JOHN ASHENDEN

AND THE

SCIENTIA ASTRORUM MERTONENSIS

With an Edition of Ashenden's

Pronosticationes

Volume I



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JOHN ASHENDEN AND THE *SCIENTIA ASTRORUM MERTONENSIS*
With an Edition of Ashenden's *Pronosticationes*

by

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John Ashenden, who flourished between the years 1336 and 1365, was a fellow of Merton College, Oxford, and an astrologer. In the later Middle Ages the science of the stars, or *scientia astrorum*, comprised both astronomy and astrology. Merton College is well known for the school of natural philosophy which prospered there in the first half of the fourteenth century. At the same time, a group of Merton fellows and their acquaintances specialized in the *scientia astrorum*. Ashenden's writings are illustrative of the scholarship of this Merton circle. The circulation and copying of astronomical and astrological texts played a major part in their studies. Ashenden compiled a large Summa of astrological theory from nearly one hundred sources. He also made predictions on the basis of reputed influences of eclipses and planetary conjunctions. Coincidental events, which appeared to follow what he had predicted, greatly encouraged him. He composed his predictions out of academic interest rather than for personal gain. His writings continued to be read for 400 years; yet by the Age of Enlightenment his learning had lost its value. Ashenden's scholarship was indicative of the weaknesses of medieval scientific enquiry--it was mostly qualitative rather than quantitative; and assertions were never put to real experimental tests. Astrology had as much to do with theology as it had with science. The questions of determinism, natural causation, and numerological prophecy excited Oxford theologians. On these issues Ashenden stood on an orthodox middle-ground.

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2500-word Abstract

John Ashenden, who flourished between the years 1336 and 1365, was a fellow of Merton College, Oxford, and an astrologer. On the evidence of his own words, we know that Ashenden's origins were north of the Humber. Perhaps he received his name from the town of Ashington. This was not far from Merton's appropriated church at Ponteland. The College may have recruited him in line with its policy of educating boys from the regions from which it drew income. Ashenden's university education appears to have followed the usual path; but at some stage he acquired a distinctive interest in the stars. During his academic career Ashenden drafted at least four sets predictions based on lunar eclipses and planetary conjunctions; and he produced a large astrological Summa containing traditional doctrines of the art.

In the later Middle Ages the study of the heavens, or *scientia astrorum*, comprised both astronomy and astrology. Classifiers of knowledge explicitly distinguished mathematical astronomy from astrology. They understood astronomy to be the study of the motion of the heavenly bodies, while astrology was the art of interpreting the reputed significance of celestial forces. Astronomy had a tripartite division into (1) computistical studies, i.e., the reckoning of the ecclesiastical calendar, (2) spherical astronomy, considering the motion of the fixed stars and celestial spheres, and (3) planetary astronomy, the mathematical theory describing the motion of the planets. Astrological predictions fell into various categories, the casting of

nativities being the most familiar survival today. Astrological weather forecasting also seems to have been common. In practice, astronomy and astrology were bound together in a near-symbiotic relationship. The reckoning of horoscopes, and other astrological procedures, generated the main demand for astronomical knowledge. In Oxford, as at most medieval universities, astronomy was taught as part of the *quadrivium* (arithmetic, geometry, astronomy and music). The level of instruction was rudimentary. Astrology was only occasionally taught in the fourteenth-century university.

