æther; and what influence it may have on the changes of the air's gravity.

2. Whether nitrous ſteams, or ſome ſuch mixture, may not alter the air's ſpecific gravity.

[h] Letter book, vol. x. p. 94. It is printed in the *Philoſ. Tranſ.* N°. 171. p. 991. for May 1685.

3. What influence the change of the air's ſpring by heat or cold may have upon the change of its weight.

Dr. WALLIS ſaid, that to make the vapours aſcend, there muſt be an impetus, as when duſt riſes in a room:

That the vapours are raiſed out of the earth by ſome ſuch cauſe as heat or fermentation, and are carried up as long as that impetus is able to ſurmount the weight of the air; but that then they fall again.

As to the riſing of the quickſilver in the barometer in hot weather, he queried, whether it might not ſwell by reaſon of ſome latent air in the body of the quickſilver, for that he formerly obſerved the firſt three years his barometer was filled, that upon great heat it uſed to riſe; but afterwards upon the like occaſion it fell; and he ſuppoſed, that the air then was got out of the quickſilver, and remained in the empty ſpace of the glaſs.

An experiment was ordered to be made in hot weather with a tube and quickſilver well exhauſted and filled by Dr. PAPIN, after his way.

Dr. PAPIN made an experiment to ſhew how high the water would probably riſe in an æquicrural ſyphon, as it was propoſed by Dr. REISELIUS.

A pipe full of water had its aperture inverted in a glaſs containing ſome water. When the air was half exhauſted (as appeared by a quickſilver-gage) the air-bubbles appeared plentifully in the pipe. Whence he concluded, that a ſyphon of ſixteen feet high would at the top produce bubbles, which in as ſlow a motion, as that of this ſyphon, would hinder the running of the water.

He would not adviſe to truſt to this ſyphon for above ten or twelve feet of water.

Dr. PAPIN likewiſe tried, what degrees of exhauſtion in the pneumatic engine would be neceſſary to make tepid water boil. The water did not begin to boil till the air was near all exhauſted.

April 29. Dr. LISTER vice-preſident in the chair.

There were propoſed as candidates,
Monſ. DE VILLERMONT by Monſ. JUSTEL,
Mr. CHARLES LEIGH by Mr. MUSGRAVE,
Mr. JOHN BEAUMONT.

There was preſented by Mr. BOYLE his book intitled *Short Memoirs for the natural experimental Hiſtory of mineral waters, addreſſed by way of letter to a friend.*

Monſ. BERNIER being preſent at this meeting gave to the library his epitome of GASSENDUS's Philoſophy in ſix tomes.

A letter

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, April 27, 1685[i], was read, mentioning an extraordinary tide at Dover on the 19th of March, when after it had flowed some time, it ebbed two feet, then flowed again, then ebbed and flowed a third time, and so a fourth, so that there were four flowings and three ebbings in one tide.

This letter mentioned likewise, that in the *Iter Germanicum* of father MABILLON, printed at Paris in 1685, there is the delineation of a telescope, as it was described by CONRADUS VICTOR, who lived before the year 1241: which tube differs from the *dioptra Ptolemaica* found in the manuscripts of the *great* SYNTAXIS and of the *hypotyposis* of PROCLUS: and

Mr. COLE in a letter observed, that there is a substance, proceeding from calamine ore, which far exceeds in colour and fineness all metals besides gold and silver; and that if this substance were made malleable (as he imagined it might) it would, he thought, bring brass and copper into contempt.

As to lapis calaminaris, Dr. LISTER observed, that it is a lead ore; that it calcines as lead does, and turns, like it, into several colours:

That he did not doubt, that several things would electrise.

There was read a discourse of Dr. WALLIS concerning the air's gravity observed in the baroscope[k], occasioned by Dr. GARDEN's *aerostatical hypothesis*, read at the last meeting.

Part of a letter of Mr. LEEWENHOECK of January 23, 168⅘, was read, concerning the figures of oil of tartar *per deliquium*, of Muscovy pot-ashes, and of camphire[l].

Dr. PAPIN made an experiment, to shew how water passing through a piece of dried oak was full of bubbles; but water passing through a piece of leather, had no bubbles at all. His account of it was as follows[m]:

"There having been a question moved in the last meeting, whether water "might turn into air, I have made an experiment, that will, perhaps, give some "light therein, and into the nature of plants. I take a receiver, that hath a small "hole at the top; and having stopt the said hole with cement and a piece of "wood, that passing through the hole remains half within, and half without the "receiver, I put the great aperture of the said receiver upon the plate of the "pneumatic engine, and keeping the wood, that is at the top, quite under water, "I draw the air out of the receiver. Then I see, that the water, which is at the top "of the wood, being driven thorough the wood into the exhausted receiver, will "produce there a great many bubbles: and such bubbles will appear even if the "said water hath been first well purged of air: so that it seems the wood hath "some property to turn particles of water into particles of air: which will seem "the more probable, if you make the same experiment with a piece of leather

[i] Letter-book, vol. x. p. 121.
[k] Ibid. p. 106. It is printed in the *Philos. Transact.* N°. 171. p. 1002.
[l] Ibid. N°. 173. p. 1077—1080.
[m] Register, vol. vi. p. 238.

" inſtead of wood, becauſe the water being after the ſame manner driven into " the exhauſted receiver thorough the leather will never produce any bubble."

It was queried by Mr. WALLER, how long the water paſſing through wood will appear full of bubbles? Whether the bubbles will not be ſpent in a day's time?

Dr. PAPIN was ordered to provide an æquicrural ſyphon made of tin, about twelve or more feet long, to examine how high water may be made to aſcend in it.

May 6. Dr. WALLIS preſented to the Society a printed copy of his *Hiſtory of Algebra*, wherein the faults of the preſs were many of them corrected with his own hand.

A man belonging to Mrs. PLAYFORD the printer having delivered a meſſage, that there would be ſixty copies of the Algebra brought to the Society, if they would pay 60 *l.*; it was anſwered, that if he brought ſo many copies, the Society would endeavour to ſell them within a month or two, and deliver him the money, or part of it, and the remainder of the books, provided the books were brought before the members of the Society could buy them in another place. But the man having no power to deliver the books, Dr. WALLIS undertook to furniſh twelve books for the preſent.

Upon mentioning the mixture of lapis calaminaris with copper, Sir JOHN HOSKYNS ſaid, that he had been informed, that there was a way of increaſing iron, but that it would not be tough, being ſerviceable only for caſt iron.

Dr. WALLIS propoſed, as from the preſident, that ſome perſon might be employed to ſearch the regiſters for what relates to navigation.

It was anſwered, that the books were ready for any member of the Society, who would undertake the ſearch; but that navigation had not been the general work of the Society, but the taſk of ſome particulars, as Lord Viſcount BROUNCKER, and ſome others, whoſe inventions were many of them never brought to be regiſtered. Nevertheleſs, that there are many things in the books relating to magnetiſm, the variation of the compaſs, &c. and that the Society ſhould be ready to receive commands of the preſident.

Dr. SLOANE preſented three ſorts of a ſweet ſmelling earth, found at Hoxton in a field, where ſome workmen were digging cellars for houſes, that were building. In digging but ſix feet deep there was firſt caſt up a clay, then a gravel, and afterwards a ſand, all ſmelling, but the lowermoſt the ſtrongeſt. It ſeemed to partake of a petroleum: and he ſaid, that it had yielded an oil upon diſtilling.

Mr. HENSHAW related, that he had been told, that in the French King's gardens at Paris, the top of the ſkull of a pigeon had been pared off, and the brain cut out, at ſome diſtance from the optic nerve: and that the vacuity having been filled with white wax, the pigeon had been ſeen to pick up corn three hours afterwards, but died in ſix hours.

Dr.

Dr. SLOANE ſaid, that all the cerebrum of a dog (and not the cerebellum) had been cut out at Montpellier by Monſ. CHIRAC, and the cranium filled with earth: that the dog had lived twenty four hours; but another dog, upon cutting the cerebellum, preſently died.

There was read the latter part of Mr. LEEWENHOECK's letter of January 23, 1685, being obſervations of the figures of the ſalts contained in the aſhes ſticking near the mouth of an oven of a foundery of cannon; in the aſhes ſticking to the ſides of an oven, where lead is calcined; in the ſalts of quick lime; in the lime of ſea-ſhells; in the Engliſh ſoda or glaſs-wort; in the ſoda of Britany; in the ſoda bariglia of Alicant: and in ſal armoniac [a]. The figures were likewiſe ſhewn, curiouſly deſigned by Mr. LEEWENHOECK.

In the poſtſcript he mentioned, that he had found in the womb of a bitch, that had been limed three or four times not three days before, a great number of living animals, which are the ſeed of a dog.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, May 1, 1685 [b], was read, mentioning, that at Leyden there had been cut out of a bladder by SMALRIUS a few years ago two inches of the ſmall end of a tobacco-pipe, which had been ſtuck into it ſome time before, and was kept at Leyden; a farther account of which might be procured from Mr. THOMAS MOLYNEUX: and

That one COLEBRON, a chirurgeon in Suſſex, had twice cut out the ſtone of the bladder after the manner mentioned by Dr. LISTER; and that in one of theſe attempts, the patient being a young child, he had ſucceeded.

This letter was accompanied with a copy of Sir WILLIAM PETTY's *ſupellex philoſophica*, as it had been offered to the Society at Dublin, containing forty five articles, as follows:

" 1. Scales and ſteelyards to weigh in the air and water.
" 2. Scales to ſhew the weight without proſtaphæreſis.
" 3. Inſtruments whereby to meaſure the ſuperficies of irregular bodies.
" 4. Inſtruments to meaſure irregular magnitudes.
" 5. To meaſure the fineneſs of gold and ſilver.
" 6. To meaſure the loading and unloading of a ſhip.
" 7. To meaſure the goodneſs of teleſcopes and microſcopes.
" 8. To meaſure the heat, moiſture, and weight of the air.
" 9. To meaſure ſun-ſhine and rain, and the force of wind.
" 10. To meaſure the ſtrength of ſaline liquors.
" 11. To meaſure the ſtrength of brandy and other ſpirits often diſtilled.
" 12. A parallelogram.
" 13. An artificial eye.
" 14. A Monochord and pipe.
" 15. A water level.

[a] *Philoſ. Tranſact.* N°. 173. p. 1081—1090.
[b] Letter-book, vol. x. p. 138.

" 16. A

" 16. A Mariner's compaſs, a variation, and dipping needle.
" 17. Mr. FLAMSTEAD's quadrant.
" 18. A clock.
" 19. A ſphærical magnet, and other magnets with duſt of the ſame.
" 20. An exhauſting engine.
" 21. An Æolipile.
" 22. A digeſter.
" 23. A limbec.
" 24. A randon bow.
" 25. A gun-powder meaſure.
" 26. A condenſing pipe or wind-gun.
" 27. A ſpeaking trumpet.
" 28. An acouſtic-tube.
" 29. Lamps.
" 30. A meaſure of refraction.
" 31. A wind-watch.
" 32. Teleſcopes.
" 33. Microſcopes.
" 34. Burning-glaſſes.
" 35. Priſms.
" 36. A ſtone-cutter's wheel and quadrants.
" 37. A turner's lathe for compounded figures.
" 38. A wind-furnace, bellows, and blaſt-pipe.
" 39. A ſkrew-preſs.
" 40. A touch-ſtone.
" 41. A water-trough with pullies and plummets.
" 42. A pair of globes.
" 43. A fixed globe.
" 44. A burning metal.
" 45. A looking-glaſs.

Dr. PAPIN preſented four medals made after his manner by order of the Society; the ſubſtance of them being only the gelly of bones, though the colours were different according to the ſoils.

He made likewiſe the experiment, how water would paſs through leather and ſeveral woods; and whether it would produce bubbles. His account of it was as follows[p]:

" Being commanded to try, whether water might be driven into an exhauſted " receiver through the grain of leather, and ſeveral ſorts of wood; and whether " it would produce there any bubble, I have made four experiments upon " that ſubject, and having firſt tried a piece of leather much after the ſame man- " ner as in the laſt meeting, but that this time the grain was upwards, ſo that " the water could find no way to get into the receiver, but thorough the ſaid

[p] Regiſter, vol. vi. p. 239.

" grain: I ſaw, that in half a quarter of an hour's time, hardly one drop could be " driven in, and it made no bubbles at all.

" 2dly, I have alſo tried with a cork, but I have not found, that any thing " could get through, though it ſeems to be a very ſpongy body.

" 3dly, I have tried to let a piece of oak wood ſtand upon the engine for a " whole day, and I found, that the water getting along the veſſels into the " exhauſted receiver, did ſtill produce there ſeveral bubbles, but not ſo frequent " as in the beginning; which diminution may be aſcribed to the obſtruction of " the pores by ſome impurities in the water, or by the ſwelling of the wood.

" 4thly, I have alſo tried with wood cut ſideways, that the water might not " get along the veſſels, as it did in the third experiment; and I have found, that " no water can get through the wood thus cut."

May 13, at a meeting of the COUNCIL were preſent,

Dr. LISTER vice-preſident

Sir JOHN HOSKYNS	Mr. HALLEY
Mr. HILL	Mr. WALLER
Dr. SLARE	Mr. ASTON.
Mr. HOOKE	

It was ordered, that the treaſurer give Dr. PLOT twenty pounds for his ſervices done the Society.

At a meeting of the SOCIETY on the ſame day, Dr. LISTER vice-preſident in the chair,

There were elected

THOMAS Earl of Pembroke,	Mr. BEAUMONT,
Monſ. VILLERMONT,	Mr. LEIGH.

There being ſome diſcourſe concerning the making of a general index to the Society's regiſters, it was referred to a council to be ſummoned to meet on the Wedneſday following at eleven o'clock.

Mr. JOHNSON of Canterbury ſhewed a curious proſpect of the cathedral of that city drawn by himſelf in oil-colours; as alſo ſeveral views of the country adjacent.

Mr. ASTON read part of a letter from Mr. JESSOP of Broomhall, wherein he inquired, whether any of the Society had obſerved any monthly periodical motion of the quickſilver of their barometers; ſince upon an experience only of a year and half he ſuſpected, that there are four monthly periods in it, as there are in the ebbing and flowing of the ſea.

Dr.

Dr. PLOT communicated part of a letter from Mr. OBADIAH WALKER concerning a ſwarm of bees at Univerſity-college in Oxford, which ſettled upon an elm branch, that a commoner held in his hand, as he was walking near the hall, and was hived.

A letter of Mr. WILLIAM MOLYNEUX to Mr. MUSGRAVE, dated at Dublin, April 17, 1685 [q], was read, concerning a new ſort of hygroſcope contrived by himſelf. A piece of whip-cord about four feet long was faſtened at one end to an hook: at the other end hung a pound-weight, ſo fitted, as to carry an index of a graduated circle. The moiſture of the air twiſts the rope, and gives a motion to the index upon the circle; and the drineſs of the air untwiſts the cord, and brings back the index.

Mr. HENSHAW mentioned, that he had obſerved the barometer to be ſometimes affected with a ſouth-weſt wind, as if there were an eaſterly wind. But he ſuppoſed a reaſon hereof might be, that the wind was eaſt above, though weſt below.

Mr. HOOKE obſerved, that ſome time in a winter before a froſt the quickſilver of the barometer has been higher than at any other time of the year.

Dr. PAPIN made a trial, how an æquicrural ſyphon of ten feet high made of glaſs would continue to work. After a quarter of an hour it ſtopped, and the water after an hour and a half's time reſted at about two inches from the top. But the bubbles appeared plainly at about eight feet, ſticking to the inſide of the glaſs pipe.

May 20. Dr. LISTER vice-preſident in the chair.

Dr. MILLES preſented to the Society in Dr. BRIGGS's name the ſecond edition of his *Opthalmographia*, much inlarged; which Dr. MILLES was deſired to peruſe.

Dr. DANIEL COX deſired to borrow RAUWOLF's *Itinerarium*; which the library-keeper was ordered to lend him, taking the uſual ſecurity.

A letter of Dr. PLOT was read, concerning the character to be employed in the *Hiſtory of Fiſhes*; ſome ſpecimens of which being viewed were well approved of: and it was recommended to him, that there might be a border with the Society's arms.

Dr ROBINSON communicated to the Society a draught of propoſals to be made for printing Mr. RAY's *General hiſtory of Plants*; which were read, and approved of to be printed in that form, the ſecretary drawing up a ſhort atteſtation, and ſigning it, with the liking of Dr. LISTER the vice-preſident; and the members preſent declaring, that when the book ſhould be finiſhed, they would be ready to give a farther and larger teſtimony of the eſteem, which they have of ſo learned a member.

[q] Letter-book, vol. x. p. 122. It is printed in *Philoſ. Tranſact*, N^n. 172. p. 1032. for June 1685.

Mr.

Mr. ASTON read two letters, which he had received, one from Mr. JOHN JAMES ZIMMERMAN, dated at Amſterdam; the other from Dr. REISELIUS, dated at Stutgard, April 5, 1685[r], deſiring, that ſome books might be ſent to the Duke of Wirtemberg, and mentioning, that the æquicrural ſyphon had worked at above thirty feet high.

Mr. ASTON was ordered to conſult with Dr. PAPIN in giving an account of ſuch experiments, as had been made concerning that ſyphon before the Society[s].

Mr. ASTON communicated a letter to himſelf from Monſ. JUSTEL[t], accompanying a box from Monſ. VILLERMONT, wherein were ſome of thoſe ſtrange honey-combs found in the Weſt-Indies, and formerly mentioned to the Society; together with a piece of natural ſhagreen; a piece of cinnamon of the river of the Amazons, and another ſort from another place; as alſo a piece of the clove-tree from America.

Mr. HENSHAW ſaid, that to make the ordinary ſhagreen the aſs's ſkin was boiled, and then ſtrewed with muſtard-ſeed, and preſſed to make the ſkin riſe.

The cinnamon tree from the river of the Amazons was no other than the cortex Winteranus.

Mr. HOUGHTON obſerved, that the true cinnamon and the Jeſuit's bark broke ſtringy; but the caſſia or baſtard cinnamon more ſhort.

A letter of Sir RICHARD BULKELEY to Dr. LISTER, dated at Dublin, May 5, 1685[u], was read, deſcribing the new ſort of chariot or calaſh made there by one CLEVET, having but two wheels, and not overturning; one wheel being able to go on a ſuperficies above three feet higher than the other: but if it overturns, it is done without any diſorder to the perſon, who ſits in the calaſh.

Dr. SLOANE preſented a glaſs of the water taken from the ſweet-ſmelling earth found at Hoxton. It had a very aromatic ſmell, and was now pretty clear, though it had at firſt been ſomething white. He ſaid, that a perſon had drank a pint of it, which gave him two or three ſtools; and another a quart, without being moved by it. He was deſired to draw up an account of his obſervations concerning the earth.

Dr. AGLIONBY ſhewed ſome propoſals of a perſon to furniſh a goudron or ſubſtance like tar, of good uſe for ſhips in preſerving them from the worm, and from burning, as it melts without flaming, and was good for caulking. He was deſired to bring ſome of this goudron to the Society.

Dr. LISTER mentioned, that he had received from Monſ. SEGUETTE ſome of his

[r] Letter-book, vol. x. p. 143.
[s] Mr. ASTON's letter to Dr. REISELIUS was dated June 4, 1685. Ibid. p. 144.
[t] Ibid. p. 135.
[u] Ibid. p. 126. It is printed in the *Philoſ. Tranſact.* N°. 172. p. 1028.

cryſtals, which would melt down at a candle, without flaming or cracking as ſalt; part of which he would bring to the next meeting of the Society.

The figure of the hygrometer in Mr. WILLIAM MOLYNEUX's letter to Mr MUSGRAVE, read at the laſt meeting, was ſhewn; and Dr. PAPIN ordered to make ſuch an hygrometer againſt the next meeting.

Dr. PAPIN ſhewed the experiment how ſmall bodies ſwimming upon water run together, and cleave to one another, as well where the air comes to them, as *in vacuo*.

May 27, at a meeting of the COUNCIL were preſent

Dr. LISTER vice-preſident

Sir JOHN HOSKYNS	Mr. HILL
Sir ANTHONY DEAN	Mr. HALLEY
Mr. COLWALL	Mr. ASTON.

It was ordered, that the members of the Oxford and Dublin Societies reſiding at Oxford and Dublin, who are fellows of the Royal Society, in conſideration of their charges for experiments in thoſe cities for promoting the common end, ſhall be excuſed from half their weekly payments, and that only 26 *s.* a year be demanded of them for the future:

That the treaſurer pay to Mr. ASTON the bill for copying ſome of the regiſters, being twenty four pounds eleven ſhillings and nine-pence, for the uſe of JOHN WILLIAMS:

That the ſecretary cauſe a general alphabetical index to be written out of the particular indexes of the books of the Society.

Mr. WALLER and Mr. HAAK were deſired to make an index to two of the minute-books, which had none.

Several of the members of the Society being willing to give one or more plates to the *Hiſtory of Fiſhes*, now printing at the Society's charge; it was deſired, that they would ſend in their money by Mr. HUNT to the treaſurer (a guinea being computed to be the moderate rate of each plate) to the end, that their names might be written on their plates, as they came to be ingraved.

The council agreed to propoſe to the Society Mr. MOULT, as a perſon fit to be employed in making the chemical operations, which ſhould be ordered by the Society.

At a meeting of the SOCIETY on the ſame day, Dr. LISTER vice-preſident in the chair.

Dr. TYSON preſented to the Society *Neurologia Univerſalis Raymundi Vieuſſens Montiſpeſſulenſis*, ſent from the author.

Upon.

Upon mention of the clove-bark given at the laſt meeting, it was ſaid, that an oil of clove was made of it in the Weſt-Indies.

Dr. GALE ſaid, that ARISTOTLE had mentioned a ſugar or honey of maple, curing mad perſons, and making ſober perſons mad.

A letter of Mr. MUSGRAVE was read, mentioning, that he had been written to by Dr. MARK, that the Elector of Brandenburg deſired to know the Society's opinion concerning the controverſy of Monſ. KUNCKEL: that he had commanded him to deſire the *Philoſophical Tranſactions* to be ſent, and to hold a correſpondence with the Society, and to acquaint them, that Monſ. KUNCKEL had an art of making red glaſs like a ruby; another glaſs like an agate; and artificial amber: and that he deſired to have the receit for making Prince RUPERT's metal.

Dr. LISTER remarked, that the arcanum of red glaſs was to make the red jet or glaſs lead, which flows upon nealing.

Mr. HOOKE obſerved, that the ſcarlet-red window glaſs was brought from Germany; but that there had been none brought over for eighty years paſt.

Dr. GALE mentioned, that he had ſeen a manuſcript 400 years old, intitled *Brantz de tinctura Vitri*, which, he ſaid, he would give a farther account of.

Mr. HENSHRW ſaid, that the making of counterfeit amber had been long known here, and that it was done with turpentine gently evaporated and ſtirred till it came to a conſiſtence: that it was not to be diſtinguiſhed from true ſuccinum, but by rubbing and heating it; for then it diſcovered its turpentine ſmell, whereas true amber has a roſemary ſmell.

It was ordered, that Dr. PAPIN ſhould try how this counterfeiting amber would ſucceed.

A letter of Monſ. JUSTEL to Mr. ASTON [x] was read, mentioning hail-ſtones, that had fallen at Paris, of four ounces weight, having ſeveral plates or facettes like a diamond: that the ground, where truffles grow, ſmells of them ſix weeks or a month before they are grown, but not at all when they are grown: that there was made a concave ſpeculum at Paris, five feet eight inches broad, Engliſh meaſure, and weighing 2500 *lb.* with the caſe: and that Mr. VAN SUKER, a Dutchman, had made a perſpective glaſs of 180 feet, and was perſuaded to make one of 300.

There was read an account of ſome experiment made by Mr. BALLARD, and communicated from Oxford, relating to ſome experiments of Monſ. KUNCKEL about the mixture of ſpirit of wine with ſyrup of violets, milk, and water, in order to the finding out the nature of the ſpirits, of ſeveral ſorts of wines, and other liquors [y].

[x] Letter-book, vol. x. p. 155.

[y] Ibid. p. 150.

Upon occaſion of the different heating of ſpirit of wine, Mr. HENSHAW queried, whether the ſpirit of wine made uſe of were all of it new drawn. To this purpoſe Dr. TYSON ſaid, that ſpirit of wine and ſpirit of nitre mixt in equal quantities made a liquor like blood; but that the experiment would not ſucceed, unleſs the ſpirits were new drawn.

Dr. PIT ſaid, that though ſpirit of wine well rectified ſeems to be dephlegmed, becauſe it burns off in a ſpoon, yet there may be a fallacy, ſince the heat of the ſpoon may raiſe the phlegm. And to this purpoſe, if a diſh of ſpirit of wine be ſet in water, to keep it cool, and then be fired, it will have a great deal of phlegm.

Dr. PAPIN brought in an hygrometer made after the manner of Mr. MOLYNEUX.

June 3. Dr. LISTER vice-preſident in the chair.

A letter of Dr. WALLIS to Mr. ASTON, dated at Marſton St. Laurence near Banbury, June 1, 1685[z], was read, giving notice, that he had ſent a manuſcript treatiſe of logic with a dedication prefixt to the Royal Society.

The book being preſented, the dedication was read; and the treatiſe itſelf referred to the peruſal of Mr. MEREDITH.

Mr. HOOKE read an account of a luminous phænomenon, in colour like the tail of a comet, ſeen ſometimes after ſun-ſet in the weſt, and at other times in the eaſt before the ſun-riſing, lying under or near the eclipſe, reaching from about forty degrees from the ſun to about ſeventy, being fourteen degrees large, and ending in a point. It had been firſt mentioned by Mr. CHILDREY in a book printed about 1661[a], but ſeen by him ſeveral years before, and ſince that time obſerved by Mr. HOOKE; but in 1683 publiſhed as a new diſcovery by Monſ. CASSINI at Paris, and ſince by Monſ. FATIO at Geneva.

A letter of Mr. MUSGRAVE to Mr. ASTON[b] was read, mentioning, that he had ſent two of the ſhells of the fiſh, which yields the purple, from Mr. MAUNDER, chaplain to Colonel LUTTEREL of Dunſter-caſtle in Somerſetſhire; who would have ſent the fiſh, if it would have kept without being offenſive: that the part of it, which yields the colour, was, he ſaid, a thin watry ſubſtance in the back, and not enough in one fiſh to make ſix or ſeven letters. That ſome of the ſhells are tinged in the inſide, others altogether white. Mr. MUSGRAVE likewiſe ſent the patterns of two ſorts of lewer or ſea-liver-wort, *lichen marinus Raii*, growing near Minehead, a black ſort and a green.

An extract of a letter of Monſ. VILLERMONT to Monſ. JUSTEL was read, mentioning a flying fiſh, which he took off the iſles of Porqueroles by Toulon; the mugil or cephalo; the muræna, the ſhell-fiſh ourſin or heriſſon;

[z] Letter-book, vol. x. p. 141.
[a] *Britannia Baconica.*
[b] Letter-book, vol. x. p. 140.

and

and the tail of a fiſh taken at Cayenne, which is like the beak of a parrot.

Upon a diſcourſe concerning the preſerving of dead bodies, Mr. WALLER ſaid, that he had ſeen a dead body, the face whereof looked freſh in a coffin, that had been filled up with melted pitch round the corps.

Dr. PAPIN produced the draught of a fountain of his own contrivance, which being liable to be ſpoiled by being removed, he deſired the Society to appoint ſome perſons to ſee the working of it for a whole day together, whether it will not run conſtantly without loſing any thing of its ſtrength[c].

The ſecretary read his anſwer to Dr. REISELIUS's letter.

June 10, Dr. LISTER vice-preſident in the chair.

The ſecretary was directed to return thanks to Dr. WALLIS for his manuſcript treatiſe of logic, and to mention to him the printing of it.

Dr. TYSON ſhewed one of the cochineal inſects, which appeared to be a lady-fly, and of the beetle-kind. It was delivered to Mr. HUNT to be drawn microſcopically.

Dr. SLOANE ſhewed how the water from the ſweet-ſmelling earth at Hoxton would ſuddenly change upon an infuſion of galls, and be very black.

It was deſired, that when Mr. MUSGRAVE wrote to Dr. MARK, he would inquire what likelihood there might be to obtain the copies of any of MARGGRAVE's deſigns of fiſhes about Braſil, which were ſaid to be in the Elector of Brandenburg's poſſeſſion; and to mention, that the favour ſhould be acknowledged on the plates.

Mr. HENSHEW inquired, whether Mr. COLE could fix all the ſeveral colours ſaid to come from the juice of the buccinum.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, June 6, 1685[d], was read, returning the thanks of the Philoſophical Society there for the Royal Society's remitting half of the weekly payments to ſuch of their members, as reſided at Oxford, and contributed to the making of experiments.

He mentioned in this letter, that Mr. COLE ſaid farther of this fiſh, that to have all thoſe colours, which the liquor of it affords by the help of the ſun, the liquor laid on a cloth, &c. muſt be dried in the morning ſun.

He took notice likewiſe of an old way of making artificial amber to be ſeen in a manuſcript belonging to Magdalen-hall: and

[c] Regiſter, vol. vi. p. 244. It is printed in *Philoſ. Tranſact.* N°. 173. p. 1093. for July 1685.
[d] Letter-book, vol. x. p. 148.

That

That an old braſs key had been given to the Oxford Society, ſomewhat reſembling one part of a claſp for a gown, which was ſuppoſed to be very antient, and was brought out of Berkſhire.

Mr. MUSGRAVE ſent alſo an account of a piece of wtachwork made by one SAMUEL WATSON, a watch-maker at Coventry, ſhewing the riſing, ſouthing, and ſetting of the ſun, his declination and longitude, with the hour of the day; the riſing, ſouthing, and ſetting of the moon, her conjunction and oppoſition to the ſun, the ſign and degree, in which ſhe is; the eclipſes of the ſun and moon; the day of the month in the Julian account; the day of the week; the golden number and epact; the dominical letter, and cycle of the ſun, with many other particulars. It was to be wound up but once in eight days, and was not ſubject to be out of order.

Mr. HOOKE ſuppoſed, that it might be the ſame piece of watch-work, that was in the king's bed-chamber; and was of opinion, that it would not reach the exactneſs, that was pretended.

A letter of Mr. HUNGERFORD to Dr. PLOT was read, recommending Signor GRANDI, a phyſician of Venice, as a fit perſon to correſpond with the Society.

Mr. HOOKE made a farther explanation of his opinion about the luminous phænomenon mentioned at the laſt meeting, illuſtrating it with ſeveral ſchemes.

A letter of Mr. HEVELIUS to Mr. ASTON, dated at Dantzick, May 19, 1685, N. S.[e], was read, giving notice, that he had ſent ſeveral copies of his *Annus Climatericus*, newly printed.

A letter of Monſ. JUSTEL to Mr. ASTON was read, mentioning ſome books, which had been lately printed abroad, and Monſ. DE VILLERMONT's readineſs to ſend to the Society the filtre for taking the ſalt out of lye, that has been uſed.

Two letters of Monſ. DE VILLERMONT, one in French to Mr. ASTON, the other in Latin to the Society[f], were read, giving thanks for his election into the Society, and promiſing all diligence in promoting the ends of its inſtitution.

Part of a letter of Mr. LEEWENHOECK, dated March 30, 1685[g], was read, containing ſome curious obſervations about the manner of generation from an animal, and not an egg; the crooked ſhape and ſtiffneſs of the Fallopian tubes in a bitch, rendering them incapable of giving a paſſage to eggs; his finding the animals of male ſeed in ſeveral parts of the cornua of a bitch, that had been lately limed; with a deſcription of the uterus. The reſt of the letter was deferred till the next meeting.

[e] Letter-book, vol. x. p. 142.
[f] Ibid. p. 136, 137
[g] It is printed in the *Philoſ. Tranſact.* N°. 174. p. 1120. for Auguſt 1685.

June

June 17. Upon mentioning the fixing of colours, Sir JOHN HOSKYNS ſaid, that it had been uſual to rub the backſide of the paper with alum-water, to preſerve the colours on the other ſide.

It being ſaid, that SWAMMERDAM had uſed artificial amber for preſerving his inſects, it was deſired, that Dr. SLARE would try the beſt ways of making it, in order to the preſerving the inſects in the repoſitory.

Upon mentioning the preſerving of plants with gum-water and wormwood, or rather colloquintida, Dr. SLOANE preferred the ſtitching them down to the book, after they had been preſſed between the leaves of the book.

A letter of Mr. MUSGRAVE to Mr. ASTON [h] was read, mentioning, that Dr. COLE of Worceſter had ſeen and meaſured two large ſtones voided by the penis [i].

The latter part of Mr. LEEWENHOECK's letter of March 30, was read, concerning the manner how he conceived the animals in ſeed to caſt their firſt ſkin, having a long tail, and to be nouriſhed by the egg; the deſcription of the fœtus of a ſheep after ſeventeen days; of the eggs in the ovarium, two of which were red and as big as a pea, when the whole fœtus was no bigger than an eighth of a pea: of the deſcription of the animal in the ſeed of a rabbet: of the uterus of a rabbet two days after it had been with the buck; of another uterus after ſix days: of the fœtus of a ſheep three days old.

The ſecretary was ordered to return thanks to Mr. LEEWENHOECK for this curious letter, and Sir JOHN HOSKYNS propoſed to deſire him, that he would examine, with his microſcope, the eggs of ſilk worms, that have been impregnated, and thoſe, that have not; it being probable, that thoſe eggs are fit for making a farther diſcovery; they being likewiſe not difficult to procure.

Dr. PAPIN having deſired the Society to order ſome perſon to watch his new fountain for a whole day, to ſee whether it would perform what he promiſed; Mr. HUNT and his man were ordered to attend him and relieve one another.

Dr. SLARE preſented the Society three boxes containing Swediſh minerals:

2. Minerarum argenti è fodinis Sahlbergicis.
   N°. 1. Minera argenti optima.
   2. Minera alia haud multo vilior.
   3. Minera argenti, cui multum plumbi admixtum.
   4. Bona minera argenti ſed ſaxo commiſta.
   5. Minera argenti ſingularis quæ ſi cum ▽ lavatur, tota effluit; quod Germanicè vocamus *des frtz iſt treſairſlingſtip*.
   6. Minera argenti pura & ſubtilis à lavatione reſidua, Germanice *Krymer* argenti dictus.

[h] Letter-book, vol. x. p. 158.
[i] Dr. COLE's Letter is printed in the *Philoſ. Tranſact.* N°. 175. p. 1162. for Sept. and Oct. 1685.

2. Minerarum ☿is è fodinis Falungicis.
   A. Minera ☿is diſtiſſima.
   B. Alia item bona.
   C. Minera ☿is multo ſaxo inquinata.
   D. Minera prioribus vilior.
   E. Minera ☿is viliſſima & pauperrima.
   F. Minera ☿is ſemel tota: *Win desſrtz vender Salt Roſt Reint.*
   G. Portio mineræ ſemel liquefactæ: *Deſierſtein dictæ.*
   H. Recrementum minerarum ☿is fixum: *Fixt ☿ Diſlordens.*
   I. ☿ ſecundo fuſum, non tamen plane depuratum: *Diſwartzen ☿.*
   K. Sulphur ſtillatitium: Trepſh ſulphur.
   L. ⊕tum Suecicum aliquoties depuratum.
   M. Aliud ⊕ adhuc depuratius.
3. Minerarum ♂is.
   α. Minera ♂is optima.
   β. Alia minera perbona.
   γ. Adhuc alia item bona.
   δ. Minera ♂is communiſſima.
   ε. Recrementum ♂ fixum.
   ζ. Minera ♂is Lapponica, aliquantum ☽æ non tamen planè fixæ continens.
4. Talcum Suecicum, ut mihi relatum, per ſe in △ fluidum.

Mr. HOOKE ſhewed an inſtrument for the drawing the logarithm line, which, he ſaid, was ſuppoſed by DES CARTES not to be practicable.

Dr. PAPIN gave the following account of his experiments of keeping fruits in turpentine, and a pear kept *in vacuo* ten months[k]:

" Being commanded to make ſome trials about keeping plants in turpentine " hardened by evaporation, I have accordingly tried to keep ſome flowers " in the ſame manner, but I have found, as I had been told by the " hon. Mr. BOYLE, that the turpentine being much evaporated requires " a great heat to be kept liquid enough, and ſo is apt to ſpoil the flowers: but " being little evaporated it remains ſoft and eaſy to be melted by a moderate " heat. Nevertheleſs I have brought two flowers ſo kept in ſoftiſh turpentine; " becauſe in length of time the turpentine evaporating more and more may grow " harder, and do well enough.

" The pear, that had been ſhut up *in vacuo* about ten months ago, and had " kept its colour very well for above nine months, is much altered for the pre- " ſent, the factitious air having filled up the receiver and ſeparated the cover from " it. If the Royal Society pleaſeth to make ſome trials with the ſaid factitious " air upon animals and fire, I have all things ready for that purpoſe."

[k] Regiſter, vol. vi. p. 246.

June 24. A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, June 20, 1685[l], was read, containing an account of the way of making artificial amber, deſcribed in a manuſcript at Magdalen hall; which was by ſeething turpentine in an earthen glazed pot till it is as thick as paſte, and ſetting it eight days in the ſun; and afterwards drying the things, that are formed, in the ſun.

A letter of Mr. CHARLES LEIGH to Mr. MUSGRAVE, dated June 22, 1685[m], was read, returning thanks for his election into the Society, and deſcribing the ſepia in three figures drawn upon oil-cloth: the firſt as it lies upon its back; the ſecond on its belly; the third diſſected. There was alſo ſent a writing with the ink of the ſepia, atteſted by the perſons, who were preſent. He ſuppoſed the ink to be made of an auſtere ſalt mixt with the ſlime; and mentioned a decoction of the root of the gramen alopecurinum minus uſed for the cure of the jaundice; and the bone of the ſepia to cure films on the eyes of horſes; and that wormwood growing on the moſſes yields little fixt ſalt, and that very black.

Mr. HENSHAW conceived the fixt ſalt to be black, becauſe it was not calcined.

Dr. TYSON ſaid, that the ink-veſſel of the ſepia was nothing but its gall-bladder.

A copy of the minutes of the Dublin Society from May 4th, 1685, to the 25th, incluſive, was read, as follows[n]:

" *May* 4, 1685. A formed ſtone moſt exactly reſembling a cock was ſhewn by " Mr. ASHE: 'twas found in the midſt of a huge lime-ſtone at the ſame place in " Weſtmeath, where thoſe formerly ſent to the Society were got. He alſo preſent- " ed thread made in Connaught of the root of trees; its colour very white: 'twas " fine and much ſtronger than uſual.

" Dr. MULLEN read a very particular account of the diſſection of the mon- " ſtrous double cat, mentioned in the minutes of February 23, 168⅘, and ex- " plained all the figures accurately.

" Mr. ASHE produced an account of the wind, weather and hight of the mer- " cury in the barometer for the laſt month, taken at Trinity-college.

" *May* 11. A letter was read from Mr. MUSGRAVE, dated March the 31ſt, " 1685, containing ſeveral obſervations of Dr. TURBERVILLE of Sarum: the " minutes of the Oxford Society, from March 10th to the 31ſt, were read: the " thanks of the Society were ordered to be returned for them, and a copy of Dr. " PLOT's deſiderata in chemiſtry deſired.

" Mr. MOLYNEUX obſerved upon occaſion of Dr. LISTER's account of the " motion of the mercury in the barometer for the laſt year, that the hights thereof " were not always equal in London and here, yet they did generally riſe and fall " together, eſpecially in all remarkable changes.

[l] Letter-book, vol. x. p. 182. [m] Ibid. p. 164. [n] Ibid. p. 166.

" A draught of the veſſel found in York, ſent by Mr. MUSGRAVE, was ſhewn.

" Mr. MOLYNEUX preſented the deſcription and draught of a very ingenious " hygroſcope or weather-clock (as he calls it) invented lately by him, which by a " piece of whip-cord and a weight with an index, ſhews the leaſt alteration or " variety in the moiſture of the air.

" Mr. MOLYNEUX going for England, Mr. ASHE was choſen ſecretary.

" *May* 18. Dr. WILLOUGHBY in the chair.

" The minutes of the Oxford Society from March 31 to April 23, 1685, " were read, and the thanks of the Society ordered to be returned for them.

" Upon reading the account of Dr. WALLIS's extracting the root of a number " of fifty three places in the dark; the Society was informed, that one of their " members had by the help of memory eaſily extracted the root of a number of " thirteen or fourteen places, going on in an arithmetical progreſſion of odd num- " bers, as 1, 3, 5, 7, &c. and could have proceeded with equal facility. He ſup- " poſed alſo that the root of an unity with many cyphers might be ſo extracted " with yet greater eaſe. Query, whether the doctor had any particular method " for the doing of this.

" A copy of Mr. LEEWENHOECK's letter concerning the ſalts of wine and " vinegar, &c. was deſired; as alſo Dr. GARDEN's diſcourſe of the weather.

" The demonſtration of MERCATOR's propoſition *De Quadratura Circuli* (if " not printed in the *Philoſophical Tranſactions*) was earneſtly deſired by the Society, " and Dr. WALLIS's thoughts of it.

" Mr. ASHE preſented a very odd inſect, which grew to a tree in a large huſk or " ſhell, together with a letter to him, giving an account thereof, and the hiſtory " of inſects in general from Monſ. DORCHAIRE: the thanks of the Society were " ordered to be returned for this letter.

" Dr. MULLEN gave an account of a patient of his, who had a frequent ſtrong " pulſe in the very top of his head, which ſeemed to ſhoot up from his heart: " when the pulſe beat moſt ſtrongly, there was a total intermiſſion in the wriſts; " when it beat weaker in the head, there was a defection and remiſſion in the pulſe " of the wriſts: whence he collected, that the circulation of the blood might, " perhaps, be wholly ſtopped downwards, when this extraordinary pulſe hap- " pened in the head.

" Mr. ASHE informed the Society, that he lately ſaw in the country a horſe, " whoſe yard was fixed about two inches below the anus: 'twas in as large pro- " portion as any other horſe has, and when erected ſtood prominent from the " buttock: it had alſo two teats under the belly: it ſeemed to have all the cou-

" rage and vigour of ſtone horſes, but to want their luſt or appetite for mares.
" This gave occaſion to Dr. WILLOUGHBY to diſcourſe concerning hermaphro-
" dites, one eſpecially (that paſſed for ſuch) which he ſaw in Dublin, and of
" which he gave the Society an account. Mr. ASHE likewiſe related the hiſtory
" of the gentlewoman in town, who upon ſight of a natural, that was carried
" about to beg, brought forth exactly ſuch another, not only reſembling it in
" features, and particularly in the red eyes, like thoſe of a ferret, but alſo imi-
" tating all his aukward geſtures. He produced ſome of the hair of each, both ſo
" remarkably white as not to be diſtinguiſhed.

" Dr. MULLEN gave an account of a monſtrous chicken with two bills, and al-
" ſo of an egg, which at the big end had a fleſhy ſubſtance in figure like a glaſs-
" drop, the ſmaller part hanging out, at the extremity of which was a drop of
" blood: the ſhell was not quite cloſed. This fleſhy ſubſtance taken out was as
" big as the largeſt glaſs-drop, included in a membrane very tough; the inſide
" a collection of thin ſmall tunicles crammed cloſe in that membrane, the yolk
" and white much leſs than ordinary. Accurate figures hereof are taken by Mr.
" SANDYES. Dr. MULLEN then undertook to give an account to the Society out
" of antient and modern obſervations, what has been ſaid of great and remarka-
" ble ſtones, taken out of the bodies of animals.

" Mr. TOLET was then nominated treaſurer in Mr. PLEYDELL's place.

" *May* 25. Mr. ALAND, a gentleman of Waterford, communicated to the So-
" ciety a method of finding the longitude by conſidering the diſtance of the moon
" from the ſun, its latitude from the ecliptic, and diſtance from other planets.
" He has invented a particular ſcale to reduce planets to the ecliptic, and another
" inſtrument to take their diſtances: he profeſſes to have made a dozen obſerva-
" tions, and not erred two minutes, which error he imputes to the ſmallneſs of
" his inſtruments. Ordered, that Mr. KING, Mr. TOLET, and Mr. ASHE do
" examine this method, and give an account thereof to the Society the next
" meeting.

" Mr. TOLET diſcourſed of the hiſtory, and ſeveral ways of finding the longi-
" tude hitherto thought of, with their particular inconveniences.

" Sir, I here ſend you our minutes from May 4th to the 25th. I ſuppoſe
" Mr. MOLYNEUX has communicated all before that time. I have likewiſe in-
" cloſed ſome of the hair ſo remarkably white, mentioned in the minutes of May
" the 18th, &c."

There was produced part of the cochineal fly drawn microſcopically;
As alſo proofs of ſix plates of the *Hiſtory of Fiſhes*.

A copy of a letter of Dr. LISTER to Mr. RAY [o], containing ſome obſervations about birds, which might be added to the *Ornithologia*, was read.

[o] Ibid. p. 184. It is printed in the *Philoſ. Tranſ.* N°. 175. p. 1159. for Sept. and Oct. 1685.

A letter of Monſ. JUSTEL to Mr. ASTON, dated June 17, 1685 [p], was read, mentioning a burning concave at Paris of five feet and one inch diameter, being a portion of ſixty degrees; but that it performed little more than thoſe of thirty three or thirty four inches; of which opinion was alſo Mr. HOOKE.

This letter and another of Monſ. JUSTEL [q] mentioned likewiſe a ſample of ſilk from the Antilles finer than the Eaſt-Indian; a curious plant of St. Chriſtopher's, called echino-melocardus, and another called frangipane; a ſort of mirobolans of Martinico; a piece of Weſt-Indian wood ſmelling like human excrement; virgin ſugar, which condenſed in the canes; a ſort of fiſh with a body like a leech brought from Straſburg, moving in its mud againſt change of weather, ſerving as it were for a barometer.

An account was given of the watching of Dr. PAPIN's fountain for about four hours, in which time it might be conceived, that all the water circulated above a hundred times.

It was deſired, that Dr. PAPIN would make one for the Society, as ſoon as the time ſhall be expired, that he had ſet for diſcovering that contrivance.

Dr. PAPIN brought ſome flowers included in amber, which were approved of, though the amber was conceived to be a more proper covering for inſects; a trial of which he promiſed at the next meeting.

He put ſome living flies into factitious air made from a pear, that had been ſhut up *in vacuo* eight months; but though, he ſaid, ſeveral fiſhes had died ſuddenly in it, yet it did not now ſucceed, the veſſel having been too often opened.

Upon occaſion of an antient key mentioned to have been ſhewn the Philoſophical Society at Oxford, Mr. HENSHAW produced two old Roman keys and ſeveral other antiquities, as a ſtylus, a fibula, two *res turpiculæ*, a ring, two dice, one iron, the other ivory, a lunula, ſome pieces of coloured paſte or glaſs, ſome of the plaiſter of the piſcina mirabilis, and a braſs Egyptian teraphim; which the Society deſired might be left with Mr. HUNT for two or three days, in order that drawings might be made of them.

July 1. **Dr. LISTER** vice-preſident in the chair.

It being ſaid, that the ink-veſſel of the ſepia is the gall-bladder, Dr. LISTER doubted, whether any animal could ſo eaſily part with the gall, or had any veſſels to carry it directly out of the body.

A letter of Monſ. VILLERMONT to Mr. ASTON, dated at Paris, July 4, 1685, N. S. [r], was read, deſcribing his filtre for taking the alcali ſalt out of the lye or ſuds, which was employed for waſhing linen, ſo that the ſalt is not diminiſhed in quantity or virtue. It was thus: Take quick-lime, and let it be two or three days

[p] Letter-book, vol. x. p. 191. [q] Ibid. p. 192. [r] Ibid. p. 160.

a ſlaking,

a ſlaking, till it is almoſt in powder; then take ſix tubs having each a whole at the bottom, and fill them about nine or ten inches high with lime and aſhes ſtratum ſuper ſtratum, each bed being about an inch deep. Place the tubs ſo, that the water draining out of the firſt may be eaſily received, and put ſucceſſively into the other tubs. By this means the ſalt of the lye will be exalted, and the greaſe and foulneſs taken away. The tubs may be covered, and ſet by, being ſerviceable till they are ſo full of greaſe, that the water will not paſs. The aſhes being greaſy are fit for fewel.

Dr. PAPIN was ordered to make the experiment before the Society.

A letter of Mr. MUSGRAVE was read, together with a diſcourſe of Dr. ALLEN MULLEN made before the Dublin Society upon the diſſection of a monſtrous double cat, ſome of the parts being likewiſe explained by figures [r].

Dr. PAPIN ſhewed ſome Spaniſh flies, which he had included in turpentine hardened by evaporation. The turpentine being ſomewhat clammy, the flies were left to be dried in the ſun.

He propoſed a way for making cryſtalliſations *in vacuo* by joining two cylindrical veſſels (one that contained the liquor to be cryſtalliſed, the other empty) in an obtuſe angle; by which means when the veſſels are exhauſted, the vapours may eaſily paſs out of the veſſel of liquor made more hot into the empty veſſel, which is cool, and make way for the ſalts to cryſtalliſe.

It was ordered, that this experiment be made at the next meeting.

July 8, at a meeting of the COUNCIL were preſent

Dr. LISTER vice-preſident
Sir JOHN HOSKYNS — Mr. HILL
Mr. HOOKE — Mr. ASTON.

It was ordered, that the treaſurer pay to Dr. PAPIN a quarter's ſalary, being ſeven pounds ten ſhillings.

At a meeting of the SOCIETY on the ſame day, Dr. LISTER vice-preſident in the chair.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, July 4, 1685 [t], was read, mentioning, that a great part of the univerſity being in arms [u], the Philoſophical Society there was broken up for ſome time; and communicating an account of the diſſection of a monſtrous kidney made by Dr. HUOLAGHAN at Dublin upon the 17th of January, 168$\frac{4}{5}$. It was the right kidney of a man of

[r] This diſcourſe of Dr. MULLEN is printed in the *Philoſ. Tranſact.* N°. 174. p. 1135. for Auguſt 1685.

[t] Letter-book, vol. iv. p. 183.

[u] On occaſion of the rebellion under the Duke of Monmouth.

abou

about fifty years old, and weighed forty ounces. The moſt remarkable parts in it were repreſented in ſix figures. The fifth and ſixth figures were ſuppoſed to be polypus's in the kidney.

Dr. LISTER deſired, that it might be inquired what extraordinary ſymptoms had been obſerved in the man, whoſe kidney was thus ſwoln.

There was read a continuation of the account of boiling and other fountains by Dr. TANCRED ROBINSON, together with ſome obſervations on the French macreuſe and the Scots barnacle[x], confirming the macreuſe to be the *ſcoter* or *anus niger minor* deſcribed by Mr. RAY in the *Ornithologia*, and mentioning ſome other particulars relating to birds.

Mr. HENSHAW ſhewed the Society ſome more antiquities, as a glaſs teſſera; an amulet of the Gnoſtics; an antient picture of the virgin; a cameus or mixture of ſeveral Gods; a ring of Corinthian braſs, with a maſk of Silenus in a ſardonyx; with ſome others, which were left with Mr. HUNT to be copied.

Dr. PAPIN gave an account, that a ſolution of ſugar had been two days cryſtalling *in vacuo* by the way propoſed at the laſt meeting, and was not yet fit to be taken out. He propoſed another way for a quicker diſpatch.

He likewiſe brought ſome factitious air made of raiſins, in which flies, that were put, died preſently, and fire, that was put in, was immediately extinguiſhed.

There were ſhewn ſome of the plates of the *Hiſtory of Fiſhes*, which had been ingraved at Oxford.

Mr. HILL having mentioned a paſſage in PLUTARCH, relating, that ALEXANDER had found in Suſax 5000 talents of purple, which had been kept 200 years, and was yet freſh, Dr. LISTER ſuppoſed it not to have been the colour, but garments died.

July 15. Dr. LISTER vice-preſident in the chair.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, July 11, 1685[y], was read, containing an extract of one from Mr. LEIGH to himſelf, mentioning, that in January preceding in the balſamic earth in Lancaſhire formerly ſpoken of, was found a perfect buck ſtanding upon his feet, his fleſh whole, and not in the leaſt putrified, the ſkin and hair ſound, the eyes perfect, the horns ſoft, but growing hard, when brought into the open air. It was queried how long he ſuppoſed the buck might have been there.

Mr. LEIGH's letter mentioned likewiſe a calf, which he had ſeen the week be-

[x] Printed in the *Philoſ. Tranſact.* N°. 172. p. 1036.
[y] Letter-book, vol. x. p. 183.

fore

fore, whoſe ſkin was inverted, the fleſhy ſide being outward, and the hairy ſide next to the fleſhy pannicle.

