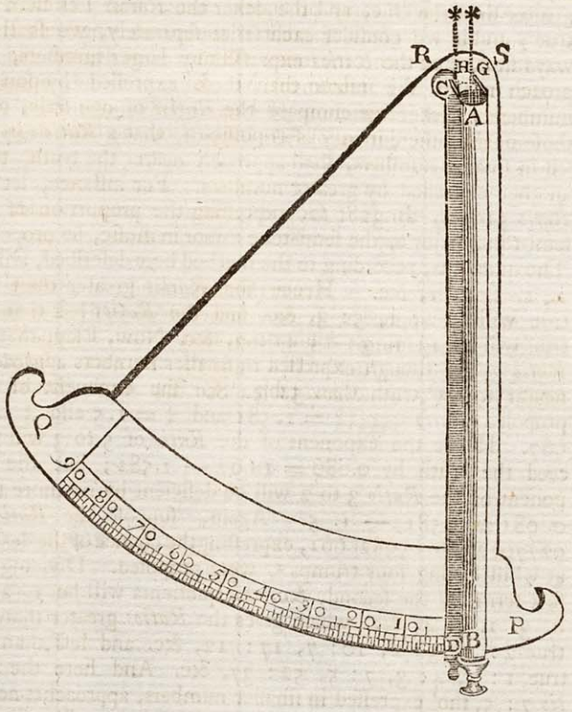
Q.

QUADRANT *(Cycl.)* — *Davis*'s QUDDRANT. When the horizon is obſcured by hazy weather, *Davis*'s *Quadrant* is of no uſe; and this often occaſions melancholy conſequences. Means have therefore been ſought after to remedy this defect. Mr. Leigh propoſes a water-level to be fixed to the *Quadrant*; and he likewiſe has given the deſcription and uſe of an apparatus to be added to this inſtrument, conſiſting of a mercurial level, which he prefers, no doubt juſtly, to a water-level. See Phil. Tranſ. N° 431. Sect. 1 and 2.

Hadley's QUADRANT, the common name for the juſtly eſteemed *Quadrant*, invented by the late John Hadley, Eſq; This *Quadrant*, which at firſt had the fate of all other ingenious inventions, to be neglected by ignorant and obſtinate men, even though highly uſeful to them in their profeſſion, ſeems at laſt to have made its way, in ſpite of habit and prejudice.

We cannot here inſert a full deſcription and draught of this inſtrument; but we muſt obſerve, that though the late Mr. Hadley was undoubtedly the inventor of it, yet the principle upon which his invention turns, had not eſcaped the ſagacity of Sir Iſaac Newton, long before, as appears from a paper in his hand-writing found among the papers of the late Dr. Halley. But this was totally unknown to Mr. Hadley, and ſeemed to have been forgot by Dr. Halley himſelf. The account of Sir Iſaac's invention is inſerted in the Philoſophical Tranſactions, N° 465, and in Dr. Martyn's Abridgment, vol. 8. p. 129. and is as follows:



P Q R S denotes a plate of braſs accurately divided in the limb D Q, into $\frac{1}{2}$ degrees, $\frac{1}{2}$ minutes, and $\frac{1}{12}$ minutes, by a diagonal ſcale; and the $\frac{1}{2}$ degrees, $\frac{1}{2}$ minutes, and $\frac{1}{12}$ minutes, counted for degrees, minutes, and $\frac{1}{6}$ minutes. A B is a teleſcope, three or four feet long, fixed on the edge of the braſs plate. G is a ſpeculum, fixed on the ſaid braſs plate perpendicularly, as near as may be to the object glaſs of the teleſcope, ſo as to be inclined 45 degrees to the axis of the teleſcope, and intercept half the light which would otherwiſe come through the teleſcope to the eye. C D is a moveable index, turning about the center C, and, with its fiducial edge, ſhewing the degrees, minutes, and $\frac{1}{6}$ minutes, on the limb of the braſs plate P Q; the center C, muſt be over-againſt the middle of the ſpeculum G. H is another ſpeculum, parallel to the former, when the fiducial edge of the index falls on $00^d\ 00'\ 00''$; ſo that the ſame ſtar may then appear through the teleſcope, in one and the ſame place, both by the direct rays and by the reflected ones; but if the index be turned, the ſtar will appear in two places, whoſe diſtance is ſhewed, on the braſs limb, by the index.