Merton College is well known for the 'school' of natural philosophy which prospered there in the first half of the fourteenth century. At the same time, a group of Merton fellows and others specialized in the *scientia astrorum*. It was not that reasearch was officially supported, but that some talented fellows developed into an informal coterie of friends who encouraged each other's study. John Maudith (fellow 1309-19) was the first recognized as an astronomer. Thomas Bradwardine, who wrote on the mathematics of proportions, also had a keen interest in the stars. A core group of fellows emerged in the 1330s and 40s. This grouping included Simon Bredon (fellow 1330-41) Ashenden, William Rede (1344-57), Reginald Lambourne (1353-7) and William Merle, who was not a Mertonian but who was active within this circle between 1337 and 1347. The writings of these men combined astronomy, astrology, meteorology and medicine. Rede drafted astronomical tables for the Oxford meridian, thus establishing a new standard for English calculators. Bredon wrote a commentary on the first three books of Ptolemy's Almagest, and compiled a medical guidebook entitled Trifolium. Merle kept a regular diary of the weather and wrote about means of predicting it. Unfortunately, there is little evidence of the interaction

of these men. However, Digby MS 176 is an important witness to their joint activities and interests. After the main period of their Oxford residence in the 1340s, the Merton circle gradually dispersed. Bredon became a successful physician. Rede pursued a career in the Church, rising to the position of bishop of Chichester.

Ashenden remained devoted to astrological scholarship; in fact he seems to have had little ambition for anything else. His chief work, the Summa iudicialis de accidentibus mundi, was a compendium of astrological doctrine concerning large-scale events such as harvests, plagues, and wars. Ashenden did not pretend to be the originator of the doctrines in the Summa; rather he aimed to collect the opinions of authorities who had treated the astrology in a rational manner. The Summa is divided into two books, each comprising twelve distinctions. The first book is concerned with general astrological theory; book two details the manifold rules for predicting different phenomena.

Book I commences with an examination of sacred history and the age of the world. Ashenden intended to show the utility of astronomical and astrological tools in the resolving the difficulties of chronology, which could not be dealt with solely by interpretation of evidence in the Scriptures. He found the estimates of the astronomers for the age of the world to be in much closer agreement than those of the biblical scholars.

In compiling the Summa Ashenden used many astrological authorities. These fell roughly into four categories: important theoretical treatises, introductory tractates, minor or aphoristic tracts, and astrometeorological works. Two great astrological treatises dominated the Summa: the De coniunctionibus magnis of Albumasar (Abu Ma'shar, died A.D.885/6), and the Quadripartitum of

Claudius Ptolemy (flourished, 2d century A.D.) Albumasar's work was the main source for the theory of great conjunctions. The Quadripartitum dealt with eclipses, but just as importantly, with the methodology of predictions. Ashenden studied the Quadripartitum very closely, with the aid of the commentary of Haly Ridhwan and a new Latin rendition by Simon Bredon. Much detailed information on astrology was provided by the so-called introductory tractates. Authors of these works included Alchabitius, Haly Abenragel, John of Seville, Roger of Hereford. The Centiloquium attributed to Ptolemy was a collection of one hundred aphorisms, and seems to have inspired a genre of minor tracts which consisted entirely of sets of astrological rules. Ashenden had recourse to several of these tracts.

Meteorology was the central theme of the Summa. Ashenden approached the subject from three angles: the natural causes of weather phenomena, the supposed celestial indications of weather patterns, and traditionally recognized weather signs. In his discussion of the natural causes Ashenden generally followed the commentary of Albertus Magnus on the Meteorologica, and the exposition of Peter of Abano on the Problems. The Aristotelian perspective is adhered to throughout.

As for predicting the weather on the basis of reputed celestial indications, Ashenden collected a great amount of material. Much of it was derived from the Indo-Arabic tradition of astrometeorology, communicated via a number of minor tracts, of little individual flavour, which were taken up with recitations of formulae. The main texts in this genre were associated with Alkindi and Jafar Indus (who was perhaps Albumasar). The principal doctrine was the lunar cycle regulated the humidity of the atmosphere. At certain points in its circuit the Moon was thought to release or retain moisture. The dry or moist nature of

planets, stars, and portions of the sky, added further variables to the equation. Ashenden reported that he had frequently used such rules to predict the weather, and they they were not unreliable. He did nonetheless find that the astrological explanations of the movers of the winds did not work in practice; nor did they stand to reason. He proposed his own system, one that presumably was in line with his experiences. Ashenden's most significant finding was that the situation of a locality, its *situs*, had a great impact on local weather patterns. However, he did not develop the idea very far.

