Drafts on chronology: section 2d

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Chap III.
The time of the Argonautick expedition stated by Astronomy

Achilles Tatius[1] tells us that the Egyptians first of any men measured the heavens & earth & inscribed the knowledge thereof in columns for the use of posterity; that the Chaldæans translated it to themselves ascribing the invention to Belus: & that the wise men of Greece ascribe it partly to their Gods, partly to their Heroes & partly to the wise men who flourished after them. The first Astronomers I meet with in Phrygia & Greece[2] were Endymion, Aristæus, Chiron, Linus, Musæus, Atreus, Ancæus, Orpheus, Palamedes. All these flourished before the Trojan war. Then came on dark times till Thales & his scholars revived Astronomy. Homer & Hesiod mention several Constellations & therefore the Constellations were formed before their days & by consequence before the destruction of Troy, there being no Astronomers celebrated between that war & the days of Thales. And even the Constellations themselves discover the age in which they were formed. For they relate to the Argonautic expedition & the times next preceding it & to nothing later. In the Constellations of the ship Argo, the Dragon called Hydra with Medea's cup & a Raven upon its carcass, the symbol of death, & in those of the golden ram, the fiery bull & the twins Castor & Pollux, you have the story of the Argonautic expedition. In those of Perseus, Andromeda, Cepheus, Cassiopeia & Cete, you have the story of Perseus. Engonasis, Sagitta, Ultur Cadens, Draco, Cancer, Leo relate to Hercules; Vrsa major & Arctophylax to Callisto & her son Areas; Vrsa minor to one of the nurses of Iupiter; Auriga to Erechthonius; Bootes, Plaustrum & Virgo, as some say to Icareus, & his daughter Erigone. There's Orion the granson of Minos with his dogs & Hare & River & Scorpion. There's Orpheus's Harp, Bellerophon's Horse, Læda's Swan, Neptune's Dolphin, Ganimede's Eagle, Iupiter's Goat with her Kidds, Bacchus's Asses, Æsculapius (or Phorbas) with his serpent, & Chiron the master of Iason with his Altar & Sacrifice. There's Virgo or Astræa or Ceres, Sagittary or Crotus the Centaur <2r> the son of the nurse of the Muses, Capricorn or Pan Aquarius or Ganimede, the Fishes of Venus & Cupid, & their parent the south Fish. In all these Constellations (which with Deltoton are all the old ones mentioned by Aratus, there's nothing relating to the Theban or Trojan wars, nothing to the times after the Argonautic expedition, & therefore they were formed in or presently after that expedition, or rather for the use of the Argonauts. For navigation gave a beginning to Astronomy, the stars being at first observed for the use of saylors.

Aristæus the Astronomer married Autonoe the daughter of Cadmus & therefore was about three generaolder then the Argonauts. He was born & educated in Libya, his mother Cyrene being carried thither from Greece & got with child, as was pretended by Apollo; & from thence [a][3] he brought into Greece the inventions of making cheese & bee hives & honey & planting & olive-yards & making oyle & of observing & determining the solstices by the risings & settings of the stars. [b][4] Atlas an Egyptian who was about one generation older then the Argonauts & governed Libya then a province of Egypt & was skilled in Philosophy Astronomy & Navigation made a sphere & in memory thereof is painted with a sphere upon his back. And the Greeks soon followed his example. For [c][5] Chiron the master of Iason the chief of the Argonauts, delinerated σχήματα ὀλύμπου the Asterisms, as Clemens Alexandrinus out of the ancient author of the Gigantomachia informs us. And [d][6] Musæus the master of Orpheus & one of the Argonauts made a sphere & is reputed the first among

