Evexit assurgens in altum,
Interque stellas luce donavit novâ
Stellis vel ipsis invidenda.
Illic sidereo spectator in Amphitheatro
Vidit ferarum splendida prœlia,
Iratisque coruscantes
Faucibus atque oculis rogos.
Illic serenarum pictis noctium scenis
Vidit planetas præscios cœli mimos
Humana ludentes fata,
Nunc ore risus comico futuros
Festivosque sales, atque hilares jocos,
Æthereis celebrare choris,
Nunc face lugubri radiisque pullis,
Et scelera, et cædes nepotum
Fingere materiem cothurnis.
Tandem rependit gratus hospes ætheris
Spectaculorum sideribus vices.
Mirantur astra posse mortales manus
Ditare terras æmula cœli domo.
Quin et rivalem lustrat amabilem,
Suamque cœlum deperiens imaginem,
Ut penitus speculo furatur
Jam plures oculos, et lumina plura requirit.

IV.

Quamvis hianti subtrahat popello
Modesta frontem fabrica, sicut decet
Sacro parente procreatam virginem
Non turbâ genitam promiscuâ;
Profanis subducat licet
Oculis plebis malè feriatæ
Intemerandum vultûs eximii decus;

Quale nec Etruscâ miratus victor in urbe
Negavit olim Carolus
Cuivis mortali fore fas profestâ
Luce videre;
Non illa cœli tamen intuentis
Criticum lumen fugit; ultro solem
Lynceum vocat, astraque curiosa
Centum receptat fenestris.
Ingentis populi videt capaces
Pegmatum moles attonitus Sol,
Mundi supervisor supremus,
Interque varios undique miratur foros
Tam bellam ordinis benignitatem,
Dum nulla lucem pars queratur amissam,
Tristemque pulla lugeat eclipsin.
Hic sole melius quilibet vel ipso
Et cunctos vidisse potest, cunctisque videri.

V.

Celandum nihil est, nihil tagendum;
Nullus hic error latebras requirit;
Perfecta surgit undequaque moles,
Et merito duplicis gerit ornamenta coronæ:
Quanta debitur quotuplexque WRENNO
Laurea victori, servatori civica,
Capitique decentior Architecto
Turrita Cybeles corona?
Devictam nimium diu
Oppressamque suis miserabilem ruinis
Tectonicen benignus
Artium civem reddidit urbi
Olim quæ rudibus dedit vagisque
Artibus urbem.

Wren's architectural employments increased with his fame, and he was required professionally in the sister University of Cambridge, to prepare designs for the new chapel of Pembroke College, of which his uncle, the Bishop of Ely, had been president and a great benefactor. He gave money and books to the college, and four thousand pounds for erecting the new chapel, of which his illustrious nephew was the architect. On May 13, of this year (1663) Dr. Frank, the master of the college, accompanied by the dean, archdeacon, and prebendaries of Ely, Dr. Pearson, of Trinity, and other heads of Colleges, laid the first stone of the foundation of the new chapel, in the name of Bishop Wren, which was built and finished at his sole charge *.

In spite of these numerous engagements, Wren did not neglect his beloved philosophy. About the same period with the foregoing, he was desired at a meeting of the society to acquaint Mr. Hooke with the apparatus, and progress which he had made in the experiment of hatching eggs by the equal and moderate heat of a lamp, in order to prosecute the experiment, which was said to have been so far advanced, as that thereby blood was produced in eggs †.

In the survey of the zodiac, which the society proposed this month, Lord Brouncker and Sir Robert Moray were assigned to Sagittarius; Mr. Balle, Libra; Dr. Pope and Dr. Croune, Aries; and Dr. Wren and his friend and fellow-labourer in science, Mr. Hooke, to Taurus ‡.

* From Bishop Wren's Autographum. Parentalia, p. 52.
† Birch's Hist. Roy. Soc. Vol. I. p. 233. ‡ Ibid.

The king* having expressed his intention of visiting the society, a meeting of the council was held on July 1, when, among other resolutions passed, it was ordered, that the council do again meet on the Monday following, at three o'clock, to consider of experiments proper for his majesty's reception; and that Colonel Long, Dr. Christopher Wren, and Mr. Hooke, be desired to meet with them on this occasion †.

At this meeting (Monday, July 6,) the council, consisting of Lord Brouncker, president, Drs. Wilkins, Goddard, and Clarke, Messrs. Neile, Aerskine, Slingesby, Balle, Evelyn, Palmer, Hill, and Oldenburgh, together with, says the original register of the society ‡, Colonel Long, Dr. Christopher Wren, and Mr. Hooke. They took the circumstance of the king's proposed visit, and the best mode of providing suitable entertainment for his majesty, into consideration, and ordered, that Mr. Hooke and the operator should so prepare the compressing engine that it might not fail in the trying of experiments therein: and that the operator take care to have the long tubes set up against the Monday following. Colonel Long promised to bring his apparatus of insects, some snake's eggs, his collection of curious stones, among which were some with natural screws; some ermines and lizards, natives of England; as also some exotic beasts' skins.

