

towards the middle of the Belt. From 9 a clock 5 minutes and 40 seconds, untill 9 a clock and 8 minutes, they saw it in the midst of the Belt. At 9 a clock and 15 minutes it was passed the middle, and was come nearer to the Occidental limb. And a little after the Heavens being over cast, he could then observe it no further.

This Observation being taken for the *Epocha*, it is easie to find hereafter the times, when this Spot shall return to the midst of the Belt. For you are only to add alwaies 9 hours and 56 minutes, and, for greater preciseness's sake, not to omit the ordinary Equation of days, that depends from the inequality of the motion of the Sun in respect of the Equinoctial, nor the particular Equation, that depends from the inequality of the motion of *Jupiter* according to the diversity of the distance of the Sun and his Apogee.

This Revolution being the swiftest and the most regular that is hitherto known in the Heavens, a Travellour alone, even without having any correspondence with other Observers, may make use of it to find the *Longitudes* of the most remote places of the Earth. We shall hereafter examine, to what preciseness we may arrive by this way.

Observations of a New Comet, made at Paris in the Royal Observatory by Signor Cassini.

Here now appears a Comet, which seems to be near the end of his Appearance, and which might have been seen above a month since, if the weather had been favourable. But he being very small, and having been a long while observed by the beams of the Sun, to which he was nigh, and afterwards by the Moon, which was greatly advanced in her light, besides that the Heavens in these parts have often been over-cast, we have not observed him but lately.

The Mathematicians of *la Fleche* perceived him from the 16 of March, and gave us here at *Paris* the first notice of it. Those of the College of *Clermont* being advertised of it, saw him the 25th of the same month. And upon notice given of it to the *R. Academy of the Sciences* by *P. Pardies*, Professor of the Mathematicks in the College of *Clermont*, Signor *Cassini* hath ever since been observing him as much as the weather did permit

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March 26. h. 7 $\frac{1}{2}$. in the evening, he saw him between the Head of *Medusa* and the *Pleiades*; without a Telescope he appeared no otherwise than a Star of the third magnitude. He appeared bigger by Telescopes, and surpassed much the Stars of the first magnitude; but he was very dark, as if it had been nothing but a small whitish cloud, and we could hardly perceive him, when we held a light to the throats of our Telescopes applied to the instruments, instead of *Sights*, for to observe with greater preciseness.

His *Head*, seen with a Telescope of 17 foot, appeared almost round; but it was well defined, and distinguish'd from the mistiness, which formed a kind of chevelure, wherewith it was encompassed; and even the middle was a little confused, and seem'd to have inequalities, as are seen in clouds.

The *Tail*, which is principally that which distinguisheth Comets from Stars, was almost imperceptible; yet by the Telescope it was seen turned opposite to the Sun, and it appeared of the length of two diameters of the Head or thereabout: For it was not easie, to measure it precisely, because being thinner according as it was farther from the Head, its extremity was insensibly lost. And so the whole Comet, Head, Tail, and Chevelure taken altogether, took up no more than 3 or 4 minutes of a degree.

H. 7. 4 S'. he was in a streight line with the *Lucida* in the Head of *Meduse*, and with the most Occidental one of the *Pleiades*; and above the two clearest Stars of the Southern foot of *Pegasus*; so that a streight line, drawn through these two Stars, did almost touch the Southern extremity of his Chevelure. This place of the Comet, transferred upon the Map of the Fixt Stars, fell precisely enough upon 23°. 25'. of the sign of *Taurus*, in 14 degrees of Northern Latitude. Mean time, we were fain to content our selves with determining after this manner the place of the Comet, because of the difficulty we found to see him by the Instruments, when the light was held to them, as was said above.

