

Chapter 12

Four Galilean Horoscopes: A Technical Analysis

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Abstract.

In a recent paper in the *Journal of the History of Astronomy* Noel Swerdlow moved beyond considerations of the historical context of Galileo's astrology, or of Galileo's own attitude to astrology, into the technical analysis of extant horoscopes in Galileo's own hand.¹ This paper extends that work with an examination, based on Galileo's own notes, of four charts from his manuscript, the *Astrologica nonnulla*; Giovanfrancesco Sagredo, Cesare Galli and his daughters Virginia and Livia. It also discusses Galileo's relationship with the traditions of medieval astrology.

A note on sources

The primary sources used in this paper are taken from Galileo's *Astrologica nonnulla*, his collection of charts and notes. The pages examined are:

Giovanfrancesco Sagredo: three pages in total consisting of Sagredo's horoscope and two pages of directions. These pages are hand labelled, pages 11, 12 and 13.

Cesare Galli: Five pages, two of which contain, firstly an overruled horoscope, and secondly a redrawn horoscope, two pages each of which contain just a few lines of handwriting each and one page consisting of Galileo's calculations of the *Dominus Geniturae*. Some of these pages are hand labelled pages 5, 6, 28.

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Virginia, Galileo's eldest daughter: three pages consisting of the horoscope, a half page of handwriting and a table calculating the *Dominus Geniturae*. Two of these pages are hand labelled 24, 25a.

Livia, Galileo's second daughter: three pages consisting of the horoscope, a half a page of handwriting and a table calculating the *Dominus Geniturae*. Two of these pages are hand labelled 21, 22.

One page of directions to an unknown horoscope.

NB. See Appendix for horoscopes and figures.

Definitions

This paper explores Galileo's astrological techniques and therefore contains a number of astrological technical terms. These terms have been defined in the glossary accompanying this paper. Galileo's astrological technique is indicated by the notes and calculations in *Astrologica nonnulla*, including his use of such medieval techniques as almutens, primaries and profections. In the charts examined in this paper, Galileo used the Regiomontanus house system, devised by the German mathematician and astronomer Johannes Müller von Königsberg (1436-1476).

The *Astrologica nonnulla*

The *Astrologica nonnulla* is a collection of some fifty pages of horoscopes and accompanying notes in Galileo's own hand. It is the first volume of the sixth part of Galileo's manuscripts at the Biblioteca Nazionale in Florence. This paper examines only fifteen of these fifty pages and so can only be considered a preliminary exploration of Galileo's astrology.

The title, written in Galileo's hand, translates to 'Some astrology notes', a term used by Galileo to suggest that the collection of notes was not organised but placed altogether and therefore warranting a title. The *Astrologica nonnulla* was his personal collection of horoscopes and notes which he maintained and annotated.

Chart points used by Galileo

The parts and additional points that were calculated by any astrologer indicate the shape and nature of his or her astrology. Each era has its fashions. In the Hellenistic period a large number of lots (parts) were

used, as well as lunations before and after birth. In the Islamic periods from the ninth-century onwards, the number of lots decreased but the concept of an *almuten* was developed. Galileo used a single lot, the Part of Fortune, along with *almutens* and pre-birth lunations. He used Ptolemy's version of the Part of Fortune in that he calculated it in the same manner for both diurnal and nocturnal charts. Galileo would also have encountered the more conventional method of calculating the Part of Fortune, taking diurnal and nocturnal births into account, through the work of other astrological authors. However, in Livia's chart Galileo made an error of over 30^0 and in Galli's chart a 15^0 error in his calculation of the Part of Fortune. Both of these errors are large enough for an astrologer, aware of the geometry of this particular lot, to notice when plotting the point in the horoscope. It is possible that Galileo did not understand the nature and geometry of this lot, and therefore may either not have understood the significance of the diurnal/nocturnal question, or have disregarded it.

Galileo's use of essential dignities and his unique scoring system

Galileo used the standard medieval essential dignities of rulership, exaltation, triplicity, terms and face. However, his allocation of triplicity rulership is unique and has implications for his calculations. He used a combination of both Dorothean triplicities, as used by the thirteenth-century Italian papal and military astrologer Guido Bonatti, together with the paired triplicities of Claudius Ptolemy, which were later used by the seventeenth century English horary astrologer, William Lilly. He also used the Egyptian terms which Ptolemy strongly criticised in the *Tetrabiblos*,² an argument with which Galileo would have been familiar but evidently rejected.

The chart of Giovanfrancesco Sagredo

Galileo met Sagredo in the late sixteenth century and had a well-established friendship with him until 1608 when Sagredo took up the position of Venetian ambassador in Syria. There is no date recorded for the consultation but it is highly likely that Galileo drew up Sagredo's chart in the early part of their friendship, while Galileo was still teaching at Padua University.

The day in seventeenth-century Florence was conventionally measured from noon. Thus Galileo gives the birth data for Sagredo as 12:13 pm on 19 June 1571. These data translate into the modern system

as 00:46am, LMT on 20 June 1571. No place of birth is given although the location of Padua yields a chart as drawn by Galileo.

The Appendix shows Galileo's calculations for the planetary positions for all four charts being examined: it also lists the modern versions. It is not unusual for small errors of a half to over a full degree to be present in the planetary positions. For example, in Sagredo's chart the moon, one of the three main points for which Galileo calculates primary directions, was inaccurate by $1^{\circ} 03'$. These errors were caused by inaccuracies in the ephemerides of the day rather than by any mistake on Galileo's part. Nevertheless they have a serious impact on primary directions, the predictive technique which links a year of life to one degree of movement of an angle or planet.

Almuten rulers and Galileo's approach to the Sun

Galileo's notes on Sagredo's chart contain a technique used to establish the planet with the most strength with regard to each of the twelve houses (the only place in the sections of the *Astrologica nonnulla* here examined in which the technique is found). This calculation, which is to define the almuten ruler of a house or point, is achieved by applying positive coding to the essential dignity of a planet, point or zodiac degree. It was introduced into Europe by Guido Bonatti in his *Liber Astronomiae*.³

This almuten table contains a few anomalies. Galileo has an unusual, perhaps unique, method of determining the triplicity rulers of a zodiac degree, which will be discussed later when examining the *Dominus Geniturae*⁴ table for Sagredo. However, if Galileo used the accepted scoring systems of the essential dignities (see glossary) as set out by Guido Bonatti, his calculation for the almuten of the fourth house would be as follows:

Sun = 0, Moon = 8, Mercury = 3, Venus = 3, Mars = 3, Jupiter = 4

According to this system, the Moon, as the highest scoring planet, is therefore almuten ruler of the fourth house. However, Galileo listed the almutens of the fourth house as both the Moon and the Sun. His allocation of the Sun to almuten rulership of the fourth house could have been for one of three reasons; because the Sun is contained in the sign ruled by the Moon; because it was contained in the same sign as the fourth house cusp; or because some of the sign Leo (the sign ruled by the Sun) is contained in the fourth house. Whatever his reasoning, Galileo

did not allow any other planet to claim such a position of power. In his calculation of the twelfth house almuten Galileo gives the following figures:

Sun = 0, Moon = 3, Mercury = 0, Venus = 9 (using Egyptian terms),
Mars = 3, Jupiter = 8, Saturn = 0

Venus was the highest scoring planet but once again Galileo also listed the Sun as almuten. This may have been because the Sun was the almuten ruler of Aries which itself was totally contained within the twelfth house.

House	Planet	Almuten
1.	☉	0
2.	☽	3
3.	☿	0
4.	☿ et ☉	9
5.	☉	0
6.	☿	0
7.	☿	0
8.	☿	0
9.	☿	0
10.	☿	0
11.	☿	0
12.	☿ et ☉	9

The Planetary and House almuten rulers of Sagredo's chart, drawn by Galileo

Galileo also allocated the Sun almuten rulership over any house in which Aries was intercepted (contained within a house and not having rulership of the cusp). In the same chart Libra is intercepted in the sixth house, yet Galileo does not list Saturn as one of the rulers of the sixth house, even though it is the almuten ruler of Libra. Thus he allowed one set of criteria for the Sun which he did not extend to the other planets. He allowed the Sun and the Sun alone to have an increased influence in the horoscope.

