The British Astronomical Association

Historical Section

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Contents:

From the Director

Mike Frost

I hope that you enjoyed our webinar in November. I'm grateful to Nick Lomb for getting up early in Melbourne to join us for a Zoom call on "Australian Eclipses". Nick's excellent talk on the Aussie eclipses of 1857 and 1871 can be found on the BAA YouTube channel. I think that we will continue to hold webinars at some time in the second half of the year. But now our thoughts turn to the next real-world section meeting, on Saturday May 18th 2024. This will take place at the Museum Street Methodist Church, Ipswich (but note that the entrance to the church is from Black Horse Lane, IP1 2EF). The church is around 1.2km from Ipswich rail station. There are a number of car parks (some with chargers) nearby, and several places to eat close by.

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As usual, we have a great line-up of speakers:

10:00	Meeting Opens
10:10–10:40	Paul Whiting, "East Anglian Aurorae"
10:40–11:40	Jack Martin, "The Bicentenary of William Huggins"
11:40–13:30	Lunch
13:30–14:25	Andy Gibbs, "One hundred and fifty years of Astronomy at Orwell Park"
14:25–15:20	Bill Barton, "Basil Brown's Astronomical Achievements"
15:20–15:50	Break (refreshments provided)
15:50–16:50	Dr. George Seabroke, "A girl's death, Rugby, rugby and astronomy: dating a Dollond telescope."
17:00	Dispersal

We will not charge for tickets for this meeting, but please register your interest via ticket tailor from the meeting website at https://britastro.org/event/historical2024

Paul Whiting, Andy Gibbs and Bill Barton are members of our host society, Orwell AS, and this meeting is part of the celebrations marking 150 years of observing at Orwell Park Observatory (IAU number 582). Jack Martin runs the Huggins Spectroscopic Observatory in Essex, so is an ideal person to commemorate the 200th anniversary of the birth of William Huggins, pioneering spectroscopist. For students of the history of the BAA, one other name should stand out - George Seabroke, a cosmologist from University College, London, who shares the same name as his great-great-grandfather, BAA president 1900-1902. George Seabroke the elder was a solicitor in Rugby, the town where I live, and I have been working with George Jr. and with the staff at Rugby School, where George Sr. began his astronomical career, to find out more about his time at the school.

George provided the following summary for his talk:
"*The chance finding of an old brass Dollond telescope in my grandparent's possessions was already exciting for me as a professional astronomer. This might have been the end of the story, but the inscription on the telescope was the crucial clue to revealing the telescope's long and interesting history. I will bring the telescope itself and present its past owners, which include known figures from the history of astronomy, Rugby (the town) and rugby (the game*)."

The speaker programme is by no means the only activity that we have organized for the weekend:

On Friday May 17th, I will be speaking to Orwell Astronomy Society (Ipswich), also at the Museum Street Methodist Church, about the "Yerkes Observatory".

After the meeting on Saturday May 18th, you are welcome to join us for a meal in Arlingtons restaurant, close to the meeting venue. After that, from 20:15 we will be going to see the Orwell Park Observatory, to the east of the town. Note that, unfortunately, this observatory is not disabled accessible (it's up five flights of stairs).

Finally, on Sunday 19th May, we hope to be visiting St Mary's Church, Playford, a couple of miles to the north-east of Ipswich. This church has the grave of Sir George Biddell Airy, seventh Astronomer Royal, and also the cottage where the Airy family lived, which has a plaque commemorating him on the wall. See you there!

A few weeks ago, Jeremy Shears sent me a link to an academic paper he thought I might be interested in, "Differential Rotation of the Solar Chromosphere: A Century-long Perspective from Kodaikanal Solar Observatory Ca II K Data", by Dibya Kirti Mishra, Srinjana Routh, Bibhuti Kumar Jha, Theodosios Chatzistergos, Judhajeet Basu, Subhamoy Chatterjee, Dipankar Banerjee and Ilaria Ermolli. arXiv:2311.18800

Kodaikanal is a solar observatory in Tamil Nadu, southern India. As in other solar observatories around the world, the observatory staff take daily photographs of the Sun. Why did Jeremy think that I would find the paper interesting? Because, in 1907, the observatory had a new director, John Evershed, a BAA founder member. His wife, Mary Evershed (nee Orr) was also a talented solar observer, and an astronomical historian, who used her time at Kodaikanal to write a book about Dante and the Early Astronomers. The Eversheds returned to England for good in 1923, and a few years after that, Mary became first director of the BAA Historical Section.