The weather could also be forecast from appearances in the air or from the behaviour of animals. William Merle collected many traditional weather signs in his De prognosticatione aeris (1340). This was Ashenden's main source, but he examined the primary authors more closely than Merle had. For instance, when using the first Georgic of Virgil, he made reference to the commentary of Servius.

Of all the sections of the Summa the distinction on pestilential diseases was the most timely, as Ashenden composed it as the Black Death was entering Britain. Ashenden'sdiscussion was established, in the first instance, on Peter of Abano's Problems commentary. Once again Ashenden independently verified references and added new material; yet he singularly failed to collect anything but book knowledge, while the plague was raging all around him. Ashenden ascribed to the common theory that the plague and other contageous diseases were transmitted by corrupted air. When someone inhaled corrupted air the generation of his life force, the *spiritus vitalis*, was weakened. The heart could not dispose of accumulating impurities and would be suffocated. Ashenden's writing had come directly from the medical book§s. His list of the symptoms of bubonic plague is apparently completely

from the medical sources, and not from personal experience.

In the remaining portions of the Summa Ashenden handled the astrological judgement of the success or failure of the harvest; and the outburst of human conflicts and wars. Concerning agriculture, he owed a great debt to William Merle. When speaking of the disposition of man to conflict, Ashenden conceded that celestial forces had only vague influence. Terrestrial factors were more immediate and acute causes of violence.

The doctrines of natural astrology may have been enshrined in the Summa, but we can get an idea of the actual execution of the art by studying Ashenden's *pronosticationes*. He drafted predictions based on a series of eclipses and conjunctions in 1345, 1349, 1357 and 1365. These treatises are remarkable on two counts: They are by far the most extensive astrological predictions surviving from the period, and they were drafted according to a consistent procedure.

Ashenden completed his first **pronosticatio** on 24 March 1345. In this tract he explored the possible significance of a lunar eclipse and three conjunctions involving Mars, Jupiter and Saturn. All these events took place in that same month of March. Ashenden interpreted them as portents of unusually cold, damp weather for the years ahead. Excessive moisture would have additional consequences, namely poor harvests, famine and widespread disease. On the positive side, the English would be disposed to victory in feats of arms. Pieced together as it was from the *regulae* of Ptolemy and Albumasar, there was little extraordinary about the 1345 predictions. However, it was extraordinary that subsequent events appeared to conform to what had been predicted. We only have his own report that the weather over the period 1345-48 was indeed

miserable. In any event, the Hundred Years War was to provide more startling occurrences. In 1346 English armies gained signal victories over the French at Crècy, and the Scots at Neville's Cross; and in 1347 Charles of Blois was captured at Roche-Derrien, and Calais surrendered after a tortuous siege. In Ashenden's mind, the final proof of the influence of the eclipse and the conjunctions was the occurrence of the Black Death. Yet when when he reviewed his original prediction he found that not enough emphasis had been placed on the disease-generating capacity of the 1345 events. He made up for his oversight by adding a final paragraph about the signs of the impending epidemic--but this was probably after the plague entered had Britain.

The apparent success of the 1345 *pronosticatio* inspired Ashenden to compile the Summa and to make further predictions. Early in 1349 he recorded his opinion on a conjunction of Mars and Saturn. The plague was still epidemic in Britain at that time, but Ashenden forecast that drier influences would neutralize the forces that promoted the disease. Later, after a number of years fulfilling administrative duties, Ashenden returned to his writer's desk. In 1357 he wrote, in two separable tractates, on the conjunction of Saturn and Mars in that year, and the conjunction of Saturn and Jupiter that was to be in 1365. As I believe, about the year 1365 he combined the two tracts, adding an introductory section and a theological codicil to the unified work. The most dramatic concern of the 1357 tract was the French war. With the capture of Jean II at Poitiers in 1356, the war must have seemed all but won. Surely when Ashenden heard the news he thought that the crown of France itself was within Edward III's reach. Ashenden had only to rationalize from the stars what looked like a sure bet. In the 1365 tract he predicted other momentous