Rulership over a house is important both in relation to the initial delineation of a chart and in the subsequent use of predictive techniques. Galileo's emphasis on the Sun in Sagredo's chart impacted on his interpretation and prediction and, given his background in observing and measuring, it is highly likely that this was intended.

Galileo calculated the almuten rulers of each of the degrees of the planets. He listed Saturn and Venus as the almuten ruler of natal Saturn, even though the clear almuten ruler on score alone is Saturn. He did not emphasise the sign ruler in any of the other almuten calculations, so there appears to be no reason for his inclusion of Venus as almuten ruler of Saturn. These discrepancies may indicate an innovation in his personal method for scoring the almutens for planets and houses, rather than error. However, as he neither shows his calculations for the almuten table for Sagredo's chart nor uses such a table for his daughters, the reason remains uncertain, it appears that he:

- a) favoured the Sun strongly in a horoscope. He considered that if any house cusp falls in the sign of the natal Sun, or any house which contains any of the degrees of Leo, or if the Sun is located in the sign ruled by the almuten of a house, then that house should also have the Sun as one its almuten rulers;
- b) allows the Sun to also claim almuten rulership over any house which may totally contain the sign Aries (this being the sign in which the Sun has the greatest number of fortitudes);
- c) appears to have devised his own scoring system for calculating almutens.

The *Dominus Geniturae* tables

For all four charts under examination, Galileo calculated a type of expanded compound almuten table which he called the *Dominus Geniturae* (Lord of the Chart). In this table he took each planet, the Part of Fortune and the nodes of the Moon, and allocated different scores to the points or planets depending on their position within the zodiac, house position and relationship to other planets and the fixed stars. Calculating the *Dominus Geniturae* using almutens and dignities was not Ptolemaic, but has its roots in the work of the Islamic astrologers.⁵ The following passage from Schoener reflects the general principles of Galileo's methodology for seeking the *Dominus Geniturae*:

Order at this point demands that you will examine carefully which of the planets in the radix of the nativity are strong and which are weak. On this subject you will inspect five things by following [the method of] John of Seville: first whether a planet is combust or not; second whether it is direct or not, or swift or slow [in motion]; third whether it is in any of its own dignities such as domicile, exaltation, triplicity, bound (term), or face, or not; fourth whether it is in the evil aspect of the infortunes, or in the good aspect of the fortunes, nor not; fifth and last, how it is located in the figure of heaven, whether it is in an angle, succedent, or cadent.⁶

As can be seen from table 1, Galileo's method for finding the strongest planet in the chart corresponds quite well with Schoener's formula. Unlike Schoener, however, he used fixed stars, which will be discussed later in this paper. The points used and the scores Galileo allocated to these points reveal in great detail his astrological thinking. One can think of this table as a photograph of the astrological techniques of Galileo, who was, by virtue of his university position, the principal teacher of astrology in Padua from 1592 to 1610.

Triplicity rulers

Galileo had an unusual approach to triplicity rulership. The Dorothean, method allocated three triplicity rulers to each element.⁷ For example, the triplicity rulers of all air signs were Saturn, Mercury and Jupiter. The order of these three planets was important due to their connections with house meanings and periods of life. The order of the first two planets was switched if the chart was nocturnal. The first two planets were known as the sect rulers and the third was considered the common, or participating, ruler. In the second century Ptolemy created a new system by removing the common ruler and working with only the sect rulers (that change with the day or night nature of a chart) of the triplicities.⁸

Galileo's method may be seen as a hybrid of the Dorothean and Ptolemaic. For the water signs (Cancer, Scorpio and Pisces) Galileo listed the Dorothean triplicity rulers of Mars, Moon and Venus (Galileo's order of listing) which are repeated in the table for both the Sun in Cancer (table 1, Sun row 4) and Jupiter in Pisces (table 1, Jupiter row 4). However, he does not seem to pay attention to the order of these rulers. Dorotheus, and later Bonatti, would have written the triplicity rulers for Sagredo's Sun and Jupiter in his nocturnal chart as Mars, Venus and the Moon, an order having profound implications for house rulership and

subsequent predictive work. Galileo then switched to Ptolemaic triplicities for all air and fire signs, allocating only two rulers to these elements.

We have only one example of Galileo's use of earth triplicities, and that is for Livia's Jupiter in Virgo. Galileo listed the triplicity rulers of this planet as Venus and the Moon. Thus Galileo appeared to use the Dorothean triplicity *only* for water and switched to the Ptolemaic technique of ignoring the common rulers for air, earth and fire signs. In addition, in Sagredo's nocturnal chart he listed for the element air Mercury and Saturn, and for fire Jupiter and Sun, and therefore *did* list these in the correct order for a nocturnal chart (table 1, Moon row 4, Mars row 4, Mercury row 4, Node row 4).

The use of the three triplicity rulers of the signs seemed to disappear from astrology within a few years of Galileo's death. The astrologer William Lilly, working in England in the mid-seventeenth century, used the Ptolemaic system of triplicity.⁹ This is a significant point for, when the older triplicity technique fell into disuse, all the medieval techniques of delineation and prediction linked to the correctly ordered triplicity rulers were also abandoned.

Aspects

Galileo's methodology for orbs and aspecting is intriguing. Up to this time, according to the work of Guido Bonatti and Johannes Schoener, aspecting was done primarily within sign and by what was known as moiety, in which each planet was assigned an orb. Traditionally these orbs were listed as diameters, so if the Sun was given an orb of 17⁰ then this made an aspect within a +/- 8⁰30' span. With each planet having its own diameter, an aspect between two planets was considered active if one touched the other's circle of influence. The aspect was thought to be at its strongest if the planet with the smaller orb was totally contained within the orb of the planet with the larger orb. This was called moiety.¹⁰ This is in contrast to the modern approach to aspecting where orbs are listed as radii and are linked to an aspect rather than to a planet.¹¹

Written under the chart Galileo constructed for his daughter, Virginia, are the orbs he used at that time. Galileo listed these as:

Planetary Orbs: Sun 17⁰, Saturn 10⁰, Jupiter 12⁰, Mars 7⁰30', Venus 8⁰, Mercury 10⁰, and the Moon 12⁰.

These are basically the orbs used by Ptolemy, who used them as diameters. Yet the aspects as given by Galileo in constructing Sagredo's chart were as follows:

Aspect	Orb	
Sun trine Jupiter	16 ⁰	
Sun trine Saturn	10 ⁰	cross sign
Moon square Jupiter	12 ⁰	
Moon sextile Mercury	7 ⁰	
Moon trine Saturn	15 ⁰	
Moon conjunct Mars	7 ⁰	
Saturn trine Mars	10 ⁰	
Jupiter sextile Venus	3 ⁰	
Jupiter trine Mercury	10 ⁰	cross sign
Jupiter square Mars	5 ⁰	
Mercury square Saturn	6 ⁰	cross sign

For the Moon's trine to Saturn Galileo allowed an orb of 15⁰, which was so large that he may have considered them as aspected by sign, on the Hellenistic model¹² However, there are three aspects that disregard the sign boundary.

He also used cross-sign aspects in Virginia's chart, in which he considered that the Sun at 20⁰ of Libra formed a conjunction with Mercury located at 4⁰ of Virgo, as well as in Livia's chart where he noted the Moon at 18⁰ Aries opposed Jupiter at 24⁰ Virgo: although he has not allocated any score for this aspect he is here allowing an orb of 24⁰ across the signs.

These examples suggest that Galileo may have used a different approach to measuring his aspects: he did not use moiety, he increased the orbs, he considered his orbs in the modern manner as radii and he used aspects across sign boundaries. The crossing of sign boundaries in aspect is considered to be the work of Kepler,¹³ who was an ally and supporter of Galileo's.¹⁴ This removal of sign boundaries in aspecting and the orbs considered radii and linked to aspects rather than planets is a feature of modern astrology and its presence in Galileo's astrology could be one of the earliest recorded incidents of this approach.

