

Astronomy and Astrology in the 12th century

presented at the 6th Irish Conference of Medievalists,
Maynooth, 26 June 1992
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Introduction: John of Salisbury

If one is looking for an illustrative twelfth-century intellectual, one cannot do much better than John of Salisbury.

Book II of his *Policraticus* is devoted to a general discussion of omens, divination and the philosophical problems of predestination. He makes his distaste for astrologers clear, lumping them in with "practitioners of other trivialities", but it is clear that his difficulties with them were not entirely due to a philosophical disagreement. In chapter 19, he says: It is plausible that there is some power in the phenomena of the heavens ...Therefore inquisitive minds investigate the powers of celestial phenomena and endeavour to explain by the rules of their type of astronomy everything which comes to pass on this world below. Now astronomy is a noble and glorious science if it confines its disciples within the bounds of moderation, but if it be presumptuous enough to transgress these it is rather a deception of impiety than a phase of philosophy. There is indeed much that is common to astronomy and astrology, but the latter tends to exceed the bounds of reason, and, differing in its entire aim, does not enlighten its exponent but misleads him John emphatically does not deny that God has given us some means of supernatural fore-knowledge. He takes pains to describe the astrological characteristics of each of the planets, and he believes in weather lore. But he is against the casting of horoscopes to answer trivial queries, and he argues that astrologers are subversive of true religion and of the concept of free will. "They impose upon things a sort of fatality under the pretext of humility and reverence for God". The fact that John of Salisbury is so annoyed by them suggests a fair number of astrologically minded literate people, and the theological style of his case against them makes one wonder who he was writing for. Was he seriously hoping to argue the astrologers into submission? I hardly think so, and in fact he concedes a lot more philosophical ground to them than he strictly needs to. Book II of the *Policraticus* is an appeal to the statesman to be guided by the church rather than by any fortune-tellers, and it is because astrologers behave like fortune-tellers and 'practitioners of other trivialities' that they should be shunned by the Christian statesman. I hope to show this evening that John of Salisbury's fears that astrologers were challenging for a role in high politics in the twelfth century were reasonable, and to throw a little light on how this had come about. The Twelfth century renaissance in general, Hereford in particular There were many twelfth-century scholars who went to Spain in search of the new Arabic knowledge. Daniel of Morley was one of the few who left a record of his motives and experiences. In his *book de naturis inferiorum et superiorum* he gives an account of his disgust at the state of learning in Paris, with its concentration on law and theology, and of his journey to Toledo in search of "the world's wiser philosophers". There he encountered Gerard of Cremona, who had translated among many other works Ptolemy's *Almagest*. Gerard had founded a school of translators and was actually giving lectures to students on astrology. Daniel returned to England, laden down with precious books, and encountered his patron, John, Bishop of Norwich. Daniel's book was inspired by the Bishop's questions about "astronomy [and] those sublunary events which seem to serve the higher bodies by a kind of necessary obedience". It was not the only book written at the request of a twelfth century bishop to spread the new learning. The town of Hereford had already acquired connections with astrology by the end of the eleventh century. Robert of Lorraine, Bishop from 1175 to 1196, wrote several works on the calendar, on astronomy and on that recent import the abacus. His successor, Gerard, was reputed to have an

unhealthy knowledge of astrology and the dark arts. He was transferred to York in 1101 and died there suddenly and mysteriously in his garden in 1108, with a Latin treatise on astrology by his side. William de Vere, who was the Bishop of Hereford from 1186 to 1199, encouraged the new scientific knowledge coming from the Arabic world. De Vere had visited the East himself before the fall of Jerusalem and was interested in the translation of manuscripts. We have some evidence for the teaching of science at Hereford from a poem addressed to Gerald of Wales by Simon de Freine, an old friend of Gerald's from Hereford who is also the author of two surviving narrative Norman French poems. He begins by praising Gerald's learning, and sympathising with his failure to become a bishop. As some of you probably know Gerald had been elected (though not consecrated) Bishop of St David's in 1176, and claimed to have been offered several Irish sees at the end of the 1180's; but the rich English bishoprics seemed permanently out of his reach. The poem then describes Hereford as the home of the trivium and quadrivium, and having given two lines each to the studies of grammar, logic, rhetoric, arithmetic, geometry and music, de Freine then devotes ten lines to astronomy, six to geomancy, and another two lines to each of physics and law. These last three are not traditionally liberal arts, but from the context it is clear that they were being taught in Hereford when de Freine was writing at the end of the twelfth century. The section of the poem on geomancy makes it clear that the Hereford geomancer is using Gerard of Cremona's tract *Si quis per arte geomanticam* this provides a direct link between Hereford and the Toledan school of translators. Gerald had even less sympathy than John of Salisbury for the new knowledge; in the foreword to his *Speculum Ecclesiae* he refers to "certain books, claiming to be by Aristotle, recently discovered and translated in Toledo", and although most of his characteristically robust remarks have been lost in the only surviving manuscript, what survives suggests that he feared the new doctrines would lead to heresy. His own tastes ran more towards theology, although his works on Wales and particularly on Ireland contain a large amount of what we would call natural history. William de Vere gave him a Hereford prebend but there is no evidence that he actually went there to teach.