By this inſtrument the diſtance of the moon from any fixed ſtar is thus obſerved: view the ſtar through the perſpicil by the direct light, and the moon by the reflected (or, on the contrary) and turn the index till the ſtar touch the limb of the moon, and the index ſhall ſhew upon the braſs limb of the inſtrument, the diſtance of the ſtar from the limb of the moon; and though the inſtrument ſhake, by the motion of your ſhip at ſea, yet the moon and ſtar will move together, as if they did really touch one another in the heavens; ſo that an obſervation may be made as exactly at ſea as at land. And, by the ſame inſtrument may be obſerved, exactly, the altitudes of the moon and ſtars, by bringing them to the horizon; and thereby the latitude, and times of obſervations, may be determined more exactly than by ways formerly practiſed. In the time of obſervation, if the inſtrument move angularly about the axis of the teleſcope, the ſtar will move in a tangent of the moon's limb, or of the horizon; but the obſervation may notwithſtanding be made exactly, by noting when the line, deſcribed by the ſtar, is a tangent to the moon's limb, or to the horizon. To make this inſtrument uſeful, the teleſcope ought to take in a large angle: And to make the obſervation true, let the ſtar touch the moon's limb, not on the outſide of the limb, but on the inſide. Vid. Philoſoph. Tranſact. N° 465. p. 155, 156.

For the common uſes at ſea a teleſcope is not neceſſary; Mr. Hadley's Quadrants are therefore generally made without one, which renders the uſe of them much more ready. He has alſo added ſome contrivances to facilitate their uſe; which are deſcribed in the printed papers uſually ſold with the inſtrument: Other *Quadrants* have been contrived ſince, by ſome ingenious artiſts, all of which have their merit, but the particulars of their conſtructions are too many for this place; and perhaps on the whole nothing preferable to Mr. Hadley's invention has yet been found.

Mural QUADRANT. Mr. Gerſten has lately given us a deſcription of a new aſtronomical *mural Quadrant*, which he ſays is free from many of the uſual inconveniencies attending the uſe of ſuch inſtruments. See Phil. Tranſ. N° 483. Sect. 18.

QUADRIGA, in ſurgery, otherwiſe called CATAPHRACTA, is a ſtrong bandage made uſe of in fractures of the *Sternum*. It is compoſed of a double headed roller about ſix Paris ells long, and three or four fingers broad. See *Heiſter*'s Surgery, P. III. Ch. 4. §. 14.

QUADRILLE, a well known game at cards; and which has been, in ſeveral caſes, the object of mathematical computations. See Mr. *De Moivre*'s Doctrine of Chances, 2d edit. p. 83 to 90.

QUAKING-*graſs*, in botany. See the article GRASS, *Append.*

QUANTITY *(Cycl.)* — The note in the Cyclopædia, from Mr. Machin's paper in the Phil. Tranſ. N° 447. ſhould have been extended, as it ſerves to render the notions of mathematical *Quantity* more diſtinct and adequate than any thing that is commonly to be met with in authors on this ſubject. Not to give the reader the trouble of turning to the Cyclopædia for the ſake of a few lines, we ſhall inſert the whole. Mr. Machin, in the poſtſcript to the ſolution of Kepler's problem, inſerted in the before cited number of the Phil. Tranſ. ſays,

That he takes a mathematical *Quantity*, and that for which any ſymbol is put, to be nothing elſe but number with regard to ſome meaſure which is conſidered as one. For we cannot know preciſely and determinately, that is, mathematically, how much any thing is but by means of number. The notion of continued *Quantity*, without regard to any meaſure, is indiſtinct and confuſed; and although ſome ſpecies of ſuch *Quantity*, conſidered phyſically, may be deſcribed by motion, as lines by points, and ſurfaces by lines, and ſo on; yet the magnitudes or mathematical *Quantities* are not made by that motion, but by numbering according to a meaſure.

Accordingly, all the ſeveral notations that are found neceſſary to expreſs the formations of *Quantities*, do refer to ſome office or property of number or meaſure; but none can be interpreted to ſignify continued *Quantity* as ſuch.

Thus ſome notations are found requiſite to expreſs number in its ordinal capacity, or the *numerus numerans*, as when one follows or precedes another, in the firſt, ſecond, or third place from that upon which it depends; as the *Quantities* $x^{\prime}$, $x^{\prime\prime}$, x, x', x'', referring to the principal one x.

So, in many caſes, a notation is found neceſſary to be given to a meaſure as a meaſure; as for inſtance, Sir Iſaac Newton's ſymbol for a fluxion $\dot{x}$; for this ſtands for a meaſure of ſome kind, and accordingly he uſually puts an unit for it, if it be the principal one upon which the reſt depend.

So ſome notations are expreſly to ſhew a number in the form of its compoſition, as the index to the geometrical power x^n, denoting the number of equal factors which go to the compoſition of it, or what is analogous to ſuch.

But that there is no ſymbol or notation but what refers to diſcreet *Quantity*, is manifeſt from the operations, which are all arithmetical.