I am sure that the Eversheds would be delighted to hear that the solar observations that they and the staff of the observatory made, over a century ago, are still of use in cutting-edge science. Historical records have value.

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Finally, may I take the further opportunity to plug a book, the result of a multi-disciplinary project, which I have been involved in. "Eclipse and Revelation: Solar Eclipses in Science History, Art and Literature", published by OUP, came out in the UK on February 9th; you may have seen me speaking about it at the BAA and indeed at AstroFest. Among the contributors are two people who have spoken at historical section meetings, Prof Tom McLeish and Prof Jay Pasachoff; Tom McLeish is a named editor, along with Henrike Lange, Associate Professor of Italian Renaissance Art and Architecture at UC Berkely in the United States. Alas, Tom and Jay are no longer with us; both passed away from cancer during the last eighteen months. As "last astronomer standing", in addition to writing my chapters, I took on the job of technical editing. Images from the book launch event at the Royal Astronomical Society can be seen below.

I'm sure section members will find a lot in E&R to interest them. I commend it to you! The book's website on OUP is www.tinyurl.com/eclipseandrevelation If you order the book from OUP (thank you!), enter code **ASPROMP8** for a 30% discount.

Mike Frost

Images of "Eclipse and Revelation" launch event at Burlington House

From the Deputy Director

Bill Barton

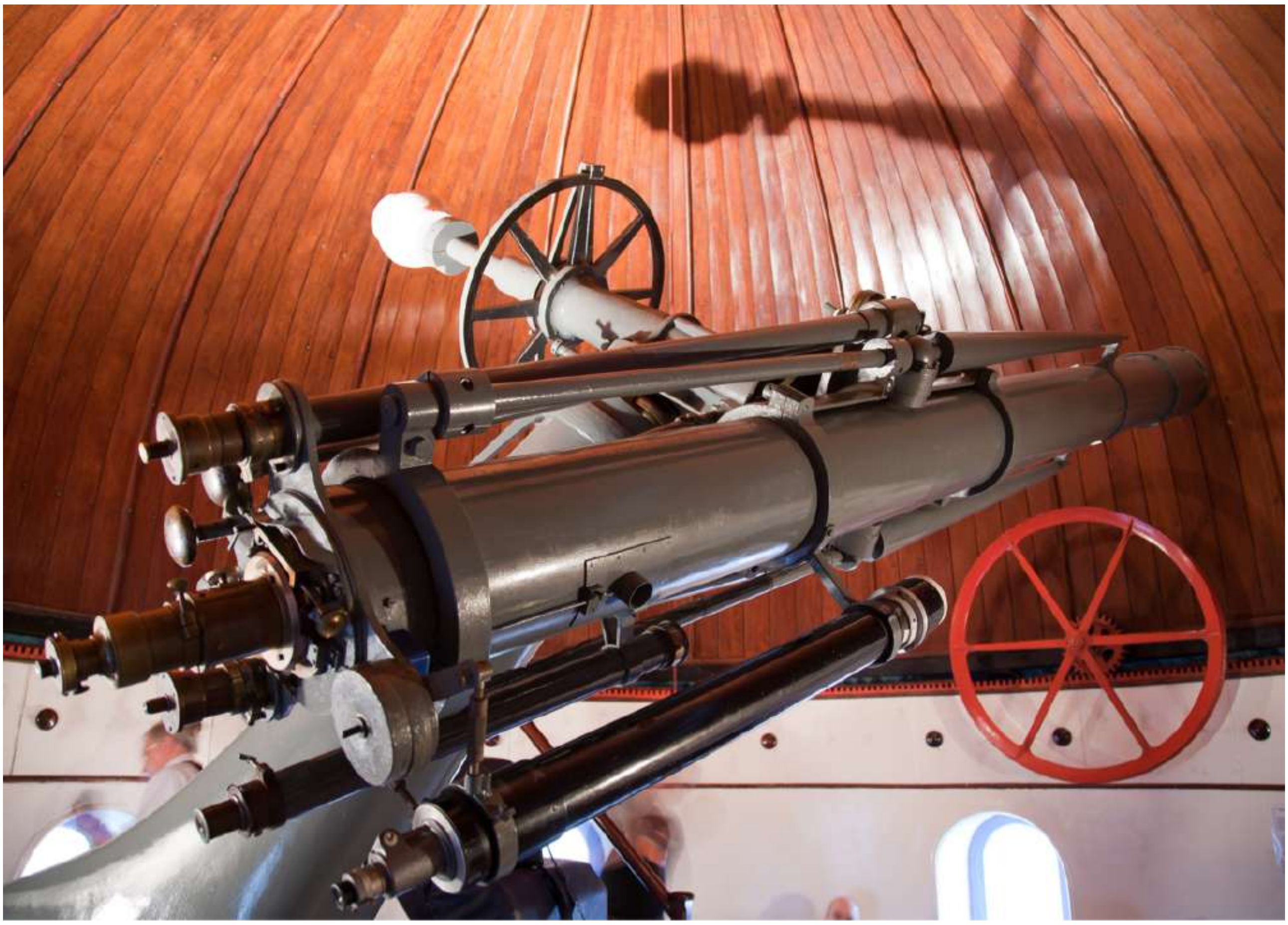
I'd just like to say how much I am looking forward to welcoming everyone to Ipswich later this spring for our 2024 Section Meeting helping to celebrate 150 years since first light at Orwell Park Observatory. Patrick Moore and the Lunar Section visited fifty years ago, in 1974. The meeting reports does hint that they might have known they were there for its centenary. Incidentally that meeting ended with Patrick and Henry Hatfield trying to outbid each other to buy the Orwell Park Refractor.