Apart from Daniel of Morley, three other writers are known to have been working on the new Aristotelianism in the Anglo-Norman cultural area. My own work has concentrated on Roger Infans or Roger of Hereford, who is presumably the astronomer who Simon de Freine describes in his poem. I shall have more to say about him later. We have more knowledge of the life of Alexander of Neckham, or Alexander Nequam, author of the encyclopaedic work *de naturis rerum*. He was born in 1157 - we know this because his mother was Richard the Lion-Heart's wet-nurse - he taught in Paris from 1180, and returned to his old post as master of the schools in Dunstable in 1186, finishing his life as a canon of Cirencester after a period of teaching in Oxford. As Jennifer Moreton has pointed out, Alexander's list of the Irish rivers in *de naturis rerum* is probably derived directly from Gerald. All these people knew each other: the third scientist, Alfred of Sareshel or Shareshill, also called Alfredus Anglicus, dedicated his book on the motion of the heart to Alexander, and a translation of a pseudo-Aristotelian text, *de plantis*, to Roger. I wonder if that is one of the texts that Gerald was complaining about in *Speculum Ecclesiae*.

We have already seen two bishops at the end of the twelfth century patronising scholars of the new science, John of Norwich and William de Vere of Hereford. A rather more prominent example is Gilbert Foliot, Bishop of Hereford and later of London, to whom Roger of Hereford's work dated 1176 on the *compotus* is dedicated.

European influences: Astronomy in the twelfth century.

Before I look at the role of astrology in medieval Europe I shall briefly look at the place of astronomy in the quadrivium, as an aid to understanding time and the calendar. Jacques le Goff has written that before the invention of the mechanical clock in about 1280 the church was effectively in control of time and was therefore responsible for regulating the working day and much else besides. The immediate relevance of time-keeping to a monastic community is of course that the offices were supposed to take place at particular hours of the

day or night, and these were determined in a number of different ways. If the monastery was determined to have Matins finished before dawn, that required very careful timing of the *Frégre* Jacques who had to ring the bell to wake the community. It is usually assumed that there were water-driven clocks, which could be filled to a certain level so that an alarm will ring after a given length of time, but no examples survive of these ingenious mechanisms.

One approach was that of Gregory of Tours, writing in the 570's, who gave detailed instructions for the timing of Nocturns, recited just after midnight, including watching for the rising of certain stars and measuring the passage of time by chanting psalms. The particular star to look out for and the number of psalms to be chanted would change with the time of year, depending on how long the nights were and where the Sun is in the Zodiac. The necessary astronomical calculations to work out, for instance, which star will be rising at a given hour of the night are not particularly simple. An added complication arises before the clock has been invented because we are usually dealing with unequal or seasonal hours, defined as a twelfth of the time from dawn to dusk (or dusk to dawn during the night). At this point enter the astrolabe, the earliest and perhaps the best-known astronomical import from the Arabic world. Ptolemy describes a spherical astrolabe in the second century, but the planispheric astrolabe seems to have been largely an Islamic development. [Brief demonstration]: Basically the astrolabe represents the co-ordinates of the local sky (in other words the horizon, zenith and so on) on a fixed plate, and a rotating plate carries a stylised star-map and ecliptic. A pointer and angular scale on the back allow the user to measure the altitude of the Sun or a bright star; the star-map and co-ordinate plates can then be used to find the time of day, in equal or in unequal hours. Abelard and Heloise were so impressed with the astrolabe that they named their child after it shortly before 1120. Adelard of Bath wrote a popular treatise on the astrolabe in about 1149, which he dedicated to the future Henry II of England; I shall return to that later.