occurrences. First, the kingdom of Scotland would meet with catastrophe. Then, and more importantly, the sect of Islam would be overthrown by Christian forces. Ashenden's more ambitious predictions have made some think of him as a political astrologer. His forecasts do conform with a 'rule of current events'; that is, he did shape the interpretation of celestial portents to fit the trends in political happenings. Yet there is no positive evidence to support the notion that Ashenden had ulterior motives for composing his *pronosticationes*. He certainly gained no career advancement on their account.

Ashenden's scholarly pursuits are illustrative of the weakness of medieval scientific enquiry. He had at least a basic understanding of mathematical astronomy, but he was no enthusiast for the use of mathematics in problem solving. As an astrologer Ashenden had the opportunity to measure the success or failure of his predictions under real circumstances. He was willing to put an assertion to the test of sound reasoning, but also to the test of his experience. Ashenden may rightly be said to have trod along the path that Robert Grosseteste had cleared in the thirteenth century. However, when Grosseteste, or the Merton natural philosophers, or even Ashenden noted their 'experiences' they were speaking of everyday events from which they drew common sense conclusions. They had no experimental method by which they could have critically assessed the workings of natural phenomena.

In his scholarship Ashenden relied heavily on book learning. Ideas acquired an authority when they became disseminated and generally accepted by learned men. True or useful doctrines won acceptance. Erroneous teachings fell out of use, or never became widely known. Time was the real test of theory, and knowledge was the shared experience of learned men. An individual's contribution to knowledge was small, and its value would be evident

only after many years. Authority emerged with the gradual revelation of truth.

Matters of faith had much to do with the search for truth in fourteenth-century Oxford. The science of the stars had three potential meeting points with contemporary theology, on questions of free will and determinism, the importance of natural causes, and the problem of eschatological prophecies. The theological position of Thomas Bradwardine dominated the first two categories. Bradwardine believed that God's prior will and foreknowledge could and did coexist with man's freedom of choice. He also condemned vulgar astrology, which set the heavenly bodies in God's place. Ashenden seems to have held to a theological middle-ground. He criticized determinism and openly attacked the so-called prophets who wanted to use astrological methods to predict the Second Coming of Christ and the end of the world. Ashenden believed, as did others, that God normally acted in the world according ordained natural causes, rather than by miraculous powers.

This thesis has three appendices, including a full description of Digby MS 176, the table of contents of the Summa, and a list of manuscripts containing Ashenden material. The appendices are followed by an edition of Ashenden's *pronosticationes* and the De tribus coniunctionibus attributed to him.

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With an Edition of Ashenden's *Pronosticationes*

Volume I

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PREFACE

The object of this thesis has been a straightforward and compelling one--as Frederick II would have said it--to present things that were, as they were. For any medievalist this is challenging task; and, admittedly, a young student from the midwest of America and writing in the 1980s is at a further disadvantage when presenting the lives and ideas of men who flourished over six hundred years ago. I thus owe a major debt to all who kindly aided me. Foremost is my supervisor, Professor J.D. North. His guidance has been like that of the polestar for a bewildered traveller. It would be difficult to praise him too highly. In relation to Merton College, Dr Roger Highfield, the College Librarian gave me my bearings. Mrs Jennifer Moreton read portions of the thesis and made some valuable suggestions. Mr T.Y. Kong helped me overcome some computing difficulties. I specially wish to thank the staff of the Bodleian Library for catering so expertly for the day to day needs of research. Finally, I would like to dedicate this thesis to my parents--to the memory of my Father, whose character I should have inherited in greater measure; and to my Mother, whose living devotion is a continuing inspiration.