Lastly, I would have thought that after a decade of early retirement spent working on the history of astronomy in Suffolk there wouldn't be much left to find, but I've only just come across two nineteenth/twentieth century lady astronomers, Edith Mary Rix (1866-1918) and Annie Walker (1863-1940). They both had careers in astronomy which might be viewed as having failed. I still have some work to do and have yet to decide where I'm going to publish this research.

Also this year, for the first time in over forty years of membership, I'll attend my first BAA Winchester Weekend. I'm there because I'm making a short presentation at the Equipment & Techniques Section meeting. My subject is about fitting components from different manufacturers together to make a working solar spectroscope. The telescope I'm using is a Carl Zeiss Telementor and the spectroscope is a Questar Q-Max. If you're interested in this, but can't make the Winchester Weekend then a written version should be in the next E&T section news. Hopefully there'll be time to meet up to chat with section members.

Just to whet your appetite, here are a couple of images of Orwell Park.

Orwell Park House with the observatory on the right


The 10” (250mm) aperture Tomline Refractor

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Edmond Halley and his Work on Comets

Robert Persse

Kepler’s work allowed astronomers to predict the movements of planets and moons, but comets were much more difficult to understand. They moved quickly before fading away and appeared only once as far as anyone knew. There was very little reliable data to go on. But it’s well known that Edmond Halley predicted the return of a comet, so, clearly, he must have calculated its orbit somehow. Halley wrote two books to explain his work - *A Synopsis of the Astronomy of Comets*, and *A Compendious View of the Astronomy of Comets*. The English translations of both books are available here (*Compendious View* follows directly after *Synopsis*).

A Compendious View

I’ve chosen to review *A Compendious View* first because it is easier for non-mathematicians to understand. It was published in Latin in 1749 seven years after Halley’s death and was translated in 1757. It was written for general readers and is well worth reading today. It has a lot of history with footnotes and has good details of Halley’s thinking but avoids maths where possible.

To summarize the book:

Aristotle and most others thought comets were aerial vapours, but Seneca the Philosopher thought they were celestial bodies and predicted that an explanation for them would one day be found. In 1577 Tycho found comets had no diurnal parallax, so they were 'higher than the Moon'. Then in 1680 a 'prodigious comet' was visible for four months. Flamsteed at Greenwich and Cassini in Paris made accurate observations. Isaac Newton found the orbit using a 'geometrical' method and later Halley adapted this method to an 'arithmetical calculation' which could be used for any comet. Newton and Halley assumed the orbit was parabolic.