the Greeks who made one. But the [e][7] Asterisms of the Greeks were different from those of the Egyptians & Libyans. These things might be done by Chiron & Musæus while the ship Argo was building: not sooner because that ship was one of the Asterisms; nor later because Chiron was at that time very ancient, being born in the golden age & being the grandfather of the Argonauts Peleus & Telamon. The sphere was therefore made for the use of the Argonauts: for the Asterisms were at first delineated for the use of Navigators. The [f][8] people of the island Corcyra attributed the invention of the sphere to Nausicae the daughter of Alcinous king of the Pheaces in that island, & she might learn it from the Argonauts who [g][9] in their return home sailed to that island & made some stay there with her father. Sophocles [h][10] tells us that Palamedes the son of Nauplius king of Eubœa found out <3r> Arithmetick & measuring & the heavenly signes & the measures & revolutions of the stars & turnings of the Bear & setting of the Dog & improved navigation & the art of war. Nauplius was a very skilfull saylor & one of the Argonauts & survived the destruction of Troy & might teach his son Palamedes, & Palamedes was slain at Troy, & therefore measured the stars (that is, their distances) & formed or reformed the signes & asterisms before he went to war. Musæus might set the stars on the globe by viewing the heavens as a Painter draws a face & Palamedes by his measures might draw the signes & asterisms & solstices & equinoxes more exactly. In those days[11] Astronomers understood also the motion of the Sun in the Ecliptic from west to East & the reason of his eclipses & observed the Solstices. Strabo[k][12] tells us that Danaus for shewing aquatic instruments & Atreus for teaching that the course of the Sun was contrary to the conversion of the heavens, were made kings; & Servicus[l][13] saith that Atreus found out an Eclips of the sun which came to pass, that is, he predicted it or at least found out the reason of it: And Iustin [m][14] that Aristæus found the rising of the stars in the solstice. And in the island Syrie or Syrus there was an Heliotropium or place prepard for observing the solstice as Bochart[n][15] shews out of Homer & his old Scholiast: which Heliotropium remained there till the days of Diogenes Laertius.

Now Achilles Tatius[16] tells us that some anciently placed the solstice in the beginning of Cancer, others in the eigth degree of Cancer, others about the twelft & others about the fifteenth degree. This variety of opinions preceeded from the Precession of the Equinox then unknown to the Greeks. At first the solstice was in the 15^{th} degree or middle of the Constellation of Cancer, then in the 12^{th} 8^{th} & 1^{st} degree successively. The Iews began their year with that new moon which fell upon the vernal Equinox or within half a month before or after it. This year they brought out of Egypt, changing only the beginning thereof from the autumnal Equinox to the vernal. And to make the first month begin with the first signe, the Egyptians in their sphere & the Greeks in theirs might place the Equinoxes & Solstices in the middles of the signes. For the Greeks had their knowledge from Egypt & began the Attic year sometimes before & sometimes after the summer solstice as the Iews did their year both before & after the Vernal Equinox.

After the times of the Argonautic expedition & Trojan war the communication between Greece & Egypt ceased & Astronomy lay neglected till Psammiticus let the Greeks into Egypt. The Thales[a][17] revived Astronomy observed the stars himself was reputed the first of the Greeks who could predict Eclipses & wrote a book of the Tropicks & Equinoxes & predicted them, & his scholar [b][18] Anaximander erected gnomons to observe the solstices &equinoxes & made a sphere. For the Constellations were at first delineated on spheres, & the art of making planispheres being difficulter was invented <4r> later. Pliny [c][19] tells us that Thales determined the occasus matutinus of the Pleiades to be upon the 25^{th} day of after the autumnal Equinox; & thence [d][20] Petavius computes the Longitude of the Pleiades in ♈ $23^{deg.}$ 53'. Now the bright star of the Pleiades in the end of the year 1660 was in ♉ $25^{d.}$.15'. 51" by the observations of Hevelius & thence recconing backwards a degree for every 72 years (which is the known motion of the Equinox) that star will be found in ♈ $23^{d.}$. 53' six hundred years before Christ, that is, in the 41^{th} year of Thales, supposing him born an. 1 Olymp. 35 as is the received opinion. And therefore Thales did not retain the place of the Equinox determined by Astronomers who lived before the Trojar war, but observed it himself & placed it where it was in his own age. His publishing a book about the solstices & equinoxes & predicting them that other might examin the matter shews that he proposed a new opnion & appealed to experience about it & his predicting Eclipses shews that he knew the true position of the Ecliptick. Now the Pleiades being then in ♈ $23^{d.}$ 53', the summer solstice was the 11^{th} degree of Cancer.