It mentioned alſo a ſort of peat making ſo ſtrong a fire, as to flux a gold ring; and a tumor in a man's intercoſtals, which voided every day a fat ſubſtance as big as a nut.

Dr. LISTER remarked, that ſome peats make a very ſtrong fire: that at Appletreewick their lime-ſtones were all burnt within; that peat being bituminous metals might flux with it, as we ſee tin ore does with roſin, though with ſalts it all flies away.

Mr. HENSHAW ſaid, that a glow-worm held in the hand left ſhining, as a piece of rotten wood held near the fire, till it recovers itſelf by lying in the cold air.

A letter of Monſ. JUSTEL to Mr. ASTON [z] was read, mentioning, that a glow-worm ſhut in a fir-box had made the box tranſparent, though a cole of fire would not do it: that Monſ. VILLERMONT had a wreath ſent from Cayenne of about an inch thick, and three inches and a half diameter, the ſides whereof being preſt with a twenty pound weight lengthened to a foot; and upon withdrawing the weight returned to the former ſize and ſhape. From a paſſage quoted from a Spaniſh author it was ſaid to be a ſort of gum, that had an extraordinary ſpring.

There were likewiſe ſent from Monſ. VILLERMONT the figures of a ſtar-fiſh, and of the fruit of the cinnamon of the Amazons, ſeeming to be like a pine-apple.

A letter was read from Mr. ST. GEORGE ASHE, ſecretary of the Dublin Society, to Mr. ASTON, dated July 4, 1685 [a], returning thanks to the Royal Society for remitting half the payments to their members, who were of the Dublin Society, and communicating a copy of the minutes of that Society from June 1 to June 29, as he had in a former letter of May 30 thoſe from May 24 to the 25th incluſive [b]. Theſe minutes were as follow:

"*June* 1, 1685. This meeting was wholly taken up in reading Mr. ALAND's "paper about the longitude, and diſcourſing thereon.

"*June* 8. This being Monday in Whitſon-week, our meeting was adjourned.

"*June* 15. A letter from Mr. MUSGRAVE, dated May the 21ſt, was read, con- "taining Dr. GARDEN's ingenious diſcourſe of weather: the thanks of the So- "ciety were ordered to be returned for it. Some aſſertions of the doctor's therein "gave occaſion to the following queries to be conſidered and examined.

"1, Whether when it happens to rain, as the mercury riſes in the barometer, "the wind ſtill changes?

[z] Letter-book, vol. x. p. 194. [a] Ibid. p. 174. [b] Ibid. p. 166.

"2dly,

" 2dly, Whether when the wind turns to north, northeaſt, or northweſt, the " mercury always riſes ?

" 3dly, Whether at the riſing of the winds, the mercury generally ſubſides ?

" 4thly, Whether the extreme hights in the barometer, (which were obſerved " by Mr. MOLYNEUX to happen at the ſame time here, and at London) were " higheſt here or there ?

" The ſame letter gave occaſion to Dr. WILLOUGHBY to relate an account he " had from ATHAN. KIRCHER of a way of ſolving an odd meteor, which hap- " pens about Rhegium in Italy, every year in the hotteſt months, viz. the ap- " pearance of cities and men walking in the clouds ; that the ſhore and country " thereabouts abounds with antimony and ſelenites ſtones, the vapours drawn up " from which are ſpecular, and of the nature of looking-glaſſes, ſo that a ſmall " church upon a hill grows into a city ; and two men walking or fighting will be " multiplied into an army.

" He alſo gave a conjecture how the trade of ſelling winds was performed in " Lapland, &c. viz. by a conſtant diligent obſervation, they foreknow the " moſt notable changes thereof, which are more regular and ſtated in thoſe colder " countries, than with us : and hence it is, that the ſeller will determine his wind " to ſuch a day, but not any particular one, which the chapman requires.

" A letter from Mr. ASTON, June the 4th, was read ; and thanks were order- " ed to be returned to the Royal Society for the great honour and encouragement " done to us, in obliging our members (which were alſo fellows of their Society) " to pay but twenty ſix ſhillings a year contribution.

" In relation to Mr. RAY's *Hiſtory of Fiſhes*, which is ſetting out, every one " promiſed by his inquiries and endeavours to promote it, and to bring in what " information they could get. Dr. PAPIN's way of raiſing water was earneſtly " deſired, if not ſoon publiſhed ; and alſo a more particular account of the " monthly periodical motion of the mercury, and of the experiment of bodies in " water uniting *in vacuo*.

" Ordered, that the experiments of water paſſing through bodies, mentioned in " this letter, be repeated by Mr. ASHE and Mr. SMITH.

" Dr. SILVIUS preſented the new *Journal de Medicine*, and gave the Society " an account of the diſputation *De Acido et Urinoſo* between VOIGHT and " KUNCKELL, which he was deſired to examine.

" *June* 22, The minutes of the former meeting being read, this query was or- " dered to be added to the former :

" Whether the motion of the mercury was a more certain indication of the wea- " ther in the morning, at noon, or in the evening ?

" Dr. HUOGLAGHAN informed the Society, that having diſſected the child " with two heads, three arms, &c. mentioned formerly, he found, that all the in- " ward parts were double, except of the liver (which was as big as two livers) and " heart not much above the ordinary dimenſion.

" A letter from Mr. MUSGRAVE, dated May the 29th, was read, containing " the figures of a large ſtone of the bladder; the earthen veſſel found at York, " and a ſhell taken out of the ureter of a woman; and likewiſe Dr. WALLIS's " diſcourſe concerning the air's gravity in purſuance of Dr. GARDEN's. Half of " this diſcourſe was read, and upon mention of the air's ſpring as one of the " cauſes of wind, Mr. TOLET obſerved (as a confirmation thereof) that in " the late fire of the caſtle of Dublin, the glaſs windows of a gallery were all " forced inwards, the external air preſſing in, as the ſpring of the other was " weakened by rarefaction.

" Mr. ASHE gave an account, ſufficiently atteſted, of a man in Gallway, who " ſuckled his child for nine months: the father and daughter are now alive both, " the former having yet hanging breaſts like thoſe of nurſes. A more full ac- " count hereof was ordered to be brought in.

" Information given of a monſtrous fiſh with two hinder feet, taken upon the " ſhore at Myrean: this will be ſeen and examined.

" *June* 29. The monſtrous fiſh, mentioned in the laſt, was ſhewn: it is four " feet ſeven inches $\frac{1}{4}$ long with its tail, two feet ſeven inches $\frac{1}{4}$ broad with the " fins: the head two feet two inches $\frac{2}{10}$ round, is like a ſhark's; its mouth is " eight inches $\frac{4}{10}$ wide, having four rows of very ſharp teeth; it has two broad " fins by the ſhoulders, and two leſſer ones at the inſertion of the tail, near the " extremities of which fins grow out two very ſtrong feet ſix inches $\frac{8}{10}$ long, with " joints and hollow hoofs; its tail is two feet three inches $\frac{7}{10}$ long, much nar- " rower than the body, and diſtinguiſhed by ſeveral vertebræ. It was dried and " ſalted before we ſaw it, ſo that nothing remarkable within could be obſerved. " Our ſeamen and fiſhermen affirm they have not ſeen any fiſh like it: the figure " hereof is ordered to be taken by Mr. SANDYES.

" Dr. MULLEN preſented ſome urns with the bones and aſhes contained, found " at Dontrilegue in the county of Cork, with a letter giving an account thereof " from Mr. ANTHONY IRBY. They were taken out at three foot deep, being " fifteen in number, each having a ſmall round ſtone on the top for its cover; " ſome contained a pottle, others a quart, and the leaſt a pint. Ordered, that the " thanks of the Society be returned for this preſent and the letter.

" Mr. SMITH alſo informed us of urns found at Warringſtowne in the county " of Down in a Dane's fort: there was a ſmall building of ſtone about the cavi- " ty, containing a large urn with ſeveral ſmall ones: one of theſe is preſented to " the college library.

" A letter from Mr. MUSGRAVE, dated May 30th, 1685, was read, containing some minutes of the Oxford Society. Upon reading Dr. LISTER's proposal for cutting the stone by the os pubis, Dr. MULLEN informed, that this way of section is treated of by one VAN RHUINHUYSE; and Dr. DUN assures, that such a method has been long practised in France.

" Some of Mr. BELLARD's experiments were tried, viz. river water poured into a like quantity of spirit of wine grew only luke-warm, as KUNCKEL affirms. The like also succeeded in spirit of wine mixed with water, which had salt dissolved in it. Ordered, that the other experiments be repeated at our next meeting.

" A stone resembling a bird's wing, sent by Mr. FOLEY.

" Mr. SMITH also affirmed, that near Loughbricklan in the county of Down, upon removing a heap of stones to repair a bridge, the mouth of a cave was discovered, in a large room of which was a building of stone, containing two great urns: these by the eagerness of the searchers (who supposed them to hold money) were instantly broken."

Mr. ASTON was directed to desire Mr. ASHE to send over the figure of the monstrous fish, that it might be communicated to Mr. RAY.

Dr. PAPIN shewed the dissolution of sugar, which had been four days crystallizing *in vacuo*. It was not like sugar-candy, but like a piece of a sugar-loaf.

He likewise brought a large and more compleat draught of the vessels designed for the hastening evaporations and distillations by means of vacuum, the apparatus being conceived to be of use in the making of salt, copperas, and other things made by evaporation.

The experiment was ordered to be made in a small vessel at the next meeting.

Dr. LISTER presented a poem by Dr. ROBERT GROVE *De Sanguinis Circuitu*.

He likewise shewed the case of a bird of the jay-kind not described by Mr. RAY, and called in some places a silk-tail; which was delivered to Mr. HUNT to take the figure of it.

Dr. SLARE gave in an account of experiments, which he had made with a piece of mineral called kobalt, which had been sent him from Germany: which account was ordered to be registered [c] as follows:

" I have had by me a good large piece of a mineral ore, sent me as a great rarity from a physician to the Duke of Zell, under the title of coobalt and minera argenti.

[c] Register-book, vol. vi. p. 259.

" The ſubſtance of this ore looks ſomewhat white, and ſhining, eſpecially " when it is firſt broken: from this external aſpect it may perchance derive the " name of minera argenti: the miners call it coobalt. It breaks almoſt every " where mixt with veins or ſpecks of ſtone or ſpar.

" This ore comes out of Saxony, the like being yet to be found no where elſe: " they make it as criminal for any to carry it away before they have prepared and " diſguiſed it, and by ſome additions have brought it to that, which they term " zaffera, which ſeems to be a corruption of another word from the misfortune " of the German pronunciation: they bear ſo hard upon the ſ, that they often " make a z of it, inſomuch that I have often obſerved the young tyros in the " Latin tongue, that have put in writing ſuch Latin words they have learned " or heard from their maſters, to make theſe miſtakes very uſual, writing ſapiens " and the like with a z, zapiens: nor do I doubt but they have a reſpect to the " effect or product of this ſtone, which is the ſapphire-blue it reſembles: ſo that by " zaffer they would indicate the ſapphire made by this preparation.

" In the repoſitory I find a little fragment of a ſtone ſent by Dr. PLOT, which " has the character of metallum zaphoræ given it; and another paper with zaffera " writ upon it, with this interrogation, whether it be an earth?

" Dr. MERRET[a] has been very inquiſitive about it, in his obſervations on the 12th " chapter of the firſt book. He examines CARDAN, who calls it an earth, CÆS- " ALPINUS, who reckons it among ſtones, and SCALIGER, who paſſes it by un- " touched. Whereupon he concludes it an artificial compoſition of braſs, ſand, " lapis calaminaris, but not without ſome diffidence.

" Having ſhewn this ore to ſeveral curious perſons, I never met with any that " knew it: for that reaſon, before I preſented it to the Society, which I dare now " venture to do, I was willing to try, whether it were really the ſame thing, which " it was commended to me for. In the proſecution of theſe experiments we " may come to ſome reaſonable account of the nature of this ore.

" Dr. MERRET's conjecture of its being an artificial preparation is made void " by this very preſent, which ſhews itſelf to be a true ore or mineral.

" The name given it in the repoſitory of metallum zaphoræ is ſomewhat er- " roneous; for this mineral will afford no metal, and ſcarce any regulus; which " antimony plentifully does: nor will it melt down, but in ſtrong fires it " evaporates.

" In order to the preparing it for uſe, our firſt operation was calcination. " This we did after it had been powdered, by putting it into an iron pan, and " ſtirring it up and down, when it was red hot. In this condition it will ſmoak " ſo long until it be prepared.

[a] Who publiſhed at London 1662, in 8vo, a tranſlation from the Italian of ANT. NERI's *Art of Glaſs, How to colour Glaſs*, &c.

" The ſmoak, that riſes from this mineral, is arſenical: for in Germany, where " they prepare great quantity, they preſerve the white flowers by catching them " in an arch built over the calcining furnace, and they are again ſublimed into a " cloſe arſenic: we could plainly ſee theſe white flowers riſe out of this ore.

" When the ore has been thus prepared, if you reverberate it a little farther " it will be ſomewhat the richer; yet there is no neceſſity, for we have made it " do very well after the firſt preparation: and this is the true zaffer.

" The way uſed by the Germans to diſguiſe and increaſe the thing they " call zaffera:

" Take of this prepared powder one part of calcined, and pulveriſed pebbles, or " fine ſand two parts; mix all well together, and moiſten it with water, ſo that it " may be put up in barrels. This in a ſhort time will become as hard as a ſtone, " and muſt be broken in pieces with iron hammers. The ſand is ſuper-added to " increaſe the profit of the commodity.

" The common proportion of this zaffera, to give a ſapphire tincture to the mat- " ter of glaſs, is three grains to an ounce.

" In our experiments, we have too deeply tinged the glaſs; for that piece of " glaſs, N°. 2, though it had but two grains to an ounce, yet it proved too much, " for I believe a grain, or one and a half at the moſt, will ſuffice, this being as " deep again as it need to be.

" That, which has N°. 4. had four grains of the zaffera well rubbed and mix- " ed with an ounce of our vitrifying matter, which is in the lump almoſt quite " opaque, being made thin, and poliſhed on a ſtone makes but a dirty dull " colour.

" Note, that theſe experiments were made in crucibles for expedition, and rather " to ſhew the true nature of the ore, than to make fine glaſs; for this has ſpecks " and blebs, but we regard here only the tincture.

" Next week I intend to bring ſome of the true zaffer, and alſo of the ſophi- " ſticate, as it is ſold to us, made of the mentioned true zaffer; and alſo the " ſtone, which makes our blue ſtarch, which is alſo made of this ore."

Mr. HOOKE ſhewed ſome farther uſe of his inſtrument for deſcribing ſpiral lines; which he was deſired to print, or, to give a copy to be entered in the Society's books.

July 22, at a meeting of the COUNCIL were preſent

SAMUEL PEPYS, Eſq; preſident

Sir CYRIL WYCHE	Mr. HILL
Dr. LISTER	Mr. HOOKE
Mr. HENSHAW	Mr. ASTON.

It

It was ordered, that two copies of Mr. HEVELIUS's *Annus Climactericus* be ſent as preſents from the Society, one to the Philoſophical Society at Oxford, and another to that at Dublin; and that the ſecretary give them notice thereof: and

That Mr. FLAMSTEAD be excuſed his arrears of the weekly payments till Michaelmas laſt.

It being repreſented, that ſeveral members of the Society were in great arrears, contrary to the ſtatutes; it was ordered, that the following names ſhould be left out of the liſt next to be printed, unleſs they ſhould ſatisfy the treaſurer in the mean time.

ARTHUR Earl of Angleſey
Dr. ARDERNE
Sir ROBERT ATKYNS
GEORGE Duke of Buckingham
Mr. JOHN BEMBDE
Mr. WILLIAM BRIDGEMAN
Sir JOHN BROOKE
Dr. BURNET
WILLIAM Earl of Devonſhire
CHARLES Lord Clifford.
Dr. EDWARD CHAMBERLAYNE
Sir. JOHN CHARDIN
Sir WILLIAM CHURCHILL
Dr. CLARKE
Mr. PETER COURTHOP
Mr. THOMAS COX
Lord Durſley
Sir RICHARD EDGECOMBE
Mr. HENRY EVE
Sir B. GASCOIGN
Sir EDWARD HARLEY
Sir JAMES HAYES
Mr. JODOCUS KRULL
Mr. JOSEPH LANE
Sir JOHN LAURENCE
Dr. [4] JOHN LOCKE
Dr. MERRET
Dr. DANIEL MILLS
Mr. WILLIAM NAPPER
Mr. THOMAS NEALE
Mr. J. NEWBURY
Sir THOMAS PLAYER
Sir WILLIAM PORTMAN
Mr. HENRY POWLE
WILLIAM Earl of Strafford
Sir JAMES SHAEN
Mr. THOMAS SHERIDAN
Dr. G. SMITH
Sir WILLIAM SOAME
JOHN Earl of Twedale
Sir GILBERT TALBOT
Sir JOHN TALBOT
PHILLIP Earl of Leiceſter
Sir PATIENCE WARD
Sir GEORGE WHEELER
Mr. WILLIAM WINDE
JOHN Lord Yeſter.

At a meeting of the SOCIETY on the ſame day, Dr. LISTER vice-preſident in the chair.

Upon reading the minutes of the laſt meeting Mr. HOOKE produced a tranſcript of a paſſage in Mr. KUNCKEL's book *De Arte Vitraria*, which he had procured a tranſlation of; agreeing with the account, that Dr. SLARE had given of kobalt and zaffer, and confirming what his experiments had made out.

There were read ſome papers communicated by the Dublin Society; as a letter of Dr. CHARLES WILLOUGHBY and one of Mr. GEORGE TOLET to Dr. WIL-

[4] He had taken the degree of bachelor of phyſic, February 5, 167$\frac{4}{5}$.

LOUGHBY,

LOUGHBY[e], containing his answer to one HERNE, who had appealed to the Royal Society and the Philosophical Society at Oxford, to determine a question about the situation of the lines of longitude and latitude on the terrestrial globe; Mr. TOLET affirming the line of longitude to lie north and south, and the line of latitude to lie east and west; and Mr. HERNE asserting, that the line of longitude lies east and west, and the line of latitude north and south. The rest of the papers being a problem about gunnery sent by Mr. HALLEY to Mr. WILLIAM MOLYNEUX, and two problems of Mr. TOLET relating to the same subject[f], and requiring calculation, were referred to Mr. CLUVERUS to examine, and make a report of at the next meeting, when they should be farther considered of.

Mr. HOOKE read a discourse relating to the Chinese character, and their way of casting account[g], which he compared to, and illustrated by the antient Roman abacus.

He was ordered to procure a Roman and a Chinese abacus to be made, and to be kept in the repository.

Dr. PAPIN made a trial of Monsr. DE VILLERMONT's way of separating the grease and foulness from the lye, that had been used: his account of it was as follows[h]:

"The foul soap-water, that I began to filtrate a week ago, could not wet the "filtre thoroughly in about an hour's time; although the filter was prepared ac- "cording to Monsr. VILLERMONT's directions: yet I must confess, that my "vessels being but a foot high could not be so fit for a quick operation as his "may be. The next day I stood again near an hour before I could get any drop "from the filtre: at last it began to work but slowly: and after I had got near "eight ounces of filtrated liquor, I carried four ounces of it to the hon. Mr. "BOYLE, that found it of a strong lixiviate taste, and having caused it to be eva- "porated, he found . . . . . of lixiviate salt, that was a little oily, because it "had been filtrated but once. I have brought it hither with the rest of the fil- "trated liquor. If the Royal Society pleaseth, I will take the vessels home with "me, that I may try more at leisure, how quickly the filtre works; how many "times it may serve; and how much salt may be recovered by a certain quantity "of quicklime and ashes."

July 29. Dr. LISTER vice-president in the chair.

Upon the mention in the minutes of the last meeting, Dr. LISTER supposed, that kobalt might be a sort of antimony, though it contained but a small quantity.

Mr. CLUVERUS gave an account, that he had read the papers transmitted from Ireland: that he conceived the contest between Mr. TOLET and Mr. HERNE

[e] Letter-book, vol. x. p. 175.
[f] Ibid, p. 177.
[g] Printed in the *Philos. Transact.* vol. xvi. N°. 180. p. 63 for March and April, 1686.
[h] Register, vol. vi. p. 252.

about

about the longitude to be grounded upon a misunderstanding of one another; for that the longitudes or latitudes themselves are different from their determinations. Mr. HERNE talks of the longitude without a determination; and in this manner the line of longitude is always an arch of the equator lying east and west, as latitude is an arch of the meridian stretching north and south. But Mr. TOLET speaks of the determination, that is of the lines, which shew the bigness and longitude or latitude; and these lines, that give the bigness of longitude, lie north and south, but those, that comprehend the latitude, lie east and west.

He took notice likewise, that the Spanish geographers reckon the longitude from east to west (whereas other nations do from west to east) because of their frequent sailing to the West-Indies; it being easier to say 1, 2 and 3, than 359 and 358, &c.

A letter of Mr. MUSGRAVE to Mr. ASTON, dated at Oxford, July 25, 1685[i], was read, mentioning *lignum fossile*, *cornu ammonis*, and *ostracites*, dug out of a well near Faringdon; an egg-shell having a loose cap rising up at one end of the same matter with the shell; and a wild Virginia rat's skin above four feet long from the nose to the anus.

A paper was read, which had been sent from Dublin, being an answer of Mr. EDWARD SMITH, fellow of Trinity-college in Dublin, to some queries proposed by Mr. WILLIAM MOLYNEUX, concerning Lough Neagh[k].

Dr. LISTER remarked, that though Mr. SMITH denied, that he had ever heard, that the water of the Lough petrified, but the earth, yet he had been informed otherwise of that place; and that it appeared to him, that the water did petrify in other places.

A letter of Monsr. JUSTEL to Mr. ASTON[l] was read, mentioning, that a friend of his at Paris had found out a way to teach in a quarter of an hour two men, who did not understand one another, to communicate their thoughts: that the machine to go under water was finished and performed very well: that an intire pear had been found under a bulwark, at the gate of Paris near the temple, which was well coloured and unperished, though it must have lain in a black earth above a hundred years: that Monsr. PERROT had contrived a new sort of organ: that a German pretended to raise up the King's statue, of 20 or 30000 weight, with a cord of a quarter of an inch thick and a double pulley, by a child of twelve years old; and to carry a bell of 32000 weight to the top of Notre Dame with a cord as big as one's finger and double and trebble pulleys, by a girl of twelve years of age.

A curious model of a double bottomed ship was presented by Mr. HOUGHTON in the name of Mr. JOHN WORLIDGE of Petersfield, which had been made some years before by his brother, Mr. WORLIDGE, a gold-smith at Portsmouth. A

[i] Letter-book, vol. x. p. 203.
[k] Ibid. p. 248. It is printed in the *Philos. Transact.* N°. 174. p. 1108. for August 1685,
[l] Letter-book, vol. x. p. 204.

paper

paper of the deſcription and excellency of the veſſel being read was ſent with it to the repoſitory, being firſt entered in the letter-book [m].

Mr. HOOKE brought in a model of the Roman and Chineſe abacus, which he had cauſed to be made for the repoſitory, and continued his diſcourſe about the Chineſe language.

Dr. PAPIN made the experiment of diſtilling *in vacuo* according to the method, which he had before laid down, and which had been approved of.

The Society adjourned till towards the term, at which time a ſummons was to be ſent out for their meeting again.

Sept. 18, at a meeting of the COUNCIL were preſent

SAMUEL PEPYS, Eſq; preſident

Dr. LISTER	Mr. HOOKE
Mr. HILL	Mr. ASTON.

The preſident having authoriſed HENRY FAITHORNE, bookſeller, to be one of the printers to the Royal Society, he took his oath accordingly.

It was ordered, that HENRY FAITHORNE print a book intitled *Hiſtoria Plantarum*, written by Mr. JOHN RAY, fellow of the Royal Society; and the licence was accordingly ſigned by the preſident.

Octob. 28. Dr. LISTER in the chair, the SOCIETY met again at Greſham-college, having been ſummoned in the uſual manner.

Four letters of Mr. MUSGRAVE to Mr. ASTON, dated Aug. 1, Oct. 11, Oct. 19, and Oct. 25 [n], were read; the firſt mentioning the ſinking of ſeveral woods in water; the meaſure of EDMUND MELLOONE, a large Iriſhman, ſhewn at Oxford ſome years before, 7 feet 6 inches high; the length of his ſpan being 14 inches; of his cubit 2 feet; of his arm 3 feet $2\frac{1}{2}$ inches; from the ſhoulder to the crown of the head $11\frac{3}{4}$. The letter of Octob. 11. mentioned one to Dr. BATHURST, dean of Wells, concerning ſeveral perſons in the family of Mr. SPEKE of White Larkenden troubled with unuſual fits, which came upon them all at the ſame inſtant, though they were in diſtant places. Their geſtures and actions were the ſame; if one laugh, ſang, curſed, or was any other way paſſionate, the reſt did the ſame; and the diſtemper at the ſame time went off from all. Mr MUSGRAVE's letter of Octob. 25, took notice, that there had been ſome diſcourſe in the Philoſophical Society at Oxford concerning the effect of bleeding on the eye ſight; arguments being brought from experience, that it had both weakened and ſtrengthened the ſight in different conſtitutions.

Dr. PLOT obſerved on the mention of the large Iriſhman, that there was kept

[m] It does not appear there. [n] Letter-book, vol. x. p. 210, 224, 253.

in

in the library of Brazen-nose college the picture of a person, called the child of Hull, being nine feet three inches high.

It was queried, whether the fits of the persons mentioned in one of Mr. Musgrave's letters lasted long; and whether they were not caused by something, which the persons had eaten.

A letter of Sir Richard Bulkeley to Mr. St. George Ashe, dated at Old Bawn, July 11, 1685 [o], was read, concerning his newly invented chariot; and he being present at the Society explained more fully several particulars in the said letter.

The most obvious objections against the said chariot being the great noise made by the rollers and the firing of the axle-tree by the swift turning round of the wheels, it was queried, whether petrified wood, being not subject to fire, nor to break but with the grain, as wood does, might not be of use.

Sir Richard Bulkeley acquainted the Society, that he had sent for his chariot made after this model, and hoped in a little while to shew it them.

Mr. Evelyn communicated a letter, which the president had desired him to shew to the Society, dated at Portsmouth, Octob. 25, 1685 [p], containing an account of the remarkable effects of a storm of thunder and lightning the day before, happening to two of the King's ships then lying in the harbour of Portsmouth.

Dr. Slare communicated to the Society, by the direction of Mr. Boyle, an historical account of a strange self-moving liquor [q], which Mr. Boyle had had in his keeping several months, and during that time had carefully observed.

Dr. Slare was desired to inquire what the ingredients of that liquor were.

Mr. Haak presented a paper, intitled *Typus Eclipseos Solaris, quæ contigit die 2 Julii, p. m. A D.* 1684, *ab Observatoribus* Jo. Ph. Wurtzelbaux & Ge. Chr. Eimmarto *Noribergæ exhibitus.* Mr. Halley said, that he had considered the paper, and found, that by the end of the eclipse at Nuremberg compared with the end of it at London, the difference of meridian between them was 44½ minutes.

Mr. Houghton presented in the name of Mr. Graham a pair of Indostan shoes, an arrow, and some writing upon a palm-leaf.

He likewise shewed two stones, which were conceived to be gypsum, and good chiefly formortar.

Dr. Gale presented to the Society a large earthen urn, with the bones in it, and an earthen cover upon it, which had formerly been dug up out of a gravel-pit in the north field of Peckham in the parish of Camberwell in Surrey, as appeared

[o] Letter-book, vol. x. p. 105.
[p] It is printed in the *Phil. Transact.* N°. 177. p. 1212 for December 1685.
[q] Ibid. N°. 176. p. 1188.

from a paper ſigned by ſeveral perſons, who were preſent at the finding of this urn and ſeven or eight urns more, which were not ſo intire.

A paper having been communicated by Monſ. JUSTEL, printed at Paris, and intitled *Experience propoſée aux Phyſiciens par * * le 8 Octobre 1685*, being a contrivance for a perpetual motion; Dr. PAPIN obſerved, that the method was not practicable, ſince the bellows could never be opened, their outſide being preſt with a weight of twenty ſeven inches of quickſilver, equal to the atmoſphere, and the inſide being helpt but with five [r].

Nov. 4, at a meeting of the COUNCIL were preſent

Dr. LISTER vice-preſident,
Sir ANTHONY DEAN — Mr. WALLER
Mr. HILL — Mr. ASTON.

A letter from Dr. WALLIS being read relating to the accounts of his arrears, the council was ſatisfied therewith, and ordered the arrears to be ſtruck off.

Sir RICHARD BULKELEY was propoſed as a candidate and approved.

At a meeting of the SOCIETY on the ſame day, Dr. LISTER vice-preſident in the chair.

Among the woods, that ſink in water, Sir JOHN HOSKYNS mentioned heart of oak in the foreſt of Dean.

There were preſented to the Society from Monſ. VILLERMONT two books, one concerning the river of the Amazons, and the other the catalogue of the library of Monſ. SEGUIER.

A letter of Mr. LEEWENHOECK, dated July 13, 1685, was read, ſhewing, that as in the ſeeds of plants and trees the young plant or tree is contained with all its parts, as leaves, veſſels, body, root; ſo in all animal productions the animalcule contains the figure of the animal; it ſeeming conſonant to nature, that the ſeed of the body of the thing be contained in a very little room.

There were read four letters of Monſ. JUSTEL to Mr. ASTON [s], received during the Society's receſs, concerning a picture of the French King upon a marble table of twelve feet ſquare and an inch thick, the colours being all ſunk into the marble; an incombuſtible plant, ſaid to be found near the Pyrenees, to make cloth of; Indian partridges, that ſometimes eat one another; bitumen brought from Florida; 124 volumes ſent from China by Father COUPLET; an exact deſcription of the aquæduct then making in order to carry water to Verſailles and Marli [t]; and the change of a girl, who had been baptiſed as ſuch, into a boy.

[r] Dr. PAPIN's obſervations are printed in the *Philoſ. Tranſact.* N°. 177. p. 1240.

[s] Letter-book, vol. x. p. 206, 208, 211.

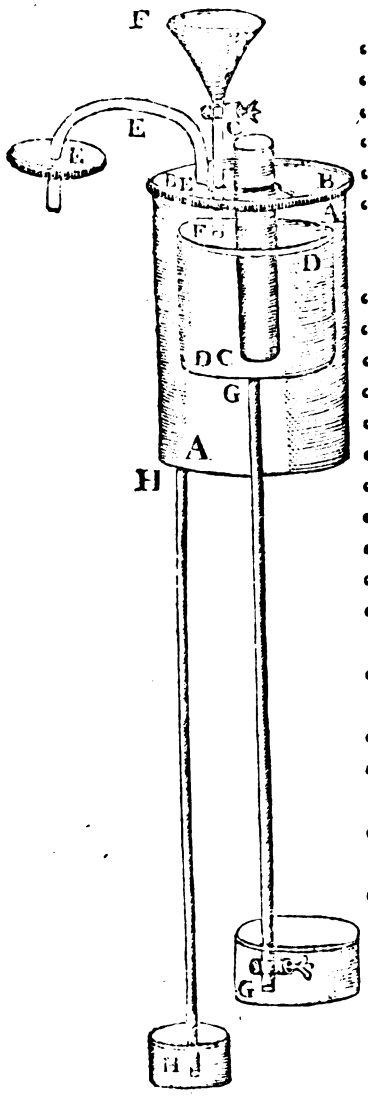
[t] See Printed in *Philoſ. Tranſact*, N°. 176. p. 1206. for November 1685.

Upon

Upon occaſion of Mr. LEEWENHOECK's letter, it being diſcourſed concerning the poſſibility of changing the nature of things, Sir JOHN LOWTHER ſaid, that barley and big interchange or turn from four rows to two, and two to four, as the ground is better or worſe.

Dr. LISTER ſuppoſed changes to be accidental, ſuch as colours in tulips and other flowers, and multiplicity of leaves in gilly-flowers; but that one plant did not change into a diſtinct ſpecies.

Dr. PAPIN ſhewed how he had completed a clepſydra after the manner of Monſ. COMIERS. The glaſs being to run an eighth of an hour, was made to turn on an axis, the jet d'eau coming to it's hight without ſhaking. His account of it was as follows [u]:



" The ſolution of ſugar, that I ſet to evaporate *in* " *vacuo*, is come to be dry in about four days: but " it did not cryſtallize like ſugar-candy: it doth but " look like a piece of a ſugar-loaf. I can't tell " whether it is, becauſe the operation hath been too " quick. I have brought it hither, that it may the " better be obſerved what it is.

" I have alſo prepared the two inſtruments, whoſe " deſcription I preſented in the laſt meeting, and " I have made with them a very ſucceſsful trial: " for as ſoon as an equal heat was applied to both " inſtruments together, a great quantity of vapours " was ſeen to riſe out of the water *in vacuo*; but out " of the other there appeared none at all: ſo that " it ſeems manifeſt, that *vacuum* may be a great " help to haſten evaporation and diſtillation. I have " therefore thought of an *apparatus*, that might be of " a great advantage in making ſalt, copperas, and " other wares, that are performed by evaporation.

" AA is a great veſſel to receive and condenſe the " vapours.
" BB a cover applied to it.
" CC a large pipe open upwards, and ſhut down- " wards, wherein the fire is to be kept.
" DD a veſſel to contain the liquor to be evaporated; " this is included in the great veſſel AA.
" EE a pipe making the communication between the " veſſel AA and the pneumatic engine, for to " exhauſt the air out of the ſaid veſſel.
" FF a funnel ſo ordered with a turn-cock, that we " may pour new liquor into the veſſel DD " without letting in new air.

[u] Regiſter, vol. vi. p. 250.

" GG a pipe above thirty three feet high, with a turn-cock, whereby the liquor " may be drawn from the veſſel DD when it is much evaporated and ready " to ſhoot.

" HH another pipe above thirty three foot high, whereby the phlegm condenſed " in the veſſel AA may continually deſcend and leave the veſſel empty for to " receive and condenſe new vapours.

" Now it is plain, that the inſtrument being once exhauſted of air through the " pipe EE, a body may keep it at work conſtantly without any more ado, but to " keep fire in the pipe CC: and through the pipe GG draw the liquor out of the " veſſel DD, when it is ready to ſhoot: and thorough the funnel FF put new " liquor into the veſſel DD as often as it is convenient. Such an inſtrument be- " ing kept conſtantly at work, would in a year's time ſave a very great expence " of fire: neither is it ſo difficult to be made well and good, but I would un- " dertake it at my own peril, if any body hath occaſion to uſe it: mean while if " the Royal Society pleaſeth to ſee the experiment of evaporation *in vacuo*, with " the little inſtrument, that I have ready made, I will bring it hither for the next " meeting."

Sir RICHARD BULKELEY was propoſed a candidate.

Nov. 11, at a meeting of the COUNCIL was preſent

Dr. LISTER vice-preſident,

Mr. HILL	Dr. SLARE
Mr. WALLER	Mr. ASTON.

Dr. LISTER, with the approbation of the council, licenſed a book, intitled *Appendix ad Hiſtoriam Naturalem piſcium Domini* WILLUGHBII, *&c.*

Mr. ASTON acquainted the council, that the preſident, SAMUEL PEPYS, Eſq; would give the Society fifty pounds to be laid out as the council ſhould judge moſt convenient.

It was ordered, that the money be laid out to pay for fifty plates in the *Hiſtory of Fiſhes*; and that the preſident's name be put to thoſe fifty plates: and

That the Society be acquainted therewith, that they may all concur in returning their thanks to the preſident.

At a meeting of the SOCIETY on the ſame day, Dr. LISTER vice-preſident in the chair.

A committee was choſen out of the fellows of the Society, ſuch as were not of the Society, for the auditing of the treaſurer's accounts, being Mr. MEREDITH, Mr. PITFIELD, Mr. PERRY, Mr. HOUGHTON, and Mr. LODWICK.

Dr.

Dr. LISTER having acquainted the Society, that the preſident had ſent word by Mr. ASTON, that he gave them fifty pounds to be laid out as the council ſhould direct, Mr. EVELYN, Dr. LISTER, and Dr. GALE were deſired to wait upon the preſident with the thanks of the Society.

Dr. SLOANE's obſervations concerning the ſweet ſmelling water found the laſt ſummer at Hoxton near London, was read, and ordered to be regiſtered [x].

There were communicated by Mr. MUSGRAVE a letter given him by Dr. BATHURST, and an extract of a letter from Dr. OVER; the firſt being from Dr. DERHAM of Wargrave near Henley concerning a child, who died at a year and half old, and whom he had opened, and found the pericardium filled with a purulent matter of a greyiſh colour inclining to yellow, about the quantity of a quart, very ſour, and a polypus running from the right auricle through the cava into the ſubclavians, and one or both of the jugulars. The ſecond letter contained two ſtrange caſes of the ſmall pox; viz. of a child born full of the ſmall pox, and dying of them, the mother being free of them for ſix years paſt; and of a woman dying of the ſmall pox after ſixteen days, her child half a year old, who lay with her, and ſucked her, not being infected.

Dr. LISTER remarked, that the diſeaſe was a dropſy about the heart, but that he did not take the liquor to be acid, but alkalizate, as other things within the habit of the body uſually are.

Dr. SLARE ſaid, that he had made ſeveral experiments proving the liquors in the body not to be acid.

An experiment having been tried by Mr. BOYLE with a convenient apparatus, proving, that water included in a ſlender pipe would preſs upon a large baſis as much as a pillar of water as large as the baſis, and as high as the ſlender pipe; he appointed Dr. PAPIN to ſhew the ſame to the Society; which was done, and the ſame experiment was ordered to be repeated at the next meeting.

Nov. 18. An account of ſome experiments made with the *ſaliva humana* by Dr. SLARE, and mentioned at the laſt meeting, was read, and ordered to be regiſtered [y], as follows:

" By reaſon of the ſmall quantity of ſpittle, that can be collected otherwiſe, I " was forced to make uſe of the ſpittle of a gentlewoman put upon a ſalivation, " whoſe caſe was not venereal but ſcrophulous.

" After ſhe had uſed three drams of mercurius dulcis, the ſalivation was car- " ried on very ſucceſsfully. I could not find, that a piece of gold kept ſome

[x] Regiſter, vol. vi. p. 265. It is printed in Mr. RAY's *Philoſ. Letters*, p. 193.
[y] Regiſter, vol. vi. p. 263.

" hours

" hours in her mouth would attract any quickſilver unto it, as ſome do venture " to relate as a common experiment. Nor did I find, that either fine gold, or " ſilver, or tin, after it had been lodged a whole night in a quart at leaſt of the ſa- " liva, did alter its colour the next day, ſo that nothing did offer to amalgam " with them.

" The ſpittle itſelf, when it was poured into the baſin, did ſeem to riſe up in " bubbles, and to have ſome fermenting inteſtine motion; but this laſted not " long after it was diſcharged the body.

" I attempted to make it ferment with alcalies, to find out the ſubacid men- " ſtruum, SYLVIUS and others have declared it to be; but the volatile ſalts of ar- " moniac, and thoſe of hartſhorn, as alſo the fixed ſalts of wormwood, oleum " tartari per deliquium, would not produce any fermentation or motion at all.

" Moreover, having tried all the four ſpirits, ſuch as of nitre and ſpirit of ſalt, " with oil of vitriol, and the more mild acids of lemons and vinegar, I could " not produce any ebullition, or the leaſt commotion of the liquor.

" This put me upon a farther examen of the ſaliva by committing it to " diſtillation in a very moderate warmth of the ſand.

" I conveyed a gallon of it into a large retort, and examined the liquor as it " diſtilled over: the firſt quart was quite inſipid water; ſo was the ſecond; the " third quart began to ferment a little with a ſtrong oil of vitriol, but regarded " not the other acids of ſpirit of ſalt or ſpirit of nitre.

" The laſt, that came over, was about twelve ounces: this ſeemed to have ſome " ſalt in it by the yellow colour, but yet was not of a piquant urinous ſmell; it " did a little more ferment with oil of vitriol than the former.

" In the bottom of the glaſs, I found a greyiſh ſalt, which is not truly vola- " tile, nor yet a lixiviate fixt ſalt, much leſs like a marine ſalt; for it ſhews it- " ſelf to be a true alcali, by its very ready fermenting with any acid.

" Note, that through this whole operation there was nothing, that in the leaſt " ſavoured of acidity, which might have been expected to enſue upon di- " ſtillation, if there had been any ſalts contained in the ſaliva with any diſpoſition " to acidity. For we find the bitter or inſipid juices of wood upon diſtillation to " degenerate into acid liquors."

A book was preſented from Mr. BOYLE, intitled, *Of the Reconcileableneſs of the ſpecific Medicines to the corpuſcular Philoſophy: to which is annexed a Diſcourſe about the advantages of the uſe of ſimple Medicines.*

A letter of Mr. VINCENT was read, deſiring a correſpondence with the ſecre-

tary

tary about philoſophical matters; and the ſecretary was ordered to write to him.

Mr. HOUGHTON mentioning, that the price of corn had been obſerved for twenty years at Oxford and Cambridge, he was deſired to procure an account at London, his expences not exceeding five ſhillings.

A copy of the minutes of the Society at Dublin from the 6th of July to the 10th of Auguſt was read, as follows[z]:

" I am aſhamed I can make no better a return for your very acceptable com-
" munications: our company of late has been very thin, and people's heads ſo
" much diverted with politics, that next meeting, I believe, we ſhall adjourn
" till the term: however, if any thing worth acquainting you with, happen, in
" the mean time, I will not fail to give you a punctual account thereof.

" I am juſt now informed of a girl, who has ſeveral horns in many parts of her
" body: of this you ſhall have an account by the next.

" *July* 6, 1685. Mr. TOLET brought in a propoſition in gunnery, ſent from
" Mr. EDMUND HALLEY, with its conſtruction and rule, bu without a demon-
" ſtration. He ſhewed the conſtruction to hold true in all caſes, but deduced ano-
" ther rule from thence.

" A letter from the right reverend the Lord Biſhop of Leghlin, dated June
" the 19th, was read, containing ſeveral curious obſervations, which his Lordſhip
" has made concerning inſects. Two things he would yet have farther inquired in-
" to in their hiſtory, 1ſt, how to rank them according to their follicles, which
" ſome weave of thread, others (the hairy ones) make of hair, others of earth,
" crumbs of leaves, wood, moſs, &c. and ſome make none at all, but ſuſpend
" themſelves againſt a tree or wall by a ſingle thread drawn acroſs their bodies,
" and faſtened at both ends to the wall. 2dly How to range them according to
" their chryſaliſes, or aurelias; both which he conceives would conduce as much
" to the well underſtanding their natures, as the knowledge of plants by their
" cods and ſeeds (or the ſeeds and their caſes or covers) and of birds by their
" neſts and eggs (the former of which do much diſcover their ſagacity and many
" other properties) can conduce to the right underſtanding of theirs; the folliculi
" of inſects being anſwerable to the neſts of birds, or to the cods or ſeed-caſes in
" plants; and their cryſaliſes correſponding to the eggs of thoſe and to the ſeeds
" of theſe, whence immediately do ſpring the living creatures. The thanks
" of the Society ordered to be returned for this letter.

" The remaining part of Dr. WALLIS's very rational ingenious diſcourſe con-
" cerning weather was read, and our thanks ordered to be returned.

[z] Letter-book, vol x. p. 242.

" A letter from Mr. MUSGRAVE, dated June the 21ſt, containing the mi-
" nutes of the Oxford Society, from May the 26th to June the 16th, was read.
" Several of the members promiſed to enquire diligently, whether ſuch ſhells as
" that, which contains the purple-fiſh, be found on our ſhores: the thanks of the
" Society ordered to be returned Mr. MUSGRAVE for his preſent, and that it be
" carefully laid up in our repoſitory.

" An account of the wind, weather, hight of the mercury, &c. for the
" month of June brought in by Mr. ASHE.

" A letter from Sir RICHARD BULKELEY, with a deſcription and trial of the
" new calaſh, mentioned by Mr. CLINET, was read.

" *July* 13, We adjourned our meeting, becauſe of the philological act at the
" college.

" *July* 20. A letter from Mr. MUSGRAVE containing Dr. PLOT's deſiderata
" in chemiſtry was read, and committed to Dr. SYLVIUS and Dr. MULLEN, who
" from ſome hints therein propoſed to make a few experiments, and to give the
" Society their thoughts: they alſo mentioned ſome farther arcana to be added to
" this catalogue.

" Dr. MULLEN ſhewed the following experiments before the Society. An
" equal quantity of river-water mixed with ſpirit of wine cauſed a great many
" bubbles, which laſted long, was but milk warm, and pellucid. Pump-water
" with ſpirit of wine made greater fermentation; the bubbles ſoon diſap-
" peared; 'twas warmer than the firſt, and turned wheyiſh. Rain-water with
" ſpirit of wine cauſed a fermentation and heat like the firſt, with no altera-
" tion of colour: the like alſo happened in plantain water poured into ſpirit of
" wine, but ſpirit of wine poured into the diſtilled water produced a greater fer-
" mentation. Sublimate ſulphuris per campanam mixed with ſpirit of wine fer-
" mented more ſlowly, but became blood-warm, that is, much warmer than the
" reſt. Syrup of violets with ſpirit of wine made ſmall fermentation, with a few
" bubbles: it turned of a greeniſh colour. Cornu cervi uſtum upon ſyrup of
" violets turned green, upon which ſublimate ſulphuris per campanam poured
" changed it to red, with a very great fermentation. Milk dropped into ſpirit
" of wine preſently coagulated.

" *July* 27. A diſcourſe of Mr. RAY's concerning the macreuſe or ſcoter, and alſo
" one of Dr. TANCRED ROBINSON on the ſame ſubject, and concerning boiling
" and other fountains communicated by Mr. MUSGRAVE, were read, and our
" thanks ordered to be returned. They gave occaſion to Mr. ACTON to diſcourſe
" of ſomewhat relating to them, mentioned in old authors; and of the account
" STRABO gives of the lake Avernus, which mentions the reaſon, why, even in
" his time, it had loſt its infectious mortal effluvia. The deſcription likewiſe of
" this bird was read out of Mr. WILLOUGHBY's *Ornithology*, which agrees
" indifferently to a ſea-fowl frequently taken near the iſland called Ireland's Eye.

" A large

" A large piece of Lough Neagh ſtone found on the ſhore was given to Mr. " SMYTH, having the exact grain of wood, and the mark of cutting.

" *Auguſt* 3. An account of the wind, weather, hight of the mercury, &c. is " brought in by Mr. ASHE. What Dr. GARDEN affirms, that when the wind " turns to north, N. E. or N. W. the mercury always riſes, was not found true.

" A letter from Mr. MUSGRAVE, dated July the 16th, was read, containing " the draught of the incombuſtible cloth, and the figure and deſcription of an In- " dian honey-comb, which ſeveral affirm to be ſo like that of our common hum- " ble bee, its honey likewiſe being much more limpid than that of other bees, " and its lodgings in trees and other cavities, that it may well deſerve farther " inquiry.

" An extract alſo of a letter from Mr. LEIGH of Lancaſhire was communi- " cated, which gave account of a buck found intirely whole and uncorrupted un- " der ground: Query, whether the hoofs as well as horns were ſoft, and grew " hard when expoſed to air? Of a calf whoſe ſkin was inverted: query, whether " 'twas brought forth alive, and whether the ſkin hung looſe and was faſtened, " the hairy part to the fleſhy pannicle? Of peats which burn ſo violently as to " melt down gold: query, of what ſort of earth they are made? becauſe ſome- " what like this was affirmed of a kind of Iriſh turf. Of a wound; out of whch " there came daily a piece of fat as big as a nut, which was friable and would " blaze in the fire. A piece of black ſtone full of ſhining particles and of a ſul- " phureous ſmell was preſented, taken out of a quarry near Maryborough in the " Queen's county. Dr. MULLEN was deſired to examine it.

" Ten pieces of old Britiſh coin, found in the middle of a rock, were ſhewn " by Mr. ASHE.

" *Auguſt* 10. A letter from Mr. MUSGRAVE was read, containing a very odd and " remarkable relation of one, who for many years has had conſtant obſtinate con- " vulſions every Sunday, by Dr. COLE of Worceſter. Another letter alſo from " Mr. MUSGRAVE, communicating a like relation by the ſame doctor, of pe- " riodical convulſive motions returning every 5th day, which the doctor cured. " The thanks of the Society ordered to be returned for theſe conſiderable com- " munications.

" Dr. MULLEN gave a relation of a gentlewoman, a patient of his, who had " four cold fits of an ague, and as many hot ones every twenty four hours The " fits came ſo thick on one another, that there were but very ſmall intermiſſions, " for preſently after ſhe cooled out of her hot fit, ſhe fell into a cold one. Thus " ſhe was for four or five days before he was ſent for; but in two days ſhe reco- " vered by a method he uſes for cure of that diſtemper.

" He alſo acquainted the Society, that he ordered a quantity of ſcurvy-graſs " to be bruiſed in a ſtone mortar, and to be put up in a convenient veſſel; which, " having firſt poured enough of ſtrong brandy on it to cover it, he cloſed very

" well and ſo kept it for a month, and then diſtilled it in a limbeck, and got a " good quantity of a very pungent ſpirit, much inſipid phlegm, and laſt of all " an oil as inſipid as ſallet oil, which he was ſurprized at, having expected the " moſt pungent acrimonious oil, that he knew any vegetable to yield, when " he ſaw, that the ſcurvy-graſs yielded any. But having repeated the experi- " ment (though the fermentation or maceration was continued but for four or " five days) he had reaſon to think, that there were two oils in it, one a very " pungent piercing one, and the other wholly inſipid: for he ſeparated a ſmall " quantity of the former along with the ſpirit, and the latter he ſeparated along " with the inſipid phlegm. He is therefore induced to believe, that the volatile " æthereal piperine oil in the firſt parcel of ſcurvy-graſs was changed into a ſpirit, " there being neither oil nor milkyneſs to be ſeen in what came over the helm, " finding that in the latter parcel both was to be found, and over and above ſome " of the pungent oil."

The ſecretary was deſired to procure a copy of Dr. PLOT's *Deſiderata* in chemiſtry.

There being preſented ſome obſervations of Dr. WALLIS upon a book of Mr. RICHARD NORRIS concerning his manner of finding the true ſum of the infinite ſecants of an arch of an infinite ſeries [a], the papers were put into Mr. HOOKE's hands to read over, and make a report of them at the next meeting.

The experiment made at the laſt meeting by Dr. PAPIN was again tried; viz. that a veſſel of water being broader at the bottom than the top, weighs equal to a cylinder of water as broad as the bottom of the veſſel, and as high as the perpendicular from the ſurface of the water to the bottom.

Dr. PAPIN ſhewed likewiſe a way of keeping the juices of fruits and other parts of vegetables without any addition. The juice of cherries being ſhut up *in vacuo* in two glaſſes three quarters full upon the 26th of June, in a day's time the liquor was clear, and the ſediment fell to the bottom: in four days time both bred air. One glaſs was ſufficient to ferment, but was ſtill cloſe, except when the air broke out. The other was boiled a quarrer of an hour in *balneo Mariæ*, and from that time neither bred air nor fermented. This liquor was very generous and well taſted, having the reliſh of the fruit; but the other, that fermented, was poor and ſomething ſharp.

Nov. 25. Sir RICHARD BULKELEY was elected and admitted.

It being diſcourſed concerning the ſtandard foot of Paris and ſeveral other places, compared with the Engliſh foot; Mr. HALLEY was deſired to give directions for the making a meaſure in metal to be kept in the repoſitory, containing, together with the Engliſh, the Paris, Roman, and other feet moſt in uſe.

[a] Dr. WALLIS's obſervations are printed in the *Philoſ. Tranſact.* N°. 176. p. 1193.

A paper was communicated by Mr. ARTHUR BAILEY, being obſervations, which he had directed to be made by a maſter of a ſhip, that was to paſs the æquinoctial line, in order to the knowing the place, where the direction of the ſouth pole prevails above the north [b].

It was wiſhed, that the maſter of the ſhip had continued his obſervations, when he was to croſs the line the ſecond time after he was paſt the Cape of Good Hope.

A paper was communicated by Mr. HAAK from Mr. ARNOLD of Nuremberg, being an account of the declination of the magnetic needles lately obſerved by EIMART, &c. in order to the aſcertaining its variations [c]. But it was judged, that the needle was in the ſame poſition, in which it had been obſerved five years before.

The two laſt papers were delivered to Mr. HALLEY, to conſider of againſt the next meeting.

The Society deſired, that Mr. HALLEY, Mr. HOOKE, Mr. HAYNES, Mr. PAGET, and Mr. FLAMSTEAD, as likewiſe Dr. WALLIS and Mr. CASWELL at Oxford, would ſeverally obſerve the declination of the needle about the winter ſolſtice now approaching; and that each of them would give in their account in writing.