Halley used this method to do an 'immense calculation' and produced a table of orbital elements of comets (This is in *Synopsis*). This table summarises in one page all knowledge of comets that he was able to find. He noticed the three comets of 1531, 1607, and 1682 had similar elements and suspected they were probably the same one. He predicted it would return in 1758.

At this point the text changes to the third person – it is no longer Halley writing but someone else writing about his later work.

Halley re-did his work using elliptical theory and found this was a very good fit with actual observations. Several examples are given. He also found three more probable instances of the comet (1305, 1380, and 1456) and became more certain that these were all the same body.

The last part of the book (pages 20-24) is speculation about the nature of comets and the number of them in the far regions of the solar system.

A Synopsis

A *Synopsis* was first published in Latin by the Royal Society with a translated version shortly after in 1705. It was written for astronomers and mathematicians and has a brief six pages on the history of comets.

On page 7 is a table of orbital elements of 24 comets with the title *The Astronomical Elements of the Motions in a Parabolic Orb of all the Comets that have been hitherto duly obsrv'd.*

Halley writes, 'This Table needs little Explication, since 'tis plain enough.'

This table is well worth looking at since it shows that the comets of 1531, 1607, and 1682 (now known as Halley's comet) have very similar figures, but it's not entirely clear what some of these figures mean. My attempt to understand this gets quite technical and I decided to leave it to part 2 of this article.

The middle section of the book (pages 8-17) is very mathematical. It contains *A General Table for Calculating the Motions of Comets in a Parabolic Orbit* that astronomers could use to find the positions of comets if they already had the elements.

Halley explains The Construction and Use of this General Table, but his explanation is difficult to understand. He expects readers to be astronomers familiar with maths including the geometry of parabolas. He doesn't use modern conventions and has an unfamiliar way of looking at things. He states some facts without explanation but explains in detail others which seem simple. There are some quirks and oddities in the typesetting and some terms appear that are not easy to decipher. The lack of white space makes the text much harder to read.

The use of the General Table involves multiplying a lot of numbers and Halley uses logarithms for this. Logarithms have now lost their importance, but for 400 years they were an essential tool for calculating.

The table is followed by two worked examples for the comets of 1664 and 1683.

Because most readers will not want to go into detail of the maths, I have included this in part 2 of this article.

In the last pages of *Synopsis* (pp18-24) Halley discusses his work and thoughts on comets. This is easy enough to understand. His ideas are quite modern and I don't think what we now know about the motions of comets today would surprise him much. There is no mysticism or mention of the supernatural.

Halley compares his worked examples with actual observations - they fit very well.

He describes the difficulty of the work and the care he put into it. The Synopsis is a shorter version of a planned future work that was never done.

Halley warns the reader that the accuracy of the elements for some of the comets is suspect since the raw data is not accurate. He laments the lack of observations for some comets, especially those in the Southern sky.

Comets come from any direction and are equally likely to be retrograde or direct. Halley suspects that there are many others too far out to be visible. He has hitherto taken the trajectory as exactly parabolic so the comets would escape the Sun forever. None appear to have hyperbolic speed. But he suspects that most comets move in very long period ellipses. He compares the orbits of long ellipses and parabolas and argues that they are very similar.

The General Table of comets could be used to see if any new observed comet has been seen before, and maybe to predict it's return. Halley speculates that the comets of 1531, 1607, and 1682 were really the same comet since their elements are similar and the slight difference in periods could easily be caused by the effects of Jupiter and Saturn. Saturn's period was already known to be affected by Jupiter. The comet of 1456 may also be the same, but observations were not good enough to be confident.

Halley predicts that the comet now named after him would return in 1758 and says that astronomers have much work to do on any new comets. He suggests the comets of 1532 and 1661 were two apparitions of the same comet, but the 1532 observations were not good enough to be sure.

Halley does not tell us how he did the calculations for the orbits but refers the reader to Newton's *Principia* near the end of the third book, or an explanation by Dr David Gregory in *Astronomiae Physicae et Geometricae Elementa*. I could only find a Latin copy of this online.

Halley speculates that maybe a comet would one day pass close enough so it's distance could be found by parallax, and therefore the distance to the Sun. He talks about the difficulties of using parallax at that time. The use of comets for this purpose was first suggested by Nicolas Facio. Halley wonders what would be the effect of a close approach of a comet to the Earth, but declines to speculate.