"Dr. Christopher Wren promised to think upon some experiments proper for the purpose, and to send them from Oxford to the president. He mentioned the turning glass thermometer, with an index, left with Dr. Goddard §."

* Charles II. † Birch's Hist. Roy. Soc. Vol. I. p. 268.
‡ Vol. II. p. 249. § Birch's Hist. Roy. Soc. Vol. I. p. 271.

This promise led to the following letter from him to Lord Brouncker, the president.

" Oxford, July 30*, 1663.

" My Lord,

" The act and noise of Oxford being over, I retired to myself as speedily as I could, to obey your lordship, and contribute something to the collection of experiments designed by the society for his majesty's reception. I concluded on something which I thought most suitable for such an occasion; but the stupidity of our artists here makes the apparatus so tedious, that I foresee I shall not be able to bring it to any thing ere I am necessitated to take a journey, which I am unavoidably tied to. What in the meanwhile to suggest to your lordship I cannot guess. The solemnity of the occasion, and my solicitude for the honour of the society, make me think nothing proper, nothing remarkable enough. It is not every year will produce such a master-experiment as the Torricellian, and so fruitful as that is of new experiments; and, therefore, the society have deservedly spent much time upon that and its offspring: and if you have any notable experiment that may appear to open new light into the principles of philosophy, nothing would better beseem the pretensions of the society; though possibly such would be too jejune for this purpose, in which there ought to be something of pomp. On the other side, to produce knacks only, and things to raise wonder, such as Kircher, Scholtus, and even jugglers abound with, will scarce become

* Parentalia erroneously calls this July 30, 1661.

the gravity of the occasion. It must therefore be something between both, luciferous in philosophy, and yet whose use and advantage is obvious without a lecture; and besides that, may surprise with some unexpected effect, and be commendable for the ingenuity of the contrivance. Half a dozen experiments, thus qualified, will be abundantly enough for an hour's entertainment; and I cannot believe the society can want them, if they look back into their own store. For myself, I must profess freely, I have not any thing by me suitable to the idea I have of what ought to be performed upon this occasion. Geometrical problems and new lines, new methods (how useful soever) will be but tasteless in a transient show. New theories, or observations, or astronomical instruments (either for observation or facilitation of the calculi) are valuable to such artists only as have particularly experimented the defects that these things pretend to supply. Sciographical knacks (of which an hundred sorts may be given) are so easy in the inventions, that now they are cheap. Scenographical, catoptrical, and dioptrical tricks require excellent painting, as well as geometrical truth in profile, or else they deceive not. Designs of engines for ease of labour, or promoting any thing in agriculture or the mechanic trades, I have occasionally thought upon divers; but they are not intelligible without letters and references, and often not without demonstration.

"Designs in architecture are only considerable as they are appropriated to some work in hand, or else, as they are a kind of criticism and search into antiquity. In navigation, it will be presumptuous to proffer at any thing, while we expect from your

lordship an accurate theory, from the times of Noah unknown, and reserved for your lordship, a second great endeavour of human nature. The needle had possibly more of chance than invention; yet that gave us a new world. This will be the product of reason and philosophy, and may give us the undiscovered parts of our globe. In the few chemical experiments I have been acquainted with, I cannot tell whether there will be any, that will not prove too dirty or tedious for an entertainment. Experiments of anatomy, though of the most value for their use, are sordid and noisome to all but those whose desire of knowledge persuadeth them to digest them. Experiments for the establishment of natural philosophy are seldom pompous; it is upon billiards and tennis-balls, upon the purling of sticks and tops, upon a vial of water or wedge of glass, that the great Des Cartes hath built the most refined and accurate theories that human wit ever reached to; and certainly nature, in the best of her works, is apparent enough in obvious things, were they but curiously observed; and the key that opens treasures is often plain and rusty; but unless it be gilt, the key alone will make no show at court.

"If I have been conversant in philosophical things, it hath been principally in these ways, which I have recounted to your lordship, by which your lordship perceiveth how useless I am for this occasion. Yet if your lordship will still pursue me, I know not what shift to make, but to retire back to something I have formerly produced or discoursed of.