Yet Galileo still employed reception, an aspecting technique which is linked to the signs involved (see the glossary). In the *Dominus Geniturae*

table for the chart of Galli which has Mercury in Capricorn and Mars in Virgo, Galileo allocated a score for the mutual reception between the two planets. Additionally, in the few brief notes on delineation in the *Astrologica nonnulla* for Sagredo's chart, he writes:

Venus being alone is an auspicious signifier of character, free from the aspects of malefics and, being illuminated by the benign rays of Jupiter and Mercury in sextile, determines the most honest, praiseworthy and best of characters, and makes him kind, happy, merry, beneficent, pacific, sociable pleasure-loving, a lover of God, impatient of troubles [of taking pains?].¹⁵

Galileo was here discussing the positive aspects to Venus via the rays of Jupiter and Mercury (see glossary), based on the idea that a planet is an active entity and casts rays around the horoscope. Galileo considered a planet's aspects to be an active force, or identity, in the chart.

Finally, Galileo supported the astrological notion that squares to the Moon's nodes are difficult.¹⁶ No other aspects to the nodes are recorded in any of the four charts. However, for Livia he listed in the negative part of the table a square from Mercury to the node.

Galileo's use of aspects is therefore a blend of methods found in Ptolemy and Guido Bonatti, a combination which is consistent across all four charts examined.

The Almuguea

In Sagredo's *Dominus Geniturae* table (table 1 Mercury row 4) as well as in Galli's and Virginia's tables, Galileo includes what Ptolemy defined as the almuguea.¹⁷ One planet is said to be the almuguea of another if the distance between the two natal planets is the same as the distance between the two signs ruled by those planets. The two planets are said to assist each other. According to Bonatti, the two planets must also be in the same degree and minute of their respective zodiac signs.

For example, let it be posited that the Sun is in the ninth degree and twelfth minute of Capricorn; now it is necessary that Mercury be in the ninth degree and twelfth minute of Sagittarius because between the ninth degree and the twelfth minute of Capricorn and the ninth degree and twelfth minute of Sagittarius there is one whole sign.¹⁸

Yet, in the case of Sagredo, Galileo defined Mercury as being in almuguea to the Sun when Mercury is located at $3^0 01'$ Leo and the Sun is $7^0 14'$ Cancer. In Galli's chart he scored Mercury, at $11^0 58'$ Capricorn, in an almuguea relationship to the Sun at $23^0 04'$ Sagittarius. In the case of Virginia he listed three other almuguea relationships, all of which are correct by sign but not by degree. It appears, then that Galileo used almuguea on the basis of sign relationships only and ignored the need for the planets to be in the same degree and minutes of respective signs.

Scoring of the *Dominus Geniturae* tables

Galileo considered the speed and movement of a planet as its single most important feature, as is shown in his attribution of up to six points for a planet if it is in direct motion, (see table 1 row 9) but he subtracts five points for a planet that is retrograde, as in the case of Saturn in Sagredo's table (table 1 Saturn row 15). Since a planet must be either direct or retrograde, the disadvantage of retrograde motion is eleven points. Common astrological tradition considered that the retrograde motion of a planet was a weakening of the planet. However, the allocation of such a large positive scoring for not being retrograde is unusual.

With an average top score in these tables of the low twenties, this meant that about fifty percent of a planet's score was influenced by its motion. This strong bias towards direct motion ensured that it would be nearly impossible for a retrograde planet to be the *Dominus Geniturae*. Similarly the luminaries, which do not undergo retrograde motion, were judged for their speed; slower than average speed was a minus score while faster movement attracted a positive score.

It would seem that forward motion of a planet was therefore of greater importance than rulership, which traditionally had always been the stronger factor. His other strong emphasis is the planet's relationship to the Sun. Astrological tradition deducted points from a planet if it was too close in zodiacal degree to the Sun a condition known either as 'combust' or 'under the Sun's beams', depending on its closeness to the Sun. From the *Dominus Geniturae* table for Virginia we can see that Galileo is using this technique. He decided that Virginia's Jupiter Galileo declares it is combust with its 9^0 orb to the sun but in the case of both Mercury (14^0 from the sun) and Venus (13^0 from the sun) he called them 'oppressus' and they lost only four points instead of the five points deducted for combust. Galileo used slightly different orbs from those suggested by Bonatti, who had discussed this idea in his *Liber Astronomiae*, writing that combust is the weakest state but that, when a

planet is not as depleted when it is either entering or emerging from the Sun's rays.¹⁹

Galileo subtracted points for combustion, as in Virginia's chart in which Jupiter loses five points for being combust, and added points to planets if they are free of the Sun. (See table 1 row 7). Once again, since every planet must be either combust or free of the Sun, then any planet that is combust is disadvantaged by ten points, or about fifty percent of the possible score. It seems that the ruling planet needed to be both direct and clear of the Sun and that, in Galileo's astrological opinion, these were the two vital ingredients of a planet's strength, in contrast to the more classical opinion that the greatest strength was provided by the essential dignities. Galileo appears to have challenged the traditional importance of the zodiac, replacing it with the movement of the heavenly bodies and their aspects to each other. His use of cross-sign aspecting, for example, challenged traditional notions of the significance of sign cusps.

Astronomical considerations: One might expect Galileo to have linked his astrological charts with his knowledge of the sky, yet this does not appear to be the case, for example, in his handling of Venus in Sagredo's chart.

Galileo used the conventional system in which a planet's strength might be evaluated partly on whether it was oriental (rising before the Sun) or occidental (setting after the Sun). Oriental of the Sun (to the east) was considered masculine, while occidental was feminine. Thus a masculine planet in a masculine orientation to the Sun was seen as favourable, while a feminine planet was considered to be helped if it was occidental. In Sagredo's chart Venus, a feminine planet, was oriental, rising before the Sun, and in a masculine area of the chart. Therefore, according to the astrological doctrine of the day, it was depleted in strength. Accordingly, Galileo deducted two points from Venus' score. Yet on the day of Sagredo's birth Venus was almost at its greatest elongation (separation from the Sun) and therefore would have been a brilliant morning star just a few hours after his birth. If Galileo was actually linking the horoscope to the sky, one would expect that he would have questioned its astrological devaluation, particularly since, as he had calculated via the *Domina Geniture*, Venus was so important in Sagredo's horoscope.

Evolving astrological concepts

Galileo produced two tables of *Dominus Geniturae* for his daughter Virginia, one on the same sheet of paper as his original chart and the other on a separate sheet. The second sheet takes into account additional points and changes the ruler from Jupiter to Mercury, although he did not re-edit his original horoscope. It is possible that the first sheet was an earlier horoscope done for his daughter and the second table was drawn up later when he was reconsidering the chart and wanted to recalculate the ruling planet using a slightly different method.

In both his daughters' charts Galileo also added into the *Dominus Geniturae* table the concept of peregrine (see glossary) to the scoring of planetary strength (see figures 3 and 4). However, he didn't use it in Sagredo's chart. Similarly his way of writing the symbol for the Part of Fortune was different in Sagredo's chart than in his daughters' horoscopes. This suggests that his astrology may have been changing as he listened to other astrologers or reconsidered his own practice.

The life force: the hyleg

Hellenistic and Islamic astrological traditions both placed emphasis on the need for the astrologer to determine whether a child was going to survive childhood and grow into adulthood. This question was approached by first looking in the child's horoscope for the 'life-giver'. Such a planet, if present, was called the hyleg, prorogator or, by Galileo, the apheta. Galileo noted the apheta in each of the charts studied in this paper.