A letter from Dr. VINCENT, dated at Clare-hall Cambridge, November 23, 1685 [d], was read, mentioning an invention, which he had, he thought, brought very near its utmoſt perfection, of that univerſal benefit, that it would be ſerviceable and very deſirable to all mankind, except thoſe, who cannot write and read, and as eaſy and cheap as valuable. This he offered to diſcover, if he could have ſubſcriptions for it as for a book. To which it was anſwered, that the Society could not proceed in his way, till they knew the matter.

Two letters in Latin were read, one to the Society, the other to Mr. ASTON [e], the latter dated at Dantzick in Auguſt 1685, and ſigned *S. A. Von L.* preſenting ſome copies of the three *Litteræ buccinatoriæ ad univerſos in Hermeticis curioſos directæ*; challenging the Hermetic philoſophers to give ſome proof of their ſecret art, or elſe they ſhould be written againſt and diſcovered to be cheats; together with ſome copies of a book in anſwer to Monſ. SCHROTER's inſtruction about the making of gold.

The letter to the Society ſeemed to demand two things: 1. Whether they were againſt publiſhing the book, with which the Hermetics were threatened. 2. Whether they were indifferent in it, and would acquieſce in the doing it; which he deſired to know.

[b] Printed in the *Philoſ. Tranſact.* N°. 177. p. 1213. for December 1685.
[c] Ibid. N°. 178. p. 1253.
[d] Letter-book, vol. x p. 257.
[e] Ibid. p. 267, 268.

A copy of the books was given to Dr. SLARE to peruſe and report the contents of them; another copy being deſigned for Mr. HENSHAW, and a third for Mr. BOYLE, if the latter had them not already.

An account of ſeveral experiments made by Dr. SLARE, to ſhew the inſufficiency of alcalis and acids to diſcriminate the *res medica*, was read, as follows[f]:

" In order to our inquiry into materia medica, or into thoſe ſimples, that are " uſed in medicine, it ſeems neceſſary to ſearch after ſuch proper and adapted " inſtruments, as may beſt ſerve ſuch purpoſes. It's well known, that ſome would " make up all bodies of the four elements, and reduce them to thoſe four; " others are for three, others five chemical principles; but there is ſcarce ſo " much need as of mentioning theſe groundleſs hypotheſes, ſince the great patron " of true philoſophy, Mr. BOYLE, has ſhewn the imperfection of thoſe princi- " ples, and taught us to build on better foundations. Amongſt other hypotheſes, " that of acidum and alkali has obtained very much repute, inſomuch that on " theſe two pillars ſome profeſſors of phyſic have raiſed great ſuperſtructures, " even ſyſtems of phyſic; and others do ſteer the whole courſe of their practice " by the conduct of this hypotheſis. Mr. BOYLE has in an excellent treatiſe on " this ſubject, made it very plain, that all phænomena in nature cannot poſſibly " be explained and accounted for by the mentioned hypotheſis; ſo that he juſtly " reprehends the latitude given by the teachers of this doctrine, but withal allows " it to be of very great uſe in chemical and phyſical matters. Of how great uſe " and importance this hypotheſis may be, it will not be amiſs to enquire and " determine; for if by this way the cauſes and effects of all or moſt phænomena " may be ſtated and diſcovered, the method is ſo eaſy and compendious, that " it would be very happy we were ſecure of the truth of it: but if there be much " fallacy or uncertainty in this notion of acid and alkali, then it were better re- " moved out of our way, or elſe circumſcribed within its proper bounds.

" That there are ſuch ſubſtances in rerum natura as acids, it is undoubtedly " true and obvious.

" There are alſo natural acida and artificial.

" There are alſo ſalts, that are called alkalis, and theſe properly and impro- " perly ſo.

" By alkali is properly meant a fixt ſalt: and here may be ranged all ſorts of " vegetable fixt ſalts, whether of the herba kali or pot-aſh, ſalt of wormwood " and of other vegetables; for the fixt ſalts of animals are rarely met with.

" By alkali improperly ſo called are meant the volatile ſalts of vegetables or " animals; or, yet more improperly, if not impertinently, all teſtaceous bodies, " and in the greateſt latitude of all, any thing, that ferments with an acid.

[f] Regiſter, vol. vi. p. 268.

" The

" The better to accommodate this diſcourſe to the preſent meeting, I will not " make it tedious, but lay down two or three propoſitions, and prove them by " experiments; and then infer a corollary or two.

" 1. That there are few bodies in their natural ſtate have ſo much of alcali " ſalt in them, whether fixt or volatile, as will produce a fermentation or con- " flict with an acid.

" 2. That many, the greateſt number perhaps of thoſe experiments, that are " made to prove this hypotheſis, are upon a miſtake; and that in reference to the " common materials they uſe.

" 3. There are many ſubſtances, that have very great proportions of alcali ſalts " in them, where acids not in the leaſt regard them, ſo as to make any conflict " with them.

" 4. There are bodies, that abound very much with acids and alcalis both, " and that in unequal proportions, and yet are not at all to be diſcovered by " any commotion or fermentation produceable either with the alkali or acid.

" To the firſt propoſition, that there are much fewer bodies than one would " expect, or eaſily believe, endowed with this preſumed alcali, ſo confidently re- " ported to be an ingredient in all bodies, ſo neceſſary for the projected acid to " make a conflict or luctation with. For the proving this poſition, I will fetch " my experiments from ſalts themſelves diveſted from any other heterogeneous " mixture, that might hinder the free operation of the acidum upon them. More- " over theſe experiments ſhall be made on the moſt catholic ſalts, that run in the " veins of the macrocoſm and microcoſm, as chemiſts love to call the earth, and " the human body. Namely, vitriol, alum, common ſalts, ſalt petre, and ſal " calcarius deſcribed firſt by the very learned Dr. LISTER: as alſo ſpittle, blood, " ſerum ſanguinis, and urine.

" 1. We made a ſtrong ſolution of green vitriol, and poured thereon firſt ſpi- " rit of vinegar, and then I tried the ſame ſolution ſucceſſively with other acids, " uſing ſpirit of ſalt, and even ſpirit of nitre itſelf; but there followed no luc- " tation or conteſt, or any incaleſcence: Yet conſidering with myſelf what potential " acid was concealed in this ſubſtance, from whence oil of vitriol comes, I mixed " with a ſtrong ſolution of this vitriol ſpirit of ſal armoniac, which is a high alcali, " upon which alſo no conflict or motion enſued.

" 2. Having made a ſtrong lixivium of alum by diſſolving it in water, I firſt " mixed with one part of this ſolution common vinegar, and then I mixed with " another part ſpirit of Venus or of verdigreaſe, and ſo proceeded to ſpirit of ſalts, " and of nitre; but could not with any of theſe diſcern either any conflict or heat " to ſucceed the mixture. I alſo made the like experiment with the volatile ſpirit " of hartſhorn, and with a ſtrong ſolution of ſalt of tartar, called oil of tartar, " both high alcalis: but without the leaſt emerging ebullition or motion of the " liquors; only they thickened one another by an union of their ſalts.

" 3. I then made experiments with ſea-ſalt, whoſe empire is as vaſt as the " ocean; nor could we here with any of our acids produce any fermentation, nor " at all with the named alcalis. I muſt ſet a mark upon oil of vitriol, that

" being

" being a very unfit teſt to examine bodies withal, for it works many times ſo " promiſcuouſly on acids and alcalies, and ſpares ſcarce any thing, whether ani- " mals, vegetables, minerals, or metals: For though our natural acids, and al- " ſo other highly corroſive acids, paſs by this ſolution without any conteſt, yet " this does hiſs and heat and boil upon the firſt contact with common ſalt.

" 4. Nitre, an univerſal ſalt, as boundleſs as the air, gave us no manner of " obſervations, but only this, that neither in ſubſtance nor ſolution it made any " luctation, conflict, or any ſort of action, with either our high acids or alcalis: " nor did oil of vitriol itſelf make here any ſtir or effervescence.

" 5. I made a very ſtrong ſolution of Dr. LISTER's ſal calcarius, and poured " into ſeveral diſtinct glaſſes, (ſet in order for that purpoſe) a certain proportion " of this diſſolved ſalt, for I find, that a little water takes up a great quantity of " it. My method is to begin with the vinegar, and then with ſpirit of vinegar; " then with ſpirit of Venus, which I take to be vegetable acids; I afterwards " proceed to ſpirit of ſalt, of nitre, and ſometimes oil of vitriol, that are mineral " acids. I could not produce any ebullition upon the application and mixing " of theſe acids in any proportions: with alcalies there was no expectation of any " lucta, in which I was not diſappointed.

" The human body abounding with ſalts, and the humours being moſt of " them actually ſalt to the taſte, I made ſome experiments, of which I ſhall not " give the minutes, but only the ſucceſs for brevity ſake.

" The blood I put on the trial was warm, and not yet ſeparated. The urine " was alſo warm and very lixiviate to the taſte; but neither of theſe made the " leaſt ſtir or conflict with any of the named acids, even the fierce oil of vitriol it- " ſelf. The ſerum ſanguinis being cold did the ſame thing with the reſt. With " the ſaliva I made my experiments with various ſorts of alcalis, by reaſon of the " notion of its being an acid: but experiments, that have been offered at the board " of the Royal Society, and others yet to be tried, will clear it from having aci- " dity; though it be yet farther than any of the former juices of the human body " from any poſſibility of fermenting with an acid. So much for the firſt " propoſition.

" The ſecond propoſition.

" 2. That perhaps the greateſt number of experiments to prove this " hypotheſis, have been erroneous and miſtaken. No bodies have been more " firmly relied on to prove the inherent alcalis than thoſe that are teſtaceous ſub- " ſtances, as oculi cancri, the ſhells of fiſhes, pearl, and other hard ſubſtances of " fiſhes; whereas theſe and many other fixt alcalis (as they are called) have little, " if any ſalt at all in them: ſo in like manner ſtones, and chalk eſpecially, by rea- " ſon of their eaſy fermentation with an acid, are certainly determined to abound " with fixt alcali ſalts. The common error about chalk I dare not paſs by with- " out examining, and the rather becauſe this is ſo conſtantly aſſerted to have " much ſalt in it, inſomuch that GLAUBER (according to his way) conceals a pro- " ceſs how to get four or five ounces of nitre out of chalk: but for my part, after

" ſeveral

" ſeveral careful examinations, I could yet never procure any ſort of ſalt out of " chalk.

" We took a pound of chalk and beat it to powder, and then boiled it in " water for many hours, after this filtred it, and evaporated the water; but found " no ſalt in it, more than common water contains.

" We then put a pound of chalk in a ſtrong reverberatory, where it lay above " fifty hours in that mighty heat: while it was yet warm, I conveyed it into a " quantity of fair water, and made the water boil upon it to extract any contain- " ed ſalt; but upon the evaporation of this water, I found no more ſalt in this " than in the former experiment. The remaining calx did very eaſily ferment " with the mildeſt acids. I could enumerate an abundance of inſtances, both in " the animal and mineral kingdom, where for the moſt part there is no ſalt at all " to be found, or if any, after that is removed, the fermentation with an acid is " very ſtrong and violent: but theſe inſtances will be referrible to other poſitions " alſo.

" The third propoſition, that there are many natural ſubſtances, that have " much alcali in them, where yet the acids will not produce any ferment; " here I might inſtance in tartar, which abounds ſo plentifully with alcali, that " ſcarce any body has more, and yet is not at all concerned when mixt with an " acid; but on the quite contrary, if you mix an alcali with it, the luctation will " ſoon begin. However, if we ſeparate one from the other, we may find only a " very mild acidity, and in very ſmall proportion compared with the great quan- " tity of the alcali ſalt, ſo little regarded or detected by this way of experiment- " ing, there being ſo few natural bodies ſtocked with this alcali ſalt, as the firſt " propoſition complains of, that I muſt borrow ſome inſtances from more artifi- " cial bodies; and here ſal armoniac will be a very plain and notable one; for in " this we can make it appear, that there are above eight ounces in a pound of the " higheſt volatile alcali, from whence might be expected the greateſt ebullition; " but upon the trial we found, that it regarded not the vegetable acids, nor would " it ferment, or make any commotion with ſpirit of nitre, but ſilently diſſolved " in it, as it would have done in water. Nitre is no wiſe inferior to tartar, for " it yields above half of a true fixt alcali ſalt, but yet makes no luctation with any " acid: ſee the fourth catholic ſalt above named.

" The fourth propoſition.

" 4. That ſome bodies have both acids and alcalis in unequal proportions, that " yet will not fight, either when attempted with an acidum or alcali. I need only " call upon the two laſt named ſalts for a proof of this propoſition, ſal armoniac " and nitre, theſe containing both ſtrong acids upon certain ways of diſtillation, " both which, as above ſaid, make no colliſion with acids and not at all with al- " kalis. This way of proceeding with acids and alkalis, by projecting the one " or the other of various vegetables, gives but little ſatisfaction. As to the al- " cali, I could never find it diſcover any of thoſe four juices, we obſerve all ſorts

" of

" of wood yield upon diſtillations, ſo as to make this expected luctation, on va-
" rious duſts of logwood, lignum vitæ, oak duſts, &c. all of which do ſo plen-
" tifully afford us a vegetable vinegar, if I may ſo term it; much leſs can we ex-
" pect, that the very ſmall proportion of fixed ſalt, that is to be found in wood,
" ſhould make any viſible agitation, when acid liquors are conveniently mixed
" with them, For I could never find this to ſucceed with many acids upon ſe-
" veral ſaw-duſts: and on the greateſt parts of dried and powdered vegetables.
" Though in theſe the eſſential ſalts are ſubacid, and the fixt alcalizal.

" Some corollaries.

" 1. This hypotheſis of acidum and alcali ſeems very uſeleſs, becauſe the great-
" eſt part of the materia medica cannot be brought to ferment, or fight either
" with acid or alcali. Vid. the firſt propoſition.

" 2. From the premiſes we have reaſon to ſuſpect moſt of the inductions
" made, where even the luctation of ferment happens to ſucceed. See the third
" propoſition.

" 3. That other more ſatisfactory cauſes of the produced fermentation (where
" acids are made to work with ebullition on our ſimple bodies) ought to be in-
" quired after and aſſigned.

" 4. That though I have often made uſe of high and corroſive acids about theſe
" experiments, the better to convince the ſcrupulous; yet I do not think them
" fairly applicable, becauſe theſe, eſpecially the mineral acids of vitriol, and the
" ſpirit of ſalt, and ſpirit of nitre, do ſo promiſcuouſly tear all bodies in pieces,
" where no alcalis were ever found.

" 5. That the natural or vegetable acids of lemons, of apples, of grapes, &c.
" are more proper teſts.

" 6. That even theſe natural acids are not to be relied on, where the conflict
" does enſue. See the third propoſition.

" 7. That the beſt uſe can be made of this hypotheſis ſeems to be this,

" To extract the ſalts ſuppoſed to be in any of our ſimples, or other natural
" body, I mean to extract them in water, which is the proper ſolvent, or men-
" ſtruum for ſalts, and then to mix either acid or alkali, as your judgment or
" experience ſhall direct; if the acid produce a fermentation or luctation more or
" leſs, you may then be pleaſed to infer, that you have an alcali ſalt there, et
" vice verſa; and after this manner perhaps may make ſome uſe of it in re medi-
" ca; though ſcarce ſo much as to build a new body or ſyſtem of phyſic upon
" theſe two pillars, being too few and feeble to bear any great ſuperſtructures.

" I will rather join with Dr. GREW, and take in the colours, ſmell, and taſtes
" of bodies: the laſt of theſe is ſo very well treated of by him, that he has made
" it exceeding uſeful to examine many things by, eſpecially vegetables and other
" parts of our materia medica.

" I will add one more, which ſhall be the analyſis of bodies by diſtillation,
" that this muſt needs be owned of great uſe, both unto the theory and practice

" of phyſic. Not excluding any other expedient for the better trying the nature " and conſtitution of what the faculty call ſimples, I will begin with diſtillation : " and firſt of all with ſuccinum, one of the moſt uſeful drugs belonging to the " materia medica. For the future I intend to examine bodies, firſt in compoſito, " and then in analyſi. I have ſome few experiments on ſuccinum itſelf in concreto ; " which I beg leave to poſtpone to the next meeting, and now to begin with the " volatile ſalt of ſuccinum.

" This volatile ſalt I have ſome ways to prove it a volatile ſalt ſui generis, (if I " may be allowed to call it volatile) for it differs from all other volatile ſalts of " vegetable and animal bodies. But before I come to that, I think I muſt ex- " clude it from being truly a volatile ſalt. For here I would lay down the true " ſtandard of volatile ſalts, viz. that thoſe ſalts, which, upon diſtillation either in " their own phlegm or in common water, do aſcend or riſe out of this water, " leaving the water behind, I find theſe to be volatile ſalts ; or that all volatile " ſalts, vegetable and animal, are lighter and ſooner elevated by heat than water. " To return to our ſalt of amber, I always found, that common water would quite " evaporate and leave our ſalt dry at the bottom : yet upon a ſtronger degree of " fire, the ſalt of amber would riſe up to a great hight. So that it is called a " volatile ſalt, yet improperly ſo, becauſe it does not come to the ſtandard of " volatility, which is to be more volatile than water. As to the nature of this " volatile ſalt, there are ſome properties of it, that plainly prove it an acid, or ra- " ther ſubacid : by touching a ſolution of it with a knife it corroded the metal, and " left a ſtain, as the juice of lemons does. Take equal parts of this ſalt, and of " ſalt of amber, and rub them in a mortar, and then diſſolve them thus mixt in " common water, and they produce the uſual conflict, that real acids and alcalis " are owned to do. The hon. Mr. Boyle has taught us a moſt excellent and " pleaſant experiment, far beyond that of luctation, to examine acids and alcalis " with, namely, by the tincture of lignum nephriticum, which has two very " manifeſt colours, viz. a blue and an orange-colour : the acid always deſtroys " the blue, and leaves in it one uniform orange-colour : with one drop of ordinary " ſpirit of ſalt, I have deſtroyed the colour of an ounce of this blue tincture. I " poured ſome of this diſſolved ſalt of amber into the mentioned tincture, and it " took off the blue, and left it, as ſpirit of ſalt had done before. We alſo made " a ſolution of this ſalt in water, and then by putting filings of iron into the ſolu- " tion, let it ſtand ſome hours in a cold place, that it might work upon the me- " tal, which it did without much ebullition, as it appeared by mixing it with a " ſolution of galls, for it turned to a deep ink. I farther obſerved by a gentle " ſublimation of this volatile ſalt by a lamp furnace, that the figure of it was apt " to riſe, and ſettle itſelf in long cylinders, which to the eye ſeem to run up to a " pyramid : but by a microſcope they ſeem to me plainly to be a great many " round cylinders, that did ſettle one a top of the other, like ſeveral ſhoots or " branches a little unequally ſet together, ſomewhat like to knot-graſs. I pre- " ſerved ſome of theſe ſalts in the bottom of my glaſs, as they were juſt ready to " take flight, and volatilize, and found ſeveral of the little ones, juſt like one " branch of the many, that ſeem to go to the making up of one of our volatile

" pikes, or cryſtals, if I may ſo call it, for it looks ſomewhat like cryſtal in " the microſcope.

" I alſo endeavoured to ſhoot them by diſſolving theſe ſalts in water, and then " by evaporating ſome of the water, that ſo the ſalts might ſubſide, and ſhew " their figures; and I found them all incline to run into long and cylindrical fi- " gures, as the ſalts being at hand do demonſtrate. Dr. PAPIN upon my requeſt " evaporated ſome of the water, my ſalts of amber was diſſolved in, in his vacuo, " which hereupon ſhot into a cryſtal, bearing the figure of a croſs, which ſeems " alſo to be made up of thoſe cylinders beforementioned.

" I was willing to be the more particular in deſcribing this ſalt, becauſe I have " met with ſeveral phyſicians of my acquaintance, who have been unwilling to " believe it differing from other volatile ſalts; and therefore have very often " joined them together in the ſame compoſition, which I know they would ſcarce " have done, had they ever made the former experiment, namely, that of mixing " the volatile ſalt of armoniac with that of amber, and then diſſolving both toge- " ther in water: for had they ſeen how diſagreeing ſalts they are, it would cer- " tainly have made them conſider, whether they would not have fermented, and " quarrelled much more in the warm ſtomach (which is ſeldom without lympha " enough to diſſolve them) than in the cold air, and by this means the truly vola- " tile ſalt would, no doubt, have left its texture, its motion, and volatility: for " this is the effect of all acids, they are apt to clip the wings of all volatile ſalts, " inſomuch, that it requires much art and trouble to reduce them to their former " ſtate of volatility.

" Moreover, thoſe, that derive all diſeaſes from acids, eſpecially ſpaſms, whe- " ther epileptic or other convulſive motions, will now calmly conſider, whether " they have done well in giving this medicine in that quantity as they have done: " for ſurely they conſidered it a volatile alcali, and like ſalt of man's ſkull, " of hartſhorn, &c. and far from being its antagoniſt. The reaſon of this miſ- " take I judge to proceed from hence. Succinum is in itſelf a ſort of a reputed " alcali, and uſed in ſubſtance againſt epileptic or convulſive diſeaſes, and not " without reaſon. The oil of ſuccinum is alſo known, both as to the ſmell and in- " ternal operations, to help in thoſe diſaffections; from whence the chemiſt argues " the volatile ſalt, which is generally the moſt penetrating and moſt vigorous and " eſſential part of the body, muſt needs be more powerful in its operation, than " plain amber, which is very often true, but not always to be relied on: for I " could give many inſtances, where bodies, in their natural ſtate, have properties " quite foreign, if not oppoſite, to what they have in the ſtate of analyſis, or in " their chemical principles. I will at preſent inſtance only in brimſtone, which " is a mild ſoft body, and agreeable to what the acidiſts would call an alcali; yet " we know, that one of the moſt corroſive menſtruums is diſtilled from it upon " accenſion. Theſe two are pretty parallel, for even here the chemical error has " perhaps done much miſchief; this very corroſive menſtruum has been given " for an excellent pectoral medicine in caſes of the lungs, upon the account that

" it came from ſulphur, whoſe concrete may pertinently enough be uſed in thoſe " caſes.

" I have made a digreſſion, which is the more excuſable, for as much as it " relates to the materia medica, and conſequently the health of man, and ſo is not " very far from our purpoſe. In the next place I deſign to examine ſuccinum as " it is a concrete, and alſo in its oil, in its balſam, the fixt ſalt, and the caput " mortuum, and will give the proportions of each: and will ſee to what ſpirits of " natural bodies it relates, whether gums or bitumens."

Some of the volatile ſalt ſublimed, being viewed in a microſcope, appeared like cryſtal cylinders.

Mr. WALLER was deſired to deſign the figure of the ſalt, as it appeared in the microſcope.

The farther conſideration of Dr. SLARE's paper was referred to the next meeting.

Nov. 30, being the day of the anniverſary election of the officers of the Society for the enſuing year, the preſident took the chair, at the time when thirty ſeven fellows were preſent, though the number was afterwards much increaſed. The ſcrutators choſen were Dr. GALE and Mr. WALLER. The eleven members continued of the council were

Mr. ASTON
Mr. COLWALL
Mr. EVELYN
Mr. HENSHAW
Mr. HILL
Sir JOHN HOSKYNS
Dr. LISTER
Mr. PEPYS
Sir CYRIL WYCHE
Sir JOSEPH WILLIAMSON
Sir CHRISTOPHER WREN.

The ten members elected into the council were

Sir RICHARD BULKLEY
Mr. FLAMSTEAD
Dr. GALE
Mr. HAYNES
Mr. HERBERT
Mr. MEREDITH
Mr. PERRY
Dr. TANCRED ROBINSON
Dr. TYSON
Lord Vaughan.

SAMUEL PEPYS, Eſq; was continued preſident:
Mr. HILL treaſurer:
Mr. ASTON one of the ſecretaries,
And Dr. TANCRED ROBINSON choſen the other ſecretary.

Then the following perſons, The Lord Vaughan, Sir RICHARD BULKELEY, Mr. FLAMSTEAD, Dr. GALE, Mr. HAYNES, Mr. HERBERT, Mr. MEREDITH, Mr. PERRY, Dr. ROBINSON, and Dr. TYSON, took the oath of office.

A tide-table for the year 1686, compoſed by Mr. FLAMSTEAD, was licenſed, and the *imprimatur* ſigned by the preſident.

Dr. GALE preſented from Dr. CUMBERLAND a book, intitled *An Eſſay towards the Recovery of the Jewiſh Meaſures and Weights.*

There were expoſed on the table all the figures of the *Hiſtory of Fiſhes*, ordered and completed by the great care of Dr. LISTER, together with ſixty ſheets of the hiſtory.

Then were viewed the regiſter of all the experiments made the laſt year, the journal of the meetings, and the entry of the letters.

Soon after the laſt anniverſary election, the Society loſt by death one of its moſt conſiderable members,

JOHN PELL, D. D. who was deſcended of an antient family in Lincolnſhire. His grandfather and father, who were both of his name, lived at Southwyke in Suſſex, the latter being miniſter of that place, and dying when he was but five or ſix years old; and his mother was of the family of the HOLLANDS in Kent. He was born at Southwyke, March 1, 1610, and educated in grammar learning at the free-ſchool, then newly founded, at Stenning, a Market-town in Suſſex, under Mr. JOHN JEFFERIES. At the age of thirteen he was ſent to Trinity-college in Cambridge, being then as good a ſcholar as moſt maſters of arts in that univerſity; but though he was eminently ſkilled in the Greek and Hebrew languages, he never offered himſelf a candidate at the election of ſcholars or fellows of his college. His perſon was handſome, and the habit of his body ſtrong; and therefore ſcarce ever uſing recreations, he proſecuted his ſtudies with the more application and intenſeneſs [g]. In 1628 he drew up *The Deſcription and Uſe of the Quadrant; written for the Uſe of a Friend in two Books* [h]; the original manuſcript of which is ſtill extant among his papers in the Royal Society; and the ſame year he held a correſpondence with Mr. HENRY BRIGGS on logarithms [i]. In 1630 he wrote *Modus ſupputandi Ephemerides aſtronomicas (quantum ad motum ſolis attinet) paradigmate ad annum 1630 accommodato*; and *A Key to unlock the Meaning of* JOANNIS TRITHEMIUS, in his diſcourſe of ſteganography; which key Mr. PELL the ſame year imparted to Mr. SAMUEL HARTLIB and Mr. JACOB HOMEDÆ. In the ſame year, 1630, he took the degree of maſter of arts at Cambridge [k]; and the year following was incorporated in the univerſity of Oxford [l], and on the 7th of June wrote a letter to Mr. EDMUND WINGATE on logarithms; and on the 5th of October, 1631, wrote *Commentationes in Coſmographiam Alſtedii*. July 3, 1632, he married ITHAMARIA [m], ſecond daughter of Mr. HENRY REGINOLLES of London, by whom he had four ſons and four daughters [n]. March 6, 163$\frac{3}{4}$, he finiſhed his *Aſtronomical Hi-*

[g] WOOD, Faſti Oxon. vol. i. col. 253. and General Dictionary, article PELL (JOHN) vol. viii. p. 250.

[h] The preface to it is dated May 19, 1628.

[i] There is extant a letter to him of Mr. BRIGGS on that ſubject, dated at Merton-college Oct. 25, 1628.

[k] General Dictionary, *ubi ſupra.*

[l] WOOD, *ubi ſupra.*

[m] She is ſometimes written ATHAMAR.

[n] General Dictionary, *ubi ſupra.*

ſtory of Obſervations of heavenly Motions and Appearances; and on the 10th of April following his *Eclipticus Prognoſta: or the Eclipſe-Prognoſticator*; *or Foreknower of the Eclipſes*; *teaching how by Calculation to forcknow and foretel all ſorts of Eclipſes of the heavenly Lights.* In 1634 he tranſlated *The everlaſting Tables of heavenly Motions grounded upon the Obſervations of all Times, and agreeing with them all, compoſed by* PHILIP LANSBERG *of Ghent in Flanders, and ſet forth by himſelf in Latin in the Year of his Age ſeventy one, and in the Year of our Lord* 1632: *Now turned out of Latin into Engliſh, and from the ſexaginal to the decimal Subdiviſion for the more Eaſe in Calculation:* And on the 12th of June the ſame year he committed to writing *The Manner of deducing his Aſtronomical Tables out of the Tables and Axioms of* PHILIP LANSBERG. March 9, 163$\frac{4}{5}$, he wrote a letter of remarks on Mr. GELLIBRAND's *Diſcourſe mathematical on the Variation of the Magnetic Needle*; and on 3d of June following another on the ſame ſubject.

His eminence in mathematical knowledge was now ſo great, that he was thought worthy of a profeſſor's chair in that ſcience; and upon the vacancy of one at Amſterdam in 1639 by the death of HORTENSIUS, Sir WILLIAM BOSWELL, the Engliſh reſident with the ſtates general, made uſe of his intereſt, that he might ſucceed in the profeſſorſhip of mathematics [o]; which was not filled up till above four years after, in December, 1643, when Mr. PELL was choſen to it [p]. The year following he publiſhed, in two pages in quarto, a refutation of LONGOMONTANUS's diſcourſe *De virâ Circuli menſurâ*, printed at Amſterdam in 1644 in quarto. Mr. PELL's refutation was dated Aug. 1, 1644, and concludes thus: *Abunde igitur ſufficit hæc unica pagella tot Chartis Libriſque aliquoties editis refutandis; triumque horularum ſpatio noſtra premens Veſtigia, poſt pauculas multiplicationes & diviſiones, tot annorum incredibiles* LONGOMONTANI *Labores prorſus periiſſe videbis. Ita cenſeo* JOANNES PELLIUS, *Coritano-regnus, Anglus, Matheſeos in illuſtri Amſtelodamenſium Gynaſio Profeſſor. Calendis Sextilibus, anno* 1644.

In June, 1646, he was invited by the Prince of Orange to be profeſſor of philoſophy and mathematics at Breda in the college newly founded there by his highneſs, with the offer of a ſalary of 1000 gilders a year [q]; which he accepted of, and upon his removal to Breda was eaſed of the profeſſorſhop of philoſophy [r], and diſcharged only the duties of that of mathematics, which he did, as he had done before at Amſterdam, with great ſucceſs and reputation.

His *Idea Matheſeos* [s], which he had addreſſed to SAMUEL HARTLIB, Eſq; who in 1639 had ſent it to Monſ. DES CARTES and Father MERSENNUS, was printed in 1650 at London in 12mo in Engliſh with the title of *An Idea of Mathematics* at the end of Mr. JOHN DURIE's *Reformed Library-keeper.*

He left Breda and returned to England in 1652; and in 1654 was ſent by the protector CROMWELL agent to the proteſtant cantons in Swiſſerland, his in-

[o] MS. note of Dr. PELL.

[p] WOOD, *ubi ſupra.*

[q] Letter of Mr. PELL to Sir CHARLES CAVENDISH from Amſterdam, 9 July, 1646, N. S.

[r] Letter to the ſame from Breda, $\frac{17}{27}$ Novemb. 1646.

[s] It is printed by Mr. HOOKE in his *Philoſ. Collect.* N°. 5. p. 127.

ſtructions

ſtructions being dated March 30 of that year. His firſt ſpeech in Latin to the deputies of Zurich was on the 13th of June following; and he continued in that city during moſt of his employment in Swiſſerland, in which he had afterwards the title of reſident. Being recalled by the protector, he took his leave of the cantons in a Latin Speech at Zurich on the 23d of June, 1658 [t]; but returned to England ſo ſhort a time before the protector's death, that he had no opportunity of an audience of him [u].

After the reſtoration he entered into holy orders, being ordained deacon March 31, 1661, and prieſt in June following, by Dr. ROBERT SANDERSON, Biſhop of Lincoln [x]; and on the 16th of that month was inſtituted to the rectory of Fobbing in Eſſex, given him by the King [y]. On the 5th of December following he brought into the upper houſe of convocation the calendar reformed by him aſſiſted by Mr. SANCROFT, afterwards Archbiſhop of Canterbury. In 1663 he was preſented by Dr. GILBERT SHELDON, Biſhop of London, to the rectory of Laingdon in Eſſex, to which he was inſtituted on the 23d of July [z]. Upon the promotion of that Biſhop to the ſee of Canterbury in the next month, he became one of his grace's domeſtic chaplains, being then doctor of divinity; "and expected, as Mr. WOOD tells us [a], "to be made a dean; but being not a perſon of activity, as others, who mind "not learning are, could never riſe higher than a rector. The truth is, he was a "ſhiftleſs man as to worldly affairs; and his tenants and relations dealt ſo un-"kindly by him, that they cozened him of the profits of his parſonage, and "kept him ſo indigent, that he wanted neceſſaries, even ink and paper, to his dy-"ing day." He was for ſome time confined to the King's-bench priſon for debt; but in March 1682 was invited by Dr. WHISTLER to live in the college of phyſicians, where he continued till June following, when he was obliged by his ill ſtate of health to remove to the houſe of a grand-child of his in St. Margaret's church-yard, Weſtminſter [b]. He died at the houſe of Mr. COTHORNE, reader of the church of St. Giles's in the Fields, in Dyot-ſtreet in that pariſh on Saturday 12 December 1685, and was interred by the charity of Dr. RICHARD BUSBY, maſter of Weſtminſter ſchool, and of Dr. JOHN SHARP, rector of St. Giles's church, in the rector's vault under that church [c]. He was declared a fellow of the Royal Society May 20, 1663, by the council, ſoon after the granting of the ſecond charter to the Society. He publiſhed in 1664, in quarto without his name, an *Exercitation concerning Eaſter*. He drew up *A Table of ten thouſand ſquare Numbers, namely, of all the ſquare Numbers betweeo* 0 *and an hundred millions, and of their Sides or Roots, which are all the whole numbers betwixt* 0 *and ten thouſand. With an Appendix concerning the Endings or laſt Figures of all ſquare numbers:* printed at London 1672, in folio. He publiſhed his *Inaugural Oration*, made upon entering upon his profeſſorſhip at Breda. He made great alterations and additions to RHONIUS's *Algebra*, printed at London 1668, in quarto, under the title of *An Introduction to Algebra, tranſlated out of the High Dutch into Engliſh by* THOMAS BRANCKER, M. A. *much altered and augmented by* D. P. [i. e. Dr. PELL.] *Alſo*

[t] From his original papers.
[u] General Dictionary, *ubi ſupra*, p. 251.
[x] Ibid.
[y] Bp. KENNET's regiſter and chronicle, p. 575.
[z] Ibid.
[a] *Ubi ſupra.*
[b] General Dictionary, p. 251, 252.
[c] WOOD, col. 254.

a Table

a Table of odd Numbers leſs than one hundred thouſand, ſhewing thoſe, that are incompoſit, and reſolving the reſt into their Factors or Coefficients. Supputated by the ſame THOMAS BRANCKER. A copy of this book, with many corrections and improvements of Dr. PELL, is amongſt his papers in the Royal Society. He demonſtrated the ſecond and tenth books of EUCLID, which piece was in manuſcript in the library of the Lord Brereton at Brereton in Cheſhire, as likewiſe ARCHIMEDES's Ψαμμίτης, and the greateſt part of DIOPHANTUS's ſix books of arithmetic; of which author he was preparing in Auguſt 1644 a new edition, in which he would have corrected the tranſlation, and made new illuſtrations [d]. He deſigned likewiſe to publiſh an edition of APOLLONIUS, but laid it aſide in May, 1645, at the deſire of GOLIUS, who was engaged in an edition of that writer from an Arabic manuſcript given him at Aleppo eighteen years before [e]. Beſides thoſe of his papers, which were left by him at Brereton in Cheſhire, where he reſided ſome years, being the ſeat of WILLIAM Lord Brereton, who had been his pupil at Breda, a great quantity of the reſt came after his death into the hands of Dr. BUSBY, which Mr. HOOKE reporting to the Royal Society, February 10, 168$\frac{5}{6}$, was deſired to uſe his endeavours to obtain thoſe papers for the Society. But they continued buried under duſt, and mixed with the papers and pamphlets of Dr. BUSBY in four large boxes, till June 1755, when the writer of this hiſtory procured them for the Society by means of the reverend RICHARD WIDMORE, M. A. librarian of the church of St. Peter's Weſtminſter, from the truſtees of Dr. BUSBY. The collection contains not only Dr. PELL's mathematical papers, letters to him, and copies of thoſe from him, &c. but likewiſe ſeveral manuſcripts of Mr. WALTER WARNER, the philoſopher and mathematician, who lived in the reigns of the Kings JAMES I. and CHARLES I.

Dec. 2. SAMUEL PEPYS, Eſq; preſident in the chair.

The minutes of November 25 were read; as likewiſe the proceedings of the general meeting upon St. Andrew's day for the election of a preſident and officers for the enſuing year.

Mr. HOOKE read a paper of obſervations upon Mr. NORRIS's book, wherein he declared, that he had formerly ſhewn a way for deſcribing the rhumb-line and ſome other things relating to navigation: and that he had peruſed Dr. WALLIS's obſervations upon Mr. NORRIS's book.

Mention being made of an univerſal meaſure, Mr. HOOKE ſaid, that he had thought of a natural body, which might be an univerſal ſtandard, which he would diſcover at the next meeting.

The minutes of the Philoſophical Society at Oxford of November 17 were read, mentioning a catalogue of ſeveral leaves and ſeeds brought from St Chriſtopher's; a diſſection by Mr. PIGOTT, junior, of the fund of the bladder made in a dog after Dr. LISTER's directions, which ſucceeded well, the dog being recovered

[d] Letters of Mr. PELL to Sir CHARLES CAVENDISH from Amſterdam, Aug. $\frac{10}{20}$, 1644.

[e] Letter to the ſame from Amſterdam, May $\frac{9}{19}$, 1645.

gradually

gradually in a fortnight's time; lacteals proceeding from the bottom of the ſtomach, &c.

A letter of Mr. JOSUA WALKER, dated at Oxford November 26, was read, mentioning an experiment made there, that twelve ounces of water were ſufficient to buoy up a veſſel, that weighed above twenty pounds. It was made uſe of to confirm the tenth propoſition of the fourth book of STEVINUS's ſtatics.

This letter mentioned likewiſe an experiment of a new ſort of pump with two ſuckers lying in two ſockets cloſe at the bottom of a well, &c.

Mr. HALLEY gave an account, that he had read over the experiments about the declination at Nuremberg, and the application of the poles of the needle to the ends of a piece of iron held perpendicular, obſerved by a maſter of a ſhip, when he croſſed the æquator. He doubted whether the obſervations made at Nuremberg five years before were exactly true, it being certain, that the declination varies in other places.

He deſired, that order might be given to ſeamen, not only to obſerve the different applications of the poles of the needle to the iron in croſſing the line near Guinea, but alſo as they return upon the line towards the Eaſt-Indies.

A letter was communicated, written by Mr. WILLIAM NICHOLSON to Mr. OBADIAH WALKER, maſter of Univerſity-college Oxford, and dated at Carliſle, November 2, 1685, concerning two Runic inſcriptions, one at Bridekirk and the other at Beaucaſtle; the latter of which is deſcribed, with a conjecture at the meaning of the characters, which were legible. The ſecretary was ordered to deſire, that this letter might be printed [f].

A letter of Mr. WILLIAM MOLYNEUX to Mr. ASTON, dated at Dublin, Oct. 27, 1685 [g], was read, containing ſome objections to Dr. GARDEN's letter to Dr. MIDDLETON concerning the trade winds, and an account of his firſt diſcovering the circulation of the blood in a newt or ſalamandra aquatica about two years before, together with an extract of the regiſter of the Dublin Society May 26, 1684, atteſting the trials made before them.

Mr. ASTON declared, that he had received an account thereof from Dublin above a year before, which would appear both from the minutes and letter-books; ſo that this diſcovery muſt be owned to be Mr. MOLYNEUX's, except Dr. GARDEN can bring authorities, which did not yet appear.

A letter of Mr. ST. GEORGE ASHE to Mr. ASTON, dated at Trinity-college Dublin, Sept. 16, 1685 [h], was read, concerning the continued rains upon the 18th of Auguſt and the night before, which cauſed the river Shannon about Athlone

[f] It is printed in the *Philoſ. Tranſact.* N°. 178. p. 1287.

[g] Letter-book, vol. x. p. 259. It is printed in the *Philoſ. Tranſ.* N°. 177. p. 1236.

[h] Letter-book, vol. x. p. 222.

a hundred

a hundred miles from the ſea to run backward for twenty four hours together, there being never any tide there: of which he gives an ingenious reaſon drawn from the nature of the channel, being narrow and bounded below, and flat and laky above the place, where ſeveral brooks heightened with ſudden rains fell in.

This letter mentioned likewiſe a new lamp invented by the Biſhop of Ferns [i], to enlighten a large hall or church: a man, who for many years ſquinted every other day, on which his eyes were very weak; and afterwards changed to a conſtant daily ſquint: a new philoſophical character invented by Mr. KEOGH; and a liquor of Dr. MULLEN, which being injected into one dog's veins made him die preſently apoplectic, and poured down another dog's throat, fluxed him.

Another letter of Mr. ASHE to Mr. MUSGRAVE, dated at Dublin, October 10, 1685 [k], was read, concerning a girl in Ireland, who had ſeveral horns growing on her body, between thirteen and fourteen years of age, born at Waterford. The horns firſt appeared about the third year of her age: they were moſt about her joints and flexures, and faſtened to the ſkin like warts. Thoſe at the end of her toes were as long as the toes: thoſe at the elbows four inches long, and twiſted like a ram's horn.

Dr. SLARE ſhewed one of the cryſtals of amber, being ſhot in the exact figure of a croſs; ſome of the water, wherein the ſalts were diſſolved, having been evaporated by Dr. PAPIN.

Dr. PAPIN ſhewed ſome raw cherries, which had been preſerved in the gelly of bones ever ſince the 27th of July laſt. They were well coloured, but ſomething ſhrunk, well taſted as was the gelly.

December 9, at a meeting of the COUNCIL were preſent

Dr. GALE vice-preſident

Lord Vaughan	Mr. FLAMSTEAD
Sir CYRIL WYCHE	Mr. HAYNES
Sir RICHARD BULKELEY	Dr. ROBINSON
Mr. HILL	Dr. TYSON
Mr. HERBERT	Mr. MEREDITH
Mr. PERRY	Mr. ASTON.

The vice-preſident Dr. GALE was ſworn.

Mr. ASTON declared to the council, that he had laid down his place of ſecretary [l].

Dr.

[i] Dr. NARCISSUS MARCH.

[k] Letter book, vol. x. p. 263. It is printed in the *Philoſ. Tranſ.* N°. 176. p. 1202. for November 1685.

[l] The occaſion and manner of his and Dr. ROBINSON's reſignation of the office of ſecretaries to the Society will appear from the following paſſage in a letter of Mr. EDMUND HALLEY

Dr. ROBINSON desired likewise to be excused being secretary.

It was ordered, that a summons be sent out for the members of the Society to meet upon the Wednesday following at three o'clock in the afternoon for the choosing two new secretaries.

WILLIAM MOLYNEUX, Esq; and Mr. ST. GEORGE ASHE were proposed as fit to be elected into the Society.

At a meeting of the SOCIETY on the same day, Dr. GALE vice-president in the chair.

WILLIAM MOLYNEUX, Esq; and Mr. ST. GEORGE ASHE were proposed as candidates.

Mr. SAMUEL FOLEY's *Natural Arithmetic*[m], dedicated to the Society, was read, and ordered to be printed.

The problem of ARCHIMEDES solved by the Lord Viscount Montjoy, president of the Dublin Society, was read, and ordered to be printed.

A letter of Mr. WILLIAM MOLYNEUX, containing his observations upon Mr. HEVELIUS's *Annus Climactericus*, was read, and a copy of it given to Mr. HALLEY.

An order was made for summoning the Society on the Wednesday following at three o'clock in the afternoon for the electing two secretaries in the room of Mr. ASTON and Dr. TANCRED ROBINSON, who desired to be excused from being secretaries any longer.

Dec. 16, at a meeting of the COUNCIL were present

to Mr. WILLIAM MOLYNEUX, dated at London, March 27, 1686, Supplement to letter-books, vol. 4. p. 330. "On St. ANDREW's day last, "being our anniversary day of election, Mr. "PEPYS was continued president, Mr. ASTON, "secretary, and Dr. TANCRED ROBINSON chosen "in the room of Mr. MUSGRAVE. Every "body seemed satisfied, and no discontent ap- "peared any where, when on a sudden Mr. "ASTON, willing, as I suppose, to gain better "terms of reward from the Society than for- "merly, on December 9th in council declared, "that he would not serve them as secretary, "and therefore desired them to provide some "other to supply that office; and that after "such a passionate manner, that I fear he has "lost several of his friends by it. The council, "resolved not to be so served for the future, "thought it expedient to have only honorary "secretaries, and a clerk or amanuensis, upon "whom the whole burthen of the business "should lie, and to give him a fixed salary, "so as to make it worth his while, and he to "be accountable to the secretaries for the per- "formance of his office According to which "resolutions Sir JOHN HOSKYNS and Dr. GALE "were chosen secretaries; and on January 27th "last they chose me for their under-officer with a "promise of a salary of fifty pounds per ann. "at least."

[m] It is inserted in the letter-book, vol. x. p. 230. under the title of *Computatio Universalis, seu Logica Rerum.*

SAMUEL PEPYS, Esq; president

Lord Vaughan	Dr. LISTER
Sir JOSEPH WILLIAMSON	Dr. ROBINSON
Sir RICHARD BULKELEY	Dr. TYSON
Sir JOHN HOSKYNS	Dr. GALE
Sir CYRIL WYCHE	Mr. MEREDITH
Mr. HILL	Mr. PERRY
Mr. HERBERT	Mr. ASTON.

The queſtion was put, whether the council ſhould recommend to the Society the choice of another clerk, as being for the uſe of the Society and the eaſe of the ſecretaries: which was carried by ten votes in the affirmative againſt five in the negative.

The queſtion being put, whether the laſt ſecretaries ſhould be gratified for their care and pains and ſervice, it was carried in the affirmative.

It was ordered, that Mr. ASTON ſhall have as a gratuity ſixty pounds: and That Mr. MUSGRAVE ſhall have a piece of plate of ſixty ounces, with the thanks of the Society and their arms upon it.

At a meeting of the SOCIETY on the ſame day, the preſident in the chair.

After a long debate, Sir JOHN HOSKYNS and Dr. THOMAS GALE were choſen ſecretaries by a great majority in the room of Dr. TANCRED ROBINSON and Mr. FRANCIS ASTON, who reſigned the ſaid office at the laſt meeting.

This affair took up ſo much time, that nothing elſe was done at this meeting.

The Society then adjourned till after Chriſtmas.

168⅝. *Jan.* 13, at a meeting of the COUNCIL were preſent

SAMUEL PEPYS, Esq; president

Lord Vaughan	Mr. MEREDITH
Sir JOSEPH WILLIAMSON	Dr. LISTER
Sir RICHARD BULKELEY	Mr. ASTON
Sir CYRIL WYCHE	Mr. PERRY
Mr. HILL	Dr. ROBINSON.
Mr. HERBERT	

A committee was choſen to audit the accounts of Mr. HILL as treaſurer, conſiſting of the preſident, Sir RICHARD BULKELEY, Mr. MEREDITH, Mr. PERRY, and Dr GALE.

There was much diſcourſe concerning the qualifications and office of the clerk, but nothing reſolved upon.

At a meeting of the SOCIETY on the ſame day, Dr. LISTER vice-preſident in the chair.

Part of a letter of Mr. LEEWENHOECK, tranſlated by Mr. LODWICK, was read, concerning embryo-plants, which he affirmed himſelf to have found perfectly formed in ſome ſorts of ſeeds, particularly the cotton-ſeed [n].

Mr. LODEWICK was deſired to proceed in tranſlating the remainder of that letter.

Dr. LISTER ſaid, that plants are ſometimes full of a mealy ſubſtance, viz. in the ſpring: which ſubſtance, after the plants are run up, is no longer found in them.

Dr. PAPIN read a paper of his, containing an account of the contrivance of his water-engine for circulating water; which was ordered to be regiſtered [o].

He read likewiſe his thoughts concerning the water-engine at London-bridge, which raiſes water without intermiſſion [p]. He affirmed, that though the inward contrivance of that pump was concealed, he could make another, which ſhould have the ſame effect, and produced a ſcheme of his invention.

A letter in Latin from JOHN WEICHARD VALVASOR, dated at Wagenſperg in Carniola, December 3, 1685, N. S. [q], was read, deſiring a correſpondence with and election into the Society; giving an account of himſelf and his performances, and of the wonderful lake of Zirknitz in Carniola, and promiſing the natural hiſtory of it.

Dr. GALE was deſired to return him an anſwer.

Jan. 20. Dr. LISTER vice-preſident in the chair.

Dr. PAPIN read a farther diſcourſe concerning his engine, that raiſes and circulates water.

Mr. POVEY remarked, that one Mr. DESSOUN had raiſed more water for the Earl of Winchelſea with an ordinary and eaſy wheel.

Mr. HEVELIUS's letter to Mr. ASTON, dated at Dantzick, Decemb. 29, 1685, N. S. [r], was read, containing his obſervations of the total eclipſe of the moon, Decemb. 10, N. S.

Dr. PAPIN ſhewed a glaſs of ſtrawberries, preſerved in a gelly of bones, which

[n] Letter-book, vol. xi. p. 1. It is printed in the *Philoſ. Tranſact.* N°. 199. p. 700.

[o] Regiſter, vol. vi. p. 286. It is printed in the *Philoſ. Tranſact.* N°. 178. p. 1274.

[p] Regiſter, vol. vi. p. 291.

[q] Letter-book, vol. x. p. 273.

[r] Ibid. p. 275. Part of it is printed in the *Philoſ. Tranſact.* N°. 178. p. 1256.

were

were found not to anſwer expectation, the fruit being ſpoiled, and the ſinell and taſte gone into the gelly.

Dr. SOLOMON REISELIUS's letter to Mr. ASTON, dated at Stutgard, Octob. 8, 1685[t], concerning the Wirtemberg ſyphon, was read; whereby it appeared, that Dr. PAPIN had exactly conjectured at the compoſition of the ſame ſyphon.

This letter confirmed likewiſe the writer's thoughts of Dr. PAPIN's engine for circulating-water, with propoſals of his own about doing the ſame thing: which were referred to Dr. PAPIN to conſider of and anſwer.

January 27, at a meeting of the COUNCIL, Mr. PEPYS the preſident in the chair, and moſt of the council preſent, upon conſideration had of the charter, were of opinion, that the Society was not limited to the number of their clerks; and that the choice of clerks is to be made by the majority of thirty one at leaſt, or of the members preſent, if more than thirty one.

Orders agreed upon by ſeveral councils, containing their opinion concerning the qualifications neceſſary for a clerk to be choſen by the Society till St. Andrew's day following.

1. Reſolved, that if a fellow of the Society be choſen into the office of clerk, he ſhall before his admiſſion to his office reſign his fellowſhip.
2. If any perſon other than a fellow ſhall be choſen clerk, he ſhall be incapable of being choſen a fellow, while he holdeth the office of clerk.
3. That he ſhall have no other employment.
4. That he ſhall conſtantly lodge in the college, where the Society meeteth.
5. That he ſhall be a ſingle man without children.
6. That he ſhall obey all orders from the preſident, council, or ſecretaries.
7. That he ſhall be maſter of the Engliſh, French, and Latin tongues.
8. That he ſhall be able to write a fair and legible hand.
9. That he ſhall be completely ſeen in the mathematics and experimental philoſophy.
10. That all letters of philoſophical correſpondence ſhall be ſigned by one of the ſecretaries, and not by the clerk.
11. That the clerk ſhall be accountable to the council for the performance of his office, as it ſhall be from time to time appointed to him.
12. That his ſalary for copying, entering, and the performance of all other parts of his office, ſhall be after the the rate of fifty pounds *per annum* at the leaſt, he being found as above, and performing his duty to the ſatisfaction of the council.

The duty of the clerk.

1. He ſhall take the minutes of the Socie y in a book, and not in looſe papers.
2. He ſhall draw up the minutes at large againſt the next meeting.

[t] Letter-book, vol. x. p. 208. Part of it is printed in the *Philoſ. Tranſact.* N°. 178. p. 1272.