Jennifer Moreton spoke yesterday about the computus, so I hope those of you who were there will forgive me for recapitulating some of the points she covered. The problem addressed by the computists is the calculation of the date of Easter. Once you have actually decided that you want Easter to be the first Sunday after the first full moon on or after the spring equinox, which is really what the earliest debates are about, you have to determine on what dates these astronomical events are going to occur. The astrolabe helps a certain amount with the equinox, which at least always takes place at constant intervals, but the lunar month varies in length. Full moons repeat themselves on a cycle that is roughly but not exactly 19 years, and the cycle that had been used by the Church was known to be out of synch with Nature by several days. Haskins lists a good dozen computistical works written in the twelfth century. Some of their writers, including Roger of Hereford are aware of the improved lunar theory of the Arabs, who had developed it because they used a fundamentally lunar calendar. This tradition culminated of course with Roger Bacon in the following century.

The Arabic contribution

It is worth digressing for a moment to look at why it was the Arabs had access to the most accurate predictions of planetary positions ever made until then. Claudius Ptolemy in second century Alexandria had produced a planetary theory which provided an excellent working model of the solar system. In the fifth and sixth centuries the Sasanid Persians synthesised the planetary theory of Ptolemy with a slightly different theory of Indian origin; their state Zoroastrianism required detailed astronomical knowledge for religious reasons. In the seventh century, their empire fell to the Arabs. Their Sanskrit texts are lost to us now, but they were translated and adapted by ninth-century scholars in Baghdad, and it was these ninth-century works on the whole that became known in Western Europe in the twelfth century and later.

A particularly important Arabic writer was Muhammad ibn Musa al-Khwarizmi; our word "algorithm" is derived from the medieval Latin version of his name. His book combining

Greek and Indian traditions of basic mathematics was called the al-Jabr wa'l-Muqabalah and our word "algebra" comes from this work, translated by Robert of Chester. He also compiled what became the first astronomical tables to make it to Western Europe, translated by Adelard of Bath in the 1120's. European writers also knew 11th-century astronomical tables compiled in Toledo, probably by al-Zarqali who was known in Latin as Azarchel. Robert of Chester produced tables for the latitude of London in 1149, and Roger of Hereford produced tables for Hereford in 1178.

Astrology in the twelfth century

So far I have given you scientific and rational reasons why Western European Christians in the eleventh and twelfth centuries would have been interested in Arabic astronomy. Of course, this is not the whole story. In her recent book on the rise of magic in early medieval Europe, Valerie Flint argues that there was an ever-present tradition of divination and folk-magic throughout what used to be called the Dark Ages. Her account of what she calls 'the magic of the heavens' convincingly suggests that the traditional picture of astrology disappearing between the fall of the Empire and the arrival of Gerbert of Aurillac on the scene does not stand up to the evidence from the church councils which frequently condemned astrologers, or the writings of Augustine and Isidore of Seville. Although Isidore condemned the use of astrology for augury, he was enthusiastic about medical astrology. Many Christian writers, including Bede, were willing to give the Moon a certain significance: medical and agricultural operations would be based on its phase. Comets and eclipses were also admitted by the Church to be harbingers of disaster.

It therefore seems likely that Arabic astrology was being specifically sought in the twelfth century as a means of reducing the influence of pagan folk-astrologers. The Church's sponsorship of the new Arabic teaching on astrology is better understood as an attempt to make the process of reading omens from the stars 'scientific', and therefore more closely under church control: predicting an eclipse, for example, is much more impressive than merely making it go away once it has happened, and compiling a horoscope laboriously from a book of bulky tables is a much more convincing process than the more traditional method of adding up all the letters in the subject's name and subtracting the age of the moon. The potential of the pastoral uses of astrology must have been a factor in inspiring so many bishops to promote it.

The use of astrology in medicine can be illustrated by the twelfth-century text *de urina non visa* Of Unseen Urine, by William of Marseilles, another Englishman. The medieval doctor would be expected to make a diagnosis from the patient's urine. There is an obvious problem if the patient's urine can not be obtained. William solves this tricky question by casting the patient's horoscope and working out what the urine should have looked like. This approach is also helpful if you do have the urine but it doesn't fit the patient's other symptoms. *De urina non visa* seems to draw on native European astrological traditions as well as Arabic ones.