There are different methods for measuring length of life. One, described by Ptolemy,²⁰ first locates the hyleg and then uses either its strength or primary directions to measure how many years will pass until this planet is influenced by a negative place in the chart. The second method, which appears to derive from the Islamic world, finds the hyleg but then looks for another planet, the alcocoden, which aspects the hyleg. The alcocoden then allocates the number of years of life.²¹

Galileo referred to the length of life only once in his notes and that was in connection with Sagredo's chart. In these notes he refers to the alcocoden but allows it to be the same planet as the hyleg.

Venus is constituted as hyleg, apheta or the prorogatrix of life; and, by the same token, the alcocoden, since she is in her own house.

This was not a generally accepted way of working with the alcocoden. Undoubtedly, through the work of Ptolemy, Bonatti and Schoener, Galileo would have encountered methods involving both with and without an alcocoden. Generally speaking, however, all authors agree that the hyleg can only be 'elected' from a few selected chart points, as Ptolemy²² clearly states:

[...] the Sun, the Moon, the Ascendant, and the Part of Fortune, are to be considered as the four principally liable to be elected to the office of prorogator [...].

Although Galileo seems to conform to this rule in the case of Virginia and Galli, 'electing' the Sun as their hylegs, in Sagredo's case he elects Venus while he nominates Mercury for Livia. Therefore it is impossible to detect which of the dozens of methods of determining the hyleg Galileo used, or indeed whether he used his own preferred method. However, we can see that his technique did follow the nature of Guido Bonatti's²³ argument that the chart be judged either conjunctional (born on a waxing moon) or preventional (born on a waning moon). Galileo carefully noted on all four charts the nature of the lunation before birth as well as the degree position of this lunation. In the case of Galli he noted this as a lunar eclipse.

It is evident that Galileo considered the vitality of the individuals for whom he calculated horoscopes but did not follow any one technique, preferring to use a combination. Whether these were his original methods or those of his contemporaries one cannot tell.

The fixed stars in primary directions

Galileo also used primary directions for prediction (see glossary). Next to his orbs for aspects under Virginia's chart Galileo listed the orbs²⁴ that he used for aspects to fixed stars that had been projected onto the ecliptic:

1st magnitude stars 7⁰30', 2nd magnitude 5⁰30', 3rd magnitude 3⁰30', 4th magnitude 1⁰30'.

Like most astrologers before him (the notable exception being the work of the Greek author known as 'Anonymous of 379'), Galileo followed Ptolemy's method, locating the fixed stars by projecting them on to the ecliptic. He used a total of fifty-eight stars in his preparatory work for Sagredo's primary directions. For most of these stars he used the Latin

description of the star's location in the constellation rather than a proper name. These loosely followed Ptolemy's descriptions from the *Almagest*. For example, for Algol he used the name 'Cap.Med.' (Caput Medusa) and for Betelgeuse he used 'Hum. Dex. Orion' (Right Shoulder of Orion). Indeed, Galileo used only seven proper names in his entire list of fifty-eight stars. Ptolemy gave a list of over 1000 stars in his *Almagest* so Galileo's selection of fifty-eight stars and nebulae indicates his choice. A full listing of these stars, Galileo's Latin names, their modern accepted proper name and Galileo's calculated positions, as well as the actual position for the birth of Sagredo, is given in table 3.

Further predictive techniques

Of the four horoscopes under examination in this paper, only the chart of Sagredo has any predictive work attached, indicating his use of profections (see glossary) and the direction of the ascendant via ecliptical degrees; he directed Sagredo's ascendant through the full 360^0 of the zodiac. In this table Galileo noted not only particular events, such as the directed ascendant's change of sign, house or Egyptian term, but also when the degree of the directed ascendant conjoined the ecliptical position of a fixed star. In addition, Galileo noted when the ascendant made either a dexter or sinister aspect to one of the natal planets. When such an aspect was made he noted the planet's celestial latitude and its motion in two extra columns. There is no indication that Galileo linked these events to different years of Sagredo's life. This table raises a problem: if it was some form of primary direction, a year of time for a degree of motion, then Galileo would not have needed to direct through the full 360^0 of the zodiac. Neither does the table seem to be some form of preparation for his primary direction calculations, as some of the same figures are reproduced both on that page and separately in the page of calculations for the primaries. So this page is more likely a reference sheet for some other predictive method, possibly profections.

Yet the evidence of this table suggests that Galileo was using a different form of profections from Ptolemy's.²⁵ Galileo may have replaced what he considered a clumsy Hellenistic approach of counting the years of life around the chart one year per one sign, by simply working with a ratio of $365 \text{ days} = 30^0$. Such a mathematical step would have been logical for him to take, unless, of course, he had learned such a technique from another source. Once the table was set up, then any date in Sagredo's life could have been easily converted to a degree of the zodiac and the table consulted as to the nature of that degree. There is no

other known evidence of this type of profection amongst the pages of the *Astrologica nonnulla* examined for this paper, but the existence of such a carefully calculated table suggests that Galileo was working with an unusual approach to both directions and profections.

Galileo also used Ptolemy's method of directing the ascendant, midheaven and Moon; Ptolemy had explained how the direction of each of these key points is linked to key areas of the client's life.²⁶ Galileo directed these three points, tabulating sign and term changes, as well as conjunctions, to fixed stars and aspects to the natal planets. Alongside each entry he listed the size of the oblique ascension arc and from this he could transpose Sagredo's age in years. He placed all these primary direction tables on the one sheet, allowing him to conveniently look at all three facets of Sagredo's life for any given period from birth to seventy or eighty years of age.

Thus, Galileo allowed the ascendant, midheaven and the Moon to act like a moving point arcing through the chart. Galileo may have changed this technique later, as is evident from a single sheet which does not refer to the charts of Sagredo, Virginia, Liva or Galli. This sheet contains directions up until the age of 99.59 years, and applies a single increasing arc to all planets and points in the horoscope and relates this back to the natal chart.

Galileo's delineation notes

It is rare for an astrologer, unless a novice, to write out delineations. To find so little delineation text in Galileo's astrological work therefore suggests that the *Astrologica nonnulla* is the work of an experienced and practised astrologer. Galileo commenced his notes on Virginia, Livia and Galli with a consideration of the relationship between Mercury and the Moon. To Galileo, Mercury was the rational mind while the Moon represented the sensitive powers of the soul, and he looked for a cordial relationship between them. In Virginia's case he noted that Mercury and the Moon were in separate signs and had no aspect.²⁷ He delineated this as a jarring or discord. Galileo's reference to the 'very debilitated Moon' indicates his use of besiegement, as the Moon lies between the two malefic planets of Mars and Saturn. The note concerning family matters may refer to the fact that Galileo considered Saturn to be so strong in Libra (its sign of exaltation) that the besiegement of the Moon would inhibit the birth of any children.

In Livia's case Galileo noted that Mercury was also separate from the Moon. Mercury, though, was so strong that it would overcome the

difficulties of the Moon and the rational mind could therefore be judged stronger than the sensitive part.²⁸ In Galli's case he only made a few notes:

Mercury and the Moon are in a trine aspect which benefits a balance between the rational and the feeling ability.²⁹

In 1390, in his work *On the Judgement of Nativities*, Antonius de Montulmo had suggested a psychological approach to astrology: instead of simply looking to the fate or fortune of a chart, he suggested techniques for examining a chart for intelligence, morality and emotional well-being. He based this proposition on Aristotle's three souls, vegetative, sensitive and intellective, linking the sensitive soul to the Moon and the Intellective soul to Mercury. In the charts of Galli, Sagredo and his daughters Galileo approached his delineation work in the spirit of Montulmo. In both his daughters' charts Galileo also considered the nature of their intelligence by a closer examination of Mercury, consisting of its house, sign, aspects and relationship with any fixed stars.³⁰ Indeed, if his delineation of Livia's chart has any merit, then it is little wonder that she suffered from the severe environment of the convent in which she was placed.³¹ Galileo's notes for Sagredo's chart, however, are somewhat different, indicating, along with slightly different *Dominus Geniturae* tables, that Sagredo's chart was possibly drawn up at a different time.³² Galileo first discussed the *Dominus Geniturae* and its excellent condition, and then suggested the temperament of the chart, its condition based on the four qualities, hot, cold, wet and dry; the elements, fire, earth, air and water; and humours, choleric, melancholic, sanguine and phlegmatic. There are many methods of judging temperament, some of which are similar to the point-scoring method of the *Dominus Geniturae* table, while others are based on personal judgement. Galileo seemed to use the latter of these methods, stating that Sagredo is sanguine without providing supporting astrological calculations.