3. He

3. He ſhall enter the minutes, after they have been read at the board, in the journal-books.

4. He ſhall draw up all letters, and bring them to be ſigned by one of the ſecretaries.

5. He ſhall index the books of the Society.

6. He ſhall keep a catalogue of all the gifts to the Society.

Theſe orders drawn up by the council, touching the qualifications and buſineſs of the clerk, were twice read before the Society at the time of election: and it being queried, whether the Society might not diſpenſe with ſome of the ſaid qualifications, it was anſwered by the preſident, that the council only gave them as the reſult of their thoughts concerning the perſon fit to ſerve them; but that they were ſtill at liberty to chooſe whom they pleaſed.

At a meeting of the SOCIETY on the ſame day, Mr. PEPYS preſident in the chair.

This day being ſet apart for the choice of a clerk, to be aſſiſtant to the ſecretaries, little elſe was done; only

Dr. PAPIN was ordered to provide ſome experiments againſt the next meeting.

Then the reſult of the debates of the council concerning the qualifications and buſineſs of a clerk having been twice read, after ſome diſcourſe thereupon, the Society proceeded to their choice.

The members preſent were thirty eight, of which upon balloting Dr. SLOANE had 10 voices

Dr. PAPIN	8
Mr. SALISBURY	4
Mr. HALLEY	16.

But the majority of the members preſent being requiſite to an election, the ballot was repeated, and then

Dr. SLOANE had	9 voices
Dr. PAPIN	6
Mr. HALLEY	23.

Mr. HALLEY being thus choſen was ſworn before the council.

Sir. ROBERT GORDON was propoſed candidate by Sir CHRISTOPHER WREN.

The preſident then appointed Sir JOSEPH WILLIAMSON and Sir CYRIL WYCHE his vice-preſidents.

Feb. 3, at a meeting of the COUNCIL were preſent

Mr.

Mr. PEPYS preſident

Lord Vaughan	Mr. HERBERT
Sir JOSEPH WILLIAMSON	Dr. TYSON
Sir JOHN HOSKYNS	Dr. GALE
Mr. HILL	Mr. PERRY.
Mr. EVELYN	

It was ordered and reſolved, that Mr. EDMUND HALLEY, as clerk, do conſtantly and of courſe attend at the councils of the Society, and be always ſummoned, and do there take minutes ſitting uncovered at the lower end of the table; but to withdraw when particularly ordered:

That he do inquire and ſatisfy the council what inventories of the Society's papers were made, when they were taken into the care of Mr. HOOKE and Mr. ASTON:

That he bring in an account of what he finds wanting of the Society's books and papers; and that he inquire after them:

That he and Mr. HUNT make a liſt of the things in the repoſitory; and that Mr. HUNT have notice of this order in writing: and that Mr. HILL and Mr. HALLEY deſire Dr. GREW to do for the Society what he promiſed, in order to the making of a catalogue of the repoſitory firſt; and that then Mr. HALLEY and Mr. HUNT continue and perfect the liſt:

That at the next council the matter of the *Tranſactions* be conſidered:

That Sir JOHN HOSKYNS, Dr. GALE, Dr. LISTER, Mr. HILL, and Dr. TANCRED ROBINSON be a committee to conſider of the diſpoſal of the *Hiſtory of Fiſhes*: and

That againſt the next council the members come prepared to give their thoughts about the means of making experiments in a philoſophical method.

Sir ROBERT GORDON having been propoſed candidate by Sir CHRISTOPHER WREN was approved by the council to be propoſed to the Society for election.

At a meeting of the Society on the ſame day, Sir JOSEPH WILLIAMSON vice-preſident in the chair.

Sir ROBERT GORDON having been propoſed in the laſt council and approved, was choſen fellow of the Society, and admitted.

Dr. REISELIUS's letter concerning the Wirtemberg ſyphon was read a ſecond time; as alſo Dr. PAPIN's anſwer to it in Latin [t].

Dr. SLOANE preſented the Society with ſeveral ores and mineral ſubſtances ſaid to be found in England. He was deſired to make a catalogue of them.

Mr. HOOKE brought in an invention of his for nicely diſcovering the alterations of the hight of the barometer by obviating the objections againſt Mr. HUBIN's way, of the different counterpreſſure [u].

[t] Letter-book, vol. iv. p. 284.

[u] *His Experiments and Obſervations for the Improvement of the Barometer*, read this day before the Society, are printed in his *Phil. Exper.* &c. p. 169.

He

He mentioned alſo another experiment, to ſhew the advantages of teleſcopic ſights over plain ones.

He was deſired to explain both theſe at the next meeting.

Dr. PAPIN, for the entertainment of the Florentine envoy, Signor CAPPONI, ſhewed again the experiment of water boiling *in vacuo* by being put into cold water; and delivered a paper attempting to aſſign a reaſon of that odd phænomenon by two experiments, which he likewiſe ſhewed, and was deſired to repeat at the next meeting. His paper was as follows [x]:

" A glaſs half full of water, and exhauſted of air, was ſhewn in the Royal So-
" ciety about a year ago: and it was tried, that this glaſs being heated a little,
" and then put into cold water, or ice, the water included in the ſaid glaſs would
" thereby be ſet a boiling with a great violence. This ſeemed ſo ſurpriſing, that
" every man wiſhed to know the true cauſe of it. Now from two other experiments,
" ſomewhat akin to this, methinks, I gueſs at a good reaſon to be given of this
" odd *phænomenon:* I do therefore make bold to ſubmit it to the examination of
" the Royal Society. The firſt experiment is, that ordinary water being put *in*
" *vacuo* will produce a great many bubbles; the ſecond is, that water having
" been kept for a while in the receptacle of a wind-gun, it will likewiſe emit
" abundance of bubbles as ſoon as we ſhoot the gun, and give the air liberty to
" expand. This ſhews, that liquors being freed from an external preſſure will
" make bubbles upon the ſcore of the elaſtic particles lurking in their pores, as
" has been obſerved long ago by the hon. Mr. R. BOYLE. I do therefore be-
" lieve, that the vapours raiſed by heat in an exhauſted glaſs will make a preſ-
" ſure, which is quickly taken off, when we condenſe thoſe vapours by putting
" the glaſs into cold water, or ice: from whence it follows, that the liquor in-
" cluded in the glaſs muſt produce abundance of bubbles by the reaſon aforeſaid.
" I have prepared all neceſſaries to make the three aforementioned experiments,
" that by looking upon them the Royal Society may judge, whether it is not very
" probable, that they depend upon the ſame principle."

Signor CAPPONI mentioned a book of a philoſophical nature lately publiſhed at Florence, intitled, *Lettere due di Giuſeppe del Papa, Letttore di Piſa, ſcritti al ſignor dottore Redi, nella prima delle quali tratta del umido e del freddo, & nella ſeconda del caldo e del ſecco.*

He promiſed at his return to procure the Society a proper correſpondent at Florence.

February 10, at a meeting of the COUNCIL were preſent

Sir JOSEPH WILLIAMSON vice-preſident

Lord Vaughan	Dr. GALE
Sir CYRIL WYCHE	Dr. ROBINSON
Sir JOHN HOSKYNS	Mr. ASTON
Mr. HENSHAW	Mr. HAYNES
Mr. HILL	Mr. PERRY.
Mr. MEREDITH.	

[x] Regiſter-book, vol. vi. p. 292.

Mr.

Mr. HALLEY reported from Mr. HOOKE, that there was no particular inventory of the Society's papers taken, when they were delivered into his cuſtody.

Mr. ASTON being preſent affirmed likewiſe, that the ſaid papers were not delivered to him by inventory, but that in the beginning of Sir CYRIL WYCHE's year there was an account taken of them, entered in the journal-book of that time.

Inquiry being made after a part of the journal of the Society, which was wanting in the Society's preſſes, Mr. ASTON ſaid, that he had it in his poſſeſſion; as likewiſe all the copies of the journals and regiſters except two.

It was ordered, that Mr. HUNT carry the laſt journal and the journal of the council to Mr. ASTON to be completed by him: and that Mr. ASTON give in the original papers belonging to the Society in his cuſtody: and

That the conſideration of the *Tranſactions* be put off till the next council.

The debate about the *Hiſtory of Fiſhes* being entered upon, it was alledged by Mr. ASTON, that the book being printed at Oxford, and the plates at London, as likewiſe the *Appendix*, there could be no fraud in the printer at Oxford. Againſt which it was objected, that the cuts being deſigned for a book apart, any number of the books, that might be in the printer's hands, might by that means be made complete.

The council then agreed with their committee, that they could not proceed to make any diſpoſal of the *Hiſtory of Fiſhes*, till they ſhould hear from Dr. PLOT, and have ſecurity from Mr. HALL the printer, that he had printed no more than the number, which the Society paid for.

At a meeting of the SOCIETY on the ſame day, Sir JOSEPH WILLIAMSON vice-preſident in the chair.

The minutes of the laſt meeting were read.

Dr. SLOANE brought in again the ores and mineral ſubſtances, which he had preſented at the laſt meeting, with a catalogue of them, amounting in all to N°. 50; as likewiſe a farther preſent of the like ſubſtances, viz. from N°. 26 of his catalogue to the end.

Mr. HOOKE remarked, that the beſt way to preſerve ſome of thoſe ſubſtances, whereof the quantity was but very little, was by glewing them down to cards to be ſtuck to the bottom of a box.

Sir JOHN HOSKYNS on occaſion of theſe earths mentioned, that he had obſerved one near Market Lavington in Wiltſhire, that was very good umber.

Mr. HOOKE ſaid, that theſe brown earths are a tincture given by water running through ſome iron mineral.

Dr. SLOANE affirmed, that ſome ſorts of yellow mundic would ſtrike fire; and that upon ſtriking or breaking, it has a very ſtrong ſmell reſembling garlic; and that once on breaking a great piece, the ſcent had been ſo ſtrong as almoſt to ſuffocate him.

Sir JOHN HOSKYNS ſaid, that the ſeveral mineral colours are properly applied to the painting of glaſs, as not being deſtroyed by fire.

Mr. WALLER was put in mind of his catalogue of colours; which he promiſed to bring in at the next meeting.

Mr. HOOKE mentioned, that he had in his cuſtody ſome Engliſh cobalt, which is the mineral, out of which blue ſmalt is made. He was deſired to produce it to the Society, which he promiſed.

Mr. BOYLE's book, intitled, *An Eſſay of the great Effects of even languid and unheeded Motion: whereupon is annexed an experimental Diſcourſe of ſome little obſerved Cauſes of the Inſalubrity and Salubrity of the Air and its Effects*, was preſented from the author by the hands of Sir ROBERT GORDON.

Mr. HOOKE was deſired to ſhew his experiment about the compariſon of plain and teleſcopic ſights at the beginning of the next meeting, it being now too dark to ſee it with the exactneſs requiſite.

He reported, that the papers of the learned Dr. PELL, lately deceaſed, were partly in cuſtody of Dr. BUSBY, and the reſt at Brereton in Cheſhire. He was deſired to do his endeavour to obtain the ſaid papers for the Society.

Mr. HOOKE read his diſcourſe of the improvement of the barometer by taking off the inequality of the preſſure of the coloured liquor in Mr. HUBIN's way.

He was deſired to give it in to be regiſtered; but he deſired to be excuſed at that time, promiſing to bring in an account thereof ſhortly[y].

He mentioned upon this occaſion, that on Wedneſday the 3d inſtant the quickſilver was exceedingly high, viz. 30. 6 inches; and that he had never obſerved it higher:

That once a year in the winter-months of December, January or February the quickſilver ſtands higher than in all the reſt of the year beſides, generally preſaging froſt.

Mr. HOOKE aſſerting it, it was queried by Dr. LISTER if the regiſter or

[y] It is inſerted in the regiſter, vol. vi. p. 293. It is printed in *Philoſ. Tranſact.* N°. 185. p. 241. for November and December 1686.

journal

journal of the Society mentioned a glaſs cane of thirty two foot long made for the Torricellian experiment.

Mr. HOOKE mentioned an inſtrument of his contrivance, whereby he could diſcover the thickneſs or thinneſs of the air, abſtracted from its gravity; which he was deſired to perfect and bring in.

He was deſired to proceed to ſhew his experiment, whereby he would eſtabliſh a general weight and meaſure by means of a drop of quickſilver; it being queried by ſome of the members, whether the 500th part of a grain could, by any means, be diſcovered in a ſcale.

Sir ROBERT GORDON ſaid, that he had ſeen the 1000th part of a grain weighed; and that he had a beam capable of doing it, made by one Mr. NEILE.

Dr. PAPIN ſhewed an experiment proving the quantity of air compreſſed in the chamber of his wind-gun; which did not ſucceed, by reaſon, that the receiver was not capacious enough.

Sir ROBERT GORDON deſired, that Dr. PAPIN would by the means of his air-gun ſupply with freſh air an animal included in a ſmall ſpace, to try, if thereby the life of the animal might not be prolonged.

Feb. 17. Sir JOSEPH WILLIAMSON vice-preſident in the chair.

The minutes of the laſt meeting were read.

Mr. WALLER preſented his table of colours neatly drawn with his own hand[z]. It was ordered to be put in a frame with a glaſs before it to be hung up in the Society's meeting-room.

Mr. HOOKE ſhewed his experiment to prove the excellency of teleſcopic ſights above plain ones, by comparing a direction by the naked eye with a radius of ten feet, with that of a teleſcope of eight inches; and it appeared to the ſatisfaction of all preſent, that there was a very great advantage in the teleſcope.

He promiſed to bring in at the next meeting an invention of his, whereby the limb of a very ſmall inſtrument may be divided ſo as to have as many diſcernible parts, as a very large one, according to the uſual manner of the diviſion of inſtruments[a]: as likewiſe another contrivance to ſet ſuch a ſmall inſtrument perpendicularly to take altitudes as well as by a larger radius.

He affirmed, that Mr. HUBIN's contrivance of the barometer was formerly brought in to the Society by himſelf, and that he in truth was the inventor thereof.

[z] It is printed in the *Philoſ. Tranſact.* vol. xvi. N°. 179. p. 24. for Jan. and Feb. 1686.
[a] Regiſter, vol. vi. p. 253.

Mr. HALLEY was ordered to ſearch the books of the Society, to ſee, whether there be any record thereof.

Mr. HOOKE promiſed again to ſhew an inſtrument, that ſhould diſtinguiſh the gravity of the ambient air.

He being called upon for the experiment, whereby he would make an univerſal meaſure and weight from a drop of quickſilver, deſired to be excuſed for ſome time till the ſun had gotten more northward.

Mr. HILL affirmed, that the 1000th part of a grain had been diſcernible in ſeveral trials made formerly at Greſham-college by Dr. GODDARD.

Mr. HOOKE read and gave in an account of Mr. BOYLE's book on *languid and unheeded Motion*, preſented at the laſt meeting.

Dr. PAPIN's account of the compreſſion of the air in his wind-gun [b] was read, wherein he aſſerted the compreſſion to have been into a 60th part of the ſpace, which it naturally takes up; and that the utmoſt degree of compreſſion to be made by the ſame force depends upon the diameter of the bore of the gun.

This gave occaſion to diſcourſe of reſpiration; and it was queried by ſome, whether the blood can circulate through the lungs, whilſt the lungs are not diſtended with air. Whereupon it was ordered, that Mr. HALLEY ſhould conſult the books of the Society, to ſee, what experiments had been made to illuſtrate the queſtions about reſpiration, particularly as to the time, during which the ſame air will ſerve for the maintenance of life without renewing.

It was ordered likewiſe, that Dr. TYSON's *Anatomy of the Porpeſs* ſhould be conſulted as to the contrivance of the lungs of fiſhes of the cetaceous kind.

Dr. PAPIN ſhewed ſome more ſtrawberries preſerved in the gelly of bones; which, though they were not ſo well as might be deſired, yet the Society thought the thing worth proſecuting.

Mr. MUSGRAVE's letter of January 31, 168$\frac{5}{6}$, was read, and the paper incloſed being of ſome rare plants found in north Wales was delivered to Dr. ROBINSON, to ſee, whether, as it was pretended, thoſe plants were omitted in the laſt edition of Mr. RAY's catalogue of Engliſh plants.

Dr. SLOANE promiſed to bring in a large calculus mentioned in a letter of Mr. MUSGRAVE to Dr. GALE, dated at Oxford January 17, 168$\frac{5}{6}$ [c], to have paſſed the urethra of a woman, Mrs. ELIZABETH VERNON of Wallingford, aged ſixty three years, Aug. 7, 1685. It then, according to that letter, weighed 3 ounces

[b] Regiſter, vol. vi. p. 298. [c] Letter-book, vol. x. p. 284.

avoir-

avoirdupois. The length of it was $4\frac{1}{4}$ inches, and the compaſs of it $5\frac{1}{2}$ inches[d].

Mr. HOOKE preſented a Roman brick taken out of London wall near Aldgate; the dimenſions whereof were 11 inches in breadth, 17 in length, and $1\frac{1}{4}$ in thickneſs.

Feb. 24. Sir JOSEPH WILLIAMSON vice-preſident in the chair.

It appeared from the journal of the Society, that the contrivance of the barometer made and publiſhed by Mr. HUBIN in the year 1673, was brought in to the Society by Mr. HOOKE in June 1668.

It appeared likewiſe, that Monſ. JUSTEL had given the Society an account of ſcales at Paris turning with the 2500th part of a grain.

Dr. SLOANE brought in a ſubſtance called *ſauga*, from Surat, ſaid to be the pith of a tree, ſomewhat reſembling tallow, and which would not granulate; uſed in India inſtead of rice.

Upon occaſion of the brick, preſented at the laſt meeting by Mr. HOOKE, Dr. GALE remarked, that thoſe large bricks were ſuch as VITRUVIUS called *diatoni*; and that their uſe was to bind the wall together, being generally the whole thickneſs thereof.

It was queried, whether that brick were not rather Britiſh than Roman: to which Mr. WALLER anſwered, that the bricks of the walls of old Verulam, which are undoubtedly Roman, are exactly of the ſame dimenſions with this.

It being ſuppoſed by ſome, that this brick might have contracted ſome magnetiſm, it was tried by a ſmall needle, but found to have no reſpect thereto.

Mr. HOOKE read a paper vindicating himſelf from ſome injuries, which he conceived done him by Mr. HEVELIUS in his *Annus Climactericus*.

Mr. HAYNES was deſired to bring in an account of that book of Mr. HEVELIUS.

Mr. HOOKE promiſed to bring in at the next meeting his contrivance for ſetting a ſmall inſtrument perpendicular as exact as a larger.

He likewiſe ſhewed a glaſs-cane bent at one end, to ſhew the proportional weight of mercury to the liquors.

Dr. PAPIN ſhewed the experiment of a bird included in a ſmall ſpace of air till it was ſick, and then relieving it by ſupplying it with freſh air out of his wind-gun, which had been compreſſed ſixty times: and it was found, that the air ſeemed as good after compreſſion as before, and gave preſent relief to the bird.

[d] See likewiſe *Philoſ. Tranſact.* N°. 178. p. 1271.

Dr.

Dr. PAPIN ſhewed ſome more ſtrawberrries and raſberies in his jelly of bones, which were as the former.

March 3, at a meeting of the COUNCIL were preſent,

Mr. PEPYS Preſident

Lord VAUGHAN	Mr. HAYNES
Sir CYRIL WYCHE	Mr. MEREDITH
Sir JOHN HOSKYNS	Mr. PERRY
Mr. HILL	Dr. ROBINSON.

It was ordered, that Mr. HALLEY ſhould wait upon Mr. ASTON about the copies of the journal and regiſter books of the Society in his hands; as likewiſe to have from him the original papers and letters belonging to the Society.

Two letters, one from Dr. PLOT, and another from Mr. JOHN HALL, relating to the *Hiſtory of fiſhes*, were read; and it ſeeming to the council, that the anſwer of Dr. PLOT argued ſome diſcontent in him, they thought fit to order a letter to be written to him, to ſatisfy him of the reſpects of the Society, and to remove from him all jealouſies and miſunderſtandings about the affair of that book.

It was ordered, that the committee appointed to conſider of the *Hiſtory of fiſhes* do proceed therein; and that according to their direction a letter be ſent to Mr. HALL: And,

That Mr. HALLEY draw up *the Tranſactions*; and that when they are ſo drawn up, they ſhall be peruſed and approved by one of the ſecretaries.

Mr. HOOKE being called in was deſired to bring in a ſcheme of a method for making experiments; which he ſaid he would conſider of againſt the next meeting.

At a meeting of the SOCIETY on the ſame day, Sir JOSEPH WILLIAMSON vice-preſident in the chair.

Dr. GALE proved out of VITRUVIUS, l. 2. c. 8. that in his time building with brick in the city of Rome was prohibited; and that PLINY agrees in his dimenſions of a Roman brick with thoſe of this brick ſaying, that it was *latum pede, longum ſeſquipede*; VITRUVIUS, on the contrary ſaying, that it was *longum pede, & latum ſemipede*, l. 2. c. 3. ſo that PLINY ſeems to be underſtood of the διατόνος, whoſe length was equal to three breadths, or one length and one breadth, of the other ſort of brick mentioned by VITRUVIUS, and whoſe uſe was undoubtedly by laying here and there a courſe of them to bind and ſtrengthen the wall.

Dr. GALE likewiſe obſerved, that there were ſeveral manuſcript copies of VITRUVIUS, which he knew of, in our Engliſh libraries.

It was ordered, that an inquiry ſhould be made of Mr. ASTON for a root

given him for the Society by Mr. JUSTEL, which tinged oil, or any unctuous ſubſtance red.

Two notes from Mr. JUSTEL were read; the one giving an account of a model of a galley, in which one man can manage 60 oars, and yet tend the ſails at the ſame time; [d] and that a method had been found out of raiſing the Seine water to ſerve the fountains at Verſailles: The other mentioning a piece of rock cryſtal naturally of a facette cut, and of a very fine water, and ſo hard as to cut glaſs.

Monſ. JUSTEL inquiring in one of thoſe notes after a map of the Engliſh plantations, made by one HORNE an Hungarian, the Society ordered, that he ſhould be preſented with that made by HARMAN a Bohemian, in whoſe name they conceived Monſ. JUSTEL to have been miſinformed.

Mr. HOOKE gave an account of conveying air under water for the uſe of diving by a chain of buckets inverted, which he had formerly brought in Feb. 17, 166¾: And it was ordered, that it ſhould be ſeen what account there is of this experiment in the regiſter.

It was likewiſe ordered, that the Society's books ſhould be ſearched, in order to ſee what had been done towards the improvement of navigation.

Part of Mr. LEEWENHOECK's letter of Oct. 12, 1685, was read, concerning chyle, ſweat, pores of the ſkin, the cryſtalline humour of the eye, and the optic nerve. The reſt was reſerved to another meeting.

Mr. HOOKE ſhewed his way of ſetting a ſmall inſtrument perpendicular by means of a triangular pendulum; which he was deſired to bring in an account of in writing.

Mr. WALLER having been deſired to make an index to N° 6 of the journal books, he this day returned it with a moſt complete index.

Dr. PAPIN ſhewed an experiment of ſhooting lead of two ounces by the irruption of the air into a cylinder, out of which it had been exhauſted by his air-pump: which ſucceeded very well, the lead being caſt with a conſiderable force. He alſo gave in a paper of the ſame [e].

March 10, at a meeting of the COUNCIL were preſent,

Mr. PEPYS Preſident

Lord VAUGHAN	Dr. GALE
Sir JOSEPH WILLIAMSON	Mr. HENSHAW
Sir. JOHN HOSKYNS	Mr. HILL
Mr. EVELYN	Mr. PERRY.

[d] Letter-book, vol. ii. p. 1

[e] Regiſter, vol. vi. p. 302.

Mr.

Mr. HILL gave in a paper, containing ſome amendments and additions to be made in the plates of the *Hiſtory of Fiſhes*, ſent from Mr. RAY: And it was ordered, that Mr. HALLEY inſpect the correction of the plates to be amended by Mr. HUNT.

Mr. HENSHAW moved, that the preſident would deſire Dr. LISTER, Dr. ROBINSON, Mr. ASTON, and thoſe of the committee appointed by the Society on the 25th of March 1685 to manage the affair of printing the *Hiſtory of Fiſhes*, to give him a meeting at Greſham-college, to confer with him and the council about what had been done in the matter referred to them: which was accordingly ordered for the Wedneſday following, March 17, at eleven o'clock in the morning.

It was ordered, that the journal and regiſter books of the Society be conſulted upon the eighteen heads this day concluded upon as to their relation to uſe, and particularly navigation.

It being again deſired of Mr. HOOKE to give in his ſcheme of a method for his experiments, he requeſted, that the Society would nominate a ſubject for experiments to be made by him; but that they would leave him to his own method of proſecuting them. Whereupon the council deſired him to proceed upon which of the ſaid eighteen heads applicable to navigation he ſhould think fit; and ordered him to have a copy thereof.

At a meeting of the SOCIETY on the ſame, Sir JOSEPH WILLIAMSON, vice-preſident in the chair:

The minutes of the laſt meeting were read.

Mr. ASTON gave in the root mentioned by Monſ. JUSTEL, which tinges oil red. It was judged to be only ſome ſmall fibres of alkennet root known to have that effect; and a piece thereof produced by Mr. HALLEY tinged the greaſe of the candle of a lively red, the tincture being communicated from the bark of the root.

Upon ſearch of the regiſter book of the Society, it appeared, that Mr. HOOKE's way of carrying air under water for the uſe of divers by a chain of buckets inverted, brought in by him in the year 1663, was not entered there.

A part of Mr. LEEWENHOECK's letter was read, containing his obſervations upon gall and the ſcales, and ſlime of the eel and the bream; which ſlime, he ſaid, he had diſcovered to be parts of the body of the fiſh, and to conſiſt of a great number of veſſels interwoven together; deſcribing the manner how theſe veſſels came out of the ſcales, that lie under it. The reſt of the letter was referred to another meeting.

A paper of Mr. WORLIDGE of Petersfield in Hampſhire, brought in by Mr. HOUGHTON, concerning the original of ſprings, was in part read; wherein he endeavoured to ſhew the abſurdity of the opinions of thoſe, that derive ſprings from

rains and diſſolved ſnows; as likewiſe of that, which deduces their origin from a filtration or a percolation of the ſea-water; ſubſtituting in their places a vapour ariſing through the porous ſpungy parts of the earth, and condenſed near the ſuperficies thereof into water. The paper being long was referred to the peruſal of Dr. SLARE, who was deſired to give an account thereof.

This occaſioned much diſcourſe concerning the cauſe of fountains; and Dr. ROBINSON was of opinion, that the ſtreams raiſed by a ſubterraneous heat, either of fire or a fermentation within the bowels of the earth, was the moſt probable cauſe of ſprings; which yet was oppoſed by ſome others of the members.

Mr. HOOKE remarked, that the ſtone called braſs lumps or pyrites would catch fire by moiſture; and that a heap of coals was by this means fired at Charing ſtairs.

The lord VAUGHAN ſaid, that there was a well in Caermarthenſhire, that ebbs and flows; of which he promiſed a farther account.

Mr. HOOKE having made ſeveral obſervations on the temperature of the air at above 300 feet deep in a well on Banſtead downs in 1665, it was ordered to ſee what account there was of that experiment in the books of the Society.

Sir ROBERT GOURDON ſaid, that there was a lake in Scotland called Loch-Neſs, and a river of the ſame name, that never froze, but was ſo warm, as to melt ice, if put into it.

The notes of Monſ. JUSTEL were read, concerning an engine, that conſumes ſmoke, and prevents all ſorts of the moſt fœtid things caſt into the fire from being offenſive [f], were read: as likewiſe a paper about ſteel ſoles for ſhoes, made very light, and yet preſerving the feet from ſuffering by the inequality of the pavement, and ſharpneſs of the ſtones. One of theſe notes gave alſo an account of a very large and extraordinarily fine paper made in France, worth fifteen crowns a quire.

It was ordered, that the experiment for conſuming ſmoke be tried before the Society.

Mr. HOOKE brought in his account of the manner of ſetting a ſmall inſtrument perpendicular; but it being late, the reading of it was referred to the next meeting.

Mr. WALLER preſented three ſticks of Indian lac for ſealing.

Dr. PAPIN ſhewed a further experiment of ſhooting by means of a cylinder evacuated of air, being much longer than the former: But the effect was not ſenſibly more conſiderable than in the ſhorter cylinder.

[f] Regiſter, vol. vi. p. 303. It is printed in the *Philoſoph. Tranſ.* N° 181. p. 78, for May 1686.

He likewiſe gave in a paper concerning this experiment[s]; and produced ſome plumbs preſerved by him in his jelly of bones, which were very good.

March 17, at a meeting of the COUNCIL were preſent,

Mr. PEPYS Preſident,

Lord VAUGHAN	Dr. GALE
Sir JOSEPH WILLIAMSON	Dr. LISTER
Sir RICHARD BULKELEY	Dr. ROBINSON
Mr. HILL	Mr. ASTON
Mr. HENSHAW	Mr. PERRY
Mr. EVELYN	Mr. HAYNES
Mr. HERBERT	Mr. FLAMSTEAD.

Dr. LISTER at the deſire of the council declared, that the order for printing no more than 500 copies of the *Hiſtory of Fiſhes* was given by the direction of the committee, to whom that buſineſs was referred. He ſaid likewiſe, that it was himſelf, who had brought the plates, and agreed for the price of ingraving.

As to the paper, Mr. ASTON declared, that he brought one Mr. MILLS, a ſtationer, to Mr. HILL, who promiſed, that he ſhould be paid for the paper of the book, it being to be the ſame paper with that, on which Dr. PLOT's *Hiſtory of Staffordſhire* was printed, and to be afforded at ſeven ſhillings a ream. But that that parcel of paper not holding out, it had been ſupplied with a better ſort; for which the ſaid ſtationer was to have eight ſhillings and ſix-pence a ream.

The council being of opinion, that it was high time, that the money due for the paper, printing, and other charges of the ſaid book ſhould he paid, ordered, that the committee appointed on the 13th of January preceding for auditing the treaſurer's accounts ſhould meet on the Wedneſday following before eleven o'clock in the morning, and make a report of the ſtate of the Society's caſh to the council then to ſit.

At a meeting of the SOCIETY on the ſame day, Sir JOSEPH WLLLIAMSON vice-preſident in the chair.

The minutes of the laſt meeting were read.

Dr. SLARE brought in an abſtract of Mr. WORLIDGE's paper about the original of fountains, which had been in part read the day before in the meeting of the Society, and gave an account of his hypotheſis of the cauſe of rains and ſnows, and of the tides by an attractive influence ſuppoſed by him in the ſun and moon.

Two notes of Monſ. JUSTEL were read, giving a farther account of the engine, that conſumes ſmoke, and that incenſe burnt therein gives no ſmell at all.

[s] Regiſter, vol. vi. p. 304.

In one of these notes he sent the title of a book, called, *Critica historico-chronologica in annales ecclesiasticos eminentissimi Card.* BARONII, *authore* ANTONIO PAGI; who pretends to have found out a period, which he names *Periodus Græco-Romana*, more useful and better than the Julian period.

Mr. HOOKE shewed his demonstration of his manner of setting a small instrument perpendicular, and was again desired to bring in an account thereof in writing at the next meeting, with its application.

Dr. PAPIN brought in a paper about a way of firing gun-powder and the like *in vacuo* without the sun; but it being late, this paper with the experiment was referred to the next meeting.

Some part of Mr. LEEWENHOECK's letter, that had not been read in the Society, was ordered to be read at the next meeting.

March 24, at a meeting of the COUNCIL were present,

Mr. PEPYS President

Lord VAUGHAN	Mr. HERBERT
Sir JOSEPH WILLIAMSON	Dr. GALE
Sir RICHARD BULKELEY	Mr. MEREDITH
Mr. HILL	Mr. PERRY.

It was ordered, that the committee of the Society appointed March 25, 1685, to manage the affairs of printing the *History of Fishes* be revived; and that they be desired to proceed to do what shall be by them thought expedient to perfect the whole matter: And that Mr. HILL the treasurer pay the sum of fifty-three pounds to the order of the committee for the said book, the same being upon account for the printing and other charges appertaining to the finishing of the said book.

At a meeting of the SOCIETY on the same day, Sir JOSEPH WILLIAMSON vice-president in the chair.

Mr. HOOKE was of opinion, that the engine, which is said to consume smoke, contained in it the fire of spirit of wine, or oil of turpentine, or the like: which flame concealed in the cavity of the engine, and drawing its air by the hearth or furnace, the smoke of any thing, that was laid on the furnace, was thereby carried inwards to the flame of the burning liquor, which consumed it, or at least it dissipated its parts, so as it was no farther sensible.

A note from Monsr. JUSTEL was read concerning a plant, whose flower yields a very inflammable sulphur, which was the pulvis fulminans, mentioned in one of his last; but that it must be gathered in a critical time, by reason that the sun disperses it; and that it was believed, that the same might be had from juniper in the spring time. He mentioned likewise several very curious draughts of the cities of China, which draughts were to be seen in Holland.

Mr. HILL remarked, that he had read, as he thought, in the *Philoſophical Tranſactions* an account of a ſeed in Denmark, that would catch fire very eaſily.

A letter of Mr. ST. GEORGE ASH, written by order of the Dublin Society, and dated at Trinity-college, Dublin, March 13, $168\frac{5}{6}$ [h], was read, wherein they deſired to continue their correſpondence with the Royal Society, and promiſed to ſend an account of ſeveral curioſities then before them; and mentioned particularly a girl of eleven years of age, prodigiouſly ſkilful in moſt parts of Mathematics, having been examined before the Dublin Society with ſeverity enough in Arithmetic, Algebra, Geometry, Trigonometry, Aſtronomy, Chronology, ſpeculative Muſic, and Mechanics, in all which ſhe anſwered with great readineſs and judgment.

It was ordered, that this letter be anſwered, that the Society readily accepted the offer of correſpondence, and deſired Mr. ASH's communications; and that he and Mr. WILLIAM MOLYNEUX be informed of their having been elected members of the Royal Society.

A paper of Sir WILLIAM PETTY, containing his thoughts of the ſeveral parts, that ought to compoſe a complete treatiſe of navigation, [i] was read.

Mr. AUBREY gave an account, that there was a ſet of draughts of ſix ſheets, repreſenting the manner of ſeveral ſea-fights, done by Mr. HOLLAR. It was ordered, that they be procured for the Society.

Mr. LODWICK was deſired to tranſlate a letter of Mr. LEEWENHOECK's, containing his microſcopical obſervations upon cinnabar and gun-powder.

Mr. HOOKE, at the deſire of the council, brought in an analyſis of the whole matter of hydrography, of which he had given a fair copy to the preſident, and promiſed to give another to the Society.

Dr. GALE remarked, that the Romans never uſed either pitch or tar in their ſhipping, but wax.

Mr. HOOKE obſerved, that he remembered to have read ſomewhere, that they mixed with their wax the dregs of oil called *amurca*; but that he could not at that time recollect his author.

Dr. GALE ſaid, that the invention of tar was of no great antiquity; and that there was no Latin word for it; but that MICHAEL PSELLUS, a Greek author, mentioned it about 1000 years before.

Mr. HOOKE farther illuſtrated his contrivance for ſetting a ſmall inſtrument perpendicular. He was deſired to procure his inſtrument to be made for the uſe of the Society.

[h] Letter-book, vol. x. p. 287. [i] Printed in the *Philoſoph. Tranſ.* N° 198, p. 657. for March 1693.

A letter of Dr. REISELIUS to Mr. ASTON, dated at Stutgard, February 12, 1685[k], was produced and ordered to be read at the next meeting.

Dr. PAPIN's experiment of firing gun-powder *in vacuo*, and concluding the quantity of air made by the blaſt, was referred to be ſhewn at the beginning of the next meeting.

1686. *March* 31, Sir CYRIL WYCHE vice-preſident in the chair.

Upon occaſion of Mr. WORLIDGE's opinion of the cauſe of fountains, Mr. HENSHAW thought, that the generation of metals could not well be accounted for without allowing the hypotheſis of a central fire.

It was ordered, that a farther inquiry be made of Monſ. JUSTEL about the ſulphur of the plant mentioned in his laſt note to be a native pulvis fulminans.

Mr. HENSHAW remarked, that he had formerly preſented the Society with a ſort of ſea-weed brought from Iceland, whoſe moiſture, as it exhales, ſhoots into a ſweet ſubſtance reſembling ſugar; which therefore he called *alga ſaccharifera*.

Mr. AUBREY gave an account, that Sir JONAS MOORE had cauſed ſeveral curious obſervations about the time and hights of the tides at London-bridge to be made by means of a rod buoyed up at the bottom by cork, and ſo riſing and falling with the water: which obſervations Mr. AUBREY conceived might be in the cuſtody of Mr. FLAMSTEAD, or captain HANWAY, ſon-in-law of Sir JONAS MOORE. He was deſired to do his endeavour to procure the ſight of them for the Society.

He mentioned, that the greateſt tide found on the coaſt of England is at Chepſtow-bridge; and he moved, that Sir JOHN HOSKYNS might be deſired to inquire into the circumſtances of the tide at that place.

It was ordered, that the preſident ſhould be deſired to obtain from capt. COLLINS, who was then engaged in the ſurvey of the ſea-coaſt of England, a communication of his obſervations of the tides in the ſeveral ports, and eſpecially the head-lands.

Mr. HENSHAW remarked, that tar is the firſt running of the extract of pitch out of the fir-wood; and that the latter part being boiled makes the ſtone-pitch; and that the deſcription of the manner of making it, and its uſe in ſhipping, is in PLINY, who calls it *pix liquida*, lib. 16. cap. 11.

Mr. HOUGHTON ſhewed a part of an animal ſmelling ſtrong of muſk, and ſaid by the owner thereof to be a muſk-cod. It was cut in two places, and ſeemed to have within it two cavities, as if the teſticles had been quite dried up.

[k] Letter-book, vol. x. p. 288.

Mr.

Mr. HILL ſaid, that it was an uſual fraud to tie up parts of the ſkin of the muſk-deer, all which ſmell of muſk, into the likeneſs of cods; but that in fact it was not the teſticles of that animal, that yield the ſcent, but a gland growing under the belly.

Dr. PAPIN ſhewed his experiment of firing gun-powder *in vacuo*; but it not ſucceeding by reaſon of ſome ſoot got in with the powder, it was ordered to be tried again at the next meeting.

Mr. HOOKE gave an account of his firing gun-powder *in vacuo* with a burning-glaſs; and ſaid, that now and then a ſingle corn would go off upon the whole heap without kindling the next corn; and that at length having melted the heap into a lump, it went off after the manner of the pulvis fulminans with a very great report, and burſt his glaſs into a thouſand pieces, and ſtuck great part thereof into the cieling.

Part of a letter of Mr. LEEWENHOECK was read, containing ſeveral curious obſervations on cinnabar and gun-powder[a], and mentioning an experiment, proving the expanſion of gun-powder to be into a ſpace above 2000 times greater than the ſpace, which it takes up before fired; for that a grain weight of powder containing 13 corns takes up as much room, when fired, as 2080 grains of water.

Three papers of Dr. PAPIN were read relating to his experiment of firing gun-powder *in vacuo*; in one whereof he ſaid, that by the experiment made after the laſt meeting was over, he found, that 9 grains of gun-powder produces as much air, as fills the ſpace of a third part of a pound of water; from whence he concluded, that 9 grains of powder yields $2\frac{1}{2}$ grains of air: and from hence it would follow, that each grain gives but 213 times as much air as its own bulk; which is far ſhort of Mr. LEEWENHOECK's experiment.

N. B. That air being but about $\frac{1}{800}$ of the weight of water, which is near the weight of gun-powder, a grain of gun-powder, if it ſhould be turned into air, could take up but 800 times as much ſpace as its own bulk. Wherefore either the obſervation of Mr. LEEWENHOECK is faulty; or elſe the air produced by the exploſion of gun-powder has a greater elaſticity than the common air in a lighter body.

Mr. HENSHAW was of opinion, that the conſtituent parts of the air are no other than the ſteams and exhalations out of the earth.

Mr. HALLEY brought in two ſhells or ſubſtances reſembling ſmall beaks of birds found in ambergriſe.

Mr. HOOKE thought them to be the ſhells of ſome ſuch inſects, as the ſcarabæus naſicornis.

[a] Letter-book, vol. xi. p. 15.

Mr.

Mr. HENSHAW was rather of opinion, that they might be the ſkins of ſome ſort of juncus Indicus.

Mr. WALLER ſhewed another ſcheme of colours, wherein by the mixtures of the ſeveral blacks and yellows (which, he ſaid, were principal colours) he had produced a ſeries or ſhade of moſt colours imaginable.

A letter of Dr. REISELIUS to Mr. ASTON, produced at the laſt meeting, was now read, giving a relation of a Chalcedonian ſtone, the ſubſtance of which was clear, and of an onyx or horn-colour; but which, by the caſual laying of pulvis fulminans mixed with a red glaſs prepared for fuſion thereon, had imbibed the colour of the mixture after a very odd manner, as Dr. REISELIUS ſhewed in a figure annexed [b].

It was ordered, that a pole for erecting a teleſcope in Greſham college be ſet up, and that the treaſurer pay thirty ſhillings for the charges of it.

April 7, 1686. Mr. HENSHAW was deſired to take the chair.

Upon the mention of the muſk-cod produced by Mr. HOUGHTON at the laſt meeting, Dr. TYSON remarked, that having kept the cod or ſcent-bag by the anus of a weeſel for ſome time, it afforded a kind of a muſk-ſmell; but that at firſt it had a very offenſive ſmell.

Mr. HILL produced a paper tranſcribed from the memoirs of the Duke of Sully concerning the firing of gun-powder, after it had lain ſixteen years in the fleſh of a man. The paper was read.

Dr. TYSON ſhewed a figure of a fiſh of the acus marinus kind curiouſly drawn by Mr. WALLER, which was anatomiſed and deſcribed by himſelf. The fiſh and figure were left with Mr. HUNT for the repoſitory.

Dr. TYSON ſhewed likewiſe a ſtone taken out of the kidney of a man, which was very rough and radiated or pointed every way like an echinus, and very hard. The body of the ſtone in the middle was about the bigneſs of a large pea; and as radiated it would fill a ſmall hazle nut-ſhell.

A note of Dr. PAPIN concerning the firing of gun-powder *in vacuo* was read.

Mr. HILL read a paſſage concerning the circulation of the blood extracted from a book of MICHAEL SERVETUS [c], printed in the year 1553.

It was ordered, that the journal-book be produced and examined concerning the experiments made to prove the arterial blood made in the lungs.

April 14, Sir CYRIL WYCHE vice-preſident in the chair.

[b] This account is printed in the *Philoſ. Tranſ.* vol. 16. N°. 179. p. 22. for Jan. and Feb. 1686.

[c] His *Chriſtianiſmi reſtitutio.*

The

The minutes of the laſt meeting were read.

Two notes of Monſ. JUSTEL were read; the firſt giving an account of a ſort of ſalt, with which drowned puppies had been in a ſhort time brought to life; promiſing to get ſome of this ſalt for the Society to make the experiment with. This note likewiſe gave an account of the French King's ſtatue erected by the Marſhal DE LA FEUILLADE.

The other note mentioned a ſcarlet tincture drawn from gum lacca to be better and cheaper than that of cochineal, and not ſo apt to change; as alſo a ſtatuary, who had made a marble head for an antique ſtatue of APOLLO, that wanted an head; which he had done to admiration, and was but five days about it: that all the ſculptors would not believe it, unleſs he had ſome ſecret for ſoftening marble, or tools, that would do more execution.

A paper of Dr. PAPIN was read concerning boiling of ſago and making of chocolate *in vacuo*, to be compared with the ſame done in the air. The experiment was ordered to be got ready againſt the end of the meeting.

Sir EDMUND KING ſaid, that chocolate would not bear boiling, but muſt be made with a moderate heat; and that he found, that an egg to every fourteen ſpoonfuls of water was the beſt proportion.

The Lord Vaughan affirmed, that the Spaniſh chocolate was without eggs, and yet that it froths better than that made with eggs.

Mr. HALLEY read an account of an experiment made by himſelf to find the comparative weight of quickſilver to water by weighing a quart of quickſilver in water. This paper was ordered to be regiſtered [d] as follows:

" Having formerly made trial in a ſmall quantity of mercury, and having " found, that the weight of mercury to water was not fifteen times, as Sir JONAS " MOORE hath it, nor yet fourteen, as it is commonly accounted, but rather leſs " than thirteen and an half; I was reſolved to make trial with a greater quantity " of mercury, and accordingly I did it with a whole quart, the method this:

	lb	ʒ	ʒ
" I took a quart bottle full of mercury, and in air it weighed ——	32	00	4
" The ſame in water weighed —— —— —— ——	28	13	2
" Difference, the weight of the whole bulk in water —— ——	3	2	7
" Weight of the bottle in air was —— —— —— ——	2	7	2
" Hence the weight of the mercury was —— —— ——	29	8	7
" Weight of the bottle in water —— —— —— ——	1	8	3
" Weight of the bulk of the bottle in water —— —— ——	0	14	7
" Weight of the bulk of mercury in water —— —— ——	2	4	0
" Weight of the mercury as before —— —— —— ——	29	8	7

[d] Regiſter, vol. vi. p. 310. In the margin is a note, that there being ſome error in the weights, care muſt be had to repeat them.

" That

" That is, as 3783 drams to 288 drams; that is as $13\frac{1}{7}$ *ferè*, which I take to " be very near the true proportion of these two liquors; for the scales were very " good, and would turn with a small part of a dram, when charged with the " 30 *lb.* weight.

" From this proportion it should follow, that if the weight of air be to water as 1 " to 800, that 10514 inches or 876 feet of air should counterpoise an inch of quick- " silver, and that at that hight the quicksilver in the barometer ought to sink an " inch. The which is found to answer nearly to the experiments made on the " tops of hills; for the accounts of that made at the Py de Domme in Auvergne " is, that in 500 toise or 3000 foot high the mercury subsided $3\frac{1}{8}$ inches, and Mr. " CASWELL on the top of Snowdon hill in Carnarvanshire found, that in the " hight of 1250 yards, there was compleatly 4 inches difference: and though " these accounts make above 900 foot to an inch, yet the rarefaction of the air " above, in respect of that below being allowed for, the weight of the air in re- " spect of water will be found very near the 800th part, as it has been experi- " mented before the Society by weight in an exhausted Florence flask, query " the day."

Mr. HOOKE shewed an experiment for finding the same thing by a syphon filled with mercury in the one shank and water in the other. The water was observed $79\frac{3}{8}$ inches above the mercury, which was counterpoised by $5\frac{7}{8}$ inches of mercury standing above the section of water and mercury in the other shank, whence the proportion of their gravities is as 47 to 635, or as 1 to $13\frac{1}{2}$.

A note of Dr. GALE was read, containing the opinion of HUETIUS[e], that the original of cyphers was rather from the Greeks than the Arabians or Indians; and mentioning a manuscript copy of MARCIANUS HERACLIOTA the geographer, made use of by DAVID HOESCHELIUS in his edition of MARCIANUS, in which manuscript were some cyphers seeming to confirm HUETIUS's opinion[f].

Sir CYRIL WYCHE remarked, that it was plain from VARRO, that the Romans used to express all numbers by ten marks, as we do now by our cyphers; and he promised to produce the passage.

Monsr. JUSTEL presented a book of Monsr. MARIOTTE concerning the motion of water, &c.

Dr. PAPIN's experiment of sago and chocolate boiled *in vacuo* and in air was shewn; as it appeared, that the sago boiled *in vacuo* was much softer and tenderer than that boiled in air; but that there was very little or no difference in the chocolate, except that there was a kind of empyreuma in that made *in vacuo*, which was not in the other.

A letter of Mr. LEEWENHOECK, dated April 2, 1686, N. S. being an answer to one sent him dated March 2, O. S. and giving an account, among other things,

[e] In his *Demonstratio Evangelica.*

[f] Register, vol. vi. p. 308.

of the texture of bone viewed in a microſcope, was produced, and ordered to be tranſlated.

April 21, at a meeting of the COUNCIL were preſent

Sir CYRIL WYCHE vice-preſident,

Lord Vaughan	Mr. PERRY
Dr. GALE	Mr. COLWALL
Mr. HAYNES	Dr. ROBINSON
Mr. HILL	Mr. ASTON.
Mr. HENSHAW	

Two reports were read from the committee of the Society concerning the ſtate of the account of the *Hiſtory of Fiſhes*; the ſubſtance whereof was,

	l.	*s.*	*d.*
That there had been paid for engraving the plates, &c.	232	11	7
By an account allowed Dr. PLOT	3	7	8
By an account allowed Mr. ASTON	11	0	0
More to Mr. PAULET	51	16	6
More to Mr. HILLS	3	0	0
More to Mr. CLERK	6	6	6
Remains to be paid to Mr. HILLS, ſtationer,	42	15	0
To Mr. HUNT for engraving and deſigning, if the council ſhall think fit	7	10	0
The ſeveral incidental charges	1	12	9
Total of the charge —	360	0	0.

And ſuppoſing the number of the books deſigned 500 to be but 480 compleat, they will ſtand the Society in fifteen ſhillings each book, which they propoſe as a price for all ſuch perſons, as have given a plate to the book.

All other perſons, who are or are not of the Society, and who gave no plate to the book, to pay twenty ſhillings.

	l.	*s.*	*d.*
Beſides which the printing a ſett of figures upon paper of fifteen ſhillings *per* ream amounts to	0	5	8
Upon a better ſort at twenty two ſhillings *per* ream	0	8	0
So that to a benefactor the whole book will be in the worſt paper —	1	0	0
In the beſt paper	1	3	0
To the reſt in the worſt paper	1	5	0
In the beſt paper	1	8	0

Likewiſe that Mr. HUNT for his encouragement to look after the printing the figures may be allowed to take ſix-pence more for each book of the buyer, provided there be nothing demanded of the the treaſurer.

The

The council then agreed with the committee as to the price, and ordered, that Mr. HUNT ſhould deliver the books at the rates above written, viz. to benefactors at fifteen ſhillings per book, and to all others at twenty ſhillings per book, and beſides to take ſix-pence more of the buyer upon each book for himſelf.

It was ordered, that the bill of Mr. HILLS the ſtationer be examined by the committee; and that the treaſurer pay what they ſhall think due to him:

That Mr. RAY be preſented with twenty copies of the *Hiſtory of Fiſhes* unbound; and that Dr. GALE be deſired to ſignify the ſame to him, and to return him the thanks of the Society for his trouble and care:

That Dr. LISTER, Dr. ROBINSON, and Mr. ASTON, who have been principally concerned in the affair of printing the *Hiſtory of Fiſhes*, have the thanks of the Society for their pains and trouble in that matter: and

That Dr. PAPIN be paid the ſum of ſeven pounds ten ſhillings, being for the ſalary due at Lady-day paſt.

At a meeting of the SOCIETY on the ſame day, Sir CYRIL WYCHE vice-preſident in the chair.

The minutes of the laſt meeting were read.

Sir CYRIL WYCHE obliged the Society with an account of the Roman abacus and its uſes; and produced the paſſage in VARRO proving the numeration of the old Romans to be after the ſame manner that we now uſe in counting by our cyphers; concluding his diſcourſe with an accurate deſcription of the Roman manner of counting by the part of an *as*, by *denarii* and *ſeſtertii*, together with tables of their values in our monies.

A letter from Mr. WILLIAM MOLYNEUX to Mr. HALLEY, dated at Dublin, April 8, 1686, was read, as follows [g];

" Sir, I do with much willingneſs and joy accept of your correſpondence, which " you have ſo kindly proffered me in yours of March the 27th. I muſt acknow- " ledge it had been my part, to have prevented you in this particular, and to " have made the requeſt firſt to you; but I had heard of the late diſturbances in " the Royal Society, and was unwilling to trouble you till matters were ſettled. " But now I muſt needs expreſs my ſatisfaction in the accommodation of affairs, " and that the Society has taken the courſe they are in; for indeed I always look- " ed upon it as a defect in their conſtitution, that their ſecretaries, or he that " managed their correſpondence, was annually elective, and alſo left without an " eſtabliſhed ſalary, that might encourage, and recompence him for his trouble. " His annual election is inconvenient, becauſe upon every renewal of the ſecretary " the correſpondence falls of courſe, and without a conſiderable ſalary no man " can ſpend his whole time (for it requires *totum hominem*) in receiving and writ-

[g] Letter-book, vol. x. p. 292. Mr. HALLEY in his letter, Supplement to letter-book, vol. iv. p. 329. to which this of Mr. MOLYNEUX is an anſwer, mentioned, that Mr. ASTON and Dr. ROBINSON had *without any apparent cauſe* reſigned their office of ſecretaries.