After Thales had revived Astronomy & rectified the solstice, the Greeks became intent upon reforming their Lunisolar year. And first they mended their Dieteris, Tetraeteris & Octaeteris. Then Meton found out the exacter Cycle of 19 years, & in order to publish it, a[21] he & Euctemon observed the solstice in the year of Nabonassar 316 & Columella b[22] tells us that they placed it in the eighth degree of Cancer. Which opnion being published to the people in the tables of that Cycle became generally received & continued long in vogue. Now recconing with Astronomers that the Equinox goes backwards one degree in about 72 years & by consequence three degrees in 216 years & seven ~ degrees in 504 years, count backwards these years from the year of Nabonassar 316 & the summer solstice will fall upon the middle of Cancer or end of the 15^{th} degree of that signe in the 45^{th} year after the death of Solomon, & upon the beginning of the 12^{th} degree in the 100^{th} year of Nabonassar which was the ninth year of the reign of Psammiticus over all Egypt. Psammiticus was one of the 12 contemporary kings of Egypt during the first 15 years of his reign, then conquered all Egypt by the help of the Greeks & thereby opened a communication between Egypt & Greece, & the solstice was at that time in the twelft degree of Cancer: which opinion being brought from Egypt into Greece might obtein among the Greeks, & give occasion to Pherecydes & Thales some years after to examin the matter by observing the solstice themselves. For Thales found it gone back into the 11^{th} degree of Cancer as above. So then, about 45 years after the death of Solomon, the Solstices were in the middle of the signes where they ought to be at the first formation of the signes upon the surface of the globe.

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Eudoxus was either contemporary a[23] to Meton or a little b[24]later, but followed the older Astronomers, & published a new Octaeteris & a book of Phænomena in prose wherein he described the old Sphere of the Greeks with the constellations. Aratus wrote the same things in verse & Hipparchus Bithymus wrote a third book upon them both: which books of Aratus & Hipparchus are still extant. Gemimus has given us an Ephemeris of the Sun's passing through the twelve signes, beginning the signes of Libra & Capricorn (& by consequence those also of Aries & Cancer) with the Equinox & Solstice of Euctemon; & placing the winter solstice of Eudoxus on the fourth day of Capricorn, that is, four days later then the winter solstice of Euctemon, & the spring Equinox of Eudoxus on the sixt day of Aries, that is six days later then the spring Equinox of Euctemon. Whence its evident that Eudoxus did not observe the Equinox himself but followed the traditions of the ancient Astronomers placing it where it was before the days of Thales & knowing nothing of its motion. And for this reason in describing the sphere of the ancients, he copied after their Equinoxes & Solstices as well as after their Constellations. For he placed the Equinoxes & Solstices in the middles of the Constellations of Aries Chelæ Cancer & Capricorn, as is affirmed by Hipparchus & appears manifestly by the description of the Equinoctial & Tropical circles in Aratus who copied after Eudoxus, & more plainly by the words of Eudoxus cited by Hipparchus & still more plainly by the position of the Colures. For Hipparchus tells us that Eudoxus drew the Colure of the Solstices through the middle of the great Bear & the middle of Cancer & the neck of Hydrus & the star between the Poop & Mast of Argo & the tail of the South fish & through the middle of Capricorn & of Sagitta & through the neck & right wing of the Swan & left hand of Cepheus; & that he drew the Equinoctial colure throught the left hand of Arctophylax & along the middle of his body & cross the middle of Chelæ, & through the right hand & foreknee of the Centaur & through the flexure of Eridanus & head of Cetus & the back of Aries across & through the head & right hand of Perseus.