"I have pleased myself not a little with the play of the weather-wheel, (the only true way to measure the expansions of

the air) and I fancy it must needs give others satisfaction, if it were once firmly made, which I suppose may be done, if the circular pipes, which cannot be truly blown in glass, were made of brass, by those who make trumpets and sackbuts (who wire-draw their pipes through a hole to equal them, and then filling them with melted lead, turn them into what flextures they please); but the inside of the pipe must be varnished with china varnish, (which GRATERIX hath) to preserve it from the quicksilver; and the glasses must be fixed to the pipe with varnish, which I take to be the best cement in the world; for thus the Chinese fix glass and mother of pearl in their work. It would be no unpleasing spectacle to see a man live without new air as long as you please. A description for cooling and percolating the air at once, I formerly showed the society, and left with Mr. BOYLE: I suppose it worth putting in practice. You will at least learn thus much from it, that something else in air is requisite for life, than that it should be cool only, and free from the fuliginous vapours and moisture it was infected with in expiration; for all these will, in probability, be separated in the circulation of the breath in the engine. If nitrous fumes be found requisite (as I suspect) ways may perhaps be found to supply that too, by placing some benign chymical spirits, that, by fuming, may impregnate the air within the vessel.

"If an artificial eye were truly and dioptrically made, (which I would have at least three inches diameter), it would represent the picture as nature points it. The cornea and crystalline must be glass; the other humours water. I once surveyed an horse's eye as exactly as I could, measuring what the diameters of the

several spheres of the humours were, and what the proportions of the distances of the centres of every spherical superificies was upon the axis of the eye. The ways by which I did it are too long to rehearse, but the projection is triple the magnitude. Sir Paul Neile may possibly find out: or, if your lordship think it worth while, I shall reiterate the experiment.

"A needle, that would play in a coach, will be as needful to know the coast and the way, (joined with the way-wirer) as a pleasant diversion to the traveller; and would be an acceptable present to his majesty, who might thus, as it were, sail by land. The fabric of it may be such as this: in a sphere of glass of two inches diameter, half full of water, cause a short broad heavy needle to swim, being buoyed up by the chart, and both varnished. Instead of a cap and pin, let the perforated needle play about a small wire or horse-hair, extended like a perpendicular axis in the glass sphere; which being made weighty with lead, fixed to the nadir, and an horizon as it were cemented to it, let it play in circles like the vulgar compass. Then let an hemispherical concave box, containing the sphere in its circle, be hung upon strings after this manner: suppose a basis, upon which are erected three stiff wooden springs of yew; from the ends of which springs are strings or neives strained, forming an equilateral triangle, the middle of whose sides pass through three small loops on the brim of the concave, which therefore, hanging on the lutestrings, represents a circle inscribed in a triangle: from the middle of the brass ariseth a worm-spring, fastened by a spring to the nadir of the concave, drawing it down a little, and acting against the other three springs. Thus I suppose the springs will take

off much of the lateral and perpendicular concussions; the circles will take off oscillations; the agitations remaining will be spent in the water, and stilled by the chart covering the superficies of the water; for thus we see a trencher swimming in a bucket, keeps the water from spilling in the carriage; and the Chinese, instead of circles, have their compass swimming in water. Lastly, I would have all the bottom of the basis, near the edge, made like a brush, but with soft, thick, and inclining bristles, which will ease it like a thousand springs. It should be placed on the middle of the floor of the coach, where, by opening a window, you may likewise see the way-wirer placed on the perch.

"My lord, if my first designs had been perfect, I had not troubled your lordship with so much scribble, but with something performed and done; but being taken off by my occasions, I had rather be impertinent than disobedient, and am fain in this letter to do like the common chemist, who, when projection (his fugitive darling) hath left him threadbare, is fain to fall to vulgar preparations to pay his debts. And I must needs acknowledge, I am not only indebted to the society, but most part to your lordship, to whom I owe a double duty, both as to our president, and to my very good lord and patron.

"CHR. WREN*."

Wren continued his residence at Oxford for the rest of this

* Letter Book of the Royal Society, Vol. I. p. 97. Birch's Hist. Roy. Soc. Vol. I. p. 288, et seq.

year, pursuing his studies, his experiments, and his buildings, both at Oxford and at Cambridge*.

The barometer and its phænomena engaged much of his attention, as well as that of his scientific colleagues in London. At a meeting of the Royal Society on the 16th of September, his experiments on the changes of the weather being a portion of the discussions, Dr. Wilkins was desired to write to him for his scheme and description of the instrument†. At another meeting of the society Mr. Hooke was desired to lodge some days in Gresham College, to direct the operator in many experiments then under consideration, and to perfect Dr. Wren's new kind of thermometer, with two round glasses, and quicksilver in them‡.