" ing letters, and managing the regiſters with other troubleſome work. I hope " the Society will conſider this for the future, and ſo eſtabliſh this affair, that " hereafter they may not be at ſuch a loſs, as they have been. And now, Sir, " I muſt congratulate you upon your being ſettled in the place you have; I know " no man more fit for it than yourſelf: but then as a friend you muſt give me " leave to adviſe you to diligence, for truly I think you have a conſiderable du- " ty to diſcharge. I thank you for the account you give me of the affairs of the " Society: I had it before, but it was from a perſon concerned, whom I always " thought to blame in this particular; for I found thereby, there was a party " ariſing in the Society, that were for rejecting all kinds of uſeful knowledge ex- " cept ranking and filing of ſhells, inſects, fiſhes, birds, &c. under their ſeveral " ſpecies and claſſes; and this they termed *Natural Hiſtory*, and *Inveſtigating* " *Nature*, never attending to the uſes and properties of theſe things for the ad- " vantage of mankind, and reckoning chemiſtry, aſtronomy, mathematics, and " mechanics, as rubs in their courſe after nature. This indeed ſeemed to me " ſomething ſtrange; and I muſt confeſs, I could not but laugh at it. I return " my humble thanks to the Royal Society for the honour of admitting me into " their company, Pray, Sir, be pleaſed to let me know my debt to the treaſurer, " and I ſhall take care to ſee it timely diſcharged. I muſt alſo thank you for " your philoſophical communications, and your kind promiſe of the continuance " of them. I wiſh I may in any wiſe be able to make you ſuitable returns, but " that I muſt deſpair of, yet I promiſe you, that nothing ſhall happeu here " worth your notice, which I ſhall not timely communicate. I muſt confeſs, " we have been lately ſomething idle, and ſeveral of our meetings have been " employed by a young mathematical female in this place, bred up by one Mr. " TOLLET, a teacher of mathematics, and a moſt excellently learned man in that " kind. The child is not yet eleven, and yet ſhe hath given us ſufficient proofs of " her learning in arithmetic the moſt obſtruſe parts, algebra, geometry, trigo- " nometry plain and ſpherical, the doctrine of the globes, chronology, and on " the violin plays any thing almoſt at ſight. As this is a moſt plain inſtance " of the force and power of timely education, and of the reach, that man has na- " turally, we have thought it worth our while to conſider and examine it throughly; " and indeed we find, at leaſt that the child ſeems to have no more natural inclina- " tion or delight in theſe things than ordinarily amongſt children. But I ſuppoſe " our ſecretary, Mr. ASHE, may give you a more particular account of this matter, " and therefore I ſhall ſay no more concerning it.

" Mr. HOOKE's contrivance for the baroſcope is admirably curious. I ſuppoſe " what you mention as Monſ. HUBIN's invention is rather Monſ. HUYGENS's in- " vention, and deſcribed in the *Journal des Sçavans du Lundi 12 Decembre* 1672. " But Mr. HOOKE's goes beyond it in many reſpects: the only difficulty of Mr. " HOOKE's is in the fabric of the glaſs, and filling it with mercury; and if he have " any mechanical eaſy contrivance for doing this, he would do well to publiſh it. " I thank you for the promiſe you make me of his ſmall, yet accurate level. In- " deed I have always had a great eſteem of his mechanical inventions, of which I " look upon him to be as great a maſter as any in the world; and that is a moſt " curious part of philoſophy, and really uſeful in man's life. And whereas, I

" underſtand, that a chance word in an idle ſcribble of mine was ſomething diſ-
" pleaſing to that ingenious and learned gentleman, I deſire he may be inform-
" ed, that I deſigned no manner of ſlight by the word *pamphlet*, but ſtiled his
" book ſo, meerly as I thought it a name uſually given to ſmall ſtitched vo-
" lumes.

" As to the controverſy with Monſ. HEVELIUS about teleſcopic ſights, I can
" ſay no more than what I have formerly writ: only I will add two things; firſt,
" that I humbly conceive Monſ. HEVELIUS did not, nor does he yet rightly,
" apprehend the manner of thoſe ſights performance: this I preſume to collect
" from theſe words in his Math. Coeleſt. part. primâ, pag. 296. *Cæterum cum*
" *acus vel fila adeo prope lentem ocularem ad obſervatoris oculum vix in remotione ali-*
" *quot digitorum ſubſiſtant, dubito an dioptra hæc, oculo tam propinqua, multò accura-*
" *tius ſtellas quaſvis minimas, quam pinnuridia noſtra, ad ſex novemve pedes ad invi-*
" *cem remota, poſſit detegere.* By which 'tis manifeſt, that he makes his great
" and chief objection againſt theſe ſights on the account of the nighneſs of the
" eye and croſs-hairs, imagining, that the line of collimation (if I may ſo
" call it) in theſe ſights is no longer than between the eye and croſs-hairs;
" whereas all, that underſtand theſe kind of ſights, muſt needs know, that the
" line of collimation is as long as between the object-glaſs and croſs-hairs.
" And on this account 'tis, that I preſume to think the old gentleman did not
" underſtand theſe kind of ſights; and that Mr. HOOKE had ſufficiently convinced
" him of his error in rejecting them by explaining to him their manner of per-
" formance, and nothing more.

" The other thing I have to add is, that I eſteem it moſt diſingenuouſly done
" of HEVELIUS, in relating the trials between you and him, to call your inſtru-
" ment every where a ſextans. I acknowledge, had I known this before I writ
" my letter to Mr. ASTON, I ſhould hardly have put pen to paper. And I have
" lately been deſired by the Society at Oxford to tranſlate that letter into Latin for
" Monſ. HEVELIUS's reading: I was obedient to their demand, but I have added
" a poſtſcript to it, wherein I do not well approve of his calling a quadrant of
" leſs than two feet radius a ſextans, and ſpeaking of it as of a large and conſi-
" derable inſtrument.

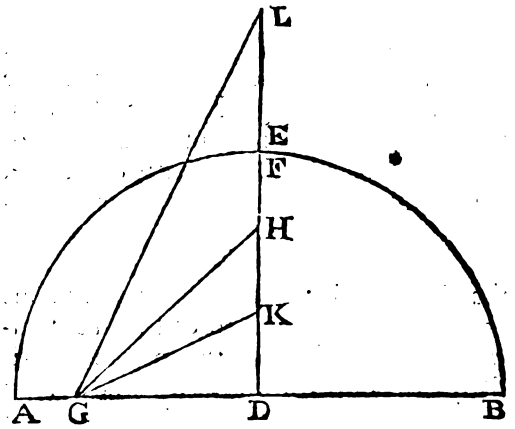
" The contrivance of Monſ. JUSTEL's furnace, that conſumes ſmoak, will be
" very acceptable; pray, when you receive it, let not us want it.

" I have by this poſt ſent to my brother a paper, that relates to a problem in
" hydroſtatics, why heavy bodies diſſolved in a menſtruum ſpecifically lighter
" than themſelves ſwim therein, and do not ſink to the bottom. Concerning
" this my brother has propoſed his thoughts in the *Nouvelles de la Republique des*
" *Lettres*; but I take the liberty of differing from him in ſome particulars: if
" you think it worth your peruſal, the penny-poſt will bring it to you from
" him at Mr. TALSUK, apothecary, at the Dragon in the New Palace-yard,
" Weſtminſter.

" You

" You may have heard of a girl in this town ſtrangely overgrown with horny " excreſcences vaſtly numerous, and very large: my next ſhall bring you the " ſketches of her, as well as my rude hand can draw them.

" You may remember, when I was laſt with you in London, you obliged me " with your rule for ſhooting on aſcents and deſcents with the mortar-piece. The " propoſition is; the greateſt random of a piece, the horizontal diſtance of an " object, and the hight or deſcent from the horizontal line, being given, to find " the two elevations, or depreſſion of the piece neceſſary to ſtrike the given ob- " ject. Your conſtruction is this. In the figure make AD = greateſt rand: " DB = AD + double hight deſcent ſtrike the ſemicircle AEB, erect the per- " pendicular ED, make DG = the horizontal diſtance, and GH = ED, and " DF = AD the greateſt rand. Then make FK FL each equal to HG; draw " KG LG the angles KGD, LGD are the elevations required; and if K fall be- " low D, KGD ſhall be the depreſſion.



" This is your conſtruction; and " thereon you have a rule, divide " the greateſt random by the hori- " zontal diſtance; but I need not " repeat it to you, you have it in " your pocket-book. I muſt beg " the favour of you to give me your " demonſtration of this rule and con- " ſtruction. You promiſed it to me, " when I was with you, but my de- " parture was ſo ſudden, I had not " time to put you in mind thereof. " The gentleman I mentioned to you " juſt now, Mr. TOLLET, upon ſee- " ing your diagram, gave me this " ſhort rule for ſhooting on aſcents: From the greateſt random ſubtract dou- " ble the hight, multiply the remainder by the greateſt random from the product " ſubtract the ſquare of the horizontal diſtance; the ſquare root of the remainder " added to the greateſt random, and ſubtracted from it will give two perpendi- " culars: the baſe to each is the horizontal diſtance, and the angles at the baſe " will be the elevations required. 'Tis manifeſt, that this rule is drawn from " your figure, but I confeſs, I have not the demonſtration; but your demon- " ſtration I am ſure will bear it, and therefore I muſt deſire you not to detain " it from me longer than your next to me. Doubtleſs you have ſeen Monſ. " BLONDEL's *Art de Jetter les Bombs*, a book wherein there is nothing material " more than what was before him in GALILEO * * * *, except only this " buſineſs of ſhooting on aſcents and deſcents: after he had propoſed the pro- " blem to Meſſieurs DE L'ACADEMIE ROYALE DES SCIENCES, Monſ. BUOT, " Monſ. ROMER, Monſ. DE LA HIRE, and Monſ. CASSINI employed their " thoughts about it; but I can aſſure you upon rigid examination, there is not " one of their rules holds true in all caſes.

" I think

" I think I have ſufficiently tired you for the firſt time. I am

" your moſt humble ſervant,

" WILLIAM MOLYNEUX."

Part of a letter of Mr. LEEWENHOECK was read, wherein he deſcribed the particles compoſing cinnabar, ſhewing them to be made up moſtly of hexagonal figures, yet not without the mixture of ſome ſulphureous and ſaline particles, whoſe figures, as viewed in his microſcope, he deſcribed.

Dr. PAPIN gave in a deſcription of an improvement of his new digeſter for diſtillation *in vacuo* [h], which he ſaid he would produce before the Society at their next meeting.

Mr. HALLEY read a diſcourſe of his own, deſigned for a *Philoſophical Tranſaction* [i], concerning the cauſe and properties of gravity, wherein he conſiders the ſeveral hypotheſes concerning its impulſes, and then mathematically deduces its conſequences in the fall of heavy bodies, and the motion of projects.

Dr. SLARE produced a letter from JOHN WEICHARD VALVASOR to the Society from Carniola, which was ordered to be read at the next meeting.

Mr. HOOKE ſhewed the experiment of the æquilibrium of water and oil of turpentine in an inverted ſyphon, as he had done before of mercury and water; and it appeared, that $92\frac{15}{16}$ of water was equal in weight to $107\frac{7}{16}$ inches of oil of turpentine; whence the weight of water to that of oil of turpentine is as 1719 to 1487, or as 1 to 0,865. Hence the weight of mercury to oil of turpentine is as 15 to 62 or as 4 to 1.

April 28. Sir JOHN HOSKYNS was deſired to take the chair.

The minutes of the laſt meeting were read.

Two notes of Monſ. JUSTEL were read, the one giving an account of the Chineſe cheſs-board and the manner of their play; and mentioning a late *Journal des Sçavans*, wherein there is an account of the diſcovery of two new ſatellites of Saturn by Monſ. CASSINI, ſo that there were five of them.

Part of a letter from Mr. LEEWENHOECK was read, containing his obſervations upon the figure of the parts of the nitre after the exploſion of the gun-powder; with ſeveral curious remarks about the manner of firing gun-powder, about the quantity of air produced by the blaſt, and about the length of a cannon to carry fartheſt.

Dr. VINCENT preſented to the Society a manuſcript treatiſe intitled, *Philoſophiæ Naturalis principia mathematica*, and dedicated to the Society by Mr. ISAAC NEW-

[h] Regiſter, vol. vi. p. 311.

[i] It is publiſhed in the *Philoſ. Tranſact.* N°. 179. p. 3.

TON,

TON, wherein he gives a mathematical demonſtration of the Copernican hypotheſis as propoſed by KEPLER, and makes out all the phænomena of the celeſtial motions by the only ſuppoſition of a gravitation towards the center of the ſun decreaſing as the ſquares of the diſtances therefrom reciprocally.

It was ordered, that a letter of thanks be written to Mr. NEWTON; and that the printing of his book be referred to the conſideration of the council; and that in the mean time the book be put into the hands of Mr. HALLEY, to make a report thereof to the council.

Dr. PAPIN gave in a paper concerning his method of diſtilling *in vacuo*, which upon trial was found to ſucceed very well, and was judged to diſtill faſter than in air.

Monſ. MARIOTTE's *Du Movement des Eaux* was produced bound, and put into the hands of Mr. HALLEY to make an extract thereof, and report it to the Society.

Mr. WALLER ſhewed a contrivance for printing of colours upon the table, which he deſigned to publiſh, being a catalogue of all ſimple and mixt colours. It was by ſmall taper pipes, which at the ſmall end were ſtopt by plugs thruſt on by ſpiral ſprings ſo as to keep the colours from running out; but when he intended to print, the plugs being thruſt back by points ſtanding out of them, the colour came down ſo as to make convenient round ſpots on the paper.

Mr. JOHN WEICHARD VALVASOR's letter, produced at the laſt meeting, being found to be little elſe but a copy of the former, which he conceived had miſcarried, was let alone.

Mr. HALLEY gave an account of two occultations of Jupiter by the moon[h], the one obſerved by Mr. HOOKE and himſelf in Greſham-college, March 31 laſt in the evening. The central immerſion was found at 9 hours 33 min. the emerſion of the firſt limb of Jupiter at 10 hours 30 min. of the laſt limb at 10 hours $31\frac{1}{2}$ min. the conjunction being but very little to the northward of the moon's centre.

The other was this day in the morning or April 27, 15 hours 49 min. when Jupiter's centre emerged from behind the moon then juſt full about 342 deg. of the inner limb of HEVELIUS's *Selenography*.

A letter in Latin of Dr SIGISMOND KONIG to the Society, dated at Berne in Swiſſerland on the laſt of Feb. $168\frac{5}{6}$[i], being a continuation of the hiſtory of his patient, MARGARET LOWER, who voided ſtones of a prodigious ſize, whereof an ac-

[h] This account is printed in the *Philoſ. Tranſact.* N°. 181. p. 85. for May 1686.

[i] Letter-book, vol. x. p. 297. It is printed in the *Philoſ. Tranſact.* N°. 181. p. 94. for May 1686.

count

count was given in the 3d *Philoſophical Collection* of Decemb. 10, 1681, was produced and ordered to be read at the next meeting.

He preſented with it two of the ſaid ſtones, one of which was ordered to be put into the hands of Dr. SLARE, who was deſired to make what experiments he ſhould judge neceſſary to examine the compoſition of its ſubſtance.

May 5. Dr. GALE vice-preſident in the chair.

ANNE TAYLOR, born June 12, 1682, and not yet four years old, being grown prodigiouſly fat and corpulent for that age, was ſhewn before the Society. She weighed forty-eight pounds and a half, and was three-fourths of a yard about the waiſt: her ſtature not greater than ordinary, viz. two feet five inches. She had a much greater voice than uſually ſuch children have, and her breaſts and nipples were grown; and by the report of her mother and others ſhe was in her ſtate of puberty: emaciated but three quarters of a year before ſhe was ſent to Alesford in Hampſhire.

The minutes of the laſt meeting were read.

Dr. GALE preſented to the Society Dr. GOAD's books of his obſervations on the weather, and the rules for predicting it.

A letter of Mr. RAY to Dr. GALE, dated at Black Notley in Eſſex May 3 1686 [m], was read, returning thanks to the Society for the 20 copies of Mr. WILLUGHBY's *Hiſtory of Fiſhes* preſented to him.

Part of Dr. KONIG's letter, produced at the laſt meeting, was read.

A paper of Mr. WILLIAM MOLYNEUX [n], aſſigning the reaſon, why the diſſolved particles of metals ſpecifically heavier than the menſtrua, that diſſolve them, do notwithſtanding ſwim therein, to be from the exceeding minuteneſs of the ſaid particles, ſuppoſing, that there is a certain weight neceſſary to overcome the *niſus*, that is in all fluids, to an union of their parts, ſo that the bodies, which by their ſmallneſs have not ſo much force or weight to deſcend with, remain ſuſpended on the pores or interſtices between the particles of the fluid menſtrua: this being an anſwer to his brother Mr. THOMAS MOLYNEUX about the ſame thing, who ſuppoſed, that the internal motion or agitation of the parts of the liquor, whereby it is made fluid, may be the reaſon of this appearance.

A paper of Dr. PAPIN was read, giving an account of an improvement of his digeſter by making it with one ſingle veſſel [o].

[m] Letter-book, vol x. p. 328.

[n] Regiſter, vol. vi. p. 316. It is printed in the *Philoſoph. Tranſ.* vol. xvi. N° 181, p. 88 for May 1686.

[o] Regiſter, vol. vi. p. 313.

Monſ. JUSTEL communicated a *journal des ſcavaus*, giving an account of the diſcovery of two new Satellites of Saturn by teleſcopes of an extraordinary length, ſome of about 200 feet long. The innermoſt of thoſe ſatellites is never above or exceeding $\frac{2}{3}$ of the length of the ring diſtant therefrom, and makes its revolution in one degree two hours, 19 minutes. The other is never more than $\frac{3}{4}$ of the length of the ring diſtant therefrom, and makes its revolution in two degrees, ſeventeen hours, forty-three minutes.

Mr. WALLER produced his table of colours deſigned for the *Philoſophical Tranſactions*.

May 12, Sir JOHN HOSKYNS was deſired to take the chair.

Upon mention of Mr. WILLIAM MOLYNEUX's theory of mixing the parts of metals with the menſtrua that diſſolve them, though by many times lighter than theſe metals, Mr. HENSHAW was of opinion, that the vapours raiſed in the air were analogous to the particles of metals riſing in diſſolving menſtrua, and much harder to explicate, there being ſo great a diſproportion in the weight of air and water.

Sir JOHN HOSKYNS mentioned as a probable hypotheſis, that aqueous particles ſhould riſe in the form of bubbles ſo thin, that they are very little more ponderous than their bulk of air, and that being agitated by the reflex beams of the ſun they are raiſed to the hight we find them: which he illuſtrated by an obſervation, which he had made in the iron-works, viz. that an handful of ſand being thrown upon the melted iron would immediately by the great heat thereof be caſt up to the top or ceiling of the place.

Upon mention of Mr. WALLER's table of colours, Dr. AGLIONBY affirmed, that in painting in freſco no metallic colours are uſed, they being moſt proper for oil-painting.

A letter of Mr. ST. GEORGE ASH, dated at Trinity-college, Dublin, April 27, 1686[p], was read, giving an account of his method of demonſtrating the 2d and 5th books of EUCLID; of a dog, that was immediately killed by injecting into the jugular vein an infuſion of opium in brandy and water; of the mathematical girl at Dublin; as likewiſe of the opinion of the Dublin Society concerning Mr. HOOKE's level.

A letter of JOHN WEICHARD VALVASOR to Dr. GALE, dated at Laback in Carniola April 1686, N. S.[q] was read, being an anſwer to one ſent him by Dr. GALE, wherein he informs the Society of ſeveral geographical and topographical charts, which he had ſent them as a preſent by way of Venice; of an invention of his to caſt a ſtatue ſix feet high all at once, and ſo thin, that it ſhould not weigh one pound weight; which invention he promiſed to communicate to the Society, if deſired: Of a treatiſe, which he had written concerning the curioſities of the lake

[p] Letter-book, vol. x. p. 309. [q] Ibid. p. 314.

of

of Zirknitts, which he would either print or ſend to the Society with a dedication to them, or elſe he would ſend them his manuſcript to be inſerted in the *Philoſophical Tranſactions*, if they ſhould think fit. And of a ſtrange tree, which from being bare is full of leaves, and has fruit upon it, all in the eve of St. JOHN's feaſt-day, therefore called St. John's walnut-tree, which he affirms to have found to be a fact.

This gave occaſion of diſcourſing of uncommon trees, that ſeem to be preternatural, as the Glaſſenbury thorn bloſſoming at Chriſtmas day, being no other than a common haw-thorn, and the oak in New-foreſt, which is always green at Chriſtmas, and yet in all other reſpects is a perfect oak. As to the ſudden growth of leaves, Mr. HOOKE gave an inſtance from BAUHIN of the yucca or arbor arboreſcens, which in a night will grow or ſhoot out many feet.

Dr. SIGISMUND KONIG's letter was referred till Dr. SLARE could give his account of the obſervables in the ſtone, which was delivered to him to be examined.

Part of a letter of Mr. LEEWENHOECK, being in anſwer to one written to him March 2, 168$\frac{1}{0}$, was read, and the reſt referred till another meeting.

Another letter of Mr. LEEWENHOECK was produced, and ordered to be tranſlated.

A note of Monſ. JUSTEL was read about a new ſort of microſcopes made by CAMPANI at Rome with three glaſſes, and not above three inches long, which were very diſtinct, but did not magnify ſo much as the great ones.

The ſame note mentioned likewiſe a Dutchman, named MAYER, who had hindered the inundation of the Tiber, and promiſed a book of very curious ſubjects in mechanics, to which, it was ſaid, the Italians were then ſtrangers.

Dr. PAPIN ſhewed the experiment of brewing in his new digeſter [r]; and it was found, that there was a very ſtrong tincture drawn from the malt in much leſs time than it could have been done in the ordinary way.

May 19, Sir JOSEPH WILLIAMSON vice-preſident in the chair.

The minutes of the laſt meeting were read.

Upon mentioning, that no metallic colours were uſed in painting in freſco, it was queried about what time the ſeveral ſorts of painting came to be in uſe: To which Mr. HOOKE anſwered, that the moſt antient painting was with gums; then with white of egg; then with wax; and laſtly with oil; the particular time of the beginning of each not being eaſily attainable.

Mr. HOOKE read a paper vindicating his level from ſome objections made againſt it from Dublin: wherein he ſuppoſed, that the pendulum thereof was not

[r] Regiſter, vol. vi. p. 120.

made with the accuracy neceſſary; and in the end he propoſed a further uſe of that invention by applying the pendulum thereof to the pendulum of a clock, which being capable of being made to vibrate as ſlow as you pleaſe, would make the clock go much ſlower than ordinarily uſed, ſo as to make the time of the winding up but very ſeldom, with the ſame number of teeth, which the ordinary clocks have.

The remaining part of Dr. KONIG's letter was read about the ſtones voided by the woman at Berne; wherein he offered his thoughts concerning their generation or concretion.

There was alſo given in an account given by Dr. SLARE of his examination of the ſaid ſtones ſent to the Society [a]: Firſt, that their ſpecific gravity was much greater than that of all other calculi or tophi generated in the body; and that it approached nearly to the weight of other common ſtones, being more than $2\frac{1}{6}$ to 1 of the weight of water; which is exactly the gravity of the icicles or incruſtations made by the petrifaction of water in a grotto. Secondly, that he had tried by pouring on of acids upon it, and that the common vinegar made a great ebullition therewith: that ſpirit of vitriol diſſolved it, but would not keep it from precipitating of itſelf; but that ſpirit of ſalt wrought upon it vigorouſly, preſently diſſolved it, and kept it from precipitation, the liquor being tranſparent; but that for want of the volatile and fixed ſalt, ſaid by Dr. KONIG to have been found in thoſe ſtones, he could not poſitively affirm it to be an animal ſubſtance.

Mr. PIGOT preſented a ſort of black earth, dug for turf at a place called Hulſe near Ormſkirk in Lancaſhire, being a bituminous ſubſtance, ſmelling ſtrong of an aromatic ſcent, reſembling very much that at Hoxton. He produced likewiſe a bottle of a liquor drawn from it, which, he ſaid, had cured a perſon of a very dangerous internal bruiſe.

It was ordered, that ſignor MALPHIGHI, Mr. HEVELIUS, Mr. LEEWENHOECK, and Monſ. BAYLE be each of them preſented with one copy of Mr. WILLUGHBY's *Hiſtory of Fiſhes*: And,

That Mr. NEWTON's *Philoſophiæ naturalis principia mathematica* be printed forthwith in quarto in a fair letter; and that a letter be written to him to ſignify the Society's reſolution, and to deſire his opinion as to the print, volume, cuts, &c. [b]

Dr.

[a] It is printed in the *Philoſoph. Tranſact.* vol. xvi. N° 182. p. 140. for June 1686.

[b] Mr. HALLEY wrote accordingly to Mr. NEWTON on the 22d of May the following letter, Supplement to letter-books, vol. iv. p. 340.

"SIR,

"Your incomparable treatiſe, intitled, *Philoſophicæ naturalis principia mathematica*, was by "Dr. VINCENT preſented to the Royal Society "on the 28th paſt; and they were ſo very ſenſible of the great honour you have done them by "your dedication, that they immediately ordered "you their moſt hearty thanks, and that the "council ſhould be ſummoned to conſider about "the printing thereof. But by reaſon of the "preſident's attendance upon the king, and the "abſence of our vice-preſidents, whom the good "weather has drawn out of town, there has not "ſince been any authentic council to reſolve "what to do in the matter, ſo that on Wedneſday laſt the Society in their meeting judging, "that ſo excellent a work ought not to have its "publication any longer delayed, reſolved to "print it at their own charge in a large quarto of "a fair letter; and that this their reſolution "ſhould

Dr. PAPIN ſhewed an experiment about boiling of rice in water in his new digeſter; which in a very little time was become a perfect pulp, the rice being ſo ſoft that it ſeemed in a manner diſſolved [t].

May 26. Sir JOHN HOSKYNS was deſired to take the chair.

The minutes of the laſt meeting were read.

Sir JOHN HOSKYNS upon the inquiry made at the laſt meeting concerning the times of the invention of the ſeveral ſorts of painting, ſaid, that one JOHN DE BRUGES was the inventor of painting in oil-colour.

A letter of Mr. WILLIAM MOLYNEUX to Mr. HALLEY, dated at Dublin May 15, 1686 [u], with the figures of the girl overgrown with horny ſubſtances, was produced and read.

Dr. SLOANE mentioned an author, named PHILIPPUS INGRASSIAS, giving a like account in his book *de tumoribus*.

Mr. JOHN HARWOOD was propoſed candidate by Dr. VINCENT.

Mr. HALLEY brought in an account of Monſ. MARIOTTE's treatiſe *du mouvement des eaux*; and upon mentioning of the hights of jets d'eau, Mr. HOOKE was of opinion, that all thoſe, which exceed forty feet in hight, have ſo great a force, that they preſently break into drops, and ſo ſpoil the beauty of the fountain.

Mr. HOOKE likewiſe occaſionally mentioned that ice is not only lighter than water, but has a refraction conſiderably different therefrom.

Part of a letter of Mr. LEEWENHOECK was read, giving an account of the tex-

" ſhould be ſignified to you and your opinion " thereon be deſired, that ſo it might be gone " about with all ſpeed. I am intruſted to look " after the printing of it, and will take care, that " it ſhall be performed as well as poſſible. Only " I would firſt have your directions in what you " ſhall think neceſſary for the embelliſhing there- " of, and particularly whether you think it not " better, that the ſchemes ſhould be inlarged, " which is the opinion of ſome here: but what " you ſignify as your deſire ſhall be punctually " obſerved.

" There is one thing more, that I ought to in- " form you of, viz. that Mr. HOOKE has ſome " pretenſions upon the invention of the rule of " decreaſe of gravity being reciprocally as the " ſquares of the diſtances from the center. He " ſays you had the notion from him, though he " owns the demonſtration of the curves gene- " rated thereby to be wholly your own. How " much of this is ſo, you know beſt; as like- " wiſe what you have to do in this matter. Only " Mr. HOOKE ſeems to expect you ſhould make " ſome mention of him in the preface, which it " is poſſible you may ſee reaſon to prefix. I muſt " beg your pardon, that it is I, that ſend you " this ungrateful account; but I thought it my " duty to let you know it, that ſo you might act " accordingly, being in myſelf fully ſatisfied, " that nothing but the greateſt candour imagi- " nable is to be expected from a perſon, who has " of all men the leaſt need to borrow reputation. " I am, &c."

With regard to this claim of Mr. HOOKE, the reader may ſee the letters of Mr. NEWTON and Mr. HALLEY in the article of the former in the *General Dictionary hiſtorical and critical*, vol. vii.

[t] Regiſter, vol. vi. p. 320.

[u] Letter-book, vol. x. p. 315.

ture

ture of bone, obſerved in his microſcopes, which he found to be compoſed of four ſeveral ſorts of pipes or veſſels running lengthwiſe, and ranged in circles about the cavity, and propoſing an analogy between the growth of bones and that of wood by the acceſſion of new circles, as it is annually in trees, and comparing the perioſteum to the bark of the tree.

Mr. HOOKE read a diſcourſe about the application of the pendulum of his level to a clock to make the vibrations thereof as ſlow as required; and he ſhewed the manner of applying it to a watch for regulating its balance.

Mr. HALLEY ſhewed the manner of the courſe of the trade-winds between the tropics in the Atlantic and the Pacific oceans; as likewiſe of the monſoons in the Indian ſeas, as he had learned them partly from his own experience, and partly from converſation with ſeamen and from their journals; attempting to explain their cauſe by the rarefaction of the air, where the ſun is hotteſt, whereby the ſpecific gravity of the air being diminiſhed, the cooler air, that is more remote, comes into its place, and drives it upwards, whereby the winds *cæteris paribus* have always an inclination towards the ſun. He was ordered to draw up this relation in writing, and to publiſh it in the *Philoſophical Tranſactions* [z].

Dr. PAPIN gave in an account of an inſtrument for filtration of his own contrivance [a], which was by pouring the liquor into a long-necked funnel, whereby the hight of the liquor being conſiderable, the preſſure thereof would be great upon the pores of the filtre; which would occaſion a ſpeedier filtration. The experiment was ſhewn before the Society, and ſucceeded.

June 2, at a meeting of the COUNCIL were preſent

Dr. GALE vice-preſident

Sir. JOHN HOSKYNS	Mr. HILL
Mr. HENSHAW	Mr. PERRY.

It was ordered, that Mr. NEWTON's book be printed, and that Mr. HALLEY undertake the buſineſs of looking after it, and printing it at his own charge; which he engaged to do:

That the buſineſs of the *Philoſophical Tranſactions*, as to the encouragement heretofore given by the Society to the publiſhers thereof, be referred to the conſideration of the next meeting of the council: and

That the conſideration of Mr. HALLEY's ſalary in relation to a clauſe in the orders made Jan. 27 paſt concerning the Society's clerk, be referred to a fuller council:

That the council-book be ſearched as to what had been done about Mr. HOOKE's ſalary.

At a meeting of the SOCIETY on the ſame day, Sir JOSEPH WILLIAMSON vice-preſident in the chair.

[z] It is printed in the *Philoſ. Tranſact.* vol. xvi. N°. 183. p. 153. for July, Aug. and Sept. 1686.
[a] Regiſter, vol vi. p. 321.

Mr

Mr. St. George Ash ſubſcribed his name, and was admitted fellow of the Society.

The minutes of the laſt meeting were read.

Two notes from Monſ. Justel were read; the one about a great ſtorm of hail lately fallen at Liſle in Flanders [b]: the other about an engine uſed at Amſterdam for quenching fire: whereupon Mr. Hooke gave a full account of an engine, which he conceived to be the ſame, being made with a gut or pipe of canvas to convey the water through crooked paſſages, where our ſort of engines cannot come to play.

Monſ. Justel's note gave likewiſe an account of a ſmith in Germany, who in the preſence of his friend had made iron red-hot by beating it; and of files made at Hamburgh ſo hard as not to wear at all; and that the pumps at Verſailles ſo much admired are ordinary in ths mines of Germany.

Mr. Hooke ſhewed the draught and contrivance of a water engine at Hackney made by one Mr. Aldersey, wherein three pumps are moved by an axis with a triple crank by means of an over-ſhot wheel.

A book preſented to the Society by the hands of Mr. Hooke from the author, Mr. Boyle, intitled *A free Inquiry into the vulgarly received Notion of Nature* [c], was delivered to Dr. Vincent, who was deſired to read it, and make a report of its contents; and the author was ordered the thanks of the Society.

June 9. Dr. Gale vice-preſident in the chair.

The minutes of the laſt meeting were read.

A letter in Latin from Monſ. Bayle to Sir John Hoskyns, dated at Rotterdam, June 8, 1686 [d], was read, returning thinks to the Society for their preſent to him of Mr. Willughby's *Hiſtory of Fiſhes*, and promiſing upon all occaſions to ſerve the Society in what ſhould lie in his power, and particularly in the matter of correſpondence.

A foreign gentleman, ſubſcribing his name Georgius Rash, ſent in a letter, incloſing, as he conceived, the ſolution of a problem, whereby the exact quadrature of a circle might be eaſily found. It was by an algebraical method of inquiring into the properties of a curve called by him *iſobole*, becauſe it has its ordinates increaſing in the ſame proportion as the angles made at a point in the axis. Mr. Hooke having peruſed it ſaid, that the curve here propoſed as new was no other than the *linea quadratrix*, being an old thought of thoſe, who had attempted ſquaring the circle. See Clavius.

[b] Letter-book, vol. xi. p. 22.
[c] Printed at London, 1686 in 8vo.
[d] Letter-book, vol. x. p. 316.

Mr. CLUVERUS produced a paper ſent from Dr. RUDBECK and Mr. PEIRINGHER of Upſal, deſiring that ſome ſpecimens of the ſeveral Engliſh ores, minerals, and ſtones mentioned therein, might be ſent to them, promiſing to communicate like ſamples of the minerals and ores of Sweden, if deſired.

Two papers of Dr. PAPIN[e] were read, the one ſhewing the great advantage of his new contrived digeſter above his old one, in ſaving of fewel, which is ſo great, that, as he computed, in twenty four hours time 150 pounds of gelly might be made with the expence of but 11 pounds of coals. Which therefore he conceived might be of great uſe at ſea.

The other paper was about drawing the tincture of the cocao-nut in his digeſter, ſo as to keep in all the volatile parts thereof. He produced three tinctures drawn from a ſmall quantity of nuts; the firſt whereof was very ſtrong both in taſte and ſmell; and excepting that it was ſomewhat too ſweet, might paſs for very good chocolate.

A book lately publiſhed by EDMUND DICKENSON, M. D. concerning alchemy or the philoſopher's ſtone, and intitled *Epiſtola ad* THEODORUM MUNDANUM *Philoſophum adeptum de quinteſſentiâ Philoſopharum & de verâ phyſiologiâ, unà cum quæſtionibus aliquot de ſecreta materiâ phyſica*, was preſented to the Society from the author by Dr. SLARE.

Mr. HALLEY read a paper, for a *Philoſophical Tranſaction*[f], in which he gave an account of the rule of the decreaſe of the hight of mercury in the barometer, according as the places are elevated above the ſurface of the earth, ſhewing how to calculate the hights of the mercury at any hight aſſigned, and *vice verſa*, by the help of the ſpaces between the aſymptote and hyperbola; or, which is the ſame thing, by the logarithms; and proving from the ſame hypotheſis, that the ſphere of air cannot much exceed the hight of forty miles, both from the extreme rarefaction at the hight, and from the depreſſion of the ſun at the end of twilight.

June 16, at a meeting of the COUNCIL were preſent

Dr. GALE vice-preſident

Sir JOHN HOSKYNS	Dr. ROBINSON
Mr. HERBERT	Mr. MEREDITH
Mr. HENSHAW	Mr. FLAMSTEAD
Mr. HILL	Mr. PERRY.

Sir JOHN HOSKYNS and Mr. HENSHAW were ſeverally ſworn vice-preſidents, according to two deputations under the hand of the preſident, then produced, and the oaths of allegiance and ſupremacy were adminiſtered to them, according to the ſtatute in that caſe.

[e] Register, vol. vi. p. 322.

[f] It is printed in *Philoſ. Tranſact.* vol. xvi. N°. 181. p. 104. for May 1686.

Cropton Havers, M. D. Mr. Thomas Molyneux, and Mr. John Harwood were allowed as candidates fit to be propoſed to the Society for election.

It was ordered, that the allowance for encouraging the publication of the *Philoſophical Tranſactions* by the ſecretaries taking ſixty copies of them as ſoon as printed, according to an order of December 13, 1682, be continued till farther order: and

That Mr. Hooke be allowed his arrears for the years 1684 and 1685; and that the treaſurer pay him ſixty pounds in full till Lady-day laſt.

This council do declare their ſatisfaction in the Society's choice of Mr. Halley, notwithſtanding his want of the fifth qualification, concluded on by the council of January 27 laſt paſt, which at the time of his election the Society was pleaſed to diſpenſe with.

At a meeting of the Society on the ſame day, Sir John Hoskyns vice-preſident in the chair.

Mr. Halley made the obſervation of the variation of the needle upon the ſtone in the area of Greſham-college, and having found the true meridian, the box being applied thereto, the needle declined 4 degrees 45 min. from the north to the weſt, and the needle being diverted by the application of iron reſtored itſelf four ſeveral times to the ſame point exactly.

Mr. Bailey preſented a letter written in the Chineſe character from the King of Mindanao, one of the Philippine iſles, to the Engliſh factory at Bantam, being very curiouſly adorned and neatly written.

It was ordered, that part of ſuch Engliſh ores, as the Society had a quantity of, be ſpared for Dr. Rudbeck, profeſſor at Upſal; and that Dr. Lister and Dr. Sloane be deſired to ſpare what they could out of their collections, to be ſent into Sweden by Mr. Cluverus.

Mr. Henshaw reported, that he had read Dr. Dickenson's book, preſented at the laſt meeting; and that it conſiſted of letters of the author to one Mundanus, whom he affirmed to have ſeen make projection during his inſtructions in the ſecret of the philoſopher's ſtone, which otherwiſe he ſhould deſpair to diſcover: to which Mundanus anſwers in doubtful terms, encouraging him to proceed, but begs his pardon for not revealing the deſired ſecret.

Two notes from Monſ. Justel were read; one giving a farther account of the invention of an anabaptiſt at Amſterdam for the quenching of fires[g]: the other containing an extract of a letter from Aramont in Languedoc near Avignon, dated May 28, 1686, concerning an extraordinary ſwarm of graſshoppers there[h].

[g] Letter-book, vol. xi. p. 24.
[h] Ibid. p. 23. It is printed in the *Philoſ. Tranſ.* N°. 182. p. 147.

Sir JOHN HOSKYNS preſented ſome bitumen or natural pitch from Pitchford in Shropſhire.

Dr. VINCENT returned Mr. BOYLE's *Inquiry into the vulgarly received Notion of Nature*, together with an account of it, which was read.

Dr. PAPIN ſhewed another experiment of weighing the air contained in a Florence flaſk, and having counterpoiſed it, when well evacuated of air, upon the readmiſſion thereof it was found to have gained juſt forty grains in weight. The quantity of water, that filled the ſaid flaſk, was four pound fourteen ounces avoirdupoiſe. Wherefore the water of the air to that of water is as 40 to 34100 or as 1 to 850. The ſcales not being ſufficiently exact, it was deſired, that this experiment might be repeated in ſome larger veſſel.

Sir JOHN HOSKYNS produced the *Nouvelles de la Republique des Lettres* for the month of May ſent to him for the Society by Monſ. BAYLE, the author.

June 23. Sir JOHN HOSKYNS vice-preſident in the chair.

Upon reading the minutes of the laſt meeting was occaſioned a diſcourſe concerning the variation of the magnetic needle; and it was ordered, that the Society's correſpondents ſhould be written to, that they might procure obſervations to be made of the ſaid variation in places as far diſtant as poſſible.

Dr. SLOANE produced four ſeveral ſorts of lead and tin ores, which he beſtowed on the Society for Dr. RUDBECK.

Dr. LISTER deſired to be excuſed at that time.

Dr. HAVERS, Mr. THOMAS MOLYNEUX, and Mr. JOHN HARWOOD were propounded candidates.

Dr. SLARE gave in a paper concerning a farther examination of the ſtones ſent by Dr. KONIG from Berne, in which paper Dr. SLARE affirmed the ſtones to yield a ſmall quantity of urinous ſpirit like ſpirit of harts-horn; proving it thereby to be an animal ſubſtance: and that the caput mortuum thereof would not adhere to Mr. HAAK's ſtrong loadſtone.

A note from Monſ. JUSTEL was read, giving an account of a book about hygrometers then printing at Paris with cuts: that the hygrometer of the Society's invention was the firſt: that an hiſtory of the buccaniers in the Weſt-Indies was written by a French buccanier or pirate: that two ſhips, which ſailed from Breſt in France, had arrived in Batavia in the iſland of Java in four months time, which was looked upon without example; and that the thermometers had been exceedingly high at Paris on Saturday the 12th of this month of June, by reaſon of the great heats.

A paper of Dr. PAPIN was read concerning the boiling of fiſh *in vacuo*; in which

paper he propoſed, that ſo boiling it might be ſerviceable for keeping it a long time from putrefaction [i].

Dr. SLARE produced a mineral water brought from Surrey within twenty miles of London; which having been kept ſeveral months in bottles afforded a very deep tincture from galls; whereas Tunbridge, Iſlington, and other vitriolate waters loſe that property, being kept but a very little time.

Sir JOHN HOSKYNS related, that one of the Knareſborough Spaws in Yorkſhire is very fetid and impregnated with much ſulphur; and that it had cured ſeveral perſons, who had been dangerouſly ill of conſumptions.

It was ordered, that Dr. PAPIN, Mr. HALLEY, and Mr. HUNT do conſider of the means of making and filling a barometer after the manner propoſed by Mr. HOOKE; and that they get one made for the Society.

June 30, at a meeting of the COUNCIL were preſent

Sir JOHN HOSKYNS vice-preſident

Mr. HENSHAW	Dr. GALE
Mr. HILL	Mr. MEREDITH
Mr. HAYNES	Mr. ASTON.
Mr. COLWALL	

Ordered, that a copy of the *Hiſtory of Fiſhes* of the beſt paper curiouſly bound in Turkey leather, with an inſcription or dedication therein, as likewiſe five others, bound alſo, be ſent to the preſident:

That the preſident be deſired to licenſe Mr. NEWTON's book intitled, *Philoſophiæ naturalis Principia mathematica*, and dedicated to the Society: and

That the treaſurer, to encourage the meaſuring of a degree of the earth, do give to Mr. HALLEY fifty pounds or fifty copies of the *Hiſtory of Fiſhes*, when he ſhall have meaſured a degree to the ſatisfaction of Sir CHRISTOPHER WREN, the preſident, and Sir JOHN HOSKYNS.

At a meeting of the SOCIETY on the ſame day, Sir JOHN HOSKYNS vice-preſident in the chair.

The minutes of the laſt meeting were read.

A letter of Mr. JOHN CASWELL to Mr. HALLEY, dated at Hart-hall Oxford, June 29, 1686 [k], was read, giving an account of the hights of ſome hills in Wales and Shropſhire, together with the obſervations of the hights of the barometer, on the tops of them. He mentioned, that Snowdon is 1240 yards high above the ſea, the mercury ſtanding thereon at $25\frac{6}{10}$ inches above the pool: that at Caderidni, the higheſt mountain in Merionethſhire, the mercury ſtood at $26\frac{4}{10}\frac{3}{0}$ inches; that on both mountains they were in the clouds. That at Slipſtones, a

[i] Regiſter, vol. vi. p. 324. [k] Letter-book, vol. x. p 318.

hill in Shropshire, the mercury stood at $28\frac{31}{100}$ inches, when at Worthen, a neighbouring place, it stood at $29\frac{6}{10}\frac{4}{0}$; Slipstones being 455 yards higher than Worthen: that there was indeed twelve hours betwixt these observations; but that he had found, that mercury did not move for three days after; so that he considered the observations as made both at the same time.

A letter from Mr. EDWARD SMITH, lately chosen secretary to the Dublin Society, dated Trinity-college Dublin, June 24, 1686[l], and addressed to the Royal Society, was read; wherein he inclosed the minutes of the Dublin Society from April 26 to May 17, inclusive, containing, among other things, an account of great quantity of poppies sprung up in a soil, where never any had been known to grow, and where most certainly none had been ever sown; which seemed an argument for spontaneous or equivocal productions.

A letter of Mr. WILLIAM MOLYNEUX to Mr. HALLEY, dated at Dublin, June 19, 1686[m], was read, containing some remarks on Mr. HOOKE's level and barometer.

Part of a letter of Mr. LEEWENHOECK was read, containing his microscopical observations upon the seeds of several Indian plants, shewing how the leaves and the part designed for the root and stem are wrapped up within the said seeds.

Mr. HOOKE read a discourse concerning the nature of the Chinese character, of their books, numbers, and writing, which he conceived to have been the literal character of some antient language now lost, so that the figure remaining, and not the sound or *potestas* thereof, it is become a real character, but incumbered with so much difficulty, that there is scarce any other help but memory. He was desired to publish this discourse, according to his intention, in a *Philosophical Transaction*[n].

A monstrous kitten was produced, having two faces joining together at the eyes, which was in the middle of the common face, and was composed of the meeting of two eyes. Upon dissecting it was found to have but one oesophagus and one aspera arteria, the two mouths joining in one common cavity. The entrails were all single; only the spina dorsi appeared double, the compages of the bones of the skull and spine being most remarkable. It was ordered, that a skeleton should be made thereof.

A farther experiment was tried of weighing the air in a considerable quantity in a great glass bottle; and by reason, that the weight thereof was said to be very considerable, it was thought requisite to make it equiponderent with water, that so the scale might not be charged with too much weight. So having exhausted the air, the bottle by the addition of weights was made just to sink in water; which done, the air being admitted, it was found to have gained in weight 690 grains: the capacity of the bottle in water was found 593052 grains; so that the

[l] Letter-book, vol. x. p. 319.
[m] Ibid.
[n] It is printed in the *Philos. Transact.* N°. 180. p. 63. for March and April 1686.

specific

ſpecific gravity of the air to that of water was at that time as 690 grains to 593052 grains, or as 1 to almoſt 860, differing very little from the experiment tried on that day fortnight, which made it as one to 852½.

A paper of Dr. PAPIN was read, ſhewing his contrivance of a ready way of exhauſting a veſſel, and keeping the vacuum, as long as he pleaſed; which he propoſed as what might be of conſiderable uſe in the preſervation of juice of plants, fruits, and the like[o].

July 7. Upon reading the minutes of the laſt meeting, in which mention was made of poppies produced after a ſpontaneous manner in Ireland, no ſeed having been there ſown, nor poppies growing near; Dr. GALE related, that a field in the pariſh of Scruton in Yorkſhire being ſown with barley, there came up nothing but oats. See Mr. RAY's preface to his catalogue of Engliſh plants.

Mr. HOOKE's notion of the Chineſe language and characters occaſioned much diſcourſe about the *poteſtates* of the letters of the antient languages; ſome being of opinion, that their ſound was continued down to us; and Mr. HOOKE ſeeming to maintain the contrary.

A note from Monſ. JUSTEL was read, giving an account, that a French ſhip having lately been at the Cape of Good Hope, had been informed by the Dutch there of an expedition, which they had made towards the tropic of Capricorn; and that they had there found a nation, which anſwered their violins with thirty inſtruments, and among the reſt with one, that was a ſort of flute, which was made with a ſlit inſtead of holes, and a ferrel caſe, that runs up and down upon it, according to the tone intended by it.

The ſame note mentioned likewiſe the great variety of all ſorts of fruits growing at the Cape of Good Hope.

A letter of Dr. WALLIS to Mr. HALLEY, dated at Oxford, July 2, 1686[p], was read, tendering his reſpects to the Society, and offering to continue the correſpondence formerly held with the Oxford Society; which he was deſired to do.

A paper of Dr. PAPIN was read, propoſing ſeveral advantages in refining ſugar *in vacuo*, which he conceived might be done much better, quicker, and with leſs trouble than after the ordinary way[q].

Mr. FAITHORNE, the bookſeller, preſented the Society with the firſt tome of Mr. RAY's *Hiſtoria Plantarum* of the beſt paper fairly bound.

A letter of Mr. LEEWENHOECK, dated July 10, 1686, N. S. giving a

[o] Regiſter, vol. vi. p. 324.
[p] Letter-book, vol. x. p. 321.
[q] Regiſter, vol. vi. p. 326.

micro-

microſcopical account of the texture of oak-wood was produced and ordered to be tranſlated.

Mr. HOOKE ſhewed a contrivance for nicely obſerving the variations of the magnetical needle; which he promiſed to proſecute againſt the next meeting.

An account was read of a ſort of ſubſtance proper for coach-glaſſes, being tranſparent like glaſs, and impenetrable to the wind and wet; and of an old tomb found near Maintenon in France, wherein were found ſkulls and bones of a larger ſize than ordinary; and with them ſome hatchets of a green ſort of ſtone, called *pierre de jade*, the ſame with our turpentine, which the Indians in America uſe.

July 14. A ſhirt of fine callico without any ſeam either in the body or ſleeves was produced by Mr. HOOKE, who having well conſidered it, offered at ſome conjectures about the manner of weaving it; which he promiſed to communicate in writing.

After the reading of the minutes, a paper of Dr. PAPIN [r] was read, concerning an experiment tending to ſhew the force, which a ſhot receives by the ruſhing of the air into an exhauſted barrel; wherein he deſigned a farther proſecution of the experiments ſhewn on the 3d and 10th of March on that ſubject.

An account of the manner of the propagation of ſhrimps, in whoſe eggs the embryo is perfectly formed before excluſion, after the ſame manner as ſome ſorts of ſeeds, which contain the whole plants, being part of a letter of Mr. LEEWENHOECK, was read.

Monſ. BAYLE preſented by the hands of Monſ. JUSTEL the *Nouvelles de la Republique des Lettres* for the month of June.

Dr. PAPIN endeavoured to try the experiment of the force of a ſhot caſt out of an exhauſted barrel, by obſerving the number of very thin boards, which the bullet would penetrate: but the apparatus not anſwering, it was ordered to be tried again.

Mr. HALLEY read the remainder of a diſcourſe about the air, wherein he endeavoured to explain the ſeveral phænomena of the baroſcope by the change of the wind in this temperate zone, ſuppoſing, that the air heing heaped up by the meeting of two contrary currents might be the cauſe of its ſtanding high; and on the other ſide, two contrary winds blowing from the ſame place muſt neceſſarily evacuate that part of the atmoſphere, from which they blew, and conſequently cauſe the mercury in the barometer to ſink.

July 21, Mr. HENSHAW vice-preſident in the chair.

There was ſhewn a wind-gun of a particular contrivance, which by having its

[r] Regiſter, vol. vi. p. 326.

receptacle

receptacle once filled with compreſſed air would diſcharge four ſeveral bullets with ſo much force, as to bury the bullets in a deal board. The ſame gun would likewiſe be charged with gun-powder ſo, that without any farther trouble than putting in the ball, it would be ſufficient to kill five times after this.

A letter of Dr. REISELIUS, phyſician to the Duke of Wirtemberg, conſiſting chiefly of complements, was read.

The minutes of the Oxford Society for the month of June were read, containing ſeveral remarkable anatomical obſervations; and, among others, an account of worms bred in the ear.

Part of a letter from Mr. PASCAL was read, relating to an extraordinary ſtorm of wind and thunder on June 14th near Polden hills in Somerſetſhire about four miles from Bridgewater; whereby many hay-cocks were taken up into the air, and ſome of the hay ſcattered at two miles diſtance.

A paper of Dr. PAPIN about a way of filling the barometer with mercury, freed as much as poſſible from air [f], was read.

A printed letter of Dr. JOHN ANDREAS STISSER, phyſician at Hamburg, intitled *De Machinis fumiductoriis curioſis*, and addreſſed to the Royal Society, was preſented by Dr. GALE from the author.

The experiment of the mercury ſinking in the barometer upon application of heat not ſucceeding, by reaſon that ſome air was got into the head of the glaſs, it was ordered to be tried again at the next meeting, and that more quickſilver be put into the veſſel, into which the end of the cane is immerged.

July 28, at a meeting of the COUNCIL were preſent

Dr. GALE vice-preſident,

Mr. HENSHAW
Mr. HILL
Dr. ROBINSON
Mr. ASTON
Mr. MEREDITH.

It was ordered, that Mr. HUNT be paid 7 *l.* 10 *s.* for drawing and ingraving ſeveral of the figures in the *Hiſtory of Fiſhes:*

That Mr. HUNT's ſalary for half a year due July 14 be paid him, viz. 20 *l:*

That Mr. HAMERLON's bill for printing off the cuts of the *Hiſtory of Fiſhes* be paid: and

That the copies of that book be left with ſeveral bookſellers to be diſpoſed of; and that as good a bargain as poſſible be made with the bookſellers, not exceeding one ſhilling a book.