And hence it is, there are ſo many ſpecies of mathematical *Quantity* as there are forms of compoſite numbers, or ways in the compoſition of them; among which there are two more eminent for their ſimplicity and univerſality than the reſt; one is the *geometrical power*, formed from a conſtant root; and the other, though well known, yet wanting a name, as well

well as a notation, may be called the *arithmetical power*; or the power of a root uniformly increasing or diminishing. This is the Power whose notation is designed in the article *Arithmetical* POWER, *Append.*

QUARTER *(Cycl.* and *Suppl.)* — QUARTER-*round*, in architecture, denotes any moulding whose contour is either a perfect quadrant, or *Quarter* of a circle, or that approaches near to that figure. Build. Dict. in voc.

QUARTERS, — *Winter*-QUARTERS, in military affairs. *Winter-Quarters*, when cold and moist, are productive of inflammatory disorders, particularly hard coughs, with inflammations of the pleura and lungs. See the article BARRACKS, *Append.*

In very hot countries it has sometimes been customary, to put armies into *Summers quarters.*

QUEEN'S *Gilliflower*, the name by which some call the *Hesperis* of botanical writers. See the article HESPERIS, *Suppl.*

QUICK, the name by which some call a species of *Mespilus*, or medlar. See the article MESPILUS, *Suppl.*

QUICK-*beam*, a name sometimes given to the *Sorbus*, or service-tree. See the article SORBUS, *Suppl.*

QUICK-*grass*, the English name of a genus of plants, called by Linnæus *Agrostis*. See the article AGROSTIS, *Suppl.*

QUICKEN-*tree*, a name also given to the *Sorbus*.

QUICKSILVER-*water*. See the article WATER, *Append.*

R.

RAR

RADICULA, in botany, the name by which Dillenius calls the *Sisymbrium* of other botanists. See the article SISYMBRIUM, *Suppl.*

RADISH *(Suppl.)* *Horse*-RADISH, a popular name for a species of *Cochlearia*, or scurvy grass. See the article COCHLEARIA, *Suppl.*

Water-RADISH, the name by which several species of *Sisymbrium* are sometimes called. See the article SISYMBRIUM, *Suppl.*

RADIUS *of Concavity*, in geometry, is sometimes used [a] for the *Radius* or ray of curvature, or the *Radius* of the osculatory circle. See the article CURVATURE, *Append.* [[a] De Moivre, Miscel. Analyt. p. 231.]

RADIUS *of Curvature*, in geometry. See the article CURVATURE.

RADIUS *Osculi* is also used in the same sense.

RADIUS *Vector*, in mechanics, is used for a right line drawn from the center of force in any curve in which a body is supposed to move by a centripetal force, to that point of the curve where the body is supposed to be. See the article *Central* FORCE, *Append.*

RAGGED *Robin*, a name used sometimes for the *Lychnis*. See the article LYCHNIS, *Suppl.*

RAIN *(Suppl.)* — Besides the causes of rain mentioned in the Cyclopædia, Desaguliers thinks it owing to the loss of electricity in the vapours whereof the clouds are formed. See the articles VAPOUR and ELECTRICITY, *Append.*

RAISING *Pieces*, in carpentry, the pieces which lie on the tops of the posts and punchions, and under the beams; those lying on the brick work being called platbands. Build. Dict. in voc.

RAMMER *for piles*. See the article PILE, *Append.*

RAMPHASTOS, in ornithology, the name by which Dr. Hill calls the *Toucan* of other writers. See the article TOUCAN, *Suppl.*

The *Ramphastos* is a distinct genus of birds, of the *Pica*, or magpie kind. Its beak is remarkably large, equal, in most species to the whole body in magnitude. There are no visible nostrils. The feet have each four toes, two of which stand forward, and the other two backward, as in the parrot. *Hill*, Hist Anim. p. 381. The species are these: 1. The *Ramphastos* with a red rump 2. The *Ramphastos* with a yellow rump. 3. The *Ramphastos* with a white rump. 4. The green *Ramphastos*, with a party-coloured beak.

These birds have been called by Linnæus, and other writers, *Rostratæ*, from the largeness of their beaks.

RAMPION is also a name given to the blue-flowered *Campanula*, or bell-flower, with an esculent root. See the article CAMPANULA, *Suppl.*

RAMSONS, a name given to the broad-leaved wild *Allium*, or Garlick. See the article GARLICK, *Suppl.*

RANGLE, in falconry, is when gravel is given a hawk to bring her to her stomach. Dict. Rust. in voc.