Part 2: THE MATHS

This part gives an insight into seventeenth century mathematical astronomy. Don't read it unless you enjoy maths. I will give the pages in *Synopsis* to help readers who want to follow Halley's original text which is sometimes very obscure. Sometimes I will give verbatim quotes from *Synopsis*. I recommend that you read my article first, then compare it to Halley's text.

A Synopsis of the Astronomy of Comets is available here.

On page 7 is the table: *The Astronomical Elements of the Motions in a Parabolic Orb of all the Comets that have been hitherto duly obsrv'd.* It lists the orbital elements of 24 comets and has column labels in abbreviated Latin, with the occasional French 'à'.

To help understand it I compared the figures with the modern elements for Halley's comet. The Wikipedia article for Halley's Comet gives these figures:

Perihelion 0.59278 au	Mean anomaly 0.07323°
Semi-major axis 17.737 au	Inclination 161.96°
Eccentricity 0.96658	Longitude of ascending node 59.396°
Orbital period 74.7 yr	Argument of perihelion 112.05°

The table below lists columns in the *Elements* table with Halley's values for the 1607 comet, modern values, and my comments. The modern values are not exactly the same as those from 1607 because of precession and the effects of the outer planets.

Column Heading	***Table value***	***Modern value***	**Comments**
Comt. An	*1607*	--	Comets were identified by the year they appeared.
Nodus Ascend	♉ *20°*	*59°*	The sign of Taurus is 30-60°, so this means 50°. The longitude of the ascending node.
Inclin. Orbitae	*17° retro*	*162°*	Inclination of the orbit. Modern convention gives retrograde orbits inclinations between 90° and 180°. So this is very close.
Perihelion	♒ **2°**	*????*	The sign of Aquarius is 300-330°, so this means 302°. This doesn't look like any angle to do with the perihelion. I don't know what this is.
Distan. Peri-hela à Sole	*58680*	*59278*	Distance from Perihelion to the Sun. A very good match. The distance of Earth to Sun is taken as 100,000.
Log. Dist. Peri-heliae à Sole	*9.768*	*4.773*	Log of Distance Perihelion to Sun. The decimal part looks good. But the magnitude is 9 instead of 4.
Temp equat Perihelii	*Oct 16 3:50*	--	Date and time of perihelion. Every apparition of the comet is different.
Perihelion à Nodo	*108°*	*112°*	Angle Perihelion to Node. This is probably the argument of perihelion.

In the worked examples at the end of this section Halley uses the Arithmetical Complement. This is 10 minus the logarithm of a number. Instead of subtracting the logarithm (to divide) we add the Arithmetical Complement and then subtract 10. This was used to make the calculations easier and more likely to be correct in the days when all calculations were done manually.

For the Log of Distance Perihelion to Sun Halley uses a magnitude for 5 times larger than normal. This seems to be similar to the Arithmetical Complement. Thanks to Mike Frost for suggesting this.

The General Table for Calculating the Motions of Comets in a Parabolic Orbit

See pages 8-11 of *Synopsis*.

The elements of a comet's orbit are numbers which completely describe the orbit's size, shape, orientation in space, and the time it passes perihelion. This information allows astronomers to construct a 3D model of the orbit, work out where the comet is in space at any time, and its position as seen from Earth.

Halley wanted to save astronomers time when they calculated a comet's position. He imagined an example comet and produced a *General Table* which could be used to find the position in its orbit at any time. This table could be adapted to fit any real comet. This is only the first part of the work astronomers needed to do to find the position as seen from Earth.

The *General Table* has three columns:

- the 'mean motion'
- the angle from the perihelion
- the logarithm of the distance from the Sun

For a particular comet, mean motion is a number proportional to the area swept out since perihelion. This area is itself proportional to time, so the mean motion is a measure of time.