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ABBREVIATIONS

AHDLMA	Archives d'histoire doctrinale et littéraire du moyen age
AIHS	Archives internationales d'histoire des sciences
BL	British Library, London
BN	Bibliothèque Nationale, Paris
BRUC	A.B. Emden, A Biographical Register of the University of Cambridge to 1500 (Cambridge, 1963)
BRUO	A.B. Emden, A Biographical Register of the University of Oxford to 1500 A.D. (Oxford, 1957-9) 3 vols
Carey	H. Carey, Astrology and Divination in England in the Later Middle Ages (Oxford, unpublished D.Phil thesis, 1984) Bodleian Library MS D.Phil.c.5028
Carmody	F.J. Carmody, Arabic Astronomical and Astrological Sciences in Latin Translation (Berkeley and Los Angeles, 1956)
Cavanaugh	S.A. Cavanaugh, A Study of Books Privately Owned in England, 1300-1450 (University of Pennsylvania, unpublished Ph.D. dissertation, 1980) 2 vols
CUL	Cambridge University Library
DSB	Dictionary of Scientific Biography (New York, 1970-1980) 16 vols
EETS	Early English Texts Society
HMES	Lynn Thorndike, History of Magic and Experimental Science (Columbia, 1923-58) 8 vols
HUO	The History of the University of Oxford, Volume I: The Early Oxford Schools, ed. J.I. Catto (Oxford, 1984)
JWCI	Journal of the Warburg and Courtauld Institutes

MBMC	F.M. Powicke, The Medieval Books of Merton College (Oxford, 1931)
MCR	Merton College Records (individually numbered)
MLGB	N.R. Ker, Medieval Libraries of Great Britain (London, 1964) 2d edition
MMBL	N.R. Ker, Medieval Manuscripts in British Libraries (Oxford, 1969-83) 3 vols
MPME	C.H. Talbot and E.A. Hammond, Medical Practitioners of Medieval England. A Biographical Register (London, 1965)
NRW	J.D. North, Richard of Wallingford. An Edition of his writings, with Translations and Commentary (Oxford, 1976) 3 vols
OHS	Oxford Historical Society
PL	Patrilogiae cursus completus, series latina, ed. J.-P. Migne (Paris, 1844-64) 221 vols
Sarton	Introduction to the History of Science (Washington D.C., 1927-48) 3 vols
Summa	John Ashenden, Summa astrologiae iudicialis de accidentibus mundi quae anglicana vulgo nuncupatur, ed. Johannes Lucilius Santritter (Venice, 1489) Unless otherwise stipulated, all references are to this edition; and quotations are with the marginal corrections in Bodleian Library, Ashmole 576
ThK	Lynn Thorndike and Pearl Kibre, A Catalogue of Medieval Scientific Writings in Latin (London, 1963) revised and augmented edition
I	Prognostication of 1345
II	Prognostication of 1349
IIIa	Prognostication of 1357
IIIb	Prognostication of 1365
IV	De tribus coniunctionibus

Citations of texts I - IV invariably refer to line numbers in the present edition

I

JOHN ASHENDEN

> In time our name will be forgotten,
> no one will remember what we have done;
> our life will pass away like wisps of cloud,
> dissolve like the mist that the sun's rays
> drive away.
>
> - Wisdom 2.4

If only because John Ashenden has never been a prominent historical figure, it seems appropriate to remind ourselves of the words from the Book of Wisdom; for whatever Ashenden once was, now, like those biblical wisps of cloud, it is mostly lost to us. Throughout the six centuries since his time, historical investigation has only infrequently disturbed Ashenden's name and works; but whether or not his is an unduly neglected fame, the facts of his existence have the potential value of an untapped resource. They merit exploration. All the same, Ashenden is the focus of this study rather than its hero. Learning more about him affords us a view of the larger things with which he was associated--the activities of a group of scholars centred on Merton College, Oxford (collectively known as the 'Merton School'). In a wider sense we gain some insight into the character of medieval thinking about the heavens. Using Ashenden as a vehicle for enquiring into larger issues does not mean we can pass him over without interest, but that we intensify our resolve to know all we can about this specific man. To start, it is enlightening to see what information has been previously available about him.