RANUNCULUS *(Suppl.)* — *Globe*-RANUNCULUS, a name sometimes given to a species of *Hellebore*. See the article HELLEBORUS, *Suppl.*

RAPE, a name sometimes used for the *Napus*, or navew. See the article NAPUS, *Suppl.*

Wild-RAPE, the English name of a genus of plants, called by botanists *Rapistrum*. See the articles RAPISTRUM, *Suppl.*

RAPHIDIA, in the history of insects, the name by which Dr. Hill calls a genus of four-winged flies, of the neuroptera-kind. See the article NEUROPTERA, *Append.*

The head of the *Raphidia* is of a horny substance, and is depressed. The tail is armed with a weapon of a slender form, sharp, horny, and simple, not bisid at the extremity. *Hill*, Hist. Anim. p. 70.

RARATAS, in botany, the name by which Plumier calls

REE

the *Ananas*, or pine-apple of Tournefort. See the article ANANAS, *Suppl.*

RAT *(Suppl.)* — *Mountain*-RAT, the English name of a creature, otherwise called the *Marmotte*. See the article MARMOTTE, *Suppl.*

RATIO *(Suppl.)* — It is to be observed, that in this article of the Supplement the method described of inserting secondary *Ratios*, gives two series, the one containing the *Ratios* greater than the true, and the other the *Ratios* less than the true; and if we consider each series separately, we shall always find, that the *Ratios* expressed by larger numbers, approach nearer the truth than those expressed by smaller numbers. But if we compare the *Ratios* of one series with those of the other, it may often happen, that a *Ratio* expressed in smaller numbers, shall approach nearer the truth, than another expressed by greater numbers. For instance, let the *Ratio* 519529 to 328612, expressing the proportion of the semi-tone major to the semi-tone minor in music, be proposed. The quotients, according to the method here described, will be 1. 1. 1. 2. 1, &c. Hence the *Ratios* greater than the true will be 2: 1, 5: 3, &c. and the *Ratios* less than the true will be 1: 1, 3: 2; 11: 7, &c. Now, I say, that the *Ratio* 3: 2, though expressed in smaller numbers approaches nearer to the truth than 5: 3; for the exponent of the proposed *Ratio* $\frac{5}{3}\frac{1}{2}\frac{9}{8}\frac{5}{6}\frac{2}{1}\frac{9}{2} = 1.581$ and $\frac{3}{2} = 1.5$ also $\frac{5}{3} = 1.667$. Hence the exponent of the *Ratio* of 5 to 3 will exceed the truth by $0.086 = 1.667 - 1.581$; but the exponent of the *Ratio* 3 to 2 will be deficient by no more than $0.081 = 1.581 - 1.5$. Again, suppose the *Ratio* of 927707238 to 659826661, expressing the chance of the dealer's at whist having four trumps [a], were proposed. Dividing the first term by the second, &c. the quotients will be 1. 2. 2. 6. 3. 1. 1. 4, &c. which gives the *Ratios* greater than the true 2: 1, 3: 2, 10: 7, 17: 12, &c. and less than the true 1: 1, 4: 3, 7: 5, 52: 37, &c. And here the *Ratio* 7: 5, tho' expressed in smaller numbers, approaches nearer to the truth, than either 10: 7, or 17: 12, as will easily appear by reducing their exponents to decimals, But no inconveniencies of this kind can happen, if we content ourselves with the principal and primary *Ratios*, they being alternately greater and less, and continually approaching nearer to the truth. — [[a] See the article WHIST, *Append.*]

RATTLE-*grass*, a name sometimes used for a species of *Pedicularis*, or Louse-wort. See the article PEDICULARIS, *Suppl.*

RATTLE-*net*. See the article WOLF-*net*, *Suppl.*

RATTLE-*snake-root*, in botany, a name sometimes used for the *Polygala*, or Milk-wort. See the article POLYGALA, *Suppl.*

RAVEN *(Suppl.)* — *Indian*-RAVEN, the English name of the *Buceros*. See the articles BUCEROS, *Append.* and CORVUS-*Indicus*, *Suppl.*

RAY, in geometry, is often used for *Radius*.

RAY *of Curvature*. See the article CURVATURE.

RAZOR-*fish*, is a name frequently given to a species of *Coryphæna*, otherwise called *Novacula piscis*. See the articles CORYPHÆNA and NOVACULA, *Suppl.*

REBUS *(Suppl.)* — REBUS, in heraldry, a coat of arms which bears an allusion to the name of the person; as three castles, for Castleton; three cups, for Butler, three conies, for Conisby; a kind of bearings which are of great antiquity.

RED-*breast*, in ornithology, the English name of a species of *Motacilla*, called also *Rubecula* and *Erithacus*. See the articles MOTACILLA and RUBECULA, *Suppl.*

REED *(Suppl.)* — *Indian flowering* REED, the name by which the *Canna* of botanists is sometimes called. See the article CANNA, *Suppl.*