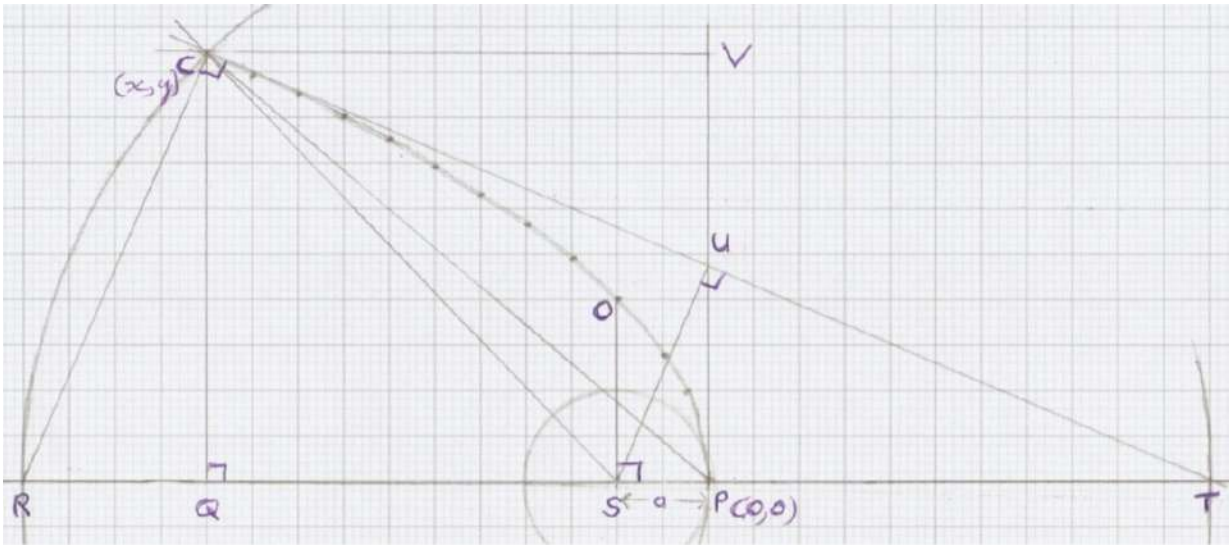
The *General Table* has 240 entries – 100 in the first quadrant and the rest spread out along the orbit. Mean motion is equal to 100 when the comet has moved through 90 degrees.

The Construction and Use of the General Table

See page 12 of *Synopsis*.

Halley follows Newton and makes the assumption that comets move in parabolic orbits with the Sun at the focus and follow Kepler's second law (equal areas in equal times). All parabolas are similar so a table for one comet can be used for all comets.

To find the relationships between the three quantities Halley used a diagram. I have redrawn it accurately with the original orientation and lettering, but with some additions to aid understanding.



I have attempted to follow Halley's work as much as possible while making it easier to understand. You still have to know some senior secondary school maths and physics. I had to use the internet several times to verify things and to remind myself of things I had forgotten. I also learned some new things. I won't explain every step as several are quite easy. But note that triangles CUS and TUS are congruent, and there are several similar triangles, some double the size of others.

S is the Sun and P is the perihelion of the comet – these are fixed points. C is the position of the comet as it moves from P through O and beyond. Other labelled points depend on the position of C. RSPT is the axis of the parabola. We define RS and ST as equal to CS. C, R and T are on a circle and RT is a diameter so the angle at C must be a right angle. Other points and lines are drawn as shown and the other right angles are constructed.

Halley points out that CT is a tangent to the parabola, but this fact is not used here.

See page 13 of *Synopsis*.

To construct the *General Table* we need to find the relationships between:

- SPOC, the area swept out by the comet since perihelion. This will give the mean motion.
- CSP, the angle from perihelion
- CS, the distance from comet to Sun

Halley calls SPOC a 'mixtilineal' area. This means bordered by lines and curves.

He does not use coordinate geometry, but I will as it is very useful here. A slight problem is that the diagram reverses the x axis which points to the left, opposite to modern convention.

Today we would use $y^2 = 4ax$ for the equation of the parabola, where ‘a’ is the focal length or distance SP. Halley mentions ‘the Parameter of the Axis’ which turns out to be ‘4a’. Later he uses ‘a’ to mean the area SPOC. He labels the distance CQ as ‘z’, but I will use CQ = y to fit modern usage. C has coordinates (x,y) and P is at (0,0).

To find the area SPOC

Let RQ = 1. This means SP = 1/2 (similar triangles. ∆ CRQ is twice the size of ∆ USP)

We are effectively using the equation $y^2 = 2x$.