Among these numerous and important avocations, Wren yet found leisure to assist his friend Dr. Thomas Willis, the grandfather of the eminent antiquary, Browne Willis, in his anatomical description and elucidations of the brain. The portion undertaken by Wren was the accurate drawings from which the plates were engraved of that celebrated work§.

* The Sheldonian theatre at Oxford, and the chapel of Pembroke Hall, Cambridge.

† Birch's Hist. Roy. Soc. Vol. I. p. 304. ‡ Ibid. p. 315.

§ Ath. Ox. Vol. II., &c.

1663. Clarissimo ac eruditissimo viro Doctori Tho. Willis, suppetias attulit in opere suo celeberrimo, *cerebri anatome*, utpote qui dissertationibus istis interesse, et circa partium usus rationes conferre solebat: qui insuper plurimas cerebri et calvariæ figuras, quo exactiores essent operæ, eruditissimis suis manibus delineare non fuit gravatus.—*Willis*, Anatome Cerebri; *Wren*, MSS.

The physiological opinions of Dr. Willis* upon the brain, are replete with the reveries of the chemical philosophy of his day. The anatomical descriptions are good, and the drawings accurate. He appears to have had some notions of the modern quackery of phrenology, or craniology, and lodges common sense in the corpus striatum of the brain, imagination in the corpus callosum, and memory in the cineritious matter which encom-

* This illustrious English physician was, as well as Wren, a Wiltshire man, being born at Great Bedwin, in that county, Jan. 27, 1621. He received the elements of his education at a noted grammar-school kept by Mr. Edward Sylvester, in All Saints, Oxford, and became a member of Christ Church in 1636. He took his bachelor's degree in 1639, and that of master in 1642. When Oxford was turned into a garrison for the king, he, with other scholars, bore arms in the royal army, and devoted his leisure to physic, in which faculty he took a bachelor's degree in 1646, when Oxford was surrendered to the parliamentary forces. In 1660 he was appointed Sedleian professor of natural philosophy, and took in the same year the degree of Doctor of Physic. He discovered the celebrated medicinal spring at Alstrop, near Brackley, of which his contemporary Aubrey gives the following account. "About 1657, riding towards Brackley to a patient, his way led him through Alstrop, where he observed the stones in the little rill were discoloured of a kind of crocus martis colour; thought he, this may be an indication of iron: he gets galls, and puts some of the powder into the water, and immediately it turned blackish; then said he, 'I'll not send my patients now so far as Tunbridge;' and so in a short time brought these waters into vogue, and hath enriched a poor obscure village †." Dr. Willis was one of the first members of the Royal Society, and soon made his name as illustrious by his writings, as it was already by his practice. He died Nov. 11, 1675, and was buried among the illustrious dead in Westminster Abbey.

† Aubrey's MSS. Vol. II. p. 585.

passes the medullary. Dr. Willis was assisted in this work by Dr. Wren, Dr. Millington, and other scientific friends *.

The progress of intellect in Europe was now in full march. This year is celebrated for the establishment of the Royal Academy of Belles Lettres and Inscriptions at Paris†, for the founding of the colony at Carolina, and for Prussia's declaring itself independent of Poland. The Royal Society of London was increasing in fame, and the learned of all nations sought and were proud of its notice. Communications were sent from the Montmorian ‡

* Præter suppetias ab hujus manu (Doctoris Lower) in dissecando peritissima allatas, celare non decet, quantas insuper acceperim a viris clarissimis, domino Tho. Millington, M. D., necnon a domino CHRISTOPHORO WREN, L.L.D., et astronomiæ professore Saviliano; qui utrique dissectionibus nostris crebrò interesse, et circà partium usus rationes conferre solebant. Porrò prior ille vir doctissimus, cui privatò observationes meas, et conjecturas, de die in diem proponebam, me animo incertum, et propriæ sententiæ minùs fidentem, suffragiis suis sæpè confirmabat. Ceterùm alter vir insignissimus Doctor Wren, pro singulari quâ pollet humanitate, plurimas cerebri et calvariæ figuras, quo exactiores essent operæ, eruditissimis suis manibus delineare non fuit gravatus.—*Willis*, Anatome Cerebri, præfatio, Lond. 1664.

† This celebrated academy was established by Louis XIV. in the month of February, 1663. It was at first composed of only four or five members, whose duty it was to write inscriptions, invent designs and legends of medals, casts, and other monuments, to the glory of the king and the illustrious men of France. Among its principal publications is the Medallic History of Louis XIV., a work as celebrated for the beauty of its designs and execution, as it is for the egregious vanity of the self-called Grand Monarque, whose weakness it flatters.

‡ Birch's Hist. Roy. Soc. Vol. I. p. 317.