[f] Regiſter, vol. vi. 327.

At

At a meeting of the SOCIETY on the ſame day, Mr. HENSHAW vice-preſident in the chair.

After the reading of the minutes, there happened much diſcourſe about the way of preſerving ſhips from the worms; and it was remarked, that ſheathing with lead was the beſt expedient, and found to be ſo by the experience of Sir ANTHONY DEANE; but that the carpenters finding it againſt their profit oppoſed it by affirming, that the iron of the pintles of the rudders of ſhips ſo ſheathed were much more apt to be corroded by the ſea-water than thoſe ſheathed with wood; which yet was a groundleſs ſuppoſition.

Dr. ROBINSON thought, that it might be worth examining, whether ſome woods would not be proof againſt theſe worms, and conſequently proper for ſheathing; into which he propoſed, that tallies of ſeveral ſorts of wood might be laid in the ſea, where theſe worms are, to ſee which was the leaſt apt to produce them.

Mr. EVELYN was of opinion, that japanning or lackering might be a very good preſervation for ſhips; againſt which it was objected, that the motion of the ſeams of a ſhip would be apt to crack the varniſh, and ſo the worms might find entrance.

Mr. HOOKE ſaid, that true Indian lac or varniſh is the gum of a tree; and that it was uſually mixt with an oil; and that it is, when green, of a very poiſonous nature, and would make the fleſh ſwell where it had touched the ſkin.

A paper of Dr. PAPIN was read concerning an experiment of ſhooting by the rarefaction of the air[t]; and he ſhewed the ſaid experiment of ſhooting with two exhauſted barrels, a long and ſhort one; and it was found, that the longer barrel carried fartheſt, and that the velocity of the lead, being of about two ounces, out of the longer barrel was about ſeventy feet in a ſecond of time.

Auguſt 4. Mr. HENSHAW vice-preſident in the chair.

Upon reading the minutes of the laſt meeting, wherein it had been propoſed, that Chineſe lac might be a good preſervative for ſhips, Mr. HOOKE ſaid, that upon inquiry he had found, that the Chineſe junks are varniſhed with lac only above water: and he obſerved, that the fabric of thoſe junks is without ribs, the planks only laced with bambos, and ſo plaiſtered.

A letter of Mr. JOHN CASWELL to Mr. HALLEY, dated Auguſt 3, 1686[u], was read, containing a farther account of his obſervations of the hight of the mercury on Snowdon and other high hills in England and Wales.

An account was read of an experiment made by Dr. PAPIN, tending to prove,

[t] Regiſter, vol. vi. p. 329. [u] Letter-book, vol. vi. p. 53.

that

that the medium of the barometer rarefied, as it is, is ſtill ſubject to be contracted and expanded by heat and cold.

A letter of Mr. WILLIAM MOLYNEUX to Mr. HALLEY, dated at Dublin July 20, 1686 [a], was read, wherein he owned himſelf fully ſatisfied of the performance of Mr. HOOKE's level; promiſed what account he could procure of the tides on the coaſt of Ireland, and gave his ſentiments about the proper reſt way for actual menſuration, in order to ſurvey a degree of the earth. "I am moſt heartily glad, "ſays he, that the Royal Society have put you upon ſo uſeful an enquiry as the mea- "ſure of a degree upon our earth: you know there have been many attempts "towards it, how accurate I cannot tell. Mr. NORWOOD's was received, till of "late Monſ. PICART pretends to be more exact, and Mr. BERNARD de ponderi- "bus & menſuris differs a little from both. I have not time at preſent to "conſult the performances of theſe men in this particular, and therefore am una- "ble to adviſe you what method to take in menſuration. But this I am apt to "believe, let a hundred men try it, and they will all differ, though perhaps the "difference may be inconſiderable. However, the attempt is laudable and de- "ſerves encouragement. I think FERNELIUS's determination in this matter is "not much relied upon; but SNELLIUS ſeems to have taken great pains herein; "and indeed his country is the beſt adapted in the world; it is ſo level and even, "one may meaſure to great exactneſs."

The Society then adjourned after their uſual manner till farther orders.

Octob. 27. The Society met again by order of the preſident.

Sir JOHN HOSKYNS vice-preſident in the chair.

Upon reading the minutes of the laſt meeting, it was remarked [b], that there was good authority to prove, that ſome ſhips of the Romans and old Saxons were ſewed together. This was ſuppoſed to be only ſmall veſſels: And it was affirmed by the ſame perſon, that he had ſeen in England ſuch a ſewed boat, the outſide being lined with a raw hide.

Dr. GALE propoſed likewiſe, that WITZEN's book of naval architecture being written in Dutch ſhould be procured to be tranſlated into Engliſh. It was recommended to the Society to conſider of a perſon knowing in the language and ſubject of the book, proper to tranſlate it.

Several letters from Monſ. JUSTEL were produced and read, in one of which [c] he gave an account of an obſervation made by the Jeſuits at the Cape of Good Hope, whoſe longitude they had found to be 18° to the eaſt of Paris; as alſo of one CLAUDIUS, a young phyſician of Breſlaw in Sileſia, a good maſter of draw-

[a] Regiſter, vol. vi. p. 328.
[a] Letter-book vol. x. p. 323.
[b] By Dr. GALE, as appears by the next paragraph.
[c] Letter-book, vol. xi. p. 25.

ing, employed by Mr. VAN RHEDEN in an hiſtory of the plants of that country; that there were already two great volumes full, one of plants, the other of draughts of them, which would be publiſhed: and that the voyage of father TACHARD, a Jeſuit, was printing at Paris.

Another letter deſcribed the manner of tranſporting the great globes made for the cardinal D'ESTREES by father CORONELLI, deſigned to be preſented to the French king; which manner was, that the large carts, in which they were to be carried, were placed upon low wheels with four axle-trees, that ſo the wheels might be changed, at the turning of a corner, without altering the poſition of the caſe.

The ſame letter gave an account of a book then printing, written by a Bernardine Monk, tending to prove the world 1800 years older than it is commonly believed.

A third letter incloſed a printed paper in Italian from Rome, being a deſcription of a manner of copying any draught upon paper by help of a lens collecting the rays of the ſun, when reflected from a ſpeculum on the original draught. This was aſſerted by Mr. HOOKE to be the ſame or very near the ſame with the contrivance of his picture-box long ſince ſhown before the Society at Arundel-houſe.

This letter gave likewiſe an account, that the intendant of the gallies had growing in his gardens all the curious plants of America: and that he had ſent an intelligent draughtſman into America, who had orders to make an exact draught of what he ſhould find curious and uncommon.

It alſo mentioned the extraordinary diligence, which had been uſed in making the new fort, built by the French at Hunningen defenſible in five days.

A fourth letter[d] gave an account that CAMPINI had cauſed a tube of 100 palms to be made at Rome, very light, being in four pieces ſhutting into one another: That the number of the inhabitants at Rome, not reckoning the Jews, who were about 30,000, amounted to above 120,000 ſouls *communibus annis*, of which there died 3000 yearly.

This letter incloſed a very curious inſcription lately found at Rome, in the baſe of a pillar.

A letrer of Monſ. BAYLE was read, including his *Nouvelles de la republique des lettres* for September.

Mr. MONSON formerly elected, being now returned from his travels, ſubſcribed his name, and was admitted fellow.

Mr. HOOKE produced a ſtone taken out of a quarry in the middle of Portland,

[d] Letter-book, vol. xi. p. 26.

wherein

wherein were the impreſſions of a ſhell of the nautilus kind, being about two feet diameter, in four turns whereof part of the ſhell ſtill continued, and there appeared within the ſubſtance thereof a ſhell like the mother of pearl of oiſterſhell, which was found to be ſo by its ſhape, taſte and ſmell. He promiſed to make farther proof thereof againſt the next meeting.

Dr. PAPIN gave in a paper [e], containing an account of an experiment tending to a diſcovery of a means to facilitate evaporation, ſo as to ſave both fewel and time; which he attempted by conveying the heat to the liquor to be evaporated by means of a worm; which in ſome meaſure anſwered his expectation.

Nov. 3. Sir JOHN HOSKYNS vice-preſident in the chair.

After the reading of the minutes of the laſt meeting, Dr. VOSSIUS's interpretation of the inſcription found on the baſe of a great pillar at Rome, read at the preceding meeting, was produced and read; and the inſcription and commentary were ordered to be inſerted in the firſt *Philoſophical Tranſactions* [f].

A letter in Latin from Signor FRANCESCO SPOLETO to the Society, dated at Venice Aug. 26. 1686 [g], was preſented by Signor SAROTTI; which letter being chiefly to requeſt the Society's opinion of a book of his ſent to them, the ſaid book was recommended to Mr. HOOKE to peruſe, and give an account of it.

Mr. HOOKE ſhewed to the intire ſatisfaction of the Society the ſhells in and upon the ſtone, which he took to be formed from a nautilus. He was deſired to get it cut with a ſaw through the middle, to try, if any valves could be diſcovered therein.

Then the Society being a ſufficient number proceeded to the election of the three candidates formerly propoſed and approved by the council; whereof Dr. CLOPTON HAVERS being unknown to Mr. ASTON, the latter refuſed to give his ballot either in the negative or affirmative; by which means the election became void; and Mr. ASTON, deſired that the ſame might be recorded, which the vice-preſident ordered accordingly.

After this Mr. THOMAS MOLYNEUX and Mr. JOHN HARWOOD were ballotted for and elected.

Dr. AGLIONBY preſented the Society with his book of the lives of the painters.

Two letters of Monſ. JUSTEL were read, in one of which he gave an account of a very antient ſepulcre lately found in France near the river Eure ſuppoſed to be older than the eſtabliſhment of Chriſtianity in that country: which Dr. AGLIONBY took home with him, and promiſed to tranſlate. This was ſent to the Society, from Monſ. VILLERMONT.

[e] Regiſter, vol. vi. p. 329. [f] They are printed in N° 183. p. 172. [g] Letter-book, vol. x. p. 325.

Another letter of Monſ. JUSTEL gave an account of a little man lately preſented to the French king, from Quimpercorantin in the Lower Bretagne. He was thirty-ſeven years old, had a great beard, and his ſtature was but ſixteen inches.

The ſame letter gave a farther account of the tranſparent ſubſtance not brittle, and therefore proper to be uſed inſtead of coach-glaſſes; that it was made of hogs bladders, whereof there were ſome large enough to make pannels of ſixteen inches one way, and thirteen or fourteen the other.

It mentioned likewiſe, that 600 manuſcripts were found in the caſtle of Buda, ſaid to be the remains of a library of MATTHIAS CORVINUS King of Hungary: and that there was an anſwer publiſhed in France to Sir WILLIAM PETTY's eſſay on *The Compariſon between London and Paris.*

Dr. PAPIN ſhewed the experiment of the engine, that conſumes ſmoke, which had been formerly communicated from France. The experiment ſucceeded according to expectation; and Sir PETER COLLITON ſuggeſted, that this might be of great uſe in diſcharging damps in mines; which the vice-preſident approved, ſince the heavy matter of the damps lying undermoſt muſt of neceſſity come to the furnace, and ſo be diſperſed by the fire.

A letter of Monſ. CASSINI to Mr. HALLEY, dated at Paris, October 10, 1686[g], was read, giving an accurate account of the diſcovery of the two new ſatellites of Jupiter, and ſtating their periods and diſtances, with nice epochas of their motions.

A letter of Mr. WILLIAM MOLYNEUX to Mr. HALLEY, dated at Dublin, September 21, 1686[h], was read, giving, amongſt other things, an account of the tides there, wherein it was remarkable, that the high water upon the quarter moon falls out later by half an hour, in reſpect of the moon's ſouthing, than in the new and full; whereas at London the quarter moons make high water above an hour and a quarter ſooner than the new and full.

There was likewiſe ſubmitted to the opinion of the Society a paper from the ſame gentleman, giving the reaſon, why in a teleſcope two or three glaſſes invert objects; and that four erect them again[i]: which paper the Society thought fit to order to be printed[k]:

A French paper communicated by Mr. BOYLE concerning an uncommon hail of a prodigious bigneſs and form[l], was read.

A letter of Dr. REISELIUS to Mr. HALLEY, dated at Stutgard, October 8, 1686[m], was read, giving an account of ſome books, chiefly medical, lately print-

[g] It is printed in the *Philoſ. Tranſact.* N°. 187. p. 299. for April, May, and June 1687.

[h] Regiſter, vol. vi. p. 332. It is printed in the *Philoſ. Tranſact.* N°. 184 p. 192. for Octob. 1686.

[i] Regiſter, vol. vi. p. 333.

[k] *Philoſ. Tranſ.* vol. xvi. N°. 183. p. 169.

[l] Regiſter, vol. vi. p. 330.

[m] Letter-book, vol. x. p. 328.

ed

ed in Germany and elſewhere, and concerning Mr. HOOKE's barometer, and the method of ſtaining the lapis calchedonius, &c. Which letter (it being late) was referred to another meeting.

Nov. 10. Sir EDMUND KING was deſired to take the chair in the abſence of the vice preſidents.

Sir EDMUND KING gave an account of a patient of an acquaintance of his, who was ſeventy five years of age, when he died, and for twelve years before his death began to ſuſpect his own underſtanding, and became very melancholy, and at length fell into a kind of mopiſhneſs or fatuity, and at laſt died. Upon diſſection Sir EDMUND found, that there was a very large ſtone in the gall, but that the reſt of the viſcera were ſound. But he obſerved, that the brain was ſhrunk about a third part, and that there was about a pint of water between the meninges filling up the cavity. Afterwards examining the glandula pinealis, ſaid by Monſ. DES CARTES to be the ſeat of the ſoul, he found, that there was in it a ſtone very large in proportion to the gland, in which it was found, ſo that it ſeemed to fill it, and was covered with the ſkin thereof. He ſhewed the ſtone, and at the requeſt of the Society promiſed to give in writing a full account thereof [n].

One Mr. BULLOCK, a carpenter, made a propoſal to the Society of an invention of his in mechanics, whereby he pretended to be able to increaſe force to ſuch a degree, as that two men ſhould be able to move or raiſe as great a weight as many oxen.

Sir EDMUND KING related, that in digging for a common ſewer near Chriſt's Hoſpital ſeveral coffins were dug up; amongſt which was one, wherein the body was dried up like bacon, and being cut with an axe, it cut like an over-dried neat's tongue; and another, wherein there was a body formed as it were in duſt, the bones and all being mouldered into powder.

The verbal proceſs upon the diſcovery of an antient ſepulchre in the village of Cocherel upon the river Eure in France [o], communicated by Monſ. JUSTEL, and tranſlated from the French by Dr. AGLIONBY, was read.

Nov. 17, at a meeting of the COUNCIL were preſent

Mr. HENSHAW vice-preſident

Sir JOHN HOSKYNS	Mr. HERBERT
Sir RICHARD BULKELEY	Mr. HAYNES
Mr. HILL	Mr. PERRY.
Mr. MEREDITH	

It was ordered, that Dr. PAPIN be allowed half a year's ſalary due to him at Michaelmas laſt:

[n] Regiſter, vol vi. p. 335. *Philoſ. Tranſact.* N°. 185. p. 228.
[o] Ibid. p. 221. for November and December.

Mr.

That Mr. JOHN HILLS, ſtationer, be allowed his bill for paper delivered for the cuts of the *Hiſtory of Fiſhes*, being 16*l.*: and

That Mr. HOOKE be allowed his bill of charges, being 3 *l.* 10*s.* in full of all his expences to this day.

Mr. MEARES, ſon of Sir THOMAS MEARES, was propoſed to the council as a candidate, and balloted for and approved for election.

It was ordered, that Mr. PITFIELD's tranſlation of the *Memoires pour ſervir à l'Hiſtoire naturelle des Animaux* be licenſed: and

That Mr. FLAMSTEAD's tide-table for the year 1687 be printed[p].

At a meeting of the SOCIETY on the ſame day, Sir JOHN HOSKYNS vice-preſident in the chair.

A committee was ballotted for and choſen to audit the treaſurer's accounts, conſiſting of Mr. WALLER, Mr. LODWICK, Mr. HOUGHTON, Mr. PITFIELD, and Mr. CLUVERUS.

Dr. CLOPTON HAVERS was elected a fellow.

The minutes of the laſt meeting were read, as alſo the ſtatutes concerning the method of election of the council and officers, according to cuſtom.

Mr. HOOKE gave an account of the book of Signor FRANCESCO SPOLETO, which had been recommended to his peruſal. He ſaid, that the author had well determined the problem of the preſſure of a body on an inclined plain: but that to the ſecond part concerning the ſeparation of the gall in the liver he could not ſo readily aſſent.

He likewiſe remarked, that the manner of evacuating damps in the mines at Leige was after the manner of the French engine for conſuming ſmoke.

Dr. TYSON and Dr. SLOANE aſſerted, that the petrifaction of the glandula pinealis was not a very extraordinary caſe; and that there were ſeveral inſtances of this accident in authors; and among others in Dr. REGNER DE GRAAF *De ſucco pancreatico*; but that the like ſtupidity with that mentioned by Sir EDMUND KING was not found in thoſe caſes.

Dr. TYSON obſerved, that in the head of a madman, who died in the hoſpital of Bedlam, he had found two or three ſmall bladders of water.

Sir RICHARD BULKELEY ſaid, that he had been informed of a gentleman at Cambridge, a good poet and mathematician, who, after his death was found to have no part of his brain ſound, but all waſted away to a ſmall matter, and like a

[p] It is printed in the *Philoſ. Tranſact.* N°. 185. p. 232.

lump

lump of putrefaction; and that when alive he had no other ſymptom than that he could not endure the heat of the ſun on his head.

Dr. SLOANE remarked, that he had been informed, that at Tholouſe, where they ſhewed the dead bodies preſerved in a vault from putrefaction, there had formerly been a lime-kiln, or elſe a great heap of lime laid; whereby the earth being impregnated with its aduſt particles became this preſervative: but that the reſt of the earth thereabout had no ſuch quality.

Mr. PACKER ſaid, that he had been informed, that there was a body dug up in Eaſt-Cheap, which had been long buried, but appeared very freſh, as if newly laid in the ground; but upon admiſſion of the air it putrefied immediately.

Dr. TYSON ſhewed an embryo, as he believed, of about ſix weeks or two months. It was ſwimming in the liquor of the amnion (which was very full) and was ſuſpended by the vaſa umbilicalia from the coat of the ammion.

He obſerved, that the chorion, which he had ſeparated, was plainly vaſcular, and tacked all over by veſſels to the amnion.

Two papers of Dr. PAPIN [a] were read, the one about farther improvement of his digeſting engine; the other about a new way of preſerving fruit by boiling it *in vacuo*. He produced ſome currans preſerved after that manner, and ſaid, that by a mercurial gage he found, that there had at firſt been air enough produced to counterpoiſe a third part of the preſſure of the atmoſphere; but that afterwards that ſubſtance or vapour returned into the fruit. He produced likewiſe ſome cherries ſo preſerved. The juice and ſmell of both were found very good, and the method of preſerving approved.

Nov. 24. Sir JOHN HOSKYNS vice-preſident in the chair.

Upon reading the minutes of the laſt meeting it was affirmed by Dr SLOANE, that quick-lime deſtroys the volatile ſalt of ſal armoniac; but this aſſertion was oppoſed by Dr. PITT and Dr. ROBINSON, who ſaid, that the mixture of quick-lime with ſal armoniac in diſtillation does not deſtroy the volatile ſalt; but that rather it agitates it to that degree, that no part will riſe in a dry form, but all in liquor, which by this manner of diſtillation is drawn much more pungent than by the ordinary way.

Dr. ROBINSON affirmed, that the mummies or bodies dried in the ſands of Africa will neither relent nor periſh by moiſture.

A letter of Monſ. JUSTEL was read, wherein he gave an account of new globes to be made at Paris by Father CORONELLI, who made thoſe for the Cardinal D'ESTREES of fourteen feet diameter. Theſe leſſer were to be about three feet and a half, and would be afforded for ſixteen Louis d'or to thoſe, who would ad-

[a] Regiſter, vol. vi. p. 337, 338.

vance to encourage the work: and that the ſame father had a deſign to undertake a new Atlas.

Mr. THOMAS MOLYNEUX preſented from his brother, Mr. WILLIAM MOLYNEUX of Dublin, his book, intitled *Sciothericum teleſcopicum, or a new Contrivance of adapting a Teleſcope to a horizontal Dial for obſerving the Moment of Time by day or Night* [b].

The ſtatutes were then read, according to cuſtom, this being the meeting next preceding the anniverſary election.

A letter of Dr. WALLIS to Mr. HALLEY dated at Oxford, November 8, 1686 [c], was read, wherein he mentions to have ſeen a child, whoſe hands and feet were each articulated with five fingers and toes beſides the thumbs and great toes; and thoſe not at all monſtrous, but as well proportioned as the four ordinarily are.

This letter gave likewiſe an account of an uncommon dropſy in a maid, out of whoſe belly was taken ſixty three quarts of water by meaſure; and approved of Mr. HOOKE's remarks on the China character, moſt of which Dr. WALLIS had found to be true by former inquiries into the Chineſe books in the Bodleian library.

Dr. PITT upon occaſion of this letter gave his opinion concerning the cauſe of the dropſy, which he conceived not to proceed from the breaking of the lymphe-ducts in the abdomen, as ſome had thought, but rather from an obſtruction of the glands, whereby a due ſeparation of the ſerum not being made, it falls ſometimes in ſuch prodigious quantities into the belly.

Upon the mention of the embryo ſhewn at the laſt meeting by Dr. TYSON, and ſaid to be of about ſix weeks or two months, Dr. PITT ſaid, that according to the obſervation of Dr. HARVEY in his book *De Generatione* no embryo can be diſcerned in the womb till after two months conception.

A letter of Mr. HEVELIUS, dated at Dantzick, April 17, 1686, N. S. [d], was read, returning thanks to the Society for their preſent of the *Hiſtory of Fiſhes*; and communicating his obſervations of the eclipſe of Jupiter by the moon, March 31, 1686; and juſtifying Mr. OLDENBURG againſt an aſperſion of Mr. HOOKE, who had repreſented, that the former had written to Mr. HEVELIUS more and different things, than he had been directed to do by the Royal Society.

A paper of Dr. PAPIN was read, containing a demonſtration of the velocity, wherewith the air ruſhes into an exhauſted receiver. This he endeavoured to make out by comparing it with the velocity of water and that of other liquors, that are more ponderous, when under the ſame preſſure. The Society approving

[b] Printed at Dublin, 1686 in 4to.
[c] Letter-book, vol. x. p. 331.
[d] Ibid. p. 333.

the

the design ordered the paper to be registered, and published in the *Philosophical Transactions* *.

Nov. 29, at a meeting of the COUNCIL were present

Sir JOHN HOSKYNS vice-president

The Earl of Carbery	Mr. HAYNES
Sir CYRIL WYCHE	Mr. PERRY
Mr. HENSHAW	Mr. ASTON.

It was resolved, that there is a necessity of a new election of a clerk in the place of Mr. HALLEY; and that it be put to the ballot, whether he be continued or not.

It was ordered, that the treasurer pay Mr. HALLEY 13 *l.* 10 *s.* in full for five dozen of *Philosophical Transactions* of a sort from N°. 179 to N°. 183 inclusive, which had been delivered for the Society's use to Mr. HUNT.

That at the next council a committee be appointed to inspect the books of the Society, to see, whether the entries be duly made: and

That Dr. PAPIN's book of experiments about the improvement of the new digester and air-pump be licensed to be printed; which was done by the vice-president.

Nov. 30 being the anniversary day of election, the following eleven members were continued of the council,

The Earl of Carbery	Sir JOHN HOSKYNS
Mr. COLWALL	Mr. PEPYS
Mr. EVELYN	Sir JOSEPH WILLIAMSON
Dr. GALE	Sir CYRIL WYCHE
Mr. HENSHAW	Sir CHRISTOPHER WREN.
Mr. HILL	

The ten chosen into the council were

Dr. AGLIONBY	Mr. LODWICK
Mr. CREED	Sir JOHN LOWTHER
Sir ANTHONY DEAN	Mr. PACKER
Mr. HOOKE	Mr. PITFIELD
Sir EDMUND KING	Mr. WALLER.

The officers elected were

The Earl of Carbery president:
Sir JOHN HOSKYNS, Dr. GALE } secretaries:
Mr. HILL treasurer.

* Register, vol. vi. p. 339. It is printed in the *Philosoph. Transf.* N° 184. p. 193.

Between this and the former anniverſary election the Society loſt a very learned member,

JOHN PEARSON, D. D. Lord Biſhop of Cheſter, who was ſon of Mr. ROBERT PEARSON, rector of Creak and Snoring in Norfolk, by ELIZABETH, one of the daughters of Dr. RICHARD VAUGHAN, ſucceſſively Biſhop of Bangor, Cheſter, and London. He was born at Snoring, February 12, 161$\frac{2}{3}$, and ſent in May, 1623, to Eton ſchool, from whence he was elected to King's-college Cambridge in April, 1632. He took the degree of bachelor of arts in 1635, and that of maſter in 1639, in which year he reſigned his fellowſhip of the college, and lived afterwards a fellow commoner in it. The ſame year he entered into holy orders, and on the 30th of December was collated to the prebend of Netherhaven in the church of Sarum. In June, 1640, he was appointed chaplain to JOHN Lord Finch, lord keeper of the great ſeal of England, by whom in December that year he was preſented to the living of Torrington in Suffolk. Upon the breaking out of the civil wars he became chaplain to the Lord Goring, whom he attended in the army; and afterwards to Sir ROBERT COOK in London. In 1650 he was made miniſter of St. Clements Eaſt-Cheap in London [f]. In 1657 he and Mr. PETER GUNNING, afterwards Biſhop of Ely, had a diſpute with two Roman catholics upon the ſubject of ſchiſm; a partial account of which was publiſhed the year following at Paris [g]. In the year 1659 he publiſhed at London in 4to his *Expoſition of the Creed*, dedicated to his pariſhioners of St. Clements Eaſt-Cheap, to whom the ſubſtance of that excellent work had been preached ſeveral years before in the form of ſermons, and by whom he had been deſired to make them public. This book was afterwards reprinted at London in folio with conſiderable improvements. In the ſame year, 1659, he publiſhed there in 4to *The Golden Remains of the ever-memorable Mr.* JOHN HALES *of Eton College*, to which he prefixed a preface, containing the character of that great man drawn with great elegance and force. Soon after the reſtoration he was preſented by Dr. WILLIAM JUXON then Biſhop of London to the rectory of St. Chriſtopher's in London, to which he was collated on the 17th of Aug. 1660. [h]; and in the beginning of the next month was created, together with ſeveral other eminent men, doctor of divinity at the univerſity of Cambridge in purſuance of the King's letters mandatory [i]. On the 22d of the ſame month he was inſtalled prebendary of Ely [k], and on the 26th archdeacon of Surrey; and before the end of the year was made maſter of Jeſus-college in Cambridge, and ſucceeded Dr. LOVE in the Margaret profeſſorſhip of divinity in that univerſity [l]. March 25, 1665, he was nominated one of the commiſſioners for the review of the liturgy in the conference at the Savoy [m]; and on the 17th of October following was inſtalled in the firſt prebend of the cathedral of Ely [n]. April 14th 1662 he was admitted maſter of Trinity college in Cambridge, in the room of Dr. HENRY

[f] General Dictionary, article of PEARSON (JOHN) Vol. VIII. p. 234.
[g] Ibid note (A).
[h] NEWCOURT Repertorium Eccleſiaſt. *Vol. I.* p. 325.
[i] Biſhop KENNET's regiſter and chronicle, p. 251.
[k] Ibid. p. 880.
[l] Ibid. p. 547.
[m] Ibid. p. 398.
[n] Ibid. p. 547.

FERNE,

FERNE, advanced to the biſhopric of Cheſter [o]; and in Aug. following he reſigned his rectory of St. Chriſtopher's [p], and his prebend of Netherhaven in the church of Saliſbury [q]. February 21, 166$\frac{6}{7}$, he was propoſed candidate of the Royal Society, and being on the 14th of March elected fellow, was admitted April 25th, 1667. In 1672 he publiſhed at Cambridge in 4to, *Vindiciæ Epiſtolarum* S. IGNATII, in anſwer to Monſ. DAILLE'. To which is ſubjoined ISAACI VOSSII *Epiſtolæ duæ adverſus* DAVIDEM BLONDELLUM. Upon the death of Dr. WILKINS, Biſhop of Cheſter, November 19, 1672, Dr. PEARSON was promoted to that ſee, to which he was conſecrated, February 9, 167$\frac{2}{3}$. In 1682 his *Annales* CYPRIANICI, *ſive tredecim Annorum, quibus* S. CYPRIANUS *inter Chriſtianos verſatus eſt, hiſtoria Chronologica*, was publiſhed at Oxford in folio with Biſhop FELL's edition of that father's works. The Biſhop of Cheſter was diſabled from all public ſervice by an ill ſtate of health a conſiderable time before his death, which happened at Cheſter, July 16, 1686. Two years after his poſthumous works were publiſhed by Mr. DODWELL at London in 4to under the following title: *Cl.* JOANNIS PEARSONI, *Ceſtrienſis nuper Epiſcopi, Opera poſthuma: De ſerie primorum Romæ Epiſcoporum Diſſertationes duæ: quibus præfiguntur Annales* PAULINI *& Lectiones in Acta Apoſtolorum. Edenda curavit & auxit* H. DODWELLUS, *cujus acceſſit de eadem ſucceſſione Diſſertatio ſingularis.* Beſides the works abovementioned the Biſhop publiſhed two ſermons, one printed at London, 1661, in 4to, intitled *No Neceſſity for a Reformation*; and the other preached before the King, March 19, 1671, on Eccleſ. xii. 14. and publiſhed by his Majeſty's ſpecial command, London 1671 in 4to.

Dec. 1, The Earl of Carbery preſident in the chair.

His Lordſhip as preſident took the oaths of allegiance and ſupremacy according to the ſtatutes; and appointed SAMUEL PEPYS, Eſq; Sir JOSEPH WILLIAMSON, Sir JOHN HOSKYNS, Sir CYRIL WYCHE, THOMAS HENSHAW, Eſq; and THOMAS GALE, D. D. his vice-preſidents for the year enſuing.

Upon reading the minutes of the laſt meeting, Dr. SLOANE affirmed, that having mixed ſalt of hartſhorn and quick-lime together, and then trying to ſublime the ſalt again, he had found, that none of it would riſe in the form of ſalt, but that it would be all converted into liquor or ſpirit.

He likewiſe obſerved, that he had formerly with ſome others made a muſcular diſſection of a human body at Montpellier; and that to preſerve the body from putrefaction, the bowels being taken out, they infuſed a tincture of myrrh and aloes drawn with ſpirit of wine, and kept it covered with fir-ſhavings in a coffin, whereby it was preſerved three months in the middle of ſummer.

He obſerved alſo, that cedar-duſt is eſteemed the beſt preſervative in this caſe; but that it was not procurable at Montpellier.

[o] KENNET, p. 547. [p] NEWCOURT, *ubi ſupra*. [q] KENNET, p. 744.

Sir JOHN HOSKYNS was of opinion, that all the true mummy is from the embalmed bodies of Egypt; and that the relations, that one ſort is from bodies buried and dried in the ſands, are probably fabulous; at leaſt worth farther inquiry.

Mr. CLUVERUS was deſired to peruſe Mr. WILLIAM MOLYNEUX's *Sciotericum teleſcopicum*, and to report to the Society the contents of it.

A letter of Dr. WALLIS to Mr. HALLEY, dated Oxford, November 25, 1686[r], was read, giving an account of what paſſed in the Society at Oxford. The letter was as follows:

" Our ſecretary, Mr. BAINBRIG, being not yet returned, I ſend you this ac-
" count of what we have been doing. Yours I communicated to our company;
" who were well pleaſed with it. The name of the child, I mentioned in my laſt,
" is DAVID RICHARDSON, ſon of JOHN RICHARDSON, a barber, lately in St.
" Martin's lane London; but now dead. The mother carries the child from
" place to place to ſhew; expecting to be gratified for ſo doing. He hath not
" two thumbs on one hand (as, I gueſs by yours, you did miſtake me) but on
" each hand one (as we have) and five other fingers inſtead of our four, all in
" good proportion (at leaſt if the thumbs be not, as they ſeemed to me, ſome-
" what too little;) and manageable (for ought I diſcerned) as ours are, with
" the advantage of one finger more on each hand: the ſix toes on each foot juſt
" as our five are.

" The experiment I propoſed in my laſt, we find (upon diſcourſe of it here)
" to have been tried amongſt the Florentine experiments, number 12 of project-
" ed bodies; and that the horizontal projection doth but little (if at all) hinder
" the perpendicular deſcent. Somewhat it ſeems to do: and the like we find to
" be in ſwimming and flying.

" Beſide the caſe of Mr. BROWN, we had here (the laſt year) in Mr. HODGES
" (parſon of Wightam) of Baliol-college, who died there of a dropſy, ſeven
" gallons of water taken out of his body: which was then thought very much;
" till that of $15\frac{1}{4}$ gallons taken out of Mr. BROWN. We made preparation for
" obſerving the eclipſe laſt Friday; but the weather was ſuch, that no moon was
" to be ſeen all night. We hope it proved better with you.

" We had a particular account of an obſervation made at Saliſbury in No-
" vember, 1684, by Colonel WINDHAM, and Mr. WARNER, of the altitude
" of quickſilver in a baroſcope, at ſeveral hights between ground to the top of
" the ſpire; and at what proportions it decreaſed.

" Dr. PLOT gave us an account of a ſtrangely great cucumber, meaſured by
" himſelf, this ſummer, Auguſt 27, in the garden of Dr. JACOB (a phyſician
" there) in length 3 feet $10\frac{1}{4}$ inches (which is more than an ell long) and in com-

[r] Letter-book, vol. x. p. 340.

" paſs

" paſs at the greateſt part nine inches; near the ſtalk ſix inches. A giant to " your little man of France. He meaſured it again September 18, when it was " ſomewhat leſs, in length three feet $9\frac{1}{8}$ inches: In compaſs nine inches in the " biggeſt part, and $5\frac{7}{8}$ near the ſtalk: And October 13, much the ſame meaſure. " He takes it to be the cucumis anguinus of botaniſts.

" We had an account of Mr. WELLS here in Holywell, a cook about ſixty-" ſeven years old, who has been troubled with the gout twenty-five years. He " conſtantly cures himſelf by drinking beer or ale, in which muſtard-ſeed is " ſteeped: and the ſame hath been found beneficial to others. Into a gallon of " table beer he puts half a pint of muſtard-ſeed, and lets it ſtand nine or ten " days.

" Dr. PLOT informs, that Sir WILLIAM ROOK near Canterbury, in a de-" plorable condition by a dropſy, was at length adviſed to ſteep four cloves of " garlic in each quart of ale he drank at meals or otherwiſe; and was thereby " reſtored to perfect health in about a month's time.

" Mr. MUSGRAVE informs from a phyſician in the country, that he cured a " rheumatiſm by giving a ſtrong vomit each day for four or five days together.

" He informs of a new fiſhing trade of herrings, begun in Somerſetſhire: the " coming of herrings up the Severn not known before this year; and now in " great quantities.

" A copy of a letter from R. P. vicar of Kildwick in Yorkſhire gives account " of an extraordinary eruption of water in June laſt; whereby the inhabitant of " Kettlewell and Starbotten in Craven in Yorkſhire ſuffered great damage. It " was after a great clap of thunder: the rock on the eaſt ſide of them was ſeen " by divers eye-witneſſes viſibly to open, and water to ſpout up in the air as high " as an ordinary ſteeple: and the current of water thence continued for about an " hour and half violently down the hill, as in one intire body, with a breaſt, as " if it would drown the whole towns. Several houſes were quite demoliſhed, and " not a ſtone left; others gravelled up to the chamber-windows, and great rocks " thrown down from the hill into the valley, and thereby immoveable: and " much more damage of goods, cattle and meadows. Since that firſt flood, there " have been two others, but not ſo great and dangerous. Theſe are the chief, " of what hath occured to us ſince my laſt. I am yours to ſerve you,

" JOHN WALLIS."

Sir JOHN HOSKYNS produced ſome ſmall cubical grains of a ſubſtance reſembling a marcaſite, which were very near true cubes, each ſide about the eighth part of an inch.

Dr. SLOANE remarked, that ſuch cubical grains were found in Yorkſhire, and were a ſort of pyrites.

A letter of JOHN WEICHARD VALVASOR of Carniola to Dr. GALE, dated at Wagenſperg in Carniola, Aug. 29. 1686. N. S. [a] was read, containing a method of caſting braſs ſtatues of an extraordinary thinneſs, which, as was alledged by Mr. HOOKE, was according to the proceſs commonly uſed; the only invention conſiſting in the addition of a third part of biſmuth or zink to his braſs, whereby it would be made to run much better, and by conſequence caſt a thinner ſtatue. This letter was delivered to Dr. AGLIONBY, who was deſired to conſider well of it, and inform himſelf in the practice of our artificers, in order to return an anſwer.

A paper of Dr. PAPIN was read about the application of his digeſter to the baking of bread, as he had contrived it to turn like a ſpit [b]. He produced ſome bread baked after this manner, which ſeemed a little dough-baked, poſſibly for want of time.

Mr. FRANCIS LODWICK was ſworn of the council.

Decemb. 8. Sir JOHN HOSKYNS, Sir CYRIL WYCHE, and Dr. GALE took the uſual oath of vice-preſident of the Royal Society before the preſident and ſeven of the council, as likewiſe the oaths of allegiance and ſupremacy, according to the charter.

The preſident being withdrawn, Sir JOHN HOSKYNS took the chair.

Upon the reading of the minutes it was remarked, that cedar ſaw-duſt was made uſe of for preſerving the bodies of animals brought from the Weſt-Indies.

Sir JOHN HOSKYNS obſerved, that he had heard, that the balm of Gilead, commonly ſold for ſuch, was the ſap or juice of the eaſtern coniferous cedar, or cedar of Libanus.

Dr. GALE related the cure of a dropſy in two perſons, well known to him, by the uſe of muſtard-ſeed in their drink.

Dr. PITT ſaid, that the uſual method of vomiting and purging does not always ſucceed in the cure of rheumatiſms; and that ſometimes, on the contrary, the diſeaſe is more exaſperated thereby.

Dr. ROBINSON ſaid, that there were cubical grains of hæmatites found near Helmeſley in Yorkſhire.

Mr. HOOKE mentioned, that he had ſome ſuch given him by Mr. WINTHROP, brought from New England, and which were true amethyſts, and tranſparent.

Dr. ROBINSON remarked, that upon great rains it is a common thing in the Woulds and in Craven in Yorkſhire, to have great eruptions of water out of the

[a] Letter-book, vol. x. p. 244. A tranſlation of part of it is printed in the *Philoſ. Tranſact.* N°. 186. p. 259.

[b] Regiſter, vol. vi. p. 341.

ſides

ſides of the hills; and that he himſelf had ſeen it ſpout two yards high out of the earth.

Mr. PAGET ſaid, that about five miles S. W. from Kettlewel in Yorkſhire, there is a lake, out of which, as by a jet d'eau, the water ſpouts out below, and becomes the head of the river Aar.

Dr. GALE mentioned, that there had been lately diſcovered a valuable copper-mine in the biſhoprick of Durham, which was granted to the dean of Durham.

Mr. HENSHAW preſented to the Society ſome of the roots of the aſtragalus ſylvaticus, ſaid in the *prodromus Scotiæ illuſtratæ* of Dr. SIBBALD to be uſed in Scotland to prevent hunger and wearineſs. It had a taſte like liquorice, and grew plentifully on Hamſtead-heath.

Mr. AUBREY produced a nautilus caſt in the ſubſtance of the pyrites or vitriol ſtone, being of a braſs colour, found in a chalk-pit.

Mr. CLUVERUS gave in an account of Mr. MOLYNEUX's *Sciotericum teleſcopicum*; which account was read, and ordered to be inſerted in the *Philoſophical Tranſactions* [c].

Mr. MEARES was elected a fellow.

Mr. WILLIAM MOLYNEUX's obſervations made at Dublin of the eclipſe of the moon November 19, 1686 [d] were communicated. The beginning of it was at 9 hours 25′ or 27′ ſomewhat dubious; the end accurately obſerved at 12 hours 4′; the quantity and duration agreeing exactly with the calculus of the ephemerides dedicated to the Royal Society.

Mr. HOOKE read a diſcourſe of his, propoſing ſeveral queries concerning ſhells and the like petrified ſubſtances found deep under ground and on the tops of hills, as nautili, helmet-ſtones [e], and the like; and he produced very elegant figures of thoſe ſubſtances drawn by himſelf.

A letter of Mr. WILLIAM COLE of Briſtol, dated there Decemb. 3 1686 [f], was read relating to the purple fiſh, and accompanying ſeven ſeveral pieces of linnen-cloth ſtained with the purple colour, and ſent up for Monſ. HUET, biſhop of Soiſſons.

A propoſal by way of addreſs to the Society from Monſ. CLAUDE BARDON, profeſſor of the mathematics, was read, deſiring their encouragement to proceed in a deſign of cauſing arithmetical tables to be ingraven on copper for the ready working of multiplication, diviſion, &c.

[c] N° 184. p. 213.
[d] They are printed in the *Philoſoph. Tranſact.* N° 185. p. 236.
[e] See his *Poſthumous works*, p. 281. *& ſeqq.*
[f] Letter-book, vol x. p. 346.

Decemb. 15. Sir JOHN HOSKYNS vice-president in the chair.

Dr. HAVERS subscribed his name, and was admitted fellow.

Mr. HOOKE was of opinion, that the cubical grains lately shewn before the Society derive their figure from the coagulation of particles impregnated with a marine salt.

Upon mention of the eruption of water on the sides of the hills in Yorkshire, signor SAROTTI said, that it was a common thing to have such spouts in the hills of the kingdom of Naples.

Mr. HOOKE on this occasion mentioned the instance of the river Mole in Surrey, which goes under the hills at Darking, and rises again at Leather-head, after the same manner as those springs in Yorkshire, where some extraordinary fall gives them the impetus, wherewith they break out.

Dr. SLOANE read part of a letter written to himself concerning a very impetuous hurricane near Montpellier about the 2d of October past, occasioned, or rather preceded by the collision of two clouds, one coming from the land, the other from the sea; whence without any thunder proceeded a flash of Lightning and a great hail, which was immediately followed by a most violent tempest of wind.

Mr. HOOKE read a farther discourse of his, by way of introduction to a theory of his concerning the petrified shells and such like substances found in the bowels of the earth, and on the tops of hills.

Mr. CLUVERUS presented from the author Mr. VAGETIUS the *Isagoge physiologica* JUNGII, lately published by him.

He produced a book of Monsr. MALLEMONT DE MESSANGE, intitled, *Le grand & fameux probleme de la quadrature du cercle resolu geometriquément par le cercle & la ligne droite*[g]; which book Mr. CLUVERUS said he had examined, and found the paralogisms, which he promised to make out before the Society at their next meeting.

An extract of a letter from Rome to signor SAROTTI, dated Novemb. 16 last[h], was communicated by him to the Society, containing the description of an urn lately discovered in a sepulchre by the late inundation of the Tiber; which urn, upon being opened, was found to exhale a very strong bituminous scent, and to have in it an oily substance contained in an earthen pot, which grew hard upon admission of the outward air. This was by some at Rome supposed to be one of those perpetual lamps mentioned by the antients.

[g] Printed at Paris 1685 in 12. [h] Letter-book, vol. x. p. 348. It is printed in the *Philos. Transf.* N° 185. p. 225.

The latter part of Dr. REISELIUS's letter to Mr. HALLEY of October 8, was read, wherein among other things, he excuſes the not having tried ſufficiently the effects of the Wirtemberg ſyphon, pretended by the inventor to be capable of evacuating water at the top thereof, and to run when above fifty feet high. This letter was ordered to be filed [i], and anſwered.

Dr. PAPIN geve in a paper [k] mentioning, that there had been tried in Venice in ſignor SAROTTI's academy the experiment of a flint and ſteel *in vacuo*, which he ſaid would not ſtrike fire without the air. He now ſhewed the experiment before the Society, and having contrived to thruſt down the trigger of a piſtol in an exhauſted receiver, it was found, that the fire, which followed the fall of the cock, was ſcarce perceptible; whereas when the air was admitted, the ſparks thereof gave a vivid light.

Decemb. 22, the earl of CARBERY preſident in the chair.

Sir WILLIAM PETTY produced a defence of his *Eſſays in political arithmetic concerning the comparative magnitudes, wealth and people of London and Paris*; which defence was read, and he promiſed to lodge it with the Society.

Upon the reading of the minutes, Sir WILLIAM PETTY mentioned an inſtance of an hill in Ireland, out of which in wet weather there were great eruptions of water.

A paper of Dr. PAPIN [l] about ſhooting a ſpherical bullet by exhauſting the air out of the barrel was read, and the experiment ſhewn: but by reaſon of the night, the fall of the bullet could not be ſeen, and therefore the experiment was ordered to be made ſome other time.

The earl of PEMBROKE informed the Society, that he had obſerved the iron plug uſed in Savoy to blow up rocks with gun-powder, to differ conſiderably from that in the repoſitory, the cylinder of the former being ſplit nearly in the diagonal; whereas the latter had only a ſmall additional wedge.

Mr. HOOKE read a continuation of his diſcourſe concerning ſhells, &c. wherein he gave ſeveral material inſtances to prove, that there have been very great changes in the earth's ſurface, as of rows of oiſterſhells found in a cliff in the Alps, ſea-ſand and ſhells at a great depth in St. James's fields, and the like ſhells obſerved by himſelf at a great hight from the ſea in a cliff in the Iſle of Wight.

A letter of Monſ. JUSTEL was read concerning a curious relation of China, then printing in French at Paris; of the preſents and embaſſy ſending by the French king to Siam; and of ſeveral books lately printed, or then in the preſs at Paris.

[i] Letter-book, vol. x. p. 328. [k] Regiſter, vol. vi. p. 342. [l] Ibid. p. 343.

A letter of Dr. WALLIS to Mr. HALLEY, dated at Oxford Decemb. 14, 1686[m], was read, giving his ſentiments concerning the reaſon of the trade winds, and accompanying the minutes of the Philoſophical Society at Oxford of November 30, and December 7. His letter was as follows:

" SIR,

" Your's I received of December 11, with the incloſed minutes of Nov. 24, " and Dec. 1, and the two problems of Mr. NEWTON; all which I have communicated to our Society here.

" The minutes we have ordered to be tranſcribed, and the original ſent you back " as you deſired. And if you deſire Mr. NEWTON's papers to be returned, that ſhall " be done alſo. By theſe papers of Mr. NEWTON, I find he hath conſidered the " meaſure of the air's reſiſtance to bodies moved in it; which is the thing I ſuggeſted in one of my late letters, and thereby ſaves me the labour of doing the " ſame thing over again. For I ſhould have proceeded upon the ſame principle; " that the reſiſtance (cæteris paribus) is proportional to the celerity (becauſe in ſuch " proportion is the quantity of air to be removed in equal times) nor do I know " from what more likely principle to take my meaſures therein. His computation from this principle I have not yet had leiſure to examine; but do preſume, a perſon of his accuracy hath not failed in his computation or reductions " from it. Upon reading that paſſage about the cubical grains of marchaſites, " found in Yorkſhire, it was ſuggeſted, that they are found in many other parts of " England; and divers of them have been here ſhewed to us. They are known " by the name of *ludus Helmontii*; and an account is given of them in Dr. PLOT's " hiſtory of Staffordſhire. Concerning the monſoons and trade-winds; ſo good " account as to matter of fact cannot but be acceptable; and the cauſes thereof " worth inquiring into. Upon diſcourſe thereof (at leaſt to ſome of us) it ſeemed, " 1. That the earth's diurnal motion from eaſt to weſt (whereby the air, if not " fully keeping pace with it, will repreſent an eaſterly wind) is not wholly to be " laid aſide: (as likewiſe that of the water in order to the tide, firſt taken notice " of by GALILEO). For though this alone does not anſwer all the phænomena, " yet it goes a great way: and where this fails, we are to ſeek a ſubſidiary reaſon of ſuch failure. 2. The other reaſon aſſigned, from the air's rarefaction " (by the vertical ſun) whereby it becomes lighter, and thereupon the heavier, " or leſs rarefied air ruſheth in upon it to preſerve the æquilibrium, ſeems to be a " purſuance of the ſame notion with that of Doctor GARDEN, in his letter printed " in the *Philoſophical Tranſactions* (Numb. 175.) who there argues from the ſame " principle. 3. But there is this difficulty in it, that the ſame notion may as well " be urged (and perhaps ſtronger) for a weſt-wind, as for as an eaſt-wind. For " while the rarefied air mounts upwards (as ſmoke and air in a chimney) and " doth perhaps ſpread itſelf (above) over what is heavier and leſs expanded " (which is that on the weſtern not the eaſtern ſide) this weſtern air (rather than " the eaſtern) will (underneath) ruſh into the place of the rarefied air; in like " manner as the air, which feeds the fire in a chimney. What elſe hath occurred " to us of late, you will find in our minutes, which are ordered to be tranſcribed

[m] Letter-book, vol. x. p. 349.

" and ſent with this. You may be pleaſed, with this to preſent my reſpects and " ſervice to the Society; and particularly to the hon. our new preſident, to whom " I wiſh much joy and happineſs in that employment. I am, Sir,

" yours to ſerve you,

" JOHN WALLIS."

Dr. PAPIN ſhewed again the experiment of a flint and ſteel in an exhauſted receiver, and the effect was as at the laſt meeting, viz. that though there was ſome light, yet it was exceedingly faint, and ſeemed only to be from the little quantity of air remaining in the receiver not perfectly exhauſted.

An account was given in by Mr. CLUVERUS of the firſt book of Monſ. MALLEMONT DE MESSANGE concerning the quadrature of the circle, wherein the author, to make the reader duly value his pretended diſcovery, gives a large hiſtory of the ſeveral attempts and miſcarriages of the famous geometers both antient and modern in this ſubject; all whom, he would have it believed, he had out-done; and wondered that others, more able mathematicians than himſelf, ſhould have miſt the diſcovery. Mr. CLUVERUS promiſed againſt the next meeting a demonſtration of the paralogiſm committed by this author in his pretended quadrature.

December 29, the earl of Carbery preſident in the chair.

The minutes of the laſt meeting were read.

Mr. HOOKE propoſed, that it might be tried whether or no the ramenta of ſteel ſtruck off in the experiment of the laſt meeting of the piſtol *in vacuo* be melted and vitrified, as is uſually obſerved *in aere*, as may be ſeen in Mr. HOOKE's *Micrographia*. It was ordered, that Dr. PAPIN prepare this experiment againſt the next meeting.

Mr. HOOKE ſaid, that ſteel-filings being caſt through the flame of a candle are thereby melted or calcined; and that thoſe, which make the moſt vivid ſparks, catch fire and flame ſo as to aſcend thereby: and he ſhewed this to be ſo by experiment.

He mentioned the experiment of driving out all the air in a veſſel by the vapours of ſpirits of wine.

A letter of Monſ. JUSTEL was read concerning a relation of the great extent of the empire of the Ruſſians and a map of their territories, then in Holland.

On this occaſion Mr. HOOKE remarked, that he had been credibly informed, that the tide of flood comes out of the eaſt into a ſecond ſtreight more eaſterly than that of Weiggats; and conſequently, that Nova Zembla is an iſland, and that there is a great ocean to the eaſt thereof inſtead of the imaginary Tartaria magna.

The Earl of Pembroke obſerved, that he had read, that there were four floods and as many ebbs in each twenty four hours about Venice.

Mr. HOOKE read a farther continuation of his diſcourſe about ſhells, wherein he conſidered the ſtructure of the nautilus and cornu Ammonis ſtone, tending to prove, that though it be true, that there is no animal known, reſembling in all points the lineaments of thoſe lately produced by himſelf; yet that it is not a ſufficient argument to evince, that there is not nor ever was any ſuch animal *in rerum naturâ*.

Sir WILLIAM PETTY gave in his two notes about the magnitudes of London and Paris, which were ordered with his leave to be printed in the *Philoſophical Tranſactions* [a].

1685/7. *Jan.* 5, at a meeting of the COUNCIL were preſent

The Earl of Carbery preſident

Sir CYRIL WYCHE	Dr. GALE
Sir JOHN HOSKYNS	Mr. CREED
Sir EDMUND KING	Mr. LODWICK
Mr. PITFIELD	Mr. WALLER
Mr. HILL	Mr. HOOKE.
Mr. HENSHAW	

It was ordered, that Mr. WALLER, Mr. HOOKE, Mr. PITFIELD, and the two ſecretaries, or any two or more of them, be a committee to inſpect the books of the Society, to ſee if Mr. HALLEY had performed his duty in relation to the entries to be made by him, according to an order of council of January 27, 1685/6: and

That Mr. HOOKE bring in againſt the next meeting of the council a propoſal in writing of what he is willing to perform for the Society; and what he expects by way of gratuity from them: which he promiſed to do; and a meeting of the council was ordered to be ſummoned for this day ſennight to conſider of his propoſal.