In the end of the year 1660 the middle of the Aselli & Præsepe, a small constellation in the middle of the constellation of Cancer was in ♋ 3. 15. 21. And at the same time the middle between the cloudy star in the forehead of Capricorn & the last bright star in his tail was in ♒ 8. 25. 51, & the point opposite to this point was in ♌ 8. 25. 51. And the Colure drawn in the middle between ♋ 3. 15. 51. & ♌ 8. 25. 51 passes as neare as can be through the middles of both Asterisms of Cancer & Capricorn, & cuts the Ecliptick in ♋ 5. 50'. 36" & ♒ 5. 50'. 36". The tail of the South Fish through which this Colure is to pass is marked out in the heavens by three great stars, the only stars placed in it, one of the third magnitude whose Longitude in the end of the year 1660 was ♒ 5. 51'. 5" & south Latitude 15. 10. 00, another of the fourth magnitude whose longitude at the same time was also ♒ 5. 51'. 5" & <6r> south latitude 17^{d}. 20'. 00", third of the third magnitude in ♒ 6^{d}. 00'. 55" with south latitude 21^{d}. 30'. 00" : and the Colure found as above passes within half a minute of the two first of these stars & within 9' 50" of the third. It passes also through the middle of the great Bear & by the first star in the head of Hydra & between the Poop & Mast of Argo, & by the stars of Sagitta on one side

& the neck & north wing of Cygnus in the other, & through the left hand of Cepheus, & so has all the characters of the solsticial Colure of the Ancients described by Eudoxus.

The back of Aries ♈ through which the Equinoxial Colure should pass is a star of the sixt magnitude whose longitude in the end of the year 1660 was ♉ 9^d. 22'. 57" & north latitude 6^d. 7'. 20". And the Colure drawn trough this star to the Ecliptick in an angle of 66^d 30' the complement of the angle in which the Ecliptic cuts the Equator, did then cut the Ecliptic in ♉ 6^d. 41'. 34", as I find by Trigonometry. The head of Cetus through which this Colure should pass is a star of the fourth magnitude whose Longitude at the time aforesaid was ♉ 2^d. 43'. 13" & south Latitude 5^d. 51'. 53" & the Colure drawn through this star to the Ecliptick in angle of 66^d 30', did cut the Ecliptick in ♉ 5^d. 16'. 53". In the right hand of the Centaur rightly delineated is a star of the fourth magnitude whose Longitude in the end of the year 1660 was ♏ 15. 13'. 5" & south latitude 20^d 52' 00" & the Colure passing through it did cut the ~ Ecliptic in ♏ 5. 41. 38 & ♉ 5. 41. 38. In the extreme flexure or elbow of Eridanus is a star of the 4^{th} magnitude of late referred to the breast of Cetus but anciently not. Tis the only star in Eridanus through which this ~ Colure can pass. Its longitude in the end of the year 1660 was ♈ 24^d. 59'. 45" & south Latitude 25^d. 18'. 19", & the ~ Colure drawn through it did then cut the Ecliptic in ♉ 6. 51. 34. The head of Perseus rightly delineated is a star of the fift magnitude whose longitude in the end of the year 1660 was ♉ 23. 12. 1 & north latitude 34. 19' 16" & the Colure drawn through it did then cut the Ecliptic in ♉ 5^d. 55'. 56". And the right hand of Perseus rightly delineated is a star of the 4^{th} magnitude whose longitude was then ♉ 24^d. 00'. 29" & north latitude 37^d. 26'. 50" & the Colure drawn through it did cut the Ecliptic in ♉ 4^d 33' 24". And the Colure drawn as near as may be through all these six stars, did then cut the Ecliptic in ♉ 5. 50'. 16" & ♏ 5. 50'. 16", as I find by taking the sixt part of the summ of the six longitudes where the six Colures drawn severally through the said six stars did cut the Ecliptic. And this Colure thus found passes through the left hand of Arctophylax & along the middle of his body, & is just – 90 degrees from the solstitial Colure found above, as it ought to be, & so has all the Characters of the Equinoxial Colure of the Ancients described by Eudoxus.