With a Telescope of 3 foot, we saw near the Comet two small Stars, distant one diameter of the Sun from one another, which stars are not in the Cata'ogues. The Comet was in a manner between those two stars, and little by little he approached to the streight line, drawn from the one to the other. Signor *Cassini* waited the time of its being precisely in this streight line; which hapned at h. 9. 15': and then he found, that he was not exactly in the middle of these two stars, and that his center was a little higher to that, which was west-ward: But h. 9. 33'. he was equally distant from them.

them both. This Observation was made on purpose to know the *parallax* of the Comet, if happily some other Observer shall have observed him in a remote Country: whence it may be judged, how far he was distant from the Earth. It was taken notice of, that from h. 8. 5". of the evening, until h. 10. 26'. he made, in respect of these two stars, an oblique motion sensible enough, going from North to South in the same time that he advanced from West to East.

Besides these two Stars, there were on the North of the Comet three other small ones, equally distant from one another, and placed in a straight line; and West-ward we saw a fourth beneath the Head of the Comet, from which she was distant about two diameters of the Comet. These 4 last Stars were so small, that we could not see them, even with a three foot Telescope; but we easily distinguish't them with one of 17 feet.

The Clouds hid the Comet about h. 10. at night, and they also kept us from seeing him the next night of March 27.

March 28. h. 7. 42'. in the evening the Comet was distant from the less bright star of the Southern foot of *Persæus*, no more than about 24'. westward. He had almost the same Latitude with this Star; so that he was precisely enough at 26. deg. 8' of the sign of *Taurus*, and in the latit. of 12 deg. 8'. We tried to take the distance of the Comet to the most remote fixt stars; but we found great difficulty in it: for we saw the Comet not distinctly enough by the Telescopes applied to the Instruments, when we held a light to the threads; and besides, there was a very rough wind, which did exceedingly discommode the Observers.

Yet notwithstanding, h. 8. 14'. we took, as well as we could, the distance of the Comet to the Star in the Eye of *Taurus* called *Aldebaran*, and we found, that this distance was of 19. deg. 38': And h. 8. 29'. the distance of the Comet to the Star, called *Capella*, was found to be of 22. deg. 32'. When we were preparing our selves to verify these distances, the clouds covering the heavens interrupted the observation.

The same evening, when we beheld the Comet with Telescopes, we saw about his head a chevelure of an almost equal length, without being able clearly to distinguish his tail opposite to the Sun. 'Tis true, that the Air was not clear enough, and even at the place of the Comet there were some small clouds.

March 29. we could not observe, because the Sky was wholly over-cast.

March

March 30. h. 9. 35'. at night, the Comet seen without a Telescope appeared no otherwise than a Star of the 4th magnitude: through the Telescope he exceeded even those of the first; but he was very dark, and in what manner soever we looked upon him, we could observe almost no tail at all of him. He had passed one degree and an half beneath the *Lucida* of the Southern foot of *Perseus*; so that this star was exactly in the midst of the Comet and the little star of the leg of *Perseus*, marked *n* by *Bayerus*, which then we saw not but by a Telescope. A straight line, drawn from one of these stars to the other, did almost touch the Southern limb of the Comet, which being transferred upon the Map of the Fixed Stars, fell upon 28 deg. and 45'. of *Taurus*, in the Northern latit. of 9. deg. 56'.

H. 9. 45'. Signor *Cassini* compared the Comet with the less bright Star of the Southern foot of *Perseus*, near which he had been *March 28*; and he found, that the Western limb of the Comet touched a straight line, drawn through this less bright star of *Perseus*'s Southern foot, and through the most Northern of the Head of *Taurus*; but that he was already got somewhat nearer to the latter. This made him judge, that the Comet, which had left, on the North-side, all the Stars of the Southern foot of *Perseus*, would in the progress of his course leave, on the South-side, all the most Northern stars of the head of *Taurus*.