At a meeting of the SOCIETY on the ſame day, the Earl of Carbery preſident in the chair.

Upon the mention of the contraction of the diſtance between us and the Eaſt-Indies, Sir JOHN HOSKYNS ſuppoſed, that this diſcovery might help to account for the nearneſs of China and Muſcovy. In ſupport of which Mr. HOOKE remarked, that he had good authority, that to the north of the China wall there is a great ocean at no great diſtance, and that the Great Tartary of the maps is wholly fabulous.

He gave an account of the tides and half tides obſervable in the iſle of Wight between it and the main, viz. that the firſt of the flood comes in from the weſt

[a] Vol. xvi. N°. 185. p. 237. for November and December 1686.

about

about the Needles; but that after the flood is well made without, it comes in from the Eaſt, and runs through with a contrary ſtream to that, which it had in the beginning of the flood.

In order to prove, that the incredible bigneſs of the nautilus or cornu Ammonis ſtone is no argument, that there have not been ſuch ſhell-fiſh of that magnitude, Mr. HOOKE produced a quotation out of MANDELSLO's travels, wherein mention is made of an oiſter, the ſhells of which weighed above 400 *lb*; which ſhells were then in the Duke of HOLSTEIN's collection of rarities.

A note of Monſ. JUSTEL was read, giving an account of a ſort of little microſcopes made at Rome by Campani, which were but three inches long, but which he pretended to be better than the biggeſt ever made by him; and that the *animalcula in ſemine canino* are plainly viſible therein.

Mr. HENSHAW preſented to the Society a Venetian balloting box brought from Venice, and a cluſter of twelve pine-cones, ſaid by Dr. SLOANE to be of the *pinus maritima* CASPARI BAUHINI.

A paper of Dr. PAPIN[a] was read concerning an experiment, which he was ready to make, in order to find the quantity of air produced by the firing of gun-powder *in vacuo*. The experiment was made in an exhauſted receiver capable of holding $4\frac{1}{2}$ *lb*. of water with 12 grains weight of gun-powder. Upon firing, the receiver, which was pretty thick, broke as with a blow from without; for the piece was driven inwards, and would not paſs out at the hole.

Mr. HOOKE conceived, that this proceeded from the preſſure of the outward air, which alone was almoſt able to have broken the glaſs, which yet it could not do, till the ſhake given by the blaſt of the powder had given it, viz. the outward air, more force by its recoil. It was ordered, that this experiment ſhould be proſecuted at the next meeting.

Sir WILLIAM PETTY produced three papers of his, being in anſwer to the objections of Monſ. AUZOUT againſt his concluſion, that London is greater than Paris and Roan taken together. He permitted them to be read, and it was ordered, that Monſ. JUSTEL's pleaſure ſhould be known with regard to the printing of an extract of Monſ. AUTHOR's letter with the ſaid anſwers of Sir WILLIAM PETTY.

A chart of the voyage of the French Jeſuits to the Eaſt-Indies, wherein the longitudes of Siam and the adjoining parts were rectified, being produced, it was now ſhewn, that the ſaid correction had been long ſince publiſhed in the *Philoſophical Tranſactions*, particularly in February $168\frac{1}{2}$, and after that in June 1683, where the very ſame rectification is to be found in two little treatiſes by Mr. HALLEY.

[a] Regiſter, vol. vi. p. 343.

Mr.

Mr. HALLEY propoſed, that the beſt way to examine the ratio of the force of the magnet at ſeveral diſtances would be by conſidering the deflections, which the magnet placed at certain intervals would occaſion in the direction of the magnetical needle from the meridian.

This experiment was ordered to be made.

January 12, at a meeting of the COUNCIL were preſent

The Earl of Carbery preſident

Sir JOHN HOSKYNS	Mr. CREED
Mr. HILL	Mr. WALLER
Mr. HENSHAW	Mr. LODWICK
Mr. PITFIELD	Mr. HOOKE.

It was ordered, that Dr. NATHANAEL VINCENT deſiring to withdraw himſelf from the Society, for ſeveral private reaſons of his own, have his bond delivered up.

Mr. HOOKE made a propoſal, that he would produce one or two experiments and a diſcourſe at every meeting, provided his ſalary be made up 100 *l. per ann.*

Hereupon, after much debate, it was concluded, that Mr. HOOKE ſhould have 50 *l.* a year from the Society, and their lawful aſſiſtance and recommendations towards his recovery of the 50 *l.* a year, which Sir JOHN CUTLER ſtood obliged to pay him during his life: and that in conſideration thereof Mr. HOOKE ſhould at every meeting produce one or two new experiments, together with a diſcourſe concerning them in writing, to be left with the ſecretary: and that the ſaid experiments ſhould proceed in a natural method.

It was ordered, that Dr. PAPIN be paid a quarter's ſalary of 7 *l.* 10 *s.* due to him at Chriſtmas laſt.

At a meeting of the SOCIETY on the ſame day, Sir JOHN HOSKYNS vice-preſident in the chair.

The minutes of the laſt meeting were read.

Dr. Cox produced ſeveral maps and diſcourſes concerning the great lakes, which are in North America, which he affirmed to have been ſurveyed by ſome Engliſhman, and found to be a great Mediterranean ſea of above 500 miles round, and that it was highly probable, that the Saſquehannough river comes out of this lake, and that Delawar river comes within 5 or 6 miles of another, which certainly falls into the lake. Upon which Dr. Cox propoſed, that an advantageous ſettlement for the beaver-trade might be made in theſe lakes. He likewiſe promiſed to give an account of the hiſtory of this diſcovery.

Dr. SLARE gave in a farther account of the ſtones ſent from Berne, and ſaid to have

have been voided by ſtool; viz. that he had calcined one of them in a ſtrong reverberatory fire for a very long time, but found, that it would not be burnt to lime. He ſhewed the ſtone, which was burnt and very white, but would not diſſolve upon putting into water, ſo that it ſeemed ſcarce probable, that ſo very compact a ſubſtance ſhould be generated *in corpore humano*.

The time being far ſpent, Mr. HOOKE's lecture and experiment, as alſo thoſe of Dr. PAPIN, were ordered to be referred to the next meeting.

January 19, the preſident in the chair.

Upon reading the minutes of the laſt meeting, and the mention, that the ſtones ſent from Berne would not calcine, nor being burnt ſhew any ſymptom of being magnetical, as thoſe calculi found in the bladder do; Dr. AGLIONBY ſaid, that theſe being voided *per anum* were moſt probably formed by concretions of the gall; and if ſo, they muſt neceſſarily be of a very different texture of parts from the calculi formed by the coalition of urinous ſalts in the bladder and kidneys.

A letter of Dr. WALLIS, dated at Oxford, January 14, $168\frac{6}{7}$ [c] was read, wherein he farther inſiſted on the diurnal motion to be a principal cauſe of the general or trade winds. The letter was as follows:

" SIR,

" Yours of January 11 I did (at our firſt meeting after our adjournment for the " holidays) communicate to our company here; to whom it was very acceptable. " As to that in the beginning of it, concerning the trade-winds and monſoons, " you have certainly done very good ſervice in giving ſo full an account of the " matter of fact: which affords good opportunity for the inquiſitive, to ſeek af- " ter the cauſes thereof: And as to theſe (though I liſt not to contend, but am " willing to allow every one the liberty of their own ſentiments) yet I am ſtill of " opinion, that (whatever other concurrent cauſes there are) that of the earth's " diurnal motion, aſſiſted by that of the annual and menſtrual of the earth and " moon, and the obliquity of both to the diurnal, are not to be excluded from " an influence on the tides and trade-winds, (for reaſons which I have elſewhere " given) nor would I wholly exclude that other notion, which Dr. GARDEN and " you purſue, of the air's rarefaction by the vertical ſun. The objection from the " monſoons ſtrikes (at leaſt) as hard againſt the latter notion, of an eaſtern " blaſt from the rareſaction by the ſun's meridional heat, as againſt the other from " the diurnal motion, and muſt be accounted for from ſome other concurrent " cauſes, and not from either of theſe ſingly. And the other objection, for a " weſtern rather than an eaſtern blaſt from ſuch rarefaction, ſeems yet to me of " weight. For if from a fire-hearth in the middle of a large hall heated air do " move upwards, (as we find it doth;) the heavier air from all parts muſt needs " ruſh in upon it; and on that ſide moſt (if any be) on which it is moſt heavy, " and therefore moſt preſſed: which is, in our preſent caſe, not that on the " eaſtern ſide, (which was heated juſt before and is not yet cold:) but that ra-

[c] Letter-book, vol. xi. p. 57.

" ther

" ther on the weſtern ſide, which is not yet heated: which ſhould rather reſemble " a weſtern than an eaſtern blaſt. What is argued from the ſun's being vertical, " at ſeveral ſeaſons, ſometimes on the ſouthern and ſometimes on the northern " ſide of the æquator, may as well be argued from the obliquity of the earth's " diurnal motion to the annual. But theſe things I repreſent only, leaving it free " for others to judge from thence as they ſhall ſee cauſe. Our minutes for ſome " days will be ſent with this, and ſome other things ſoon after as I can get leiſure. " This at preſent from yours,

" JOHN WALLIS."

This letter was accompanied with the minutes of the Oxford Society, wherein, among other things, mention is made of an extraordinary horn, that grew on the head of one MARY DAVIS in Cheſhire; the circumference of the root of which was three inches $\frac{7}{10}$, and the length laid out ſtrait was $5\frac{1}{2}$ inches: likewiſe an account of very good ale brewed in Staffordſhire with walnut leaves inſtead of hops, which taſted pleaſant and kept very well: that Dr. BAGLEY had lately diſſected an hedge-hog male and female: and that the grand Duke's diamond weighs 138 carats.

It was ordered, that in the next letter to Oxford ſome of the moſt remarkable particulars of the diſſection of the hedge-hog be deſired.

Upon occaſion of the horn growing on the woman's head, Mr. LODWICK ſaid, that he had ſeen a woman in London, who had a horn on her head wreathed like a ram's horn, the wreath of which was about an inch diameter.

A note of Monſ. JUSTEL was read, wherein he mentions, that there had been found in Canada a mountain made up of lead and tin ore, that comes to the day, ſo that there is no need of mining for it.

A ſecond note from him returned to the Society the thanks of Monſ. HUET, Biſhop of Soiſſons; for the ſamples of the Engliſh purple, which they had procured him from Mr. COLE. The Biſhop in his letter to Monſ. JUSTEL mentioned, that he had lately obſerved the crepuſculum or time of twilight to be of a much longer continuance than uſual, and deſired to know, if the ſame had been obſerved here. In anſwer to which Mr. HOOKE ſaid, that he had lately ſeen a glade of light in the morning ſuch as is common in the evening in March and April; but that he had never obſerved the like before at this time of the year.

In the ſame note of Monſ. JUSTEL mention was made of a way uſed by the ſavages in Canada for making ſeveral impreſſions on folds of a very thick bark of birch, by doubling them many times; and then graving them all at once with teeth (ſuppoſe ſome inſtrument made of teeth) and then opening them again, the impreſſion is multipled as often as there are folds.

Upon this occaſion Mr. HOOKE deſcribed a method for dying ſeveral colours on the ſame piece of cloth in pannels or ſquares, which he conceived to be the way uſed by the Indians to ſtain their callicoes.

Mr.

Mr. HOOKE read a farther lecture concerning the changes, that ſeem to have happened in the earth's ſurface, and propoſed three queries, viz, 1. Whether the earth's poles are fixed in the earth, or not? 2. Whether the earth's ſurface be truly ſpherical? and 3. Whether all perpendiculars paſs exactly through the ſame point or centre?

The experiment was tried of the ramenta of ſteel ſtruck off by the fall of the cock of a piſtol *in vacuo*, to ſee, whether they would be melted into ſmall hollow globules, as they are *in aere:* and it was found, that they were only exceedingly thin plates of ſteel, which had not ſuffered the leaſt liquefaction, as could be diſcovered on ſeveral of them.

January 26, the preſident in the chair.

The Earl of Pembroke having been formerly elected this day ſubſcribed his name, and was admitted fellow by the preſident.

The minutes of the laſt meeting were read.

A letter of Dr. WALLIS was read, concerning the reſiſtance of the medium to bodies projected through it, as likewiſe to the fall of bodies: and it was ordered to be printed in one of the next *Philoſophical Tranſactions* [d].

It was ordered, that Mr. NEWTON be conſulted, whether he deſigned to treat of the oppoſition of the medium to bodies moving in it in his treatiſe *De Motu Corporum* then in the preſs.

It was ordered, that the thanks of the Society be returned to Dr. WALLIS for his reſpect to them in dedicating his *Logic* to them, and for the preſent of that book made this day.

Part of Mr. CLUVERUS's animadverſions on the paralogiſm committed by Monſ MALLEMONT DE MESSANGE in his pretented quadrature of the circle [e] was read.

A note of Monſ. JUSTEL was read, deſiring the omiſſion of the name of the perſon, who gave Monſ. AUZOUT an account of the number of houſes in Paris, if the controverſy between Sir WILLIAM PETTY and Monſ. AUZOUT ſhould be printed.

An ephemeris for the year 1687, dedicated to the Society, was preſented to them by Mr. HALLEY.

Mr. HOOKE read a lecture, giving his hypotheſis, how ſhells and ſuch like ſubſtances come to be found deep in the earth, and far above the ſurface of the ſea,

[d] N°. 186. p. 269. for January, February and March 168$\frac{5}{6}$.

[e] Mr. CLUVERUS's animadverſions are printed ibid. N°. 185. p. 245.

as it is at preſent. He ſuppoſed, that the diurnal rotation of the earth by its *vis centrifuga* taking off part of the gravity formed the ſurface of the ſea into a compreſſed ſpheroid; that is, that the diameter by the poles is the ſhorteſt, and thoſe of the equinoctial greateſt, which ſome experiments of the ſhortning the pendulum near the equator ſeem to make out. Then, if it may be ſuppoſed, that the poles and axis are moveable, the equinoctial and greateſt diameter will be likewiſe altered, and by conſequence the parts of the land, towards which the poles approach, will be raiſed, and the ſea retire; but, on the contrary, thoſe parts, from which the poles recede, will ſink, and the water riſe upon them: and that the poles may be altered, he endeavoured to prove by alledging the latitudes of ſeveral places conſiderably different from thoſe aſſigned by PTOLEMY and the old geographers.

Mr. HOUGHTON preſented a flat ſtone very light, found on the ſea-ſide, reſembling a biſcuit-cake petrified.

Dr. PAPIN tried the experiment of firing gun powder *in vacuo*. He put ſix grains of gun-powder into his receiver, which held three pounds of water; and upon firing it was found, that the mercurial gage was riſen five inches, or that the air produced made a preſſure of about a ſixth part of that of the whole atmoſpere. Hence it was concluded, that the product of ſix grains of gun-powder would fill the ſpace of about half a pound of water, that is, much about four grains of air [f].

Feb. 2. Sir JOHN HOSKYNS vice-preſident in the chair.

The minutes of the laſt meeting were read.

Mr. CLUVERUS preſented to the Society the *Acta Eruditorum Lipſienſia* for the months of Auguſt, September, and October of the laſt year, 1686.

Dr. PAPIN preſented his new book, intitled *A Continuation of the new Digeſter of Bones; its Improvements and new Uſes it hath been applied to both at Sea and Land: together with ſome improvements and new Uſes of the Air-pump, tried both in England and Italy.*

Mr. BOYLE made the Society a preſent of ſix copies of Mr. WEIDENFELD'S book, intitled, *Prodromus de Medicinis.*

A note from Monſ. JUSTEL informed the Society, that there was lately printed at Paris the morals of CONFUCIUS, with a genealogy of the Kings of China, with other works of Father COUPLET the Jeſuit, who had ſpent twenty years in that country: and that Signor CIAMPINI deſigned to publiſh the figures of all the Moſaics, that he could procure, and deſired to know, if there were any in England. The ſame note mentioned a diſcourſe concerning microſcopes and machines for managing long tubes, which Monſ. JUSTEL expected ſoon from Rome; and that

[f] Regiſter, vol. vi. p. 345.

Signor CIAMPINI intended to publiſh a ſort of journal of what paſſed in the Roman academy.

Dr. PAPIN gave in a paper concerning the proof of the quantity of air produced by the gun-powder in the laſt day's experiment by help of a ſmall mercurial gage included in the receiver: and he ſhewed by the experiment of the cane of a barometer included in a receiver, and pumped till it came to the level of the ſtagnant mercury, that when as much air was admitted, as raiſed the mercury five inches in the cane, the gage ſtood at the ſame point as in the experiment at the laſt meeting. Whence it was evident, that the concluſion then made was true, viz. that ſix grains of gun-powder yielded four grains of air.

Mr. HOOKE read a farther diſcourſe concerning the probability of the hypotheſis, that the earth is of the figure of a prolate ſpheroid, whoſe ſhorteſt diameter is the axis. He alledged ſeveral inſtances of aſſertions concerning the elliptic figure of the planets, as of the ſun by SCHEINER, of Jupiter by CASSINI, and of Mercury by GALLET. He then propoſed ſeveral experiments proper to examine this hypotheſis, as by the vibrations of a pendulum-clock in places near the poles and near the equator; as alſo by trying, whether a degree of latitude be exactly equal in all parts of the world. Then he proceeded to enquire, whether the axis be fixt in the earth, or not; and among other queries, whether the vaſt ſandy deſerts of Africa and Arabia owe not their original to the ſea? and whether there remain any antique buildings, wherein the true meridian ſhould have been deſigned, ſuch as the Egyptian pyramids, the Athenian temple of the winds, &c.? He concluded with a promiſe to produce at the next meeting a method capable of determining by obſervation the queſtion of the mobility of the axis in a few years. To make it probable he alledged an experiment tried by himſelf, viz. that a ball being turned on its axis, as it ſwims on mercury, would change the axis of the rotation.

It was ordered, that the experiment be tried, whether phoſphorus will catch fire *in vacuo*; if not, that then it be tried, whether it will burn by the help of air produced by the exploſion of gun-powder.

February. 9, at a meeting of the COUNCIL were preſent

The Earl of Carbery preſident,

Sir JOHN HOSKYNS	Mr. WALLER
Sir CYRIL WYCHE	Mr. PITFIELD
Mr. HILL	Mr. LODWICK
Mr. CREED	Mr. HOOKE

Sir JOHN HOSKYNS made a report of the ſtate of the Society's books and papers, upon an inſpection made by the committee, appointed for that purpoſe January 5th; which report was, that they had found the ſaid books and papers in a very good condition; and the entries made according to order.

It was ordered, that a committee of the Society, who will voluntarily meet once a week in Dr. POPE's lodgings, to conſider of experiments and the correſpondents of the Society, ſhall be allowed a fire and candle at the Society's charge: and

That Mr. HOOKE be deſired to write to Amſterdam to a bookſeller of his acquaintance there about the diſpoſal of the *Hiſtory of Fiſhes*; and that he agree for 400 books at 25 *s.* a book, whereof two fifths to be paid in money, the reſt in exchange of ſuch other books, as ſhall be thought requiſite for the Society's library.

Dr. SYLVIUS of Dublin was propoſed a candidate by Sir JOHN HOSKYNS, and was approved.

The preſident ſigned an order for paying the operator half a year's ſalary due January 14th, being 20 *l.*

Upon conſideration of a propoſal made by Mr. HALLEY concerning the aſcertaining of his ſalary, it was concluded, that the council would make it for the laſt year better than 50 *l.*: but that they could not at this time reſolve on the quantum, by reaſon of the abſence of Mr. HILL, the treaſurer, who was now gone.

It was ordered, that Mr. HUNT do lay out the money for erecting a pole in the quadrangle of Greſham-college for the management of a teleſcope, the charge not exceeding thirty ſhillings.

At a meeting of the SOCIETY on the ſame day, the preſident in the chair.

The minutes of the laſt meeting were read.

Dr. SLOANE preſented from the author, Dr. MAGNOL, his *Botanicum Monſpelienſe* lately publiſhed; which Mr. EVELYN undertook to peruſe and give an account of.

A note of Monſ. JUSTEL was read, giving an account of a very odd effect of lightning on the chaſs-windows of the cloſet of the Biſhop of Soiſſons, viz. that the fire had pierced them in ſeveral places with round holes like as if made with piſtol-bullets, the glaſs not being cracked, but the edges of the hole melted and ſmooth: that theſe panes of glaſs, when rubbed, in order to clean them, fell in pieces like the glaſs-drops, which fall to powder as ſoon as any part is broken: and that, notwithſtanding this, the fire had not touched the window ſhutter, which was but two inches behind the glaſs.

A paper of Dr. PAPIN was read concerning an experiment for trying the oppoſition of the air to a body moving in it[s]; wherein he propoſed to find how much the air impeded the vibration of a flat plate ſuſpended like a pendulum, by com-

[s] Regiſter, vol. vi. p. 346.

paring the number of vibrations, wherein the ſaid pendulum would fall from ſwinging an arch of 36 degrees to an arch of ten degrees both *in vacuo* and *in aere*.

THOMAS Earl of Pembroke was unanimouſly choſen of the council of the Society in the room of Mr. PACKER deceaſed, the members having been ſummoned, according as is preſcribed in ſuch caſe by the ſtatute.

Mr. POVEY mentioned, that in Somerſet-houſe in the lower gallery was kept an exceedingly antient ivory chair, ſuppoſed to be Roman, and that it was very intire.

Mr. HOOKE produced a demonſtration of the ſpheroidal figure of the earth, proceeding from the complication of a gravity or deſcent towards the centre (which he ſuppoſed every way equal at the ſame diſtance *à centro*) and a *conatus à centro* or *vis contrifuga*, occaſioned by the diurnal rotation of the earth, which is always in a line perpendicular to the axis, and proportioned to the coſine of the latitude.

He then propoſed a method of finding nicely the true meridian line by means of a long teleſcope, which he explained by ſhewing how to be certain of the direction of ſuch a long teleſcope; and then how to derive the horizontal baſe line from the hypothenuſe given: by which exact obſervation he concluded it poſſible to determine, whether there were any change in the earth's axis more ſurely than by the coarſe obſervations of the antients; and that if any ſuch change be, it might, even in a few years, be by this means diſcovered.

Dr. PAPIN tried the experiment of the vibration of a pendulum *in vacuo* with a flat plain oppoſed to the motion; and it was found, that in 127 double vibrations the pendulum fell from 36° to 10°; and that the ſame pendulum *in aere* came to thoſe terms in ten or twelve vibrations.

Feb. 16, the preſident in the chair.

The earl of PEMBROKE having been elected member of the council in the room of Mr. PACKER, took the uſual oath.

The minutes being read gave occaſion to diſcourſe concerning experiments formerly made about the oppoſition of the air to bodies moving in it: and it was ordered, that the Journal-books be conſulted, to ſee what had been done in that matter.

The Earl of PEMBROKE gave an account of an improvement in the water-level, whereby he could, he ſaid, bring water with more certainty than by thoſe, whoſe ſights are teleſcopical.

A letter of Mr. WILLIAM MOLYNEUX, dated at Dublin Feb. 3, 168⅞, was read, mentioning a diſſertation of his concerning the appearance of the ſun near the

the horizon ſo much bigger than when he is much elevated, though they appear under the ſame angle. He affirms, that he had demonſtrated, that the ſeveral ſolutions of this problem are unſatisfactory, and that he was willing to ſend a copy of this paper to be ſubmitted to the Society's cenſure.

The ſame letter mentioned a very extraordinary excreſcence growing in the brow of a girl in Ireland, reſembling a cow's teat, occaſioned by her mother, when big of her, being thrown down by a cow, as ſhe milked it, and hit by the cow's teat on the ſame place, where this excreſcence grew on the child [a].

The Earl of PEMBROKE related, that he had read in the *Recherche de la Verité* [b] the ſtory of a child, whoſe mother having ſeen a man broke on the wheel, when big, was delivered of it, having as it were, a joint in all thoſe places, where the malefactor had his limbs broken.

A letter of Monſ. WEICHARD VALVASOR from Carniola was read, promiſing to ſend the Society an account of what is obſervable in the lake of Zirknitz; and incloſing a map of Croatia accurately made by him, which was ordered to be procured to be engraven here.

Dr. PAPIN made the experiment of phoſphorus *in vacuo*, to ſee, whether it would catch fire; and it was found, that when it grew warm, it became luminous, but did not fire gun-powder, that was upon it: but the air being admitted, it ſoon fired the gun-powder. It was ordered, that this experiment be repeated with a thinner plate; and that the experiment of the piſtol *in vacuo* be tried, after that ſome air had been produced in it by the exploſion of gun-powder, to ſee, if that nitrous medium be a fit pabulum for air.

There was read the relation of a new comet ſeen in September laſt in the ſign Virgo, obſerved by Mr. KIRCH at Leipſic out of the *Acta Eruditorum* for Nov. 1686. It was direct about the 10th degree of Virgo, with about nine degrees north latitude.

Feb. 23, the preſident in the chair.

The minutes of the laſt meeting were read.

Mr. HALLEY read a paper of his concerning an experiment for finding the comparative force of a loadſtone at ſeveral diſtances; which he conceived might be beſt obtained by obſerving the direction of an untouched needle in reſpect of two loadſtones, whereof one to be always at the ſame diſtance, and the other to be removed nearer or farther at pleaſure.

Dr. PAPIN gave in a paper about phoſphorus *in vacuo*, and tried the experiment thereof; the ſucceſs of which was, that the phoſphorus in the air ſoon fired,

[a] Regiſter, vol. vi. p. 351. *Philoſ. Tranſact.* N°. 118. p. 334. for July and Auguſt 1687.
[b] By Father MALLEBRANCHE.

but

but *in vacuo* it only ſparkled, and ſent forth a whitiſh vapour, which afterwards turned blackiſh This vapour, as ſoon as the air was admitted, took fire, and went off in a flaſh.

Mr. HOOKE ſhewed his manner of diſcovering the true meridian, by adapting a teleſcope ſo, as the direction of the ſight therein ſhould exactly anſwer to a line on the outſide of the tube. Then directing this teleſcope towards a ſmall teleſcopic conſtellation, called by him the Engliſh roſe (which, he ſaid, he had diſcovered juſt about the preſent pole-point, and wherein he formerly had marked the very point) and then letting fall two perpendiculars from the ſide of the tube, he concluded, that the true meridian would be moſt exactly deſigned; this method having the advantage of being to be put in practice at all times of the night, when clear, and theſe ſmall ſtars to be ſeen with a two feet glaſs.

March 2, the preſident in the chair.

Mr. JOHN HARWOOD having ſigned the uſual bond, and ſubſcribed his name, was admitted a fellow.

Mr. CLAVEL, bookſeller, made a propoſal to the Society, deſiring, that they would encourage the printing of Mr. BAKER's treatiſes. The Society promiſed, that ſeveral of their members would take the book, when printed, at $1\frac{1}{2}d.$ a ſheet, and as much each cut, to be printed in the ſame volume and character as the former book, intitled, *Clavis parabolica*, and in one language only.

It was ordered, that the manner of finding the meridian by help of the ſmall teleſcopical ſtars about the pole point be tried at night after the next meeting.

A letter of Mr. NEWTON was read, mentioning his having ſent up the ſecond book of his mathematical philoſophy.

An account of an experiment made by Mr. HALLEY for finding the proportion of the decreaſe of the magnetical virtue was read: and it was ordered, that that argument be proſecuted, and the reſult publiſhed in the *Philoſophical Tranſactions*.

A paper of Dr. PAPIN was read concerning the quantity of air produced *in vacuo* by the exploſion of gun-powder; and propoſing the experiment of a jet d'eau *in vacuo*, to ſee how much the water therein would riſe higher than *in aere*; or what is the oppoſition of the air to water [b].

March 9, Sir CYRIL WYCHE, vice-preſident in the chair.

The experiment of finding the meridian line by the means of the teleſcopical ſtars very near the pole was by reaſon of the cloudy weather deferred till the next meeeing.

[b] Regiſter, vol. vi. p. 347.

Mr.

Mr. EVELYN returned the *Botanicum Monſpelienſe* of Dr. MAGNOL, which had been recommended to his peruſal.

It was ordered, that RAUWOLF's travels having been lent to Dr. DANIEL COX out of the Societ'ys library above two years ſhould be demanded of him.

A letter of Dr. WALLIS to Mr. HALLEY, dated at Oxford March 4, 168$\frac{5}{7}$, was read, containing a farther illuſtration of his calculus of the oppoſition of the air to projects; together with ſome reflexions on Mr. HOOKE's hypotheſis of the mutability of the poles of the earth [c].

On this occaſion, there was read a paragraph of Mr. NEWTON's mathematical philoſophy [d] concerning the direction and poſition of the axis of a globe turning about itſelf, and ſhewing, that by the addition of ſome new matter on one ſide of a globe ſo turning, it ſhall make the axis of the globe change its poſition, and revolve about the point of the ſurface, where the new matter is added. It was thought, that the ſame tranſlation of the axis might be occaſioned in the globe of the earth by the blowing up of mountains by ſubterraneous fire.

Dr. SYLVIUS of Dublin having been formerly propoſed and approved, was choſen a fellow.

Mr. POVEY preſented to the Society a tiſſue of feathers in manner of a mantle and the pizzle of a ſea-tortoiſe, ſaid by LIGON in his *Hiſtory of Barbadoes*, p. 118. to be of very great virtue in the cure of the ſtone.

Dr. SLOANE preſented a vegetable ſubſtance growing in the ſea, called by the Iriſh *Duleſk*, but by him *Fucus membranaceus*. It was reputed to be very good for the ſcurvy, and for that purpoſe uſually chewed by the Iriſh.

Mr. HOOKE read a lecture concerning the figure of the atmoſphere, which he conceived to be of a ſhape much more oval than the water; both becauſe gravity is weaker under the equator than under the poles, whereby the air becomes more expanded there than here; as likewiſe upon the account of heat and cold, the ſaid difference is ſtill more conſiderable. From the proſecution of this notion he promiſed to explain the cauſes of ſeveral phænomena ſeeming of great difficulty, particularly thoſe of the trade-winds.

Dr. PAPIN gave in a paper, ſhewing, that upon trial of the experiment of a jet d'eau *in vacuo*, the water in the jet had, contrary to his expectation, riſen leſs high *in vacuo* than *in aere* [e]. He was prepared to ſhew the experiment, but the time being ſpent, it was deferred to the next meeting.

March 16, there was no meeting, becauſe neither the preſident nor any of the vice-preſidents were preſent.

[c] Regiſter, vol. vi. p. 53. [d] Propoſ. 66 Cor. ult. [e] Regiſter, vol. vi. p. 348.

March

March 23. Sir CYRIL WYCHE vice-preſident in the chair.

Upon reading the minutes of the laſt meeting, it was the opinion of the members now preſent, that the protruſion of mountains by ſubterraneous fire or otherwiſe may occaſion ſome alteration of the poles of the earth, as well as the acceſſion of new matter.

An extract of a letter of Monſ. HUET, Biſhop of Soiſſons, concerning purple was read, wherein he acknowledged the purple diſcovered by Mr. COLE to be a ſort of the true purpura of the antients, and to have all the marks thereof.

Dr. AGLIONBY produced a letter, dated at Tholouſe, Dec. 4, 1686, and written by Monſ. VEAY, phyſician there, to Monſ. DE ST. USSANS [a], concerning a very uncommon hermaphrodite, who was in the habit of the body wholly female, but had a penis of a very conſiderable magnitude, the common paſſage of urine, ſemen, and the menſtrua.

Dr. PAPIN produced the deſcription of an engine for applying the weight or preſſure of the air for preſſing cyder or the like [b].

Mr. HOOKE produced a book intitled *New England's Rarities*, printed at London, 1672, in 8vo. In this, p. 37, mention is made of a ſcarlet muſcle in that country at a place called Paſchataway about fifty leagues eaſt from Boſton, where in a cove called Bakers-Cove is a ſort of muſcle with a purple vein, uſed in that place to mark ſhirts, handkerchiefs, and other linnen.

There were read out of the *Nouvelles de la Republique des Lettres* for Dec. 1686, the objections of Monſ. NUIS againſt Dr. PAPIN's engine for raiſing water, grounded on the unequal lengths of the pipes, whereby the water ſhould riſe faſter in the one than in the other; and ſecondly from the great quantity of air, that muſt be rarefied to raiſe water to a conſiderable hight, eſpecially if it lie upon a great inclination.

Dr. PAPIN's anſwers to theſe objections [c] were read, wherein he endeavoured to obviate thoſe difficulties, by ſhewing how to avoid the former: and as to the latter, he computed what force and pipes are neceſſary to make the rarefaction requiſite to carry water to the diſtance of 12000 feet; though he remarked, that he propoſed ſo great a diſtance with ſome diffidence, uſing the word *perhaps*.

The Society adjourned their meeting to Wedneſday, April 6th.

1687. *April* 6, Dr. GALE vice-preſident in the chair.

After the minutes of the laſt meeting were read, the third book of Mr. NEWTON's treatiſe *De Syſtemate Mundi* was produced and preſented to the Society. It

[a] Letter-book, vol. xi. p. 62. It is printed in the *Philoſ. Tranſact.* N°. 186. p. 282.
[b] Regiſter, vol. vii. p. 1. [c] Ibid. vol. vi. p. 348.

contained the whole ſyſtem of celeſtial motions, as well of the ſecondary as primary planets, with the theory of comets; which he illuſtrates by the example of the great comet of 168$\frac{9}{10}$, proving that, which appeared in the morning in the month of Nov. preceding, to have been the ſame comet, that was obſerved in Dec. and Jan. in the evening.

Upon the mention of ſhell-fiſh yielding a purple juice, Dr. ROBINSON ſaid, that Dr. LISTER had diſcovered ſeveral ſorts of land-ſnails having a like tinging juice.

Dr. GALE reported, that he had lately received a letter of thanks from the authors of the *Acta Eruditorum Lipſienſia* for the *Hiſtory of Fiſhes* ſent them as a preſent from the Society.

It was ordered, that Mr. HUNT provide ſome oiſters, to ſee, whether in a microſcope there could be found any ſuch animalcula, as are reported to be in the liquor of oiſters from a letter of Mr. LEEWENHOECK printed in the *Bibliotheque Univerſale.*

A letter of Mr. LEEWENHOECK, dated at Delft, April 4, 1687, N. S. concerning the ſtructure of the teeth, was produced, and ordered to be tranſlated againſt the next meeting.

A large diſcourſe of Mr. WILLIAM MOLYNEUX was read, concerning the apparent magnitude of the ſun and moon[a], which ſeem much bigger than is uſual, when they are near the horizon. In it the author deſigned to ſhew the abſurdity of the ſeveral attempts to account for this odd phænomenon, and deſired the opinion of the Society thereupon. It was ordered to try, whether it be really true, that the angle of the ſun's diameter, when riſing, is not greater than the ſame diameter, when the ſun is conſiderably high.

Dr. PAPIN promiſed to bring in at the next meeting a model of his cyder-preſs, and produced ſome green-peaſe preſerved *in vacuo* ever ſince the laſt ſpring[b]. They had contracted ſomething of a rancid taſte, but were otherwiſe well preſerved.

Mr. HOOKE ſhewed a method of finding the latitude of places by help of a planiſphere of the fixt ſtars, drawn after the gnomonic projection. It was by finding two ſtars in the ſame azimuth, and two others in ſome other azimuth about ninety degrees from the former, at the ſame inſtant of time. Then drawing lines on the planiſphere through each pair of thoſe ſtars reſpectively, the common interſection of thoſe lines will ſhew the latitude of the place by the declination of the point of interſection on the planiſphere. He promiſed to ſhew at the next meeting how this method might be made more general by ſolving this problem: two ſtars come on a certain azimuth, and after a given ſpace of time two other

[a] Regiſter, vol. vii. p. 54. It is printed in the *Philoſoph. Tranſact.* N° 187. p. 314.
[b] Ibid. p. 3.

ſtars

ſtars come on ſome other azimuth: the latitude of the place of obſervation is required.

April 13. Sir JOHN HOSKYNS vice-preſident in the chair.

There was produced a deputation under the hand of the preſident conſtituting the Earl of Pembroke vice-preſident of the Society.

After the reading of the minutes Mr. HOOKE ſhewed a conſtruction of the problem of finding the latitude of a place by the help of two azimuths of two ſtars and the interval of time between them; which being too intricate to be underſtood upon reading, he was deſired to give it in at the next meeting in writing.

There were produced ſome grains reſembling wheat ſent to the Society from Mr. BOYLE. They were ſaid to be fallen in rain in Wiltſhire, and taken by the vulgar for wheat. They were bitter, and on the out-ſide covered with a looſe huſk or ſkin, that was intire. The inſide ſeemed made up of very ſmall grains. Mr. WALLER undertook to examine them microſcopically, and make a report thereof.

Mr. HOOKE remarked, that formerly ſuch grains ſeeming to have fallen in rain had been inquired into, and found to be no other than ivy berries: and ſuch he ſuppoſed theſe to be.

Part of Mr. LEEWENHOECK's letter of April 4, N. S. was read concerning the ſtructure of the teeth, which he found from microſcopical obſervations in all animals to be made up of bony veſſels and pipes, which all take their riſe from the inſide or cavity of the teeth; and that all theſe veſſels have their particular blood-veſſels, that feed them, and convey nouriſhment to them. And the obſtruction of theſe bony pipes he conceived to be the cauſe of the rotting of the teeth and the exceedingly acute pain of the tooth-ach. The reſt of the letter was ordered to be tranſlated.

It was hereupon ſuggeſted, that the inoſculation of the veins into the arteries might beſt be diſcerned in the veſſels, that enter the bones; for that thoſe of the fleſh, when they become very ſmall, are wholly loſt in the parenchyma.

A paper of Dr. PAPIN[c] was read, wherein he concluded upon experiment, that the air produced *in vacuo* by the firing of gun-powder will not ſuffice to maintain fire; for that in a receiver, wherein he had fired three grains of powder by the ſun, which yielded about $\frac{1}{11}$ of as much air, as would have filled the receiver, he found, that in a very dark room no ſparks of fire were produced upon the fall of the trigger of a piſtol.

He produced the model of his cyder-preſs, which was contrived to apply the

[c] Regiſter, vol. vii. p. 4.

weight of the atmoſphere to a preſs; and the uſe thereof was ſhewn to the ſatisfaction of the Society.

There was given in a printed paper in Italian, publiſhed by the *Academia phiſico-mathematica di Roma*, concerning ſome improvements and contrivances for microſcopes and teleſcopes. It was ordered to be read at the next meeting.

April 20. Sir JOHN HOSKYNS vice-preſident in the chair.

Upon reading the minutes of the laſt meeting, Mr. HOOKE intimated a method, whereby he could more eaſily find the latitude of a place by obſervation of two azimuths of twice two ſtars and the interval of time between, which he ſhewed to be general as well in the ſtereographic as the gnomonic projection. It conſiſted in changing the right aſcenſions of one pair of the ſtars as much as the heavens move in the time between the two obſervations, and then proceeding as if the two azimuths had been obſerved at the ſame moment of time.

Mr. AUBREY produced ſome ſeeds or grains like wheat, ſaid to have fallen in rain in Wiltſhire at a place called Chalk. They differed from thoſe produced at the laſt meeting, being ſomewhat bigger and reddiſh, and their taſte not ſo bitter.

Mr. COLE of Briſtol preſented to the Society ſeveral fair ſamples of his purple on linnen.

He ſent likewiſe an account of the ſuppoſed wheat ſaid to have been rained in Wiltſhire, which, he obſerved, he had by ſeveral trials found to be no other than ivy-berries[d]; agreeing herein with what had been concluded at the laſt meeting.

A paper from Monſ. JUSTEL was read concerning the inſcription lately found at Rome, and publiſhed in N°. 183 of the *Philoſophical Tranſactions*. It came from Monſ. AUZOUT, and was chiefly his remarks upon Dr. VOSSIUS's interpretation of that inſcription, from which he diſſented in many particulars.

Mr. HOOKE ſhewed a reflecting teleſcope made to take in ſeveral degrees. This he propoſed as a very proper inſtrument to diſcover the true pole point among the teleſcopical fixt ſtars.

Dr. PAPIN produced ſome gooſeberries, which he had preſerved for a year *in vacuo* with a ſmall quantity of ſugar. They had been ſcalded ſoon after the air had been pumped out of the veſſel.

There was introduced to this meeting by Dr. CLENCH a Lancaſhire gentleman, THOMAS BROTHERTON, Eſq; who preſented a branch of Scots fir or pine, which he had cauſed to be barked in the middle quite round; and the effect was, that in a

[d] It is publiſhed in the *Philoſ. Tranſ.* N° 186. p. 281.]

year's

year's time the wood above the place, where the bark was taken off, was grown exceedingly, above twice what could have been expected, if it had not been barked; but that the under-parts were not grown in the leaſt. Hence it was evident, that the ſap riſes in the inner parts of the wood, and returns by the circumference and the veſſels of the bark, where likewiſe the accretion of the new wood is made. Mr. BROTHERTON affirmed, that by an artifice drawn from this and the like experiments he could increaſe the growth of a tree beyond any ſkill yet known; which method, he conceived, might be of great uſe in the propagation of fruit-trees.

Sir JOHN HOSKYNS gave his opinion, that the leaves of trees ſerve to imbibe the air, and may in ſome ſenſe be ſaid to be the lungs of trees.

April 27. Sir JOHN HOSKYNS vice-preſident in the chair.

Mr. HOUGHTON preſented ſome very large acorn cups, brought out of Syria, and called by the Italians *valanie*. They were ſaid to be uſed in Venice, both acorns and cups, by the diers to die black.

He preſented likewiſe a monſtrous chicken hatched with four legs at Godalmin in Surrey.

Mr. HOOKE remarked, that he had ſeen ſuch a large ſort of acorns, brought out of Barbary near Tangier.

Upon reading the minutes of the laſt meeting, Mr. HALLEY related, that he had ſeen at Edmonton in Mr. HUXLEY's orchard a codling-tree barked all round the trunk for above ſix inches ſpace, which yet lived, and had recovered a new bark, that on one ſide joined the old, and began to approach it all round.

The latter part of Mr. LEEWENHOECK's letter of the 4th of April was read, wherein he farther proſecuted the inquiry into the make of the teeth of ſeveral animals.

Sir JOHN HOSKYNS propoſed, that it might be duly examined, what becomes of the ſwallows, and in what ſtate they are during the winter. In anſwer to which Mr. HENSHAW affirmed, that the chancellor of Denmark told him, as an undoubted truth, that in Iceland there had been taken out of the ice ſwallows, which being afterwards brought into a warm ſtove recovered and flew about the room.

A paper of Dr. HAVERS was read, wherein he gave an account of experiment, which he had made, by injecting a quantity of milk and water tinged with indigo into the inteſtinum rectum of a dog, to try, whether it would paſs the valve at the termination of the ileon:

And the ſucceſs was, that it had paſſed near a yard beyond the ſaid valve; from which he concluded, that copious clyſters may in many caſes be very uſefully

uſefully applied, as well for correction of the maſs of blood, as in colic and iliac paſſions.

It was ordered, that it be inquired of Mr. LEEWENHOECK, whether he could diſcover any animalcule in the cicatricula of an egg; and that he be deſired to inform the Society about what time of the year he made his obſervations, of the liquor of oiſters being full of animals.

Mr. HOOKE ſhewed again the ſcheme of the conſtruction of the problem of finding the latitude by azimuths of twice two ſtars.

Dr. PAPIN gave in a paper concerning an experiment, which he had made of diſtillation *in vacuo*[c]; and ſhewed ſome water of limon-peels ſo diſtilled. The ſcent thereof was found to be very ſtrong and good, but the water was nearly inſipid.

May 4. Dr. GALE vice-preſident in the chair.

Upon reading in the minutes of the laſt meeting the account of the fir-branch given by Mr. Brotherton, Dr. ROBINSON remarked, that the Straſburg turpentine iſſued from the picea, the Marſeilles turpentine from the pinus maritima, that of Venice from the larix, and that of Scio from the terebinthus.

Mr. HENSHAW obſerved, that he had an account like the former concerning ſwallows from our watermen, viz. that they have found them in the river Thames; and that towards the end of the year they aſſemble in great numbers on the little iſlands of the river, and then ſubmerge themſelves in the water.

Dr. GALE ſaid, that mackerel are blind at their firſt coming, and have a film over their eyes; but that in the heat of the ſummer they ſee, and may be taken with a hook, whereas at firſt they are only to be caught with nets.

Part of a letter of Mr. LEEWENHOECK of May 9, 1687, N. S. was read, containing ſome microſcopical obſervations on the ſtructure or conſtituent parts of the mealy pabulum of plants, included together with the embryo plants in the huſk of the ſeed. This he had found in the kernel of a medlar-ſtone to conſiſt of nothing elſe but conglomerated globules. The reſt of this letter was ordered to be tranſlated.

Dr. PITT ſaid, that having taken the yolk of an egg before it was covered with the white, he had frequently ſeen the cicatricula therein.

A paper was read, communicated by Dr. GALE, and ſaid by him to have been copied by Mr. HOLLIAR the chirurgeon from the original of Dr. HARVEY, containing ſeveral anatomical remarks made by him of the phænomena proving the cir-

[c] Regiſter, vol. vii. p. 5.

culation

culation of the blood, and others hinting the uſe of the viſcera. This paper was ordered to be filed up and preſerved [f].

" 1. All the blood in the body paſſeth twice within one hour through the heart, " and through the lungs: through the heart to receive vivacity, and new ſpi- " rits; through the lungs to receive a temperament of heat.

" 2. The panting of the heart is but the pumping about of the blood, in the " expanſion receiving, and in the contraction ſending it out; and it receives ſo " much at every expanſion, that conſidering the great proportion, and the " many beatings of the heart in half an hour, it muſt of neceſſity come round " about.

" 3. All the blood comes to the heart by the veins, and is ſent from it to the " arteries; for there are many little valvulæ in every vein, which open to the " heart, but none from it, which is a demonſtration to the ſenſe of this poſition.

" 4. The paſſing of the blood through the artery upon the contraction of " the heart is the cauſe of the pulſe, together with the ſpirits, that come with it.

" 5. The veins in the body have ſeveral names, yet have they a general con- " nexion, as if they were truly but one; for blow the umbilical vein of a dead " child born, and all the veins in the body will preſently ſwell, and be filled " with wind.

" 6. Every artery runs at laſt into a vein, and ſo ſends back the blood into the " heart.

" 7. The reaſon we find little or no blood in the arteries after men's death, " is becauſe they have no valvulæ to retain it, and ſo it ſlides through in the " veins.

" 8. The reaſon our bladders hold wind after our death, which let in water " before, is, becauſe thoſe various meanders, like the top of a young vein, that " run between the two membranes are ſhut up, and contracted by death.

" 9. The kidney is full of little teats, by which the water drops into the ureters, " and when the ſtone begins to increaſe, then thoſe teats begin to excoriate, " and being very ſenſible parts, are the chief cauſe of the pain in the body of the " kidney.

10. " It was a cuſtom at their antient matches of drinking, to take every one " an egg in his hand, and not to ſtir, untill they could hatch their eggs in their " hands by the extraordinary heat.

" 11. The liver doth not give tincture unto the blood, but rather blood diſ- " colours the liver, for we find it blood in the meſeraic veins before it comes to " the liver. And I have ſeen perfect blood in an egg, before there hath been " any liver.

" 12. The liver and ſpleen do not differ in ſubſtance; only the great quantity " of blood in the ſpleen, and more corrupt blood, makes it to look ſomewhat " bluer.

" 13. As the firſt concoction comes to the liver, ſo what is left of that con- " coction in the ſtomach, as yet crude, and what hath paſſed beyond the firſt con- " coction into the upper part of the gut, is laboured by the ſpleen, and by it pre- " pared for the liver.

[f] Regiſter, vol. vii. p. 88.

" 14. I have ſeen a gooſe, that hath had the cœcum almoſt full of chylus, and " yet beyond all that chylus nothing but excrement; which how ſhe can eject with- " out defiling the chylus is to me a miracle.

" 15. The pancreas or ſweet-bread is as a ſoft pillow to the veins and ar- " teries, and keeps them from twiſting, and intorting one about another.

" 16. All arteries are ſtronger than veins, and every artery hath its greateſt " ſtrength nigh the heart, becauſe there it ſuffers the force and impulſion of the " heart, in the emiſſion from the blood, in a great remiſſion from the heart. An " artery cannot be diſtinguiſhed from a vein, but by the valvulæ.

" 17. The heart, that hangs in its lunula almoſt juſt in the midſt of the body, " hath two veſſels. One receives the blood from the veins, and ſends it to the " lungs; the other receives it from the lungs, and ſends it to the arteries.

" 18. In fears and ſorrow, phyſic; becauſe the mind works ſtronger upon the " body, than the phyſic.

" 19. The diaphragma is that, which cauſeth the hiccough, vomitings, ſter- " nutations, and ſneezings; laughter is but a convulſion.

" 20. The diaphragma is ſo exceeding ſenſible, and of ſo different a ſenſe from " the reſt, that I am almoſt induced to think it the organ of the ſixth ſenſe.

" 21. The ſame muſcles, that ſerve for expelling excrements, are alſo cauſes " of parturition, and ſending out the fœtus.

" 22. Cut a vein, and the blood will run out; cut an artery, and it will ſpurt " out; which is another demonſtration, that it flows from the impulſion of " the heart.

" 23. The cauſe of ſleep is this, that when the ſoporiferous veins are full, and " grow heavy, they fall upon the arteries of the ſenſes, and ſo by little and little " ſtop up their paſſage, and at laſt hinder their operation; and as the ſoporiferous " begins to riſe, ſo men begin to wake.

" 24. The brain and the marrow are the ſame ſubſtance, and one receives nu- " triment from the other.

" 25. Children's kidneys are like thoſe of veal, full of little rundles, and they " grow into a compact intire ſubſtance afterwards.

" 26. Blood comes originally from the heart; firſt becauſe there is no life with- " out blood, and the heart lives firſt; ſecondly becauſe all the veins are greater, " nigher the heart, than the liver.

" 27. Many men die backward, for wind enters at the fundament, and fills the " guts; the guts beginning to ſwell blow up the liver and the heart; there the " lungs, and ſo the party is ſuffocated. Or cut the navel, that by many ligaments " holds down theſe parts, and the man is preſently ſtrangled.

" 28. All the fibræ have a natural contraction in themſelves; for take one of " them in a party dead; and ſtretch it in your hand, and it will contract of itſelf.

" 29. The preſent information and intelligence from our firſt part to another, " is very admirable; for when one makes a blow at my hand, my eye is the ſen- " tinel, and firſt diſcovers it, and that informs my common ſenſe my reaſon, " my reaſon my will, my will the ſpirits, the ſpirits the arteries, theſe my muſ- " cles, thoſe my hand to ariſe to my general defence, and all this almoſt in an " inſtant.

" 30. The

" 30. The brain is divided juſt in the middle with a membrane, which they call " ſuth: no part of the body is ſo full of veins, as the brain.

" 31. The membranes about the brain both dura and pia are called matres, " becauſe all other membranes in the body are derived from them.

" 32. The omentum or caul is to keep the guts in due order, when we ride, " or ſtir, leſt they ſhould twiſt, or knit, and ſo there could be no paſſage for the " excrement, which would be preſent death.

" 33. I have ſeen a man's ſpleen on the right ſide removed with the hand, with " much art and labour, in his proper place.

" 34. No creatures in proportion have ſo great a ſpleen and brain, as a " man."

Mr. HALLEY gave an account, that he, together with Mr. HOOKE, had obſerved in Greſham-college the ſolar eclipſe on the Sunday preceding, May 1, viz. that it was notably begun at 1 hour $17\frac{1}{2}$ min. p. m. and that the juſt end was at 2 hours 3 min. that the greateſt chord of the eclipſed part of the ſun was but $9\frac{1}{2}$ min. or about 36 deg. of the ſun's limb; and conſequently the greateſt eclipſe was juſt $1\frac{1}{2}$ min. in the ſun's diameter [g].

A paper of Dr. PAPIN [h] was read, giving an account of an experiment, which he had made to try, whether the ingredients of gun-powder might be found after exploſion *in vacuo*. Trial being made before the Society, it was found, that the parts were ſo diſperſed by the blaſt, that nothing could be concluded.

May 11, Sir JOHN HOSKYNS vice-preſident in the chair.

Upon reading the minutes of the laſt meeting, Mr. HENSHAW remarked, that Dr. HARVEY had conſidered the ſtate of ſwallows in the winter, and had diſſected ſome of them, which had been found under water, and could not obſerve, that there was either warmth or motion in them.