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So then the solstices & Equinoxes in the end of the year 1660 were gone back 35^d. 50'. 16" from their first places, & therefore recconing with Astronomers that they go back a degree in 72 years & by consequence 35^d. 50'. 16" in 2580 years & four months, & counting these years backwards from the end of the year 1660, the recconing will reduce the solstices to the middle of the signes or asterisms of Aries & Libra about sixty years after the death of Solomon. And this was the time in which Palamedes flourished.

Hipparchus Rodius the great Astronomer flourished almost 300 years after Meton & Euctemon & by comparing his own observations with those of former Astronomers concluded first of any man that the Equinoxes had a motion backwards in respect of the fixt stars & went backwards one degree in about an hundred years.[25] For such was the motion of the Equinox between the days of Palamedes & the days of Hipparchus according to the Chronology of the Greeks. To make it go back a degree in 72 years (which is the truth) the time between Palamedes & Hipparches must be shortened in the proportion of 100 to 72 & by this means Palemedes will have flourished about 60 to 70 years after the death of Solomon as above.

Thus by three several ways of recconing we have shewed that the solstices & Equinoxes fell upon the middle of the constellations of Cancer, Capricorn, Aries & Chelæ in the times between the Argonautic expedition & Trojan War. The second of the three ways is the exactest & most to be depended upon, & since it places the solstices & equinoxes upon the middle of the signes sixty years after the death of Solomon, that is, just before the Trojan war, I conclude that as Chiron & Musæus formed the Asterisms & delineated them upon the globe for the use of the Argonauts, so Palamedes reformed the globe & set the stars upon it more exactly for the use of the Greeks in their expedition against Troy, & did it in such manner that the middle of the cardinal signes might fall upon the solstices & Equinoxes observed by himself.

[1] Isagoge p. 1.

[2] Lucian de Astrologia. Laertius Proæm. Orpheus Argonaut. Achilles Tatius Isag.

[3] a Diodor. l. 4 p. 195. Iustin. l. 13. c. 7.

[4] b Diodor. l .4 .c. 2. p. 163. Plin. l. 2. c. 8 Albricus c. 22. Servius in Virgil. Æn. 4. v. 745.

[5] c Clemens Strom 1. p. 306, 332

[6] d Laertius Proæm l. 11

[7] e Achil. Tat. Isag. p. ult.

[8] f Suidas in Αναγαλλις

[9] g Apollodor. l .1. c. 9. sect. 25.

[10] h Soph. apud Achil Tatium in Isag. p. 1 Servius in Æn. 2.

[11] i Lucian. de Astrologia. Achill. Tat. c. 20.

[12] k Strab. l. 1. p. 23.

[13] l Serv. ad Æn. 1. v. 572

[14] m Iustin l. 13. c. 7.

[15] n Bochart. Canaan l .1. c. 14. p. 445. Laert. in Pherecide.

[16] Achil. Tat. c. 23.

[17] a Laert. in Thalete Plin. l. 2. c. 11.

[18] b Laert. in Anaximandro. Plin. l. 7. c. 56.

[19] c Plin. l. 18. c. 25.

[20] d Petav. Var. Dissert. l. 1. cap. 5. can. 19.

[21] a Petav. Doct. Temp. l. 4. c. 26.

[22] b Columella l. 9. c. 14. Plin. l .18. c. 25.

[23] a Euseb. Ch**{**ron.**}**

[24] b Laert. in v**{**it.**}** Eudoxi.

[25] Vide Ricciol. Almagest. Tom. 1. Lib. 3. c. 15 & 16, & Schol ad Lib 6. c. 16.