March 31. h. 8 in the evening, the Comet was in a direct line with the *Lucida* in the foot of *Perseus*, and with the most Northern in the Head of *Taurus*; but he was more than twice as much remoter from the first than the other, and being transferred upon the Map of the fixed stars, he was found at 15 minutes from *Gemini*, in the latit. of 8 deg. 49'. During the whole time that we could observe him this night, (which was till 10 a clock,) he quitted not this straight line, which was almost parallel to the horizon: notwithstanding that his own particular motion should raise him a little above it; as the parallax, on the contrary, should sink him beneath it in approaching to the horizon. It may be, there was a compensation made of these two contrary motions: possibly also the effect of both was not sensible; which ought to be examined. If it be found, that in some remote quarters the same observation have been made, the *parallax* will be determined by comparing the Observations.

April 1. the Comet could not be seen without a Telescope, because the Moon, being very near it, hid him from our sight. But
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with a Telescope only of one foot we discerned him easily enough, and found, that he had passed 45'. minutes beyond the most Northern star of the Head of *Taurus*, and that he must have touch't it, by his Southern limb; as also that he was distant one degree and 43'. from the Star that was nearest to that toward the South. This place being transferred upon the Map of the fixt stars, we found, that he was at 1. deg. and 30'. of *Gemini*, in the Northern Latit. of 7 deg. 44'.

Signor *Cassini*, having considered these two stars, observed, that the second is not less bright than the first; and yet that *Bayerus* hath not marked it, who hath made an exact enumeration of the Stars that may easily be seen with the naked eye; and that at first sight it seems, that *Tycho* hath left it out in his Catalogue. For he puts 4 stars in the place he calls *in quadrilatero cervicis*, and he speaks not of this which is the 5th, and maketh with the other four an irregular pentagone. 'Tis true, that besides these 4 stars, after he hath marked 13 others of them, he puts yet one by it self for the last, which he calls *in quadrilatero colli precedens*; as if, besides the first quadrilateral, there were yet another in the Neck of *Taurus*. Mean time there is in this place but 5 stars of the 5th magnitude, which make not a quadrilateral figure; but a pentagone, as I was just now saying.

This omission of *Bayerus*, and the denomination, which *Tycho* useth to denote these Stars, which suits not with the number nor the configuration that now appears, do administer cause to doubt, whether the Star in question be not one of those that appear from time to time; as there are two in the constellation of the *Swan*, and another in the neck of the *Whale*. We shall particularly take heed of this place of the Heavens, to clear up this doubt.

April 2. h. 8. in the even, Signor *Cassini*, having observed the Comet with a Telescope of one foot, which discovered 5 degrees, found, that he was two degrees and an half distant from the most Northern star of *Taurus*; and one degree from the star of the Ear, marked η by *Bayerus*, and by *Tycho* called *sequentis lateris Borea*.

Two lines drawn from the most Northern star of *Taurus*, one to the Comet, the other to the Star that is wanting in *Bayerus*, made a right angle; and the distance of the Comet to this angle was double to that, which is between these two Stars. This place transferred upon the Map of the fixed Stars, fell on 2 degrees and 48'. of *Gemini*, in the Northern latit. of 6. deg. and 40'.

H. 6. 50'. The line drawn through the horns of the Moon pass'd through the Star, that is at the point of the Northern horn of *Taurus*, and the distance of this Star to the Northern horn of the γ was by a Minut greater than the Semi-diameter of the Moon.

April. 3. The Sky was so cover'd, that we despair'd to observe the Comet that night: yet notwithstanding the Clouds being somewhat dispell'd h. 9. we saw him with one foot Telescope. He had pass'd over the upper Star of the Ear of *Taurus*, and he made with this Star the *basis* of an *Isoceles* triangle, on the top whereof was the inferiour Star of the Ear. The two sides of this Triangle were two times and an half bigger than the *basis*; so that the Comet was at four degrees from the sign of *Gemini*, in the Northern Latit. of 5 degr. and 38'. The clouds being almost presently return'd, we could observe no further.

April 4. The Heaven was constantly cover'd, so th at we could make no Observation at all.