It was ordered, that it be inquired from Sweden and the Sound, whether there be no fluid blood to be found in thoſe frozen ſwallows, which are ſaid to revive there upon being brought into a warm ſtove.

Mr. CHETWYND of Ingſtree in Staffordſhire being preſent obſerved, that during the time, that the ſwallows are laid up for the winter, they moult, and return in the ſpring with all new feathers.

A note of Monſ. JUSTEL was read, giving an account of a glaſs-houſe in Paris, where they make a ſubſtance reſembling excellent China-ware; and that there was a certain perſon well-ſkilled in plants ſent over to the Antilles by the French King's order, to collect and ſend to France the plants and other rarities of thoſe iſlands.

[g] *Philoſoph. Tranſact.* N°. 189. p. 370. for September and October 1687.
[h] Regiſter, vol. vii. p. 6.

This note incloſed the *Nouvelles de la Republique des Lettres* for the months of February and March 1687.

Sir ROBERT GOURDON produced a certificate under the hands of the commiſſioners of the navy of the great effect of certain pumps of his contrivance:

That his ſmall pump managed by four hands filled a veſſel containing two tuns in one minute and forty five ſeconds:

That the ordinary hand-pump, at the ſame hight, with four hands filled the ſame veſſel in ſix minutes:

That his larger pump managed by twelve ſurveyors filled the ſame veſſel in thirty one ſeconds, and by twelve ſeamen in thirty ſix ſeconds:

But that the ordinary chain-pump managed by ſix ſeamen did not fill it in leſs than four minutes.

A paper was given in by Dr. PAPIN concerning a way of diſtilling oil of ſulphur *per campanam*; for which purpoſe he conceived, that the engine, which he had formerly ſhewn for the keeping of fire under water, might with ſome little alteration be very proper[i].

A letter of Dr. WALLIS to Mr. HALLEY, dated at Oxford April 26, 1687[k], was read, chiefly relating to the apparent magnitude of the ſun or moon, which ſeem ſo much bigger near the horizon, than when they are conſiderably high. This the doctor concluded to be an optic fallacy proceeding from the eye's judging thoſe objects, that are high, to be nearer; and conſequently appearing under the ſame angle, they are eſteemed to be ſo much leſſer as they ſeem nearer.

Mr. HOOKE read a farther diſcourſe concerning his manner of finding the latitudes of places by the azimuth of twice two ſtars.

Mr. BROTHERTON gave in a paper[l] with ſome figures relating to his experiments of the barking of trees. It contained three propoſitions, which he ſuppoſed, that he had demonſtrated; viz.

1. That the ſap (moſt of it, if not all) aſcends in the veſſels of the ligneous part of the tree, and not in the cortical part, nor between the cortical and ligneous part.
2. The increaſe and growth of a tree in thickneſs is by the deſcent of the ſap, and not by the aſcent: and if there were no deſcent, a tree would increaſe but very little, if at all.
3. That there is a continual circulation of the ſap all the ſummer ſeaſon, and during ſuch time as the ſap is ſtirring, and not a deſcent at Michaelmas only, as ſome have held.

May 18, Sir JOHN HOSKYNS vice-preſident in the chair.

[i] Regiſter, vol. vii. p. 6.
[k] Ibid. p. 68. The latter part of this letter is printed in the *Philoſ. Tranſ.* N°. 187. p. 323.
[l] It is printed Ibid. N° 187. p. 307.

The

The minutes of the laſt meeting were read.

An experiment was ſhewn by Dr. PAPIN of ſhooting by exhauſting the air out of a barrel, to ſee the difference between ſhooting a bullet and a cylindrical ſlug, after this manner[l]. And it was found, that the barrel being placed horizontal at three feet ten inches above the floor, the ſpherical bullet ranged forty ſeven feet two inches, and the ſlug, which was a cylinder of the ſame diameter and hight with the bullet, no more than thirty ſeven feet.

Mr. HOOKE read a diſcourſe concerning vegetation grounded on the experiments and obſervations of Mr. BROTHERTON, and explaining his three propoſitions given in at the laſt meeting. Mr. HOOKE promiſed to inſert this diſcourſe in the *Philoſophical Tranſactions*[m].

He read a farther diſcourſe concerning his hypotheſis of the mutability of the earth's poles, which he found confirmed by an obſervation of ERASMUS BARTHOLINUS (*Act. Med. Hafn.* 1671 & 1672. *cap.* 127. *p.* 220.) who together with Monſ. PICART obſerved at Uraniburg the angles of poſition of the neighbouring places with the meridian, and, as he ſaid, found them very different from the ſame angles ſettled by TYCHO BRAHE about an hundred years before.

Sir ROBERT GOURDON delivered to the Society by the King's order a receit to cure the bite of a mad dog[n], being under the hand of Mr. THOMAS FRAZIER, his majeſty's chirurgeon. The chief ingredient of this medicine was a plant, which grows plentifully about Thetford, and is there called *the ſtar of the earth*.

A ſtranger then preſent gave an account, that alum being powdered and put into water would cauſe any mud or ſediment in water preſently to ſubſide.

Sir JOHN HOSKYNS remarked, that bitter almonds would do the ſame thing as alum.

Sir ROBERT GOURDON related, that Dr. PLOT had lately propoſed to the king the barking of all timber, deſigned for the uſe of the navy, in the ſpring, and then to let the trees ſtand ſo barked till autumn before they are felled[o]; which he conceived would very much harden the wood, and make it much more durable by drying and evaporating the ſap during the ſame. This Sir ROBERT GOURDON ſaid was the practice of the French in felling their timber; but he knew nothing of the effect.

May 25. Sir JOHN HOSKYNS vice-preſident in the chair.

Upon reading the minutes of the laſt meeting, Mr. BROTHERTON's experiments occaſioned much diſcourſe about vegetation and grafting.

[l] Regiſter, vol. vii. p. 16.
[m] N° 187. p. 307.
[n] Regiſter, vol. vii. p. 8. It is printed in the *Philoſ. Tranſact.* N° 187. p. 298.
[o] Regiſter, vol. vii. p. 8. See Dr. PLOT's Natural Hiſtory of Staffordſhire, p. 382.

Mr. HOOKE remarked, that Mr. BROTHERTON had cut on the bark of a fir-tree, which in time healed up again; and that the bark and tree throve, though all the direct fibres of the bark were divided; which ſeemed to argue inſertions or anaſtomoſes in the veſſels of the bark, whereby the ſap deſcends.

Sir JOHN HOSKYNS ſaid, that it was a receit to cure a tree of a cancer, firſt to cut it to the quick; then waſh it well in vinegar and gunpowder, and ſo wrap it up in cow-dung, which will heal it, and make it grow well again.

Mr. HOOKE remarked, that Mr. BROTHERTON had obſerved, that ſeeds ſuſpended in the air no ſooner had emitted their germ out of the huſk but it immediately turned upwards againſt the perpendicular.

Dr. GALE mentioned, that there was in Caius-college library in Cambridge a manuſcript of one GODFREY WINSALL or VINOSALVO treating about grafting of vines, as antient as King RICHARD II's time.

Mr. HOOKE read a diſcourſe concerning a ſuſpicion of his, that the earth being made up of heterogeneous parts may have ſome inequality in the diurnal rotation from the different actions of the ſun and moon; and he propoſed an experiment to try it, by obſerving the interval of time between the paſſages of two ſtars having the ſame declination through a fixt teleſcope at ſeveral times of the ſame night. In the ſame diſcourſe he ſuppoſed the reaſon of the moon's keeping one face always towards the earth to be, becauſe this hither ſide of the moon is heavier than any other, and thereby gravitating moſt towards the earth, that part is always, except a ſmall oſcillatory motion, turned towards us.

A letter of Mr. LEEWENHOECK's was read concerning coffee, firſt as to the growth and texture of the coffee-berry, wherein he found very much oil to be contained; in which oil he conceived the principal virtue of the coffee to lie; and proſecuting that notion he gave direction for roaſting the berry, and making coffee drink after the beſt manner. In the concluſion he ſaid, that the coffee-berries grow on a tree as big as our lime-trees, as he had been crediby informed.

Dr. AGLIONBY was of opinion, that coffee could not be an enemy to the nerves, unleſs in thoſe, who uſe much drinking of wine, he having obſerved, that coffee will put wine into a great ferment.

Mr. HOOKE ſuppoſed, that the roaſting of coffee is a ſort of malting thereof to make it give its tincture; and that without roaſting it would not make coffee.

June 1, there was no meeting for want of a vice-preſident.

June 8, Sir JOHN HOSKYNS vice-preſident in the chair.

Sir JOHN HOSKYNS obſerved, that in an oak-tree the ſmall under branches would be killed and rot off by the droppings of the upper boughs on them; and

yet the places in the trunk would ſo heal up, that there ſhould be no ſign in the grain of the wood, that ever there had been ſuch a branch in that place.

He remarked likewiſe, that he had been informed, that in grafting the beſt way was to inſert the grafts obliquely; in which caſe they would not fail to grow, the barks in ſome part or other being ſure to coaleſce ſo as to make the union neceſſary for the growth.

Two notes of Monſ. JUSTEL were read; the one [b] concerning a chart of the eaſtern parts of Muſcovy bordering on China, to be expected from Holland, and deſiring the election of Mr. NICHOLAS FACIO into the Society: the other about a new contrivance of Monſ. DE LA HIRE to find the variation of the magnetical needle; and to eaſe the great difficulty of finding it at ſea; and giving an account, that there was to be expected from Paris the tranſlation of an hiſtory of China out of the Portugueſe, wherein there was an exact plan of the city of Pekin made to a ſcale, whereby it appeared, that it was much leſs than Dr. VOSSIUS imagined.

Mr. HOOKE read a diſcourſe concerning a method of finding the interval of time to the utmoſt exactneſs, by ſhewing how to divide the time of each vibration of a pendulum into its parts: and he ſhewed the model of an inſtrument for the doing thereof. This he conceived might ſuffice to examine the query, which he moved at the laſt meeting, about the unequal rotation of the earth.

Dr. SLOANE related, that there was in London a certain perſon having the diſeaſe Phthiriaſis: that he uſed to be ſick, whenever the tumors producing lice ſtruck inwards to his ſtomach, but that upon the breaking out of the lice he grew well again.

Mr. HENSHAW remarked, that FRANCESCO REDI had well obſerved, that there is a particular ſort of louſe or inſect bred out of all ſorts of animals and plants; and that his carps, when decayed and ſick, had a kind of lice growing on them.

Part of a letter of Mr. LEEWENHOECK was read concerning the growth of gall-nuts, which he found to be excreſcencies of oak-leaves occaſioned by the laying the eggs of a ſort of flies on thoſe leave, which coming to hatch gnaw the ribs or veſſels of the leaves, out of the gleeting moiſture whereof he conceived theſe galls to be produced; and that within them there is commonly found a dead fly or worm ingendered therein.

Mr. HOOKE produced a book, intitled *Micrographia nova*, publiſhed by one GRIENDELIUS of Nuremberg; giving the figures of ſeveral inſects, ſeeds, &c. many the ſame with thoſe in Mr. HOOKE's *Micrographia*, but much worſe deſigned.

Dr. PAPIN propoſed an experiment, whether he could reſtore the air vitiated by noxious effluvia [c]; the trial of which was reſerved till the next meeting.

[b] Letter-book, vol. xi. p. 25. part 1. p. 22.

[c] Regiſter, vol. vii. p. 12.

June

June 15, at a meeting of the COUNCIL were preſent,

Sir JOHN HOSKYNS vice-preſident

Mr. HENSHAW	Dr. AGLIONBY
Mr. CREED	Mr. LODWICK
Mr. HILL	Mr. HOOKE.

The queſtion being put concerning Mr. HALLEY's ſalary, the gratuity above 50*l.* a year to him was remitted to the farther conſideration of the council, and in the mean time it was determined by ballot, that the treaſurer ſhould pay him 50 *l.* for the laſt year's ſalary.

Mr. NICHOLAS FACIO DE DUILLIER was propoſed as a candidate by Sir JOHN HOSKYNS, and approved.

The queſtion being put, whether the order for the payment of Mr. HOOKE's ſalary, made June 16, 1686, ſhould be executed before any other orders made ſince either for ſalaries or gratuities, upon balloting, it was carried in the affirmative.

On this day there was no meeting of the SOCIETY.

June 22, Sir JOHN HOSKYNS vice-preſident in the chair.

An experiment was made of the variation of the magnetical needle; but by reaſon of the wind it could not be determined as it ought: however it was ſeveral times found about five degrees weſterly.

Dr. SLOANE obſerved, that the account given by him at the laſt meeting of the caſe of the phthiriaſis, was related to him by Dr. BATEMAN, who added, that the patient broke out in puſtules all over his body; and that in thoſe puſtules lice, or an inſect very like them, were ingendered.

Dr. SLOANE likewiſe remarked, that he had obſerved a ſort of louſe not unlike a ſheep's tick breeding on ſwallows, which are very troubleſome to them, and ſometimes kill them.

Mr. HENSHAW ſaid, that there is a ſort of louſe found in cod-fiſh, generally in the head of the fiſh.

Mr. NICHOLAS FACIO DE DUILLIER was propoſed candidate, having been approved by the laſt council.

Sir JOHN HOSKYNS produced a piece of artificial ruby made of a ſort of glaſs tinged with a preparation of gold, according to Mr. KUNCKEL's method.

A printed paper of Monſ. DE LA HIRE [d] was read, concerning a magnetical needle contrived by him in a circular form, ſuppoſing that ſuch a circle would always reſpect the true meridian with the ſame points thereof, and the magnetical virtue change its place therein; alledging ſome experiments of the alteration of the poles of a magnet analogous to what is found in the globe of the earth.

A note of Monſ. JUSTEL's was read, giving an account of ſome books printed at Paris, and mentioning, that the authors appointed to draw up the *Journal des Sçavans* were Meſſrs COURTIN, REGIS, MAILLARD, and DE LA ROQUE.

Mr. HOOKE read a farther lecture concerning the exact meaſure of time, and ſhewed the demonſtration of the diviſion of the arch of oſcillation of a pendulum ſo as to ſhew equal times: which is done by dividing the arch in the proportion of ſines, and taking the whole length of the arch vibrated for diameter [e].

Mr. HALLEY preſented the plant called ſtar of the earth, being the chief ingredient in the remedy for the bite of a mad dog, given in by Sir ROBERT GOURDON at the meeting of the 18th of May.

Mr. HOOKE read a relation of the extraordinary force of a burning concave ſpeculum out of the *Acta eruditorum Lipſienſia* for January 1687, p. 52. He ſuppoſed, that if ſuch a ſpeculum were made of many feet diameter, the effects thereof might be expected moſt prodigious. He propoſed, that ſuch a one might be made of copper tinned with a mixture of tin, lead, and iſinglaſs, which might be made very large for a ſmall price, and bear a very good poliſh.

Dr. HAVERS read a letter from a friend of his concerning the cure of a teneſmus by bitter clyſters, the cauſe of the diſeaſe being worms conglebated in the inteſtinum rectum. Theſe were ſuppoſed by ſome of the members preſent to be aſcarides, though the gentleman, who wrote the letter, ſeemed to be of a different opinion.

Dr. PAPIN gave in a paper [f] concerning the experiment of deſtroying air vitiated with noxious fumes, which he found not to anſwer his expectation; for having tried by means of a jet d'eau to evacuate the fumes of aqua fortis mixt with the air, he found, that the air remaining after ſuch operation was ſtill unfit for preſpiration.

He gave an account of an experiment made to ſee, whether the liquor diſtilled *in vacuo* from white roſes would coagulate, as that of red roſes ſo diſtilled doth: but it was found uncongealed.

June 29, Sir JOHN HOSKYNS vice-preſident in the chair.

[d] It is printed in the *Philoſ. Tranſact.* N°. 188. p. 344.

[e] See NEWTON's Philoſ. Natur. Princip. Mathem. L. 1. prop. lii. p. 153.

[f] Regiſter, vol. vii. p. 13.

Upon

Upon reading the minutes of the laſt meeting, Mr. HENSHAW remarked, that there was uſually found on whales a louſe of the bigneſs of a man's thumb.

Sir JOHN HOSKYNS obſerved, that a ſort of lice are ſometimes found on ſalmons; and that thoſe lice are a ſign, that the ſalmons are then out of ſeaſon.

On occaſion of the burning ſpeculum, Mr. HENSHAW obſerved, that nothing yet found would melt black lead; and that he had tried it in a very ſtrong heat for fourteen days together; but it came out unchanged.

There was preſented from Dr. CHARLETON ſome ſalt ſhot upon a ſtick like ſugar-candy, ſaid to be brought out of Siberia, a province of Muſcovy. It was believed to have been coagulated in ſome ſalt ſpring, and not in a river, as was ſaid in the paper given in with it.

A note from Monſ. JUSTEL was read, giving account, that Mr. ROEMER had much improved the engine, which conſumes ſmoke, and which, he conceived, might be of great uſe in London, where the ſmoke is ſo offenſive, and ſo prejudicial to houſhold goods.

Mr. HENSHAW was of opinion, that the ſalt of ſoot being diffuſed in the air might probably be more prejudicial to the lungs than the ſmoke itſelf.

Dr. AGLIONBY ſuppoſed, that thoſe vapours being diffuſed and diluted in the air muſt become leſs noxious than when taken into the lungs together with the fuliginous matter of the ſmoke.

A paper was read given in by Mr. CLUVERUS concerning ſome tables produced at this meeting by a foreign gentleman from Mr. WASMUTH, profeſſor at Kiel in Holſtein. Theſe tables were ſaid to be founded on the holy Scripture, and to ſerve for chronological and aſtronomical purpoſes. They were recommended to Mr. CLUVERUS to peruſe and make a report of.

Mr. HOOKE read a diſcourſe concerning a method of finding the latitude of a place by obſerving two equal altitudes of a ſtar paſſing near the Zenith, having found two points, the one perpendicularly under the other, and the exact time betwixt them.

A paper of Dr. PAPIN was read about applying his engine for raiſing water by the rarefaction of the air to the raiſing of any ſort of weight out of deep mines.

Mr. HOOKE obſerved, that a rope ſtrained very tight would ſerve to convey force or motion much better than any ſuch contrivance.

July 6, at a meeting of the COUNCIL were preſent,

Sir

Sir JOHN HOSKYNS vice-preſident
Mr. HILL Dr. AGLIONBY
Mr. LODWICK Mr. HOOKE.

The queſtion being put, whether Mr. HALLEY ſhould have fifty copies of the *Hiſtory of Fiſhes* inſtead of the fifty pounds ordered him by the laſt meeting of the council, comprehending the twenty books formerly put into the hands of Mr. SMITH the bookſeller, it was determined by ballot in the affirmative.

The queſtion being put, whether Mr. HOOKE ſhould have the arrears, due to him by a former order of June 16, 1686, paid him in like manner in copies of the *Hiſtory of Fiſhes*, it was ballotted and allowed: only Mr. HOOKE deſired ſix months time to conſider of the acceptance of ſuch payment.

It was ordered, that Mr. HALLEY receive a gratuity of twenty other copies of the *Hiſtory of Fiſhes*, in conſideration of his arrears in the laſt year ending January 27, $168\frac{6}{7}$.

At a meeting of the SOCIETY on the ſame day, Sir JOHN HOSKYNS vice-preſident in the chair.

Two letters were read concerning the eclipſe of the ſun, May 1, 1687, the one from Mr. WILLIAM HAYLEY [f] made at the Strait's mouth; the other from Mr. FRANK at Barbadoes [g].

A paper of Dr. PAPIN [h] was read about the reaſon of the *camera Æolica*, or engine for producing a wind by the running of water, which had been ſuppoſed to proceed from a generation of air by the agitation of the water upon a great fall. This Dr. PAPIN had found by experience to be untrue; and he propoſed in this paper, that, according to the make of the engine, the air entering into the pipe, whereby the water deſcends, is carried down with it, and then by its levity makes its way out at the top of the veſſel, while the water runs out at the bottom.

Mr. HOOKE read a diſcourſe concerning the way of conveying force to a great diſtance, which he conceived would beſt be done by ſome ſtiff and inflexible rod, as a wire, or long pole, or the like; and ſhewed the experiment by communicating a force given in the inner hall of Greſham-college acroſs the quadrangle by means of a packthread, which was found to perform to ſatisfaction.

Dr. ROBINSON having examined the plant called ſtar of the earth in the receit for the bite of a mad dog, ſaid, that it was the *ſeſamoides Salamanticum Park. ſive Lychnis viſcoſa flore muſcoſo Caſp. Bauhini*, in Engliſh, *Spaniſh catch-fly*: that it

[f] His letter to Mr. HALLEY, dated at Leghorn, June 8, 1687, is in the Letter-book, vol. xi. part 1. p. 64.

[g] Ibid. p. 66. Mr. HAYLEY's and Mr. FRANK's obſervations are printed in the *Philoſoph. Tranſ.* N° 189. p. 370.

[h] Regiſter, vol. vii. p. 13.

grows plentifully about the mills near Newmarket, and about Thetford, *Raii Catalog. Plantar. Angl.* and is deſcribed, *Raii Hiſtor. Plantar. tom.* 2. *inter Lychnidas.*

Mr. AUBREY remarked, that this plant was to be found near a place called Chalk in Wiltſhire.

Dr. ROBINSON obſerved, that this plant had not till now been known to have any medicinal virtue.

July 13, Sir JOHN HOSKYNS vice-preſident in the chair.

Upon reading the minutes, and mention of the virtue of the plant called ſtar of the earth, Dr. SLOANE ſaid, that this ſame virtue of curing the bite of a mad dog is to be found in a book called DE GRAY's *Farrier.*

Mr. AUBREY remarked, that this ſpecific virtue had been well atteſted to him.

Dr. SLOANE added, that he knew a man, who had cured twenty couple of dogs therewith.

Mr. HOOKE ſhewed in a microſcope the cryſtals of the ſalt preſented at the meeting of June 29 from Dr. CHARLETON, ſaid to have been congealed like ſugar-candy on a ſtick in a river of Siberia. The particles thereof were ſhot into ſquare grains like table diamonds, which looked very fair in the microſcope, ſo that it appeared to be a ſort of *ſal gem* or marine ſalt.

The minutes of the Dublin Society for ſeveral months paſt were read; in which mention was made of a cavity in the ſkull of birds reaching from one ear to the other, which was conceived to be deſigned for the exquiſiteneſs of hearing. Mr. HENSHAW added, that there is a ſmall bony fulcrum ſerving to ſupport this cavity.

Dr. TYSON remarked, that he had obſerved a like confirmation of bones in the head of an owl, in which bird there is an extraordinary contrivance of a membrane to dilate and contract the pupil of the eye.

It being mentioned in the minutes of the Dublin Society, that a bruiſed ſcorpion is a ſure and ſpeedy remedy for the ſting of it, Sir JOHN HOSKYNS remarked, that he had heard, that after the ſame manner the ſting of a waſp might be cured by applying the bruiſed waſp.

There being in the ſame minutes an account of a rare caſe of a patient of Dr. MULLEN, who voided by ſtool a great number of ſmall bladders filled with matter of different conſiſtences, and ſome of them pretty large; Dr. TYSON obſerved, that ſuch voiding of bladders, unleſs in dropſical caſes, is very rare, and moſt commonly in women, in whom lumps are produced from the ovarium.

Dr. TYSON communicated his obſervations of what occurred in the diſſection of the body of Mr. SMITH of Highgate, in whoſe bladder were found ſeveral leſſer bladders of ſerum, ſome as big as a pullet's egg, and each ureter ſtopped with ſuch a bladder, and withal inflamed ſo, that no urine could paſs by them into the bladder [1].

Dr. SLOANE remarked, that upon cutting a perſon for the ſtone, there had been found, inſtead of a ſtone, only a ſtiff mucous ſubſtance near as big as one's fiſt.

Mr. CLUVERUS gave in an account of Mr. WASMUTH's aſtro-chronological tables, whereby he pretended from certain ſabbatical periods, not only to determine the motions of the ſun, moon and planets *à priori*, without obſervations; but alſo to diſcover the true time of any of the moſt remarkable occurrences in the world without hiſtory.

Mr. HALLEY gave in a figure of the eclipſe of the ſun obſerved May 1, 1687; wherein he ſhewed the phaſes thereof at London, Barbadoes and Smyrna, whoſe difference of meridians he determined, viz. Barbadoes 5 hours 58 minutes weſt, and Smyrna 1 hour 50 minutes eaſt from London.

And from the obſervation of Mr. HAYLEY at the Strait's mouth he found Cape Trafalgar 28 minutes or 7 degrees to the weſt of London.

Dr. PAPIN gave in a paper in anſwer to Mr. HOOKE's objections againſt the way of conveying force by the rarefaction of the air. It was, that his pipes being laid in a trough, and then covered with coarſe turpentine, would thereby be kept tight and ſecure againſt the paſſage of the air through any leſſer chinks or holes, that might be left in them.

Mr. HOOKE's diſcourſe, by reaſon it was now late, was referred to the next meeting.

July 20, Sir JOHN HOSKYNS in the chair.

Mr. HENSHAW obſerved, that a ſort of owls in France and Savoy, called *Dukes*, have an extraordinary faculty of dilating and contracting the pupil of the eye.

Mr. HOOKE related, that Mr. WALLER and himſelf having lately diſſected ſeveral eyes, had obſerved a great number of ſmall thrids or nerves entering through the ſclerotis into the cavity of the eye towards the bottom, and proceeding between the ſclerotis and uvea, to terminate in the outward ring of the *Proceſſus ciliares*, ſo to ſerve for the motion of the cryſtalline humour, and alſo to make the aperture of the uvea bigger or leſs.

Mr. HOOKE likewiſe read an anſwer to Dr. PAPIN's objection to the communication of motion at a diſtance by rods, with a farther explication of the vibration

[1] Regiſter, vol. vii. p. 18. *Philoſoph. Tranſ.* N° 188. p. 332.

of the rods or poles: as alſo another diſcourſe, wherein he farther explained the great inconvenience of Dr. PAPIN's way, and the impracticability thereof, by ſhewing 1, That it would be next to impoſſible to make pipes to hold ſo perfectly, as not to leak air in ſome parts. 2, That it would be as difficult to diſcover one or more ſuch leaks, or, when found, to ſtop them. 3, That neither his gutters nor turpentine nor moloſſes would prevent thoſe difficulties; for that all ſuch a gutter muſt be uncovered two leagues, when ſuch leaks happen; next, the gutters would not do up-hill and down-hill, nor croſs roads: and they would be as difficult to be kept tight from leaking out thoſe ſubſtances; nor would they hinder evaporation. And though it were poſſible, yet, 4, That the air is the worſt of all *media* for conveying ſuch power, there being more ſtrength loſt thereby than by any ſolid medium or fluid, as water, &c. becauſe of the great ſpringineſs thereof.

Mr. HOOKE ſhewed the experiment of vibration of the rods, as a pendulum, which was by ſuſpending a large Indian-cane of about thirty feet long by two packthreads about eight feet in length: by which it was plain how the weight of ſuch rods or poles for communication of traction or pulſion at a diſtance might not only be made to move freely and with eaſe, but alſo be in the nature of the weight of a ſway.

The ſame thing was alſo tried with a large ſcaffold-pole of above forty feet long, ſuſpended by two ſmall chords, which ſucceeded, as the former to the ſatisfaction of thoſe preſent.

Dr. SLOANE preſented a large ſcorpion of St. Cruz in Barbary; which was ordered to be preſerved in ſpirit of wine in the repoſitory.

July 27, Sir JOHN HOSKYNS vice-preſident in the chair.

Upon reading of the minutes of the laſt meeting, it was inquired, whether there were any emiſſion of light from the eyes of cats to help them to ſee in the dark, as in glow-worms, fire-flies, and the like: but it was the opinion of the members preſent, that in cats, owls, and ſuch like animals, the extraordinary faculty of ſeeing in the dark ariſes from the great dilatation of the pupil of the eye.

Mr. HOOKE remarked, that the light ſeen in the eyes of cats is rarely found but when the cat is frighted; or elſe very earneſt after her prey.

Sir JOHN HOSKYNS communicated the following receit of one SIMEON PAULI for a varniſh to coat and preſerve dried plants; infuſe in ſpirit of wine the ſeeds of wormwood; and then diſſolve therein as much gum elemi as it will take; and with this varniſh cover the plant. This was thought to be a good means to preſerve inſects and any ſmall animal from periſhing.

Dr. EDWARD BERNARD of Oxford returned two Arabic pſalters formerly borrowed out of the Society's library.

Mr.

Mr. HENSHAW borrowed out of the library two Greek manuſcripts, containing part of the tragedies of EURIPIDES.

Mr. HALLEY gave a deſcription of the water-galls or fiſh reſembling gelly, which is found commonly in theſe ſeas at this time of the year.

A paper of Dr. PAPIN was delivered in concerning the computation of the velocity impreſſed on a bullet in an exhauſted barrel: but it being late, it was referred till the next meeting.

The Society adjourned their meetings till Wedneſday, October 19th.

October 19, there was no meeting for want of a vice-preſident: but Sir THEODORE DE VAUX being preſent promiſed a receit for the bite of a mad dog, which he had never known to fail. He ſaid, that he had it from MATTHIAS DE HUDLESBOSK; and that it conſiſted of rue, garlic, Venice-treacle, and tin-filings.

October 26, Sir JOHN HOSKYNS vice-preſident in the chair.

Upon reading the minutes of the laſt meeting, Mr. AUBREY remarked, that the Welſh have generally black eyes; and the vice-preſident added, that this had been noted as an argument to prove the old inhabitants of Britain and the Gauls to have been the ſame nation, it being obſervable, that their eyes are as generally black as thoſe of the Germans are grey.

Dr. TYSON gave a relation of ſome very particular ſtructures, which he had obſerved in the bones of the ear and eye of an owl; of which he promiſed a written account.

Sir JOHN HOSKYNS remarked, that he had noted in the eyes of ſeveral perſons, who were very ſharp-ſighted, that the iris was of different colours, when looked on in a different poſition. This he conceived to be cauſed by ſome corrugation in the ſurface of the iris; whereby thoſe perſons were enabled to dilate their pupil extraordinarily upon occaſion.

There was preſented from Mr. JAMES FRAZIER the fowl called cappercail or cock of the wood, being found in the fir-wood in the Highlands of Scotland, being a larger ſort of heath-cock of the black kind.

Mr. HOOKE read a letter to himſelf from Mr. WALLER concerning ſtones, as nautili and ophiomorphites, lately found by him near Caineſham-bridge in Glouceſterſhire [a]. One of theſe ſtones was evidently formed in the ſhell of a common nautilus, but much bigger than the uſual ſort; and not only the diaphragms were moſt diſtinct, but alſo the holes in them, whereby the ſeveral cavities communicate, were indiſputably diſcovered, and no room left to doubt of its having been once a ſhell.

[a] Letter-book, vol. xi. part I. p. 67.

A paper

A paper of Dr. PAPIN was read concerning a way of applying the force of gun-powder to raiſe weights, and to other mechanical uſes [b]; of which he ſhewed the experiment. It was by rarefying the air included in a cylinder by the flaſh of the powder, and then applying the weight of the atmoſphere to drive down a plug into the evacuated cylinder, being the way mentioned in the *Nouvelles de la Republeque des Lettres.*

A letter in Latin from JOHN PHILIP WURTZELBAUR of Nuremberg to the Royal Society, dated there, March 31, 1687 [c], was produced, containing an account of many of the ſun's meridian altitudes taken in that city the laſt year, which ſufficiently proved the latitude of it and the obliquity of the ecliptic to have been unaltered ſince the time of BERNARD WALTHER, or the year 1487.

Part of a letter of Mr. WILLIAM MOLYNEUX, dated at Dublin, July 7, 1687 [d], was read, intimating his deſire, that a new map of the world might be made according to the late obſervations.

Mr. WALLER's account of the tides at Briſtol was produced.

Sir JOHN HOSKYNS deſired, that the cappercail or cock of the wood ſhould be inquired after from Ireland, where Dr. MOULIN ſaid they were commonly found in the market.

November 2. Sir JOHN HOSKYNS vice-preſident in the chair.

Sir THEODORE DE VAUX gave in a paper concerning the cure of the bite of a mad dog, being ſeveral receits found by him among the papers of Sir THEODORE MAYERNE. This was ordered to be publiſhed in the *Philoſophical Tranſactions* [e].

Dr. TYSON having ſaid, that there was a circular bone within the ball of the eye of an owl, to help to dilate or contract the pupil, Mr. WALLER remarked, that he had obſerved the ſame thing in a lap-wing; and that the French anatomiſts in their *Memoires pour l'Hiſtoire des Animaux* aſſert the ſame contrivance in the eye of the eagle.

Mr. ADAIR being preſent ſaid, that the male cappercail is much leſs than the female: that that preſented at the laſt meeting was a female. This bird being ſuppoſed to be of the kind of our black game of heath-cocks was ſaid to be the beſt meat of wild fowl, but the fleſh thereof apt to corrupt.

Sir THEODORE DE VAUX remarked, that near Carcaſſone in Languedoc there is a hill called *Montagne de Priape*, where the ſtones are commonly formed into

[b] Regiſter, vol. vii. p. 20.
[c] Ibid. p. 64 It is printed in the *Philoſ. Tranſ.* N°. 190. p. 405.
[d] Letter-book, vol. xi part I. p. 70.
[e] N°. 191. p. 408. for December 1687.

the

the ſhape of a human penis; one of which ſtones he promiſed to bring and ſhew to the Society.

There was preſented from Monſ. JUSTEL a book ſent to the Society by Monſ. VILLERMONT from Paris, where it was lately printed, concerning the triſection of an angle, pretended to be done by right lines and a circle.

Mr. HOOKE read a diſcourſe upon the periplus of HANNO, wherein are ſeveral things ſeeming to favour his notion of the great changes, that have happened in the earth; as where mention is made of countries flaming in the night, and a high mountain expiring fire; the deſcription of which ſeemed to agree with the Canary iſles, which Mr. HOOKE conceived to have been blown up by fire,

Mr. ADAIR mentioned, that to the weſtward of the iſles of Scotland called the Hebrides there was an iſland, which had been frequently ſeen from the land of Argyle's juriſdiction: but it was not known, that any perſon had been upon it.

November 9. Dr. GALE vice-preſident in the chair.

Dr. GALE gave an account, that there were two ſorts of heath-game in England, viz. the red and the grey game: That the cock of the grey game is black like the fowl produced at the laſt meeting: and that he had been informed, that the white ſpots, which are found on the feathers of the tail of this bird, wear away with age, and at length diſappear.

Mr. HOOKE gave his report of Monſ. TARRAGON's book of the triſection of an angle, which had been recommended to him at the laſt meeting, viz. that this conſtruction was not general, and only extended to the triſection of ſuch angles, whoſe third parts were the $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, &c. of ſome other angle had by the biſection of an angle.

Mr. HALLEY read a letter in Latin to himſelf from Mr. WURTZELBAUR, dated at Nuremburg, 16 Sept. 1687, O. S.[f], containing his obſervations of the eclipſe of the 1ſt of May, 1687[g].

He read likewiſe ſeveral letters, containing accounts of the tides, which he had procured to be obſerved on the ſouth coaſt of England.

There was produced a ſheep's head, out of the neck of which grew a ſhort leg. It was deſired of ſome of the phyſicians of the Society to examine it, and ſee after what manner it was articulated in the ſkull or vertebræ of the neck.

Dr. PAPIN gave in a paper about the quantity of air evacuated by the flaſh of gun-powder in his experiment tried on the 26th of October; which paper was read,

[f] Regiſter, vol. vii. p. 69.

[g] See *Philoſ. Tranſact.* N°. 189. p. 371.

and

and it appeared, that forty ſix parts of fifty nine of the whole cavity of the veſſel had been emptied of air.

Mr. PITFIELD preſented his tranſlation of the *Memoires pour ſervir à l'Hiſtoire des Animaux* by the Royal Academy of Sciences at Paris; to which is added, *An Account of the Meaſure of a Degree of a great Circle of the Earth*, tranſlated from the French by Mr. WALLER.

Dr. PAPIN repeated the experiment made at the meeting of the 26th of October with a third part of the gun-powder uſed then, but ſuppoſed three times as ſtrong: and the effect was, that the air expelled was equal in bulk to 2 *lb.* 5 *oun.* of water, the powder being but half a ſcruple.

Mr. ADAIR ſhewed ſeveral of his curious maps of Scotland made from his late ſurvey.

Nov. 16. Sir JOHN HOSKYNS vice-preſident in the chair.

There was preſented from Mr. BOYLE a book lately publiſhed by him, and intitled *A Diſquiſition about the final Cauſes of Natural Things, wherein it is inquired, whether, and (if at all) with what caution a Naturaliſt ſhould admit them. To which are ſubjoined, by way of Appendix, ſome uncommon obſervations about vitiated ſight.* Mr. HOOKE was deſired to peruſe this book, and give an account of its contents.

Dr. MOULIN reported, that he had examined the ſheep's head, produced at the laſt meeting; and that there appeared no articulation or junction of the ſpurious leg either with the ſkull or ſpine, but that it was tied by a ligament to the pericranium; and that the inner end of the bone was ſmall and pointed like a quill.

Part of a letter of Mr. LEEWENHOECK, concerning the generation of ants, was read; wherein he was of opinion, that the white things, taken for their eggs, are really worms, which, he ſaid, he had obſerved to be hatched into ants in a little time. The reſt of the letter was referred to the next meeting.

A committee was choſen by ballot for auditing the treaſurer's accounts, conſiſting of Sir RICHARD BULKELEY, Mr. HERBERT, Mr. MEREDITH, Mr. ASTON, and Mr. POVEY.

Sir RICHARD BULKELEY produced a paper ſent him from Ireland, being the copy of a letter from the Biſhop of Meath to Mr. WILLIAM MOLYNEUX, containing ſeveral particulars of the examination of a young wench in Ireland, out of the corners of whoſe eyes there proceeded grains of corn, as of wheat, oats, rye or barley. The circumſtances were very extraordinary, and all precautions taken to prevent fraud: but it was found, that the ſame ſort of grains ſtill iſſued; ſo that, how unlikely ſoever the thing might ſeem, the fraud, if any, could not be

diſcovered. It was obſerved, that ten grains in an hour's time was the greateſt number evacuated by her.

November 23, at a meeting of the COUNCIL were preſent

The Earl of Carbery preſident,

Sir JOHN HOSKYNS	Mr. WALLER
Dr. GALE	Mr. HOOKE
Mr. PITFIELD	Mr. LODWICK.
Mr. CREED	

The preſident ſigned an order for the payment of the gratuity given Mr. ASTON of ſixty pounds by an order of council of December 16th, 1685.

An addreſs of Dr. PAPIN was read, deſiring the payment of his arrears of ſalary by reaſon of his being about to leave England, in order to be profeſſor of mathematics in the univerſity of Marpurg.

It appearing to the council, that the debts of the Society are ſuch, that they cannot otherwiſe be ſatisfied, it was ordered, that their ſtock in the Eaſt-India company be ſold; and that Mr. HILL adviſe the beſt he can to do it ſpeedily.

The preſident ſigned an order for the payment of ſixty pounds to Mr. HOOKE, which had been ordered him on the 16th of June, 1686.

It was ordered, that Dr. PAPIN be paid 22 *l.* 10 *s.* in full of all accounts, being three quarters ſalary: and the preſident ſigned an order accordingly.

At a meeting of the SOCIETY on the ſame day, Sir JOHN HOSKYNS vice-preſident in the chair.

The minutes of the laſt meeting were read.

Mr. HOOKE gave an account of Mr. BOYLE's book of *Final Cauſes*, wherein by a great many inſtances he endeavours to ſhew the unreaſonableneſs of thoſe, who deny deſign in the proceedings of nature. The ſecond part of the book being an account of ſeveral accidents befalling the eyes, Mr. HOOKE deſired, that it might be peruſed by ſome phyſician of the Society.

The latter part of Mr. LEEWENHOECK's letter of September 9, 1687, concerning the generation of ants was read, wherein he concluded three things, 1. That the real eggs of ants are exceedingly ſmall, and not bigger than ordinary grains of ſand. 2. That out of theſe eggs are worms produced, which being without any motion of their own and helpleſs are fed by the old ants; whence it comes to paſs, that they are ſo buſy in carrying food to their neſts in ſummer, and not in order to lay up any magazine of proviſion againſt winter, as was vulgarly ſuppoſed: and 3. That thoſe which, were moſt commonly called ants eggs,

are either thoſe worms or aureliæ of young ants, or elſe a ſort of webs, wherein one ſort of ant-worms were obſerved by Mr. LEEWENHOECK to wrap themſelves a little before their maturity. He took notice by the way of the manner of the ſtinging of ants, which he found not to be by biting, as ſome imagined, but by a real ſting in the tail, which is all along on the back thereof grooved with a deep groove not unlike the ſcheit uſed by ſeamen to wet ſails withal; by means of which groove the ant conveys to the point of her ſting a ſmall drop of venomous tranſparent liquor, which by its acrimony occaſions the ſmart and ſwelling, that generally follows the ſting of ants.

Sir JOHN HOSKYNS gave his opinion as to the reaſon, why the young ants ſhould be found without motion, whilſt they are yet white; viz. becauſe the bones, which in ſuch ants are like ſhells on the out-ſide of their limbs, are not yet firm; whereby they want the neceſſary inſtruments of moving themſelves.

Mr. HALLEY deſired, that he might bring in an experiment in order to determine the quantity of vapour ariſing out of water warmed to a certain degree; which he conceived might be of good uſe in the explication of ſeveral phænomena in metereology and the theory of fountains and ſprings; as alſo to ſhew the reaſon of that remarkable current out of the Ocean into the Mediterranean ſea: which experiment he was ordered to prepare againſt the next meeting.

Nov. 29, at a meeting of the COUNCIL were preſent

Sir JOHN HOSKYNS vice-preſident,

Mr. EVELYN
Mr. HILL
Mr. LODWICK
Mr. CREED
Mr. PITFIELD
Mr. HOOKE
Mr. WALLER.

It was ordered, that Mr. HOOKE be paid 22 *l.* 10 *s.* for three quarters of a year's ſalary due to him at Chriſtmas laſt.

A committee of the council for auditing the treaſurer's accounts was ballotted for and choſen, viz. Mr. LODWICK, Mr. PITFIELD, and Mr. WALLER, who were to meet the next morning at eight o'clock.

Mr. HAUTEFEUILLE, Mr. MIDDLETON, and Mr. WILLIAM WOTTON were propoſed to the council as candidates, and being ballotted for were approved to be propounded to the Society for election.

The vice-preſident ſigned an order for the payment of 20 *l.* to Mr. HUNT the operator for half a year's ſalary due July 14 laſt.

He likewiſe gave an order for the payment of the ſum of 12 *l.* being in full for ſixty copies of the *Philoſophical Tranſactions* of a ſort from N°. 184. to N°. 188. incluſive.

November 30, being the day of the anniverſary election of the council and officers of the Society, the Earl of Carbery preſident in the chair, the following eleven members were continued of the council;

JOHN Earl of Carbery	Mr. PEPYS
THOMAS Earl of Pembroke	Mr. WALLER
Dr. THOMAS GALE	Sir JOSEPH WILLIAMSON
Mr. HENSHAW	Sir CHRISTOPHER WREN
Mr. HILL	Sir CYRIL WYCHE.
Sir JOHN HOSKYNS.	

The ten elected into the council were

HENRY Duke of Norfolk	Sir WILLIAM PETTY
GEORGE Earl of Berkley	Dr. PIT
Mr. HAYNES	Dr. PLOT
Mr. HERBERT	Dr. SLARE
Mr. PERRY	Dr. TYSON.

The Earl of Carbery was continued preſident:
Mr. HILL was continued treaſurer:
Dr. GALE and RICHARD WALLER, Eſq; were choſen ſecretaries.

Decemb. 1, the Earl of CARBERY in the chair.

After the minutes Mr. HOOKE read a lecture, being firſt a recapitulation of ſeveral things, which he had produced before the Society the laſt year, particularly concerning the ſpheroidical figure of the earth, the mutation of the poles, and the conſequences thereof[a]. He then cited a paſſage out of PLATO's Timæus, ſeeming to make much for his hypotheſis of the frequency of floods and conflagrations. It was the relation of an old man to PLATO's grandfather, who had it from an Egyptian prieſt, that the iſland of Atlantis was once ſo conſiderable, as to have inhabitants, who had conquered good part of Africa and Europe; but that in one day's time the whole iſland ſunk into the ſea. Laſtly, he gave a tranſlation of HANNO's *periplus*, from ſome paſſages whereof he collected, that there was then a conflagration of ſome lands, which, as he interpreted the words κατ' εὖθυ, were in the latitude of 36 degrees, and, as he conceived north-weſt from Madera: and he ſuppoſed the mountain called Θεῶν ὄχημα in this *periplus* to be the pic of Teneriffe; aſſerting, that he had good grounds for it; and that the *caldera* or baſin on the top of it is warm with a ſubterraneous heat.

Dr. GALE remarked, that κατ' εὖθυ would bear the ſenſe, which Mr. HOOKE put upon thoſe words; but he ſuppoſed this *periplus* to be of a Greek rather than Carthaginian original, becauſe all the names of places are Greek.

[a] See his *Poſthumous Works*, p. 377. & ſeqq.

To this it was anſwered, that the Greek tranſlator might take the liberty to change ſignificant names into his own language.

Dr. GALE obſerved, that the reputed author, or perhaps tranſlator, of this *periplus* was one HIERONYMUS LAMPSACENUS.

Mr. ASTON preſented from the author FRANCIS JESSOP, Eſq; his book lately printed, intitled, *Propoſitiones hydroſtaticæ ad illuſtrandum Ariſtarchi Samii ſyſtema deſtinatæ*, &c. which was delivered to Mr. HOOKE to bring in an account of.

A letter of Mr. JOHN WEICHARD VALVASOR, containing an accurate deſcription of the lake Zirknitz in Carniola [b], was produced and ordered to be read at the next meeting.

A letter of Mr. LEEWENHOECK, containing his microſcopical obſervations on cochineal and the Jeſuit's bark, or chinachina, was produced, and ordered to be tranſlated.

Mr. HALLEY read an account of the quantity of vapour, which in a day's time exhales from the ſurface of water [c]; and by experiment proved it to be in the warmth of ſummer not leſs than a tenth of an inch in twelve hours: whence computing the quantity of vapour raiſed out of the Mediterranean ſea, as likewiſe that, which is emptied into it by the rivers, he found, that the vapours exhaled were nearly three times as much as the rivers repleniſhed, taking the rivers with the moſt and the vapours with the leaſt, ſo that the difference ſeemed yet greater. The experiment, on which this argument is founded, was repeated before the Society at the end of the meeting.

Decemb. 14, at a meeting of the COUNCIL were preſent

The Earl of CARBERY preſident

SIR JOHN HOSKYNS	Mr. HAYNES
Sir CYRIL WYCHE	Mr. PERRY
Mr. HENSHAW	Mr. HERBERT
Mr. HILL	Dr. TYSON
Dr. SLARE	Mr. WALLER.
Dr. PIT	

The preſident ſigned an order for the delivery of a piece of plate of ſixty pounds value to Mr. WILLIAM MUSGRAVE, being a gratuity given him by an order of council of Decemb. 16, 1685.

It was ordered, that Mr. ASTON, in conſideration, that his gratuity of ſixty pounds hath been two years unpaid, and that for two years of the time ſince he was laſt excuſed his weekly payments by an order of council of Novemb. 21, 1683, he was ſecretary to the Society, be farther exempted from the ſaid payments till Michaelmas laſt.

[b] It is printed in the *Philoſoph. Tranſact.* N° 191. p. 411. [c] Ibid. N° 189. p. 336. for Sept. and Oct. 1687.

Mr.

Mr. PERRY, Dr. PIT, Dr. SLARE, and Mr. HERBERT were ſworn of the council.

A motion being made, that it was convenient, that the Royal Society's ſtock in the Eaſt-India company ſhould be transferred from Sir JOHN LAURENCE's name to that of ſome other gentleman of that company, a member of the Society: it was ordered, that Sir JEREMY SAMBROOKE ſhould be deſired to take it; and that a letter be written to Sir JOHN LAURENCE about it.

It was ordered, that Dr. PAPIN have a preſent of four copies of the *Hiſtory of Fiſhes*, and a letter teſtimonial under the ſeal of the Society of the good ſervices rendered them by him.

Dr. GREW's index to the rarities in the repoſitory was referred to Mr. WALLER, Mr. PERRY, Dr. TYSON, Dr. PIT, and Dr. SLARE, as a committee to inſpect and make a report of it.

Mr. JOHN WEICHARD VALVASOR of Carniola was propoſed candidate to the council and approved for election.

It was ordered, that the treaſurer pay Mr. HOOKE thirty-ſeven pounds ten ſhillings, as a farther gratuity, and in full of all demands ſince the laſt order of November 29 paſt.

At a meeting of the SOCIETY on the ſame day, Sir CYRIL WYCHE vice-preſident in the chair.

The minutes of the laſt meeting were read.

Mr. HOOKE read a diſcourſe tending to ſhew, that the antient ſtory couched in fable had yet a real and truly hiſtorical interpretation [c]. And after that manner he interpreted the ſtory of PERSEUS in OVID, deriving PERSEUS from περιζέω, and underſtanding by him lightning; and the metamorphoſis of ATLAS to have been the deſtroying the Heſperian gardens, and blowing up by a ſubterraneous fire the great mountain Atlas in the place where they were.

He promiſed to ſhew a like mythology of ſeveral of the other fables of antiquity.

Mr. JOHN WEICHARD VALVASOR of Carniola, Mr. WILLIAM WOTTON, Mr. HAUTEFEUILLE, and Mr. BENJAMIN MIDDLETON, having been propoſed candidates to the council, and approved, were this day elected fellows of the Society.

The firſt part of Mr. JOHN WEICHARD VALVASOR's letter from Carniola was read, being an accurate deſcription of the lake Zirknitz in that country, with an account of the ſeveral ſubterraneous paſſages and holes, at which the water enters

[c] See his *Poſthumous Works*. p. 377. & *ſeqq*.

into, and leaves the lake; as alſo of the manner of fiſhing in thoſe holes; with the titles and tenures of the ſeveral gentlemen having right to the fiſhery of the lake. The reſt of the letter was referred till the next meeting.

A paper of Sir PHILIP SKIPPON was read, containing an account of ſeveral Saxon coins lately found in Suffolk, with ſeveral curious remarks thereupon by that gentleman [d]. On the reverſe of one of theſe coins he found the word *ſterling*; by which it appears, that that word was of Saxon original, and not brought in by the conqueſt: whereby a miſtake of GRONOVIUS *de ſeſtertiis*, p. 346, who affirmed the contrary, is rectified.

Some further remarks on the ſame coins by Mr. WILLIAM WOTTON [e] were referred to the next meeting.

Sir RICHARD BULKELEY produced a letter from Mr. WILLIAM MOLYNEUX, ſomewhat calling in queſtion an account, which he had before ſent out of Ireland concerning a girl, who diſcharged grains of wheat, barley, &c. out of the corners of her eyes; for that a perſon there, upon trial, found, that without pain or trouble he could eaſily hide ſeveral grains under his eye-lid, which of themſelves will ſtart out, unleſs now and then kept back with the finger.

The ſame letter contained an account of a great inundation of water, which had lately done great damage to the city of Dublin.

Dr. PAPIN preſented to the Society his engine for the circulating of water by the rarefaction of the air; a deſcription of which is given in N° 178 of the *Philoſophical Tranſactions* [f].

Mr. HALLEY ſhewed an experiment, whereby the evacuation of the lake of Zirknitz and its ſudden filling again were exemplified. He took two baſins, and placed them one higher than the other, and ordered them ſo as to communicate by pipes placed at different hights, ſo that the water ran out of the upper, when it was full, much faſter than when it was in part empty: and the under baſin had only one pipe to let out the water, which it received from the upper, not large enough to emit all that came, when the upper was kept near full: ſo that then the under baſin filled, and a third baſin put into the under, with ſeveral holes pierced in the bottom, would continue with water in it; but the water of the upper baſin decreaſing, and the communication with the under at length ceaſing, the water of the under baſin would in ſome time be drawn off, and the third baſin, with the holes in the bottom, would be left dry; very well repreſenting the manner of the repleniſhing and evacuating of the lake of Zirknitz, as deſcribed by Mr. VALVASOR.

The Society adjourned till after the Chriſtmas holidays.

[d] *Philoſoph. Tranſact.* N° 189. p. 356. for Sept. and Oct. 1687. [e] Ibid. p. 361.
[f] P. 1274 for Decemb. 1685.

End of the FOURTH VOLUME.