The area of rectangle CVPQ is xy. And the area COPQ, which is in this rectangle AND below the parabola, is 2xy/3 (Archimedes discovered this using a form of integration!).

The area of ∆ CPQ is xy/2 so the lune-shaped area, COP is xy/6.

The area of ∆ CSP is y/4 (half base times height).

Substituting for $x = y^2/2$ and adding areas COP and CSP gives a cubic equation for the area SPOC. Multiply both sides of this equation by 12 to get: $y^3 + 3y$ = 12 times the area SPOC.

For a given area this can be solved for y.

Halley must have used Tartglia’s method for solving cubic equations - first published in *Ars Magna* in 1545. (How Imaginary Numbers were Invented has some interesting history of cubics) He doesn’t mention the case where C is between P and O. Using maths similar to the above it’s not hard to show that the cubic equation is exactly the same.

Now we consider the special case where the comet is at O:

Area SPOC (or just SPO in this case) is 1/3 (Archimedes again). The equation becomes $y^3 + 3y = 4$ Halley chose to let a mean motion of 1 represent one hundredth of area SPO, that is 0.04.

Continue with 0.08, 0.12, 0.16 and so on up to 4 where the mean motion is 100 and the comet is at O. Then continue past O taking multiple equal areas at a time.

For each of these 240 mean motions Halley solved the cubic equation for y.

To find the angle CSP: [use appropriate angle names!]

Tangent(CRQ) = CQ/RQ = y/1

There are lots of similar triangles in this diagram, and ∆UST and ∆USC are congruent.

∆CRT and ∆UST are similar, so ∠CRQ and ∠USP are equal.

∆UST and ∆USC are congruent, so ∠CRT, ∠UST and ∠USC are all equal. Therefore ∠CSP is double ∠CRQ.

To find the distance CS:

Halley now doubles the scale of the diagram so SP=1. He effectively lets SP be one astronomical unit but doesn't use that term.

ΔCRQ and ΔCRT are similar.

Cosine(CRQ) = RQ/RC and Cosine(CRT) = RC/RT

$\angle$CRQ = $\angle$CRT so RQ/RC = RC/RT

(Halley uses the secant which is the inverse of the cosine).

We know $\angle$CRQ from above, and RQ=1 by definition, so we can calculate RC. And RC2 = RT and RT/2 = CS by definition

We now have relationships between area SPOC, angle CSP and distance CS.

Halley says at this point that he composed the General Table from these equations. But he has not yet worked out the mean motion.

Rules for Calculation Using the Table

See page 14 of *Synopsis*. This relates mean motion and area.

Parabolic speed (aka escape speed) is $\sqrt{2}$ times circular orbital speed. This fact is well known today,

but not in the 18th century. Halley gives the reference in Newton's *Principia*.

Suppose a planet is in a circular orbit with radius SP. When the comet is at P it moves at $\sqrt{2}$ times the planet's speed, so the rate at which it sweeps out area is $\sqrt{2}$ times the rate of the planet.

Comet's sweep rate = $\sqrt{2}$ times planet's sweep rate

Let SP= a, t = days the comet takes to move from P to O, and T = the planet's year.

Area POS / t = $\sqrt{2}\pi a^2/$ T

$4a^2/3t = \sqrt{2}\pi a^2/T$

$3\sqrt{2}\pi/4 = T/t$ a^2 cancels out and $t \propto T$.

(Halley doesn't use the symbol π which was first used in 1706 by William Jones)

If a = 1 astronomical unit, then T = 1 sidereal year or 365.256 days.

So, t = 109.615 days or 109 days,14 hrs, 46 min

This time corresponds to a mean motion of 100, so each day adds 0.91228 to the mean motion.

The distance SP can be changed to match the perihelion distance of any comet. Kelper's third law says the period squared is proportional to the semimajor axis cubed. For a circular orbit we just use the radius. $T^2 \propto a^3$

$$T \propto a^{3/2} \text{ and } t \propto a^{3/2}$$

How to use the table.

See page 15 of *Synopsis*.

To compute the position of a real comet for a given time follow these steps:

Get the Sun's position and distance from Earth.

Get the time difference between the perihelion and the required time. Get the perihelion distance, a, and calculate $a^{3/2}$.