Judicial Astrology in the Twelfth Century

Going back to the ninth-century Baghdad of Harun ar-Rashid for a moment, we find the major figure in the theory of judicial astrology, Abu Ma'shar, whose works with their strong Aristotelian base were known in Western Europe before Aristotle's own works had been translated. His *Liber introductorius* in astronomie was translated separately by John of Seville and Hermann of Carinthia in the 1140's, and copies of both are widespread. Large chunks of Hermann's translation are to be found shamelessly copied into Roger of Hereford's Book of Astronomical Judgements, which I wrote my thesis on. Daniel of Morley and Adelard of Bath both quote extensively from it. Adelard of Bath's summary of its contents was the class text used by Gerard of Cremona in Toledo. Abu Ma'shar also wrote a book *de magnis revolutionibus* on the ages of the world. The concept sounds and is rather Zoroastrian, and it is the concept of planetary conjunctions guiding great events and

natural catastrophes as well as events in the life of the individual that we find in Western Europe in what I will call the great scare of 1186.

Casting a horoscope is not a very easy matter, even if you have clear instructions from Abu Ma'shar on how to interpret it. Although most of the medieval astronomical tables are clearly laid out, it took me all day and three sheets of A4 paper (mostly covered with mistakes) to work out the place of just one planet when I tried using them. I suppose that this must be a matter of practice, but I would be surprised if it took the medieval astrologer less than half a day to actually calculate a full horoscope with all seven planets correctly placed in their houses. He (and I suspect it would usually have been he) would then have had to write an interpretation of the data he had gained. A day of my time is probably worth about £46, and I am not a top professional working for royalty. In his book of astronomical judgements, Roger lists many problems that he expected his readers would be consulted about: parents, husbands and wives, children, journeys, business associates, marriage, whether an unborn child would be male or female, how to avoid the anger of somebody in power, whether one is destined for imprisonment or poverty. The practising judicial astrologer could be asked the likely outcome of a business venture, journey, or court case; he might also be expected to select a favourable hour for such an enterprise to begin. When Al-Mansur founded a new capital for the caliphate at Baghdad in 762, he called on the services of two astrologers, one Zoroastrian, one Jewish, to select a fortunate date. Analysis of the weddings of the Hapsburgs has shown that they tended to be timed for favourable astrological moments. Hilary Carey has written about the influence of astrology on the later medieval English court. I would like to finish by looking at three striking examples of the influence of the new astrology in the twelfth century. The first of these is what I referred to a moment ago as the great scare of 1186. Roger of Hoveden, Benedict of Peterborough and Rigord in his life of Philip II together provide us with the texts of four circular letters concerning a conjunction of all seven planets in the constellation Libra in September 1186. We are told that astrologers of Spain and Sicily, writing in Latin and Greek, all made predictions concerning this event. The first, who is only identified by the name 'Corumphiza', predicts that the Arabs will be utterly destroyed by storms, gales and a great stink. The second, one William, who we are told is the clerk to the constable of Chester, also predicts in a much more jargonised fashion the victory of the Christians over the pagan threat. It does contain some fairly accurate planetary predictions. A third letter from a monk called Anselm in Winchester tells of a lay brother there who fell into a trance, recited some dreadful Latin verse concerning the dreadful things to happen at the forthcoming conjunction, and promptly expired. The most intriguing of these letters is the fourth one, claiming to be from 'Pharamella son of Abdullah of Cordoba, to John, bishop of Toledo'. The writer claims to be a Moroccan Arab who has come across the first letter, from Corumphiza, and makes caustic comments about the ability of the Christians to interpret the stars. His first criticism is that such planetary conjunctions happen from time to time anyway without great disaster striking, which is fair enough. His second point is that in any case the anticipated conjunction will not take place in September 1186: Mars and Venus will not be in Libra. This is simply untrue, as the writer would have known if he were a real astrologer. The letter finishes with a flourish of technical astrological terms from Hermann of Carinthia's translation of Abu Ma'shar, and I think that gives it away: the letter cannot have been written in Arabic and translated, it must have been composed in Latin by somebody who had a copy of the *Liber introductorius*. Incidentally the weather in 1186 was not remarkable, although there was a small earthquake in England in 1185, and there were floods in 1187, which was also the year that Jerusalem fell. My second example comes from the work of John North, who in his book "Horoscopes and History" analyses ten horoscopes from the fly-leaf of a British museum MS (Royal App. 85) He has dated most of the planetary configurations represented in them to the early 1150's. The inscriptions alongside the diagrams tell us that they have been cast to decide such questions as whether a king will compel his barons to offer homage to his son, whether or not the Norman army will come, and what will happen now that the Count of Anjou has died. We are obviously