1. Ashenden and the Historians

The details of Ashenden's existence have never been well known. Although his writings gained wide distribution, and indeed a measure of acclaim, their author himself became altogether obscure shortly after his death. The numerous and divergent forms of the name 'Ashenden' have caused much of the problem in identifying the man. Fourteenth-century spellings alone include: As(s)yndene, Aschenden, Asschynden, Assenden, Assygdene, Es(s)inden, Eschenden, Eschynden, Eschinden(e), Aysheden. Less recognizable forms developed in the fifteenth century: Aschelden, Eshinde, Esclinda, Eschuide, Eschude, Eshilide, Exuida, Esquidus, and Eshwidus. Continental scribes had particular trouble in making sense of the name. Forms with *ui* obviously stem from the confusion of minims in manuscript copying. The corrupted *Eschuid* of the 1489 Summa edition was later anglicized as *Estwode* and *Eastwood*. (For ease of reference I have adopted the spelling *Ashenden*.) The fifteenth-century chronicler of astrology, Symon de Phares, having confused different spellings in separate sources, made Ashenden out to be two men.[1] Even well after the discovery that various forms actually represented the name of a single man, scholars were at times still uncertain about this man's identity. He is, for instance, mistakenly identified in the catalogue of Ashmolean manuscripts as John Aston, an early supporter of Wyclif.[2]

[1] Recueil de plus Célèbres Astrologues et Quelques Hommes Doctes, ed. E. Wickersheimer (Paris, 1929), 222.

[2] W.H. Black, Catalogue of the Ashmolean Manuscripts (Oxford, 1845), 160.

Ashenden's obscurity has also been perpetuated by a generally poor biographical tradition, derived in the main from what little information Johannes de Trittenheim could squeeze out of the printed edition of the Summa.[3] His account and the derivative one of Conrad Gesner were utilized by Leland, who in turn became the authority upon which the biographical knowledge of Bale, Pits and Tanner was founded.[4] Our man was known to have been English, a fellow of Merton College, the compiler of an astrological *summa*, and author of other works. On these scanty grounds Ashenden's learning received universal praise; but he was mentioned specially in connection with the Black Death, the onslaught of which he was commonly believed to have foretold. This was the virtual sum of knowledge of Ashenden, and very little supplemented the basic account until the seventeenth-century historian Anthony Wood brought attention to Ashenden's prognostications in Digby

[3] 'Johannes Estuidi natione anglicus, vir in saecularibus litteris omnium sui temporibus facile doctissimus, philosophus et astronomus nulli secundus, ingenio prestans et dulcis eloquio, scripsit ingenii sui quaedam praeclara opuscula, quibus nomen suum ad noticiam posteritatis transmisit. E quibus extat opus insigne astrologiae iudicialis de accidentibus mundi, quod vulgo appellatur Summa de accidentibus mundi: Li. ii. *Intentio mea in hoc libro.* De caeteris nihil vidi. Claruit et complevit eandem summam, sicut in eius principio fatetur sub Carolo imperatore quarto et Clemente papa sexto. Anno domini M.CCC.xlvii.' Johannes de Trittenhem, De scriptoribus ecclesiasticis (Paris, 1512), ff. 130v, 131r.

[4] Conrad Gesner, Bibliotheca universalis (Zurich, 1545), f.415r. John Leland, Commentarii de Scriptoribus Britannicus, ed. Antony Hall (Oxford, 1709), 337. John Bale, Index Britannia Scriptorum, ed. R.L. Poole (Oxford, 1902), 199-200, 518. J.Pits, Relationum Historicarum de Rebus Anglicis (Paris, 1619), 