Indeed the notes for Sagredo's chart are quite different from those Galileo made for his two daughters, and it is probable that these astrological works were undertaken at different periods. It should also be recalled that he calculated Virginia's *Dominus Geniturae* more than once, using different points on his second visit to this chart.

Conclusion

Galileo's work is firmly based in Ptolemaic and Islamic methods, yet at the same time the argument may be made that he was, like Kepler, a moderniser. Further examination of the rest of the *Astrologica nonnulla* may point to further insights into Galileo's astrology and location within the traditions of medieval or modern astrology.

Acknowledgment. Thanks to Dorian Greenbaum who provided helpful insights into seventeenth-century Latin scripts used by Galileo in his astrological work.

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3. Bonatti, Guido (1994) *Liber Astronomiae, Part II*. trans. Robert Zoller, Berkeley Springs: Golden Hind Press, p. 105. See also Omar of Tiberias (1997) *Three Books on Nativities*, trans. Robert Hand. Berkeley Springs, Golden Hind Press, p. 13; Schoener, Johannes (1995), *Opusculum Astrologicum*, trans. Robert Hand. Berkeley Springs: Golden Hind Press, p. 62.
4. The term *Domina Geniture* is the female form of the Latin astrological term of *Dominus Geniturae* although the common practice of the day was to remove the last 'a' and thus this would be *Dominus Geniture*. In this case the Lord of Sagredo's chart is Venus which is a 'Lady'. This is also the case with the chart of Livia. However, in the case of Virginia where her chart ruler is a masculine planet Galileo uses the masculine form of *Dominus Geniture*.
5. Omar of Tiberias, *Three Books on Nativities*, p. 13, pp. 57-86. See also Montulmo, Antonius de (1995), *On the Judgement of Nativities Part 1*, trans. Robert Hand. Berkeley Springs: Golden Hind Press, p. i.
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 22. Ptolemy, Claudius (1969), *Tetrabiblos*, Translated J.M. Ashmand, California, USA: Health Research, p. 131.
 23. Zoller, Robert (1981), *Tools and Techniques of the Medieval Astrologers*. USA: self published, p. 32.
 24. The use of these orbs may be peculiar to Galileo.

25. Ptolemy, *Tetrabiblos*, pp. 207-208

26. Ptolemy, *Tetrabiblos*, pp. 205-206.

27. Mirti, Grazia and Nick Kollerstrom, 'Galileo's Horoscopes for his Daughters', *Last Man Standing*, special issue of *Culture and Cosmos*, Vol. 7 no 1, Spring/Summer 2003, p. 102. With respect to this passage, Dorian Greenbaum pointed out a unique feature of the Latin script, namely of writing the letters 'ue' in a short-hand method that looked like the glyph for Saturn.

28. Mirti and Kollerstrom, 'Galileo's Horoscopes for his Daughters', p. 102.

29. The author's own translation of the text for Galli.

30. Mirti and Kollerstrom, 'Galileo's Horoscopes for his Daughters', pp. 102-3.

31. Sobel, Dava. (1999) *Galileo's Daughter*. London, UK: Fourth Estate, p. 133.

30. Kollerstrom, Nick, 'On the Character of Sagredo: An English translation of Galileo's judgements upon his nativity of Giovanni Sagredo', *Last Man Standing*, special issue of *Culture and Cosmos*, Vol. 7 no 1, Spring/Summer 2003, p. 96.

Table 2.

Galileo's scoring system for the calculation of the *Dominus Geniturae*. Galileo's scoring system for planetary essential dignities seem to follow Bonatti's while the other conditions, according to Hand (Montulmo 1995), follow Montulmo.

Score			
Rulership	5	Detriment	-5
Exaltation	4	Fall (although he does not use this in the case of Livia's Mars).	-4
Triplicity	3		
Term	2		
Face	1		
Joy	1	Does not use Gloom (opp. to Joy)	
Direct in movement	4	Retrograde	-4
Not near the Sun	5	Combust Under the beams	-5 - 4
Correct oriental or occidental position of planet	2	Incorrect oriental or occidental position of planet	-2
Aspects benefic via Conjunction, Sextile or trine	Positive score of 2, 3, 4 or 5	Aspects malefics via conjunction, square or opposition	Minus score of 2, 3, 4 or 5
		Peregrine	-5

House position of planet or point. Plus score for Angular houses and some succedent houses. Not all houses are scored	+	House position of planet or point. Minus score for cadent houses and some succedent houses. Not all houses are scored	-
Aspect to Stars – like Regulus	6	Aspect to Stars – like Algol	-5

Table 3.

Stars used by Galileo for Sagredo: Stars for which Galileo uses the accepted modern names are in *italic*. Words that are unclear in the manuscript are indicated with a question mark.

Star name	Galileo's position	Actual position	Constellation	Galileo's name
Algol	21/17 <i>Taurus</i>	20/11	Perseus	Cap. Med
Mirfak	26/27 <i>Taurus</i>	26/06	Perseus	Dex lat psei
Aldebaran	4/17 <i>Gemini</i>	3/48	Taurus	Oculi Taurus
Rigel	10/47 <i>Gemini</i>	10/50	Orion	Rigel
Bellatrix	11/57 <i>Gemini</i>	14/57	Orion	Bellatrix
Alnilam	16/57 <i>Gemini</i>	17/28	Orion	Cing Orion
Meissa	18/37 <i>Gemini</i>	17/43	Orion	Nebula in cap. Orion
Betelgeuse	23/37 <i>Gemini</i>	22/46	Orion	Hum.dex. Orion
Sirius	9/17 Cancer	8/10	Canis Major	Cani cul
Castor	14/57 Cancer	14/16	Gemini	Apollo
Pollux	18/?? Cancer	17/17	Gemini	Hercules
Procyon	20/47 Cancer	19/52	Canus Minor	Procyon

Talitha Australis could be (T.Borealis)	27 Cancer	27/56	Ursa Major	? in helice
Unknown	1/57 Leo		Andromeda?	Presep nebula
Unknown	3 Leo		Ursa Major	obse helicis
Dubhe	8 Leo	9/09	Ursa Major	Alig obsc Helic
Acubens?	8/47 Leo	7/39	Cancer	Lucid Cinos
Alphard	21/17 Leo	21/19	Hydra	Lucid hydra
Regulus	24/07	23/52	Leo	Regulus
Foot of the Bear	3/47 Virgo		Ursa Major	Caud. Helic
Zosma	5/47 Virgo	5/18	Leo	Tergus Leo
Mizar	9/37 Virgo	9/37	Ursa Major	In cud helic
unknown	12/07		Coma Berenice?	In com:bere
Vindemiatrix	3/47 Libra	3/58	Virgo	Vinoem
Spica	18/17 Libra	17/52	Virgo	Spica
Arcturus	18/37 Libra	18/15	Bootes	Aretur
Princeps	26/57 Libra	27/06	Bootes	Cali:Boot
unknown	29/57 Libra		Perseus?	Per Cent:
Alphecca	6/17 Scorpio	6/15	Corona Borealis	Alpheta
Zuben Elgenubi	9/14 Scorpio	9/07	Libra	lucid:lanx au
Zuben Eschamali	13/47 Scorpio	9/18	Libra	lucid:lanx:bor
Kornephoros	23/17 Scorpio	25/06	Hercules	brach:dep here:
Antares	4/17 Sagittarius	3/47	Scorpio	Cor. Scorpio
Ras Algethi	9/17 Sag	10/10	Hercules	Cap. Here
Ras Alhague	16/27 Sag	16/27	Ophiuchus	Cap. Ophiue:
Acumen	22/47 Sag	22/45	Scorpio	Nebula ? Scorpio
Facies	6/47 Capricorn	2/20	Sagittarius	Oculi Sag. Nebula
Vega	8/17 Capricorn	9/20	Lyre	fidicula
Dheneb	12/47 Capricorn	13/50	Aquila	p ^a antinos