concerned with the civil war of King Stephen's inglorious reign, and North suggests that the horoscopes were cast for the benefit of the future II and tentatively attributes them to Adelard of Bath, whose 1149 book on the astrolabe is dedicated to Henry. Needless to say, this claim has provoked some controversy, particularly in a vitriolic review in *Isis* by Richard Lemay. It seems to me likely that North is on the right track. My third example came up in the course of my own work on Roger of Hereford's *Liber de astronomice iudicandi*.

I discovered that it contained rather an interesting, though infuriatingly cryptic, example of a judicial horoscope. To a certain degree of accuracy the horoscope is cast for 14 December 1122, for about three in the morning, in the latitude of southern France or northern Spain. It is presumably not the birth chart of Roger himself, who we know to have been a young man in 1176 when he first appears on the scene; in fact since we know that he was writing some time after 1176, the subject of the horoscope is in his or her late fifties or older. The interpretation that Roger puts on this horoscope I reproduce here. Like any good soothsayer he starts off by predicting what he already knows to be true: that the inquiry is about a loved one, a parent, a woman, therefore a mother. Then things get interesting. He seems to be saying that this mother is travelling to meet a king, that the king will not give her a good reception, but will give her a hearing afterwards, and that there are enemies involved.

Primum considerarem domini ascendentis, et qui ipse ab angulo recte respicit ascendens. Ab eo inciperem. Primum inspicio a quo separatur. Separatur autem a sole qui est dominus 10m, et est in quarto. Scio igitur per he quod cogitat de aliqua re amata que per quartum signatur vel de patre vel de matre; sed quia luna separatur est a domino 7 qui est domus mulierum id est de matre. Quum vero est in domo vie quod de via mulieris est iuncta mercurio domino vie, in alia domo viarum. Et quum venus coniuncta est iovi in domo regis dico quod ad regem tendit cum ipse etiam sit in exaltatione sua. Sed quum est retrogradus et in oppositione veneris et venus in casu eius, rex non bene eam recipiet. Sed quum est fortuna etiam in exaltatione sua et in angulo celi liber a male postea exaudiet eam. Sed et luna que est recepta ideam signat et est de inimicis, quod virgo est signum humanum et quod est in humano signo, est dominus 12.

What kind of woman in the twelfth century is undertaking journeys to hobnob with royalty in her old age? I'm sure some of you have already leaped to the same conclusion as me, and it seems almost too good to be true: Is this perhaps the birth-chart of Eleanor of Aquitaine, who is known to have been born in Southern France some time in 1122? And if so, for what journey was she seeking astrological advice? Was it one of her journeys across the Pyrenees to find eligible brides for Richard I or Louis VIII, in 1191 and 1200? Or could it be her journey to Speyer in the winter of 1193/1194, escorting the ransom to free her son Richard? It seems appropriate that the woman who was responsible for the rise of romance in literature should eight hundred years later bring some romance to the study of medieval science.

Conclusion

Roger of Hereford has the same name as a relative of the Norman knight Adam de Hereford who appears several times in the cartulary of St Thomas's Abbey, Dublin, in connection with the estates of the de Hereford family around the start of the thirteenth century. His name always appears separated from the other de Herefords by several other witnesses. Perhaps I am trying too hard to find an Irish angle, and the absence of the title *Magister* from these documents may cast some doubt upon this identification. It has also been suggested (on even more slender evidence) that he finished his days as a monk in Bury St Edmunds. However, it is fairly certain that the astrologer Roger of Hereford was appointed a justice in eyre by Henry II in 1185. Although he worked and lived in Hereford for the last quarter of the twelfth century, he did not hold any ecclesiastical office there. It is perhaps likely that he made a living from astrology. As we have seen, a skilful astrologer could expect to be consulted by the great and the good; perhaps John of Salisbury was right to be concerned about the pernicious influence of twelfth-century science.