April. 5. h. 8. at even, the Comet had pass'd the Northern Ear of *Taurus*, and was equally distant from the upper Star of the Northern Ear, and from that which was on the front of *Taurus*. He was also as distant from the inferior Star of the Ear of *Taurus*, as this Star is from the next West-ward, by Tycho call'd *inferior precedentis lateris quadrilateri*; and a streight line, drawn through the Comet and the upper Star of the Ear, made an almost right angle with an other line, drawn from the Comet to the inferior of the two small stars, that are above the Eye of *Taurus*. This place being carried over to the Map of the fixt stars, the Comet was found at 6. deg. 18'. of the sign of *Gemini*, in the Northern latit. of 3. deg. 41'. He was so confused this night, that even with the 17 foot Telescope we could not exactly distinguish the Head from the Chevelure, which environed him. The whole appear'd a little bigger than the disque of *Jupiter*, seen by the same Telescope.

Apr. 6. h. 8. at even, a streight line drawn from the Comet to the star that is in the front of *Taurus*, made a right angle with an other streight line drawn from this same star to the inferiour of the two that are above the Eye: And the distance of this later star to that of *Taurus* was twice the distance of the same star of the front of *Taurus* to the Comet. This place being transferr'd upon the Map of the fixt stars, the Comet was found at 7. deg. 25' of *Gemini*, in the Northern latit. of 2. deg. 45'. H. 9. 6'. we saw

on the side of the Comet a star sufficiently clear, which was not further distant from him, than a little more than the diameter of the Comet, and that was at the same height of the Horizon: which may serve to determine the *parallax*, if the same observation be made elsewhere,

April. 7. h. 9. in the evening, the Comet was equally distant from the inferior star of the Northern Ear of *Taurus*, and from the superior of the root of the Northern horn. He was also as far distant from this latter star, as this star is from that of the front. This place, being carried over to the Map of the fixt stars, fell on 8. degrees and 30'. of *Gemini*, in the Northren latit. of 1. degree and 56'. As we were preparing to observe with the great Telescope, the Heaven was clouded over.

April. 8. 9. and 10. we could make no observation at all, because of the constant dark weather.

Signor Cassini's reflections on the foregoing Observations.

All the places of the Comet, that we have observed till now, fall into a line little differing from an Arch of a great Circle, which cuts the Ecliptique in the 10th. deg. 45'. of *Gemini*, and which consequently hath its greatest latitude in the 10th. degree and 45'. of *Pisces*; which latitude is between 39. and 40. deg. Nord-ward. The same Circle cuts the *Equator* at 101. degrees of the Vernal Section East-ward, and its greatest declination from the *Equator* Nord-ward is of $38\frac{1}{2}$ degrees.

Whence it follows, that the Comet at the time of his greatest Declination, wherein it may have stay'd a considerable time, hath touch'd the horizon of those that are in the latitude of $51\frac{1}{2}$ degrees; the parallel of whom passeth through the lower part of *England*, and through *Zealand, Westphalia, Saxony, Poland* &c: And that he hath remain'd at that time all night and all day above the horizon of the most Northern people; as are those of the upper part of *England, Holland, Pomerania, &c.* But that he hath pass'd through the Zenith of the lower part of *Spain*, and through *Sardinia, Calabria, Chio, Smyrna, &c;* yet without having been perceived in those places, because he there pass'd in the day-time.

Since we could not see this Comet but about the end of *March*, we have made use of our method explained in the Theory of the Comet of the year 1665, to find the places whereabout this Comet hath been during the moneth of *March*, in the Hypothesis of the equal rectilineal motion, which serveth to

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represent the places of Comets for some time of their apparition, but not for the whole time: as we have shew'd in that Theory.

Having therefore chosen two of our first Observations, (because the latter are not so proper for this purpose,) and having taken a Mean between the first Observations of the Mathematicians of *la Fleche*, we have found by this method, that the Comet had been in his Perigee the 12th. of *March* at 8 a clock in the morning: that in that time, which is that of his greatest apparent celerity, he made about 2. deg. 32'. a day in the great Circle of his *apparent* motion, and $\frac{444}{1000}$. of his perigee-distance in the line of his *equal* motion: that he was in his greatest Declination the 11th. and 12th. of *March*; and that at that time he pass'd through the inferiour Meridian at about two a clock after midnight. Wherefore, if the weather hath been favourable, he must have been observ'd by Mr. *Hevelius*, who hath seen him, witness his Letter, from the 6th. of *March*; * at * See No. 81. which time he was in perigee and made the biggest F. 4017. shew.

If we have rightly determin'd his Perigee, and that the *hypothesis* of the equality of his motion be just for that time, nor he hath begun to appear but when he was sufficiently nigh to the Earth; then he hath been visible since the middle of *February*, at which time he was as far distant from his perigee by approaching to the Earth, as he is at the present by receding from it. He must then have been at the extremity of the Southern wing of the *Swan*, and arriv'd at the Southern foot of *Pegasus* on the 23th. of *February*, of the same bigness that he was seen to be of, *March* 28. He must have arrived at the Stars of the Northern Arm of *Andromeda*, *March* the 9th; at those of her *Girdle*, the 12th. when he was in his Perigee, and in his greatest declination; to her Southern Legg, *March* 15th; between her Southern Legg and the Triangle, *March* 18th. very near as he was observ'd at *la Fleches* and under the head of *Medusa*, *March* 25th. The dayes ensuing he must have arriv'd at the places marked in our first Observations: But in the last, he hath been swifter than this *Hypothesis* will bear. To represent these latter Observations, the Line of the motion ought to have been made curve, as we did for the end of the apparent motion of the Comet of 1665, with this difference, that instead of *that* lines being convex in re-

gard of the Earth, because the motion was retrograde, *this* was to be made Concave towards the Earth; suitable to what hath been said in the same Theory, because that the motion of this Comet is direct.

According to this *Hypothesis*, those last daies, that the Clouds hindered us from seeing this Comet, he must have continued his course towards the root of the Southern horn of *Taurus*, and having pass'd the *Ecliptique* between the 9th and 10th of *April*, he must pass on the top of *Orion's* head the 20th; over his Arm the 24th; and at the end of this month he will be in the *Milky Way*. But it will be difficult hence forward to find him, because of his smallness, and the light of the Moon.

'Tis a thing worth observing, that this Comet keeps his course almost like that of the 2^d Comet of 1665, and of another of 1577 observ'd by *Tycho*. For they have pass'd through almost the same Constellations; though this be more inclined Nord-ward, and cut the *Ecliptique* five or six degrees more forward than that of 1665. So that it seems, that in this place of the Heavens there is, as 'twere, a *Zodiaque* for Comets.

An Account of some Books.

I. *De RESISTENTIA SOLIDORUM* Alexan. Marchetti, in *Prisana Academia Phil. Prof. Excusum* Florentiæ 1665 in thin 4^o.

THis book came not long since to my hands: It had been promised some years before under the Title of *Galileus ampliatas*. But the Author now follows not the Steps of *Galileus*, but demonstrates all his Propositions another way: building all upon this ground: *Momenta Graviorum proportionem habent compositam ex proportionibus ponderum & longitudinum*: which is his first Proportion. This Book being but small, and the subject admitting of enlargement, the Author promiseth a larger Treatise of the same.

II. *Tabula numerorum QUADRATORUM decies millium, una cum ipsorum LATERIBUS ab Unitate incipientibus, & ordine naturali usque ad 10000. progredientibus.* Londini, 1672.

A Table of ten thousand Square numbers, namely of all the Square Numbers between 0 and 100 millions; and of their Sides or Roots: Which are all the whole Numbers between 0 and ten thousand: 8 sheets in fol.

The Concinnity of 10, 8 or 7. Centuries in each opening, may so please some Reader's eye as to invite him to continue the

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