Altair	25/27 Capricorn	25/44	Aquila	Agla
Alshain?	0/17 Aquarius	26/28 Capricorn	Aquila?	Tres in niche ? Cap. Antinon (possibly the head of Antonio the cup bearer?)
Sualocin	9/17 Aquarius	11/25	Delphinus	Caud:Delph
Sadr?	20/07 Aquarius	18/56	Cygnus	P(?)ecbus Galli
Fomalhaut	28/37 Aquarius	27/50	Pisces Austrinus	ult:fisionis
Deneb Adige	0/47 Pisces	29/27 Aquarius	Cygnus	Caud:Cigni
Unknown	No degree given		Aquarius?	?? in the exu aqu
Markab	18/17 Pisces	17/31	Pegasus	Scapulo Pega
Unknown	22 Pisces			Inform, cirea pisces
Unknown	23 Pisces			
Scheat	25/57 Pisces	23/24	Pegasus	Cauda?
Algenib	3/14 Aries	3/11	Pegasus	Extr. Alo Pega
Alderamin	8/17 Aries	6/54	Cepheus	Dext.hum.Cep
Alpheratz	9/27 Aries	8/21	Pegasus	Cap. androme
Al Kurhah	16/37 Aries	18/18	Cepheus	certus? Cep
Hamal	28/17 Aries	1/40 Taurus	Aries	Cornu Aries
Schedar	2/27 Taurus	1/50	Cassiopeia	Cassiop.pectus
Unknown	2/37 Taurus			Deltots?

Glossary of Terms in Medieval Astrology

Air Sign. The signs associated with the element air: Gemini, Libra and Aquarius (Ptolemy, 1969:43 – 45).

Alcocoden. The alcocoden is the planet which forms a Ptolemaic aspect to the hyleg (the planet in a person's horoscope which indicates that they have a life

force) and which has the greatest dignity in the zodiacal degree of the hyleg. Once the alcocoden has been found it is then used to determine the number of years of life. The actual measure of length of life was computed using a set of rules which allocated particular years to particular planets, and then added or subtracted years depending on the aspects other planets made to the alcocoden (Omar 1997:29; Masha'Allah 1994:11).

Almuguea. One planet is said to be the almuguea of another if the distance between the two natal planets is the same as the distance between the two signs ruled by the planets (Bonatti 1995:66).

Almuten (Almutes, Almutem). There are several meanings to this term. It can be used to refer to the single planet that rules the horoscope (Omar 1997:13) However, Guido Bonatti (1994: 105) later defines it:

...Indeed sometimes a planet is the lord of the house, and another planet which is not the lord of the house is stronger in that house. That planet is called the stronger which has in that place more dignities or fortitudes, and which has more fortitudes in the house of the matter, or which signifies that matter about which there is a question. And that planet is called the signification, which Alchabitius calls Almutes...

(Alchabitius was a tenth-century Arabian astrologer whose book on astrology, *Alchabitius cum commento*, was first published in Venice, in Latin in 1473 and later in 1503. See house system).

Therefore the planet Saturn, which is the exalted ruler of the sign of Libra, as well as one of its triplicity rulers and also rules one of the terms, has greater dignity in Libra than the sign's traditional ruler, Venus. Saturn is therefore the almuten ruler of Libra. By the time of the Arabic astrologer, Abu Ma'sha, (787 – 886 C.E.) and his Jewish teacher Masha'alla (762 – 815 C.E.), the concept of the almuten was being used in determining the length of life (Masha'alla 1994:6).

However, by the time of the Islamic mathematician and astrologer, al-Biruni (973-1048 C.E.), a point system was employed in order to determine which planet had the greatest dignity in any particular zodiacal degree. Bonatti referred to these as the following: the planet that ruled a degree was allocated five points or fortitudes, the planet that was the exalted ruler of the degree was allocated four points, the three planets that were the triplicity rulers of the zodiac degree were each allocated three points, the planet that ruled the term in which the degree fell was allocated two points and, finally, the planet that ruled the face in which the degree fell was allocated one point (Bonatti 1994:18).

The only known exception known (remove) to this scoring system was found in the work of al-Biruni. He switched the values of term and triplicity, allowing the terms to score 3 points and the triplicities to score only 2 (al-Biruni, 1934:

307). However, this could possibly be a scribal error, as his following discussion on finding an almuten (from the same page) clearly implies a contradiction to his statements of weighting the term ruler in favour of that of the triplicity.

The figures [scores for the planets] are then added and compared. This is the practice of the Astrologers of Babylon and Persia, who regard the lordship of the face as very important. But among the Astrologers of the present day, the triplicity is regarded as having precedence over term and face, and indeed the latter is often considered of no account....

Angles. For the observer, in any non-polar location, the daily rotation of the earth causes four natural points to occur between the sky and the horizon. The point where the ecliptic (path of the Sun) crosses the horizon in the east is known as the ascendant; in the west this point is known as the descendant. The point where the ecliptic intersects the local meridian (the circle 90^0 to the horizon and running from north to south) is defined as the mid-heaven (this will also be the point of the culmination of the Sun on that day) and its opposite point in the circle is defined as the lower-heaven, or bottom of the sky (Ptolemy, 1969: 33). These four points create two axes in the circle of a horoscope, one from east to west and the other from north to south. The mid-heaven is now commonly referred to by astrologers as the MC (Medium Coeli) and the lower-heaven as the IC (Imum Coeli).

Apheta. Derived from 'aphesis', it has been replaced in some texts with the word 'prorogation', as in Ptolemy (1969: 134). The prorogation is interchangeable with the hyleg (Schmidt and Hand 1994: 16).

Ascendant. One of the angles of a chart, the ascendant is the geometrical point where the ecliptic crosses the horizon in the east. It therefore shows which zodiac sign and what degree of that sign was ascending at the moment for which the horoscope was cast.

Aspects. The geometric relationship between planets, points or luminaries. The types of geometric relationships and the orbs used in these relationships vary considerably over the unfolding history of astrology. In the second century C.E., Ptolemy used just five aspects (Ptolemy 1969: 36, 38): the conjunction (two planets in the same sign), the opposition (two planets in opposite signs of the zodiac), the square (two planets in signs which were 90^0 apart), the trine (two planets in signs 120^0 apart) and the sextile (two planets in signs 60^0 apart). By the time of Guido Bonatti orbs were being applied so that planets had to be not only in the correct signs but within a certain number of degrees (Bonatti 1994: 4). Later, Johannes Kepler (1571-1630) introduced new thinking into the field of

aspecting and not only increased the number of aspects but also disregarded the sign boundaries (Gettings 1985:173).

Besiegement. The term applied to a planet that either has two malefic planets (or their rays) or two benefic planets (or their rays) occupying the first zodiacal locations in front and behind the planet. The term is best described by Bonatti (1994:162):

Sometimes a planet is called besieged, and this happens in two ways. In one, to wit, that which is called *Venerations*, the besieging is called good in a good direction. [That is] when a planet is between two fortunes (or their rays) such that it has one fortune before it (or rays) and one (or its rays) after it so that it is separated from the one (or its rays) and is joined to the other (or its rays).

In another way a planet is called besieged, and that besieging is bad and in a bad direction. [That is] when a planet is between two malefics (or their rays) such that it has one malefic (or its rays) before it, and the other malefic (or its rays) after it.

Combust. A weakening of a planet's astrological function when it is located within a certain orb of the Sun. Bonatti (1995:72) wrote:

And when it [the planet] begins to enter under the rays, it is said that it begins to be combust or to have fallen into combustion; and while it is under the rays near to the Sun by 12 degrees going toward him.... [Translator's additions].