Multiply the time difference by 0.91228. This gives the mean motion of the **standard comet**. Now divide by $a^{3/2}$ to get the mean motion of the **real comet**.

For example: If a comet has a perihelion distance, a = 0.5 au, then $a^{3/2}$ = 0.3536.

Take the time difference, multiply by 0.91228 and divide by 0.3536 to get the mean motion.

From the mean motion, read the corresponding angle and the distance from the Sun. The parabola is symetrical about the axis and two positions are possible. Decide which of these is needed depending on whether the orbit is direct or retrograde, and whether the time is before or after the perihelion. This gives the "*Place of the Comet in its Orbit*". Multiply the distance in the General Table by the perihelion distance to get the true distance of the comet from the Sun. The angle in the table is already correct.

From this information and the elements of the orbit we can calculate the position of the comet as seen from the Sun "(*from the common Rules of Trigonometry*)".

See page 16 of *Synopsis*.

In the same way we can calculate the position of the comet as seen from the Earth.

Halley now gives two worked examples. These go all the way through using the General Table, then calculating the heliocentric position and the geocentric latitude and longitude. These are not converted to right ascension and declination. The examples use logarithms with all explanations in abbreviated Latin. I did not attempt to work through them.

The text on pages 18 to 24 of *Synopsis* has been covered in Part 1.

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A 4¼ inch Browning Newtonian Reflector

Paul Woodell

Here are some photos that were taken at the Stellafane Convention in Springfield, Vermont, U.S.A. of a 4¼ inch (108mm) Browning Newtonian reflector that I purchased just two days prior to the convention. It was hastily mounted it on a Celestron tripod and wedge for display.

I live in New York State, USA and recently purchased the tube, optics and upper mount to a Browning 4¼ inch Newtonian. I believe it is a match to the engraving on the cover of John Browning's "A Plea for Reflectors", the Educational Reflector (p. 16 of the 1876 edition).

As you can imagine, examples of this age and style of telescope are pretty rare in the US. I'm a member of the ATS (Antique Telescope Society) and I've communicated with several other members who own Browning reflectors, but none are a match for this scope. I've also found a number of images on the internet, some from past European auctions. However, none are of sufficient resolution to see details of the parts I'm missing.

My hope is to contact with someone who may have the same telescope, that I might obtain detailed photographs, dimensioned drawings, etc. I'd like to reproduce the missing parts and make this telescope whole again.

The final photo is from a 2017 auction at Lyon & Turnbull in Edinburgh, Scotland. I suspect that this auctioned scope is a match for the one that I own.

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Jeremiah Horrocks Statue update

In a past edition of the newsletter (number 20), we reported on the construction of a larger-than-life statue of Jeremiah Horrocks, first observer of a transit of Venus in 1639, by Lancastrian sculptor Phil Garrett. There is a progress report in a news article on the website of the University of Central Lancashire , where Phil is artist-in-residence at the Jeremiah Horrocks Institute for Mathematics, Physics and Astronomy. The 7ft 6in tall clay statue is an upscaled version of an earlier model and will be used to create a final casting in bronze. Phil's attention to detail is impressive; for example, he wore traditional 17th century clothes to capture Horrocks's clothing accurately.

Phil Garrett with his statue of Jeremiah Horrocks (from the UCLan website)

Dates for your diary

SHA Webinar, Wednesday March 13th 2024, "Mary Somerville: an education fit for a polymath" by Ruth Boreham.

Friday March 29th 2024, 4:00pm to 5:00pm, St Giles the Abbot, Church St., Cheadle, ST10 1HU, "Cheadle Moon, BAA Pioneering Women", by Mike Frost. Tickets at: www.tickettailor.com/events/supportstaffordshire/1165970

SHA Spring Conference, Saturday April 20th 2024, 9:30am to 5:00pm, Birmingham & Midland Institute, 9 Margaret St., Birmingham, with a theme of "Astronomers Royal". Booking essential, email meetings@shastro.org.uk to attend.

SHA Webinar, Wednesday May 8th 2024, "Does it count as history if I can still remember it?", by Prof. Virginia Trimble.

SHA Summer Picnic, Friday June 21st 2024, 12:00 mid-day to 3:00pm at the Temple Observatory, Rugby. Booking essential, email meetings@shastro.org.uk to attend.