Bonatti continued to give orbs and positions in order to give shades of meaning to the concept.

Conjunctional. A chart was considered conjunctional if the person was born between the times of new Moon and the full Moon, that is, when the Moon was waxing. The reverse condition is defined as a preventional chart. Whether a chart was conjunctional or preventional was an important consideration in determining the hyleg of a chart (Ptolemy 1969: 133). In addition, Bonatti (1980: 94) used the individual degree of the conjunction (new Moon before birth) or prevention (full Moon before birth) to determine the part of the hyleg which related to the inner nature of the person.

The ancients did not care to say much about this part [part of hyleg] because it is so involved with other things. But none of them [the parts] are able to exist without it. But this part is able to exist without them. It

is to these things as matter is to form. The ancients would have been able to set forth the doctrine on this if they had so desired, but they set it aside for the reasons stated above. This part is the root of the others and is taken by day or night from the degree of the conjunction of prevention which preceded the nativity or the question or the revolution, to the degree of the Moon, and this is then projected from the ascendant. And this part is called the *radix vitae* - root of life - because it comprehends entirely the whole being of the native or querent or even the revolutions, and if it is well disposed, it signifies universally the good “being” of the native and of other matters. However, if it is evilly disposed, it signifies the contrary of the aforesaid.

Debility. A planet can be debilitated in different ways but primarily by occupying a zodiac sign which does not support its nature (Bonatti 1994:33, 35).

Dignity. Also known as fortitude, see essential dignity.

Diurnal. Horoscopes are defined as either diurnal or nocturnal and this refers to whether the chart is cast for a time during daylight hours (diurnal) or during the hours of the night (nocturnal) (Ptolemy 1969:22).

Dominus Geniturae. A term used for a planet considered by its dignity, house position and aspecting to be the strongest planet in the chart (Montulmo 1995: i).

Dorothean triplicities. The set of three rulers per sign attributed to Dorotheus of Sidon. See Triplicity.

Earth Signs. These are signs to which the element earth has been allocated and are: Taurus, Virgo and Capricorn (Ptolemy 1969:43 – 45).

Elements. There are four elements in western astrology: fire, air, earth and water. The earliest known use of the elements in astrology occurred in Book I of Vettius Valens' second-century *Anthology*. Valens allocated an element to each of the twelve zodiac signs (Valens 1993:7). In the *Liber Hermetis* (1998: 11) these elements are further grouped into masculine and feminine. Fire and Air are considered to be masculine while the elements of Earth and Water are considered to be feminine.

Essential dignity. A system of allocating a type of affinity between a planet or luminary and a sign. There are five essential dignities recognised in Hellenistic astrology which are in order of strength: rulership, exaltation, triplicity, term and face (Ptolemy 1969: 42). These were also duplicated in Islamic astrology (al

Biruni 1937: 307) and passed unchanged into thirteenth-century Europe. Bonatti also called them fortitudes (Bonatti 1994: 18). When a planet is in a zodiacal position in which it is in one of its essential dignities, it is considered to have dignity.

Exaltation – One of the five essential dignities. Exaltation is a form of dignity first recorded as the *bit nisirti* by the Babylonians (Rochberg-Halton 1988: 53) in which a planet has dignity in a particular degree of a sign. By the time of Ptolemy the planets gained dignity from the entire sign rather than just the particular degrees. The exaltations are: the Sun in Aries, the Moon in Taurus, Mercury in Virgo, Venus in Pisces, Mars in Capricorn, Jupiter in Cancer and Saturn in Libra (Ptolemy 1969: 45).

Face. One of the five essential dignities and considered the least important or smallest manner in which a planet can gain dignity or fortitude from its zodiacal location. Bonatti (1994: 15) wrote that:

The faces of the signs are distinguished thus: each sign is divided into three equal parts, each of which is called a face. Each face consists of ten degrees. The first, which begins in the beginning of Aries and lasts until the tenth degree of the same sign is completed, belongs to Mars. The second face begins at the beginning of the eleventh degree of Aries and lasts until the end of the twentieth degree and belongs to the Sun. The third face begins at the beginning of the twenty-first degree of Aries and lasts until the end of the sign Aries and belongs to Venus.

He then continued through the rest of the zodiac. The system can be summarised by attributing the first face of Aries to Mars and then continuing to allocate 10⁰ of a sign to each of the planets in the Chaldean order (observed rate of movement of the planets) which is the Moon, Mercury, Venus, Sun, Mars, Jupiter and Saturn.

Feminine sign. see Elements

Fire Signs. These are signs to which the element fire has been attributed and are: Aries, Leo and Sagittarius (Ptolemy 1969:43 – 45).

Fixed stars. The planets were considered to be wandering stars, as they were seen to move amongst the other stars of the night sky. The term *fixed stars* was used to describe the stars themselves (Ptolemy 1969: 24).

House system. The division of the four quarters of the chart created by the angles into a total of twelve sections (Bonatti 1994:40). There are many different

mathematical methods. Bonatti used the system named after the Islamic astrologer Alcabitus (916-967 C.E.) and which had first appeared in a treatise written by Rhetorius (505 C.E.) entitled *From the Treasury of Antiochus, an Explanation and Narration of the Whole Art of Astrology*.

Each house refers to a different part of the native's life and each house will be governed by the following considerations: any planets in a house, the zodiac sign and the planet that ruled the house, a planet that is the exalted ruler of the house, as well as planets which are the triplicity rulers of the house (Bonatti 1994: 46-93).

Hyleg - The planet considered to grant life to a chart. There were many methods used to find this planet (see Masha'allah 1998: 48; Ptolemy 1969: 129-141).

Lots. See part of fortune.

Lunation. The new or full Moon before birth. See conjunctive.

M.C. See Angles

Masculine sign. See elements

Moiety. The use of orbs as diameters rather than radii in the calculation of aspects. In his introduction to Guido Bonatti's *Liber Astronomiae, Part III* (Bonatti 1995: iii), Robert Hand writes that:

Two planets are said to enter an aspect when they are separated by a distance amounting to the sum of their respective orbs divided by two, the well-known 'moiety' of the orbs. Such a contact between two planets indicates a minimal interaction between them, and a more powerful interaction does not take place until there is considerable overlap between the orbs. The aspect reaches maximum intensity when the smaller planetary orb is completely within the larger one.

Mutual reception. See reception.

Nocturnal. A chart cast for the time when the Sun is below the horizon. See diurnal.

Nodes of the Moon – Also known as the dragon's head and the dragon's tail (Hermes Trismegistus 1998: 64; Abu Ma'shar 1994: 57). The Moon's nodes, sometimes simply referred to as the nodes, are the points of intersection between the orbit of the Moon around the Earth and the projected orbit of the Earth

around the Sun, known as the ecliptic. The Moon's orbit cuts the ecliptic in two places and these are known as the north node, where the Moon crosses the ecliptic and moves north of the ecliptic, and the south node, where the Moon crosses the ecliptic as it moves south of the ecliptic. The dragon's head is the north node and the south node is the dragon's tail. Knowledge of the location of the nodes allows for the understanding and prediction of solar and lunar eclipses.

Oblique ascension. The actual rate that a degree of the zodiac (the ecliptic) or planetary body or a point not located on the ecliptic will rise and move through the sky for a given location. In astrology this is used to find the rate of movement in degrees of the ecliptic over the horizon in order to calculate primary directions. Working with oblique ascension is a form of visual astrology, working with what is actually visible for a given location.

Orbs. See aspects.

Part of Fortune. Considered to be one of the most important of all the parts, or lots (Schmidt and Hand 1994:37). A part was determined by measuring the angle of separation between two points in the horoscope and then applying that angle, clockwise or anticlockwise depending on the day or night nature of the chart, to a third planet or point. The resulting zodiacal degree was then considered to be the location of that particular part.

Bonatti (1980:85), who uses the traditional method of measuring from the Sun by day and the Moon by night to determine the direction of the applied angle, describes the calculations in the following way:

For example, the extraction of the *pars fortunae* is extracted from the luminaries, which as the ancients said, are of equal strength for good. But because the Sun is the diurnal benefic, it begins from the Sun by the day, and because the Moon is the nocturnal benefic, it is begun from the Moon at night. And this part is preferred above all the other parts in the same way as the luminaries are preferred to all the other stars [planets].

The only author who did not follow this method was Ptolemy (1969:131) who ignores the diurnal or nocturnal nature of the horoscope in calculating this part and states:

The part of Fortune is ascertained by computing the number of degrees between the Sun and the Moon; and it is placed at an equal number of degrees distant from the ascendant, in the order of the signs. It is in all cases, both by night and day, to be so computed and set down...

However, Ptolemy's rejection of the diurnal or nocturnal nature of chart for the part of Fortune was generally not adopted by later astrologers with the exception of William Lilly.

Peregrine. If a planet is located in a sign and degree in which it has no dignity then it is considered to be disadvantaged and classified as being in a condition of peregrine (al-Biruni 1934: 306).

Preventional. A chart was considered to be preventional if the person was born between the times of full Moon and the new Moon, that is, when the Moon was waning. See conjunctional.

Primary directions. A predictive technique based on the direction of a planet or a point in the horoscope via the diurnal movement of the celestial sphere (oblique ascension) by taking one degree of movement as being equivalent to one year of life. Ptolemy (1969:135-136) used primaries when he considered the length of life:

The amount of the increases or diminution is indicated by the degree, in which each star [planet], so operating, is exactly situated; for the number of years will depend upon, and correspond with, the horary times proper to each degree.

There are different mathematical variations which can be used in working with the celestial sphere and these give rise to different methods of primary directions.

Profections. A predictive system in which the astrologer counted, in an anti-clockwise direction, a sign (or house) per year of life. Having found the sign which corresponded to the year of life this could be more finely tuned by using that as the next starting point and counting a sign per month forward to find the particular month. Once the month and year had been found, this could be taken a step further. The astrologer could continue to count forward using a ratio of one zodiac sign (or house) per two-and-one-third days. As described by Ptolemy (1969:207-208):

.... after the number of years which have elapsed since the birth has been ascertained, the amount is to be projected from each place of prorogation, in the succession of the signs, at the rate of one sign for a year, and the lord of the last sign is to be assumed as arbiter. And, with regard to periods reckoned by months, the same rule is to be observed: for in this case also, the number of the month, as counted from the month of the nativity, is to be projected from such places as possess the dominion of the year, in the proportion of twenty-eight days per sign.

So, likewise, in the case of periods reckoned by days, the number of the day, counted from the day of birth, must be projected from the monthly places of dominion, allowing for each sign two days and a third.

The technique of profections is different from most forms of predictive methods in astrology in that, rather than the points in the chart being directed, it is the circle of the chart which is used as a never-ending series of wheels. The count of years begins with birth at the cusp of the first house, first birthday at the cusp of the second house and so on. For example, if a person was six years old (in the seventh year), then the sign opposite their ascendant would be their dominion of the year. Three months after their birthday the year dominion would still be the sign opposite the ascendant, but that particular month would be represented in the chart by the tenth sign from the ascendant (that is, the third from the seventh). Five days after the period of three months would be counted as two signs further along and be represented by the twelfth sign. In this type of profection, therefore, each chart has a year ruler, month ruler and day ruler. All profections would be repeated every twelve years since there are only twelve signs or houses. However, the condition of the rulers was not taken from the natal chart but rather from the revolution of the year (the chart for the return of the Sun to its natal position) (Valens 1996: 29-30).

Ray. The term in general use for what is now known as an aspect. However, the use of this word is important as it implies that the planets were considered active components of a chart which had the ability to cast or hurl rays (Valens 1997: 28-29; Omar 1997: 19; Bonatti 1995: 72.). The cast, or hurled, rays could be encountered in the chart by planets or points as they were moved by different forms of directions. They could also besiege or venerate a planet.

Reception. The emphasis of an aspect in a chart where one planet or luminary in aspect to another is in a sign in which the other planet has dignity. The ninth century astrologer, Masha'allah (1998: 2) wrote:

Understand that in the causing of whether things will be or will not be reception occurs because of exaltations and domiciles; that is, [its occurs] in such a manner that one of the seven planets is in the exaltation or domicile of a second planet, and that first planet is being joined to the second according to one of the seven recognized aspects; or they are both in one sign, and one of them is in the exaltation [or domicile] of its comrade and joined to it.

Masha'allah mentions seven aspects because he considered that each aspect has a waxing or waning expression: the three Ptolemaic aspects of sextile, square and

trine were counted as six aspects with the opposition as a seventh. The conjunction was considered a separate situation.

Mutual reception occurred when both planets were in the sign of each other's exaltation and/or domicile (rulerships)

Rulership. One of the five essential dignities, also known as the domicile of a planet (Masha'allah:1998: 2). According to Ptolemy the two luminaries and the planets rule certain signs as follows: the Sun the sign of Leo, the Moon the sign of Cancer; Mercury, the next planet from the Sun, rules the two signs either side of Leo and Cancer, which are Virgo and Gemini respectively; Venus rules the next two signs of Libra and Taurus; Mars the next two signs of Scorpio and Aries; Jupiter the next two signs of Sagittarius and Pisces; and lastly, Saturn rules the two remaining signs which are the opposite sides of the zodiac to the signs ruled by the luminaries, Capricorn and Aquarius (Ptolemy 1969:41).

Temperament. A method of considering the physical and behavioral tendencies of a chart based on the four qualities, *hot, cold, wet and dry*; the four elements, *fire, earth, air and water*; and the four humours, *choleric, melancholic, sanguine and phlegmatic*. All people are composed of a mixture of these qualities, elements and humors, and the mixture is called the 'temperament'.

Terms (also bounds). One of the five essential dignities, terms were seemingly irregular divisions of the degrees of each zodiac sign into groups. Each grouping within a sign is ruled by a different planet. Each zodiac sign contains five terms with each one being ruled by one of the five planets. The luminaries do not rule any terms. There are two main types of terms: the earlier set was labelled by Ptolemy as *Egyptian* and the later set, which were devised by Ptolemy in his attempt to make them more logical, are known as the Ptolemaic terms (Ptolemy 1969:47).

Triplicity. One of the five essential dignities. There are four elements in the twelve zodiac signs and each element is attributed to three signs (see elements). Each group of three signs is assigned triplicity rulers. The Greek astrologer Dorotheus of Sidon (1993: 161) assigned three planets to each triplicity. For example, for the fire signs the triplicity rulers were: the Sun, the diurnal ruler; Jupiter the nocturnal ruler; and Saturn the participating ruler. However, Claudius Ptolemy in his *Tetrabiblos* (1969:44) wrote that:

The first triangle, or triplicity, is formed by three masculine (fire) signs, Aries, Leo and Sagittarius, having the Sun, Jupiter, and Mars as lords by house. Mars, however, being contrary in condition to the solar influence, this triplicity receives, as its lords, only Jupiter and the Sun.

By day, therefore, the Sun claims the principal co-regency of it and Jupiter by night.

He therefore used only two triplicity rulers instead of the three put forward by Dorotheus approximately a century earlier. This reduction to two triplicity rulers per sign was also followed by the fourth century Greek astrologer Paulus Alexandrinus (1993:5). However, both traditions prevailed as Islamic astrologers preferred to work with the full three rulers (Omar 1997:2; Masha'allah 1994:21). This gave rise to two systems of triplicity, the Dorothean and the Ptolemaic.

Under the Sun's beams (or rays). The condition of a planet as it emerges from being combust (al-Biruni 1934:296; Bonatti 1995:75).

Water Signs. These are signs to which the element water has been attributed: Cancer, Scorpio and Pisces (Ptolemy 1969: 43-45).

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NB See references to main paper for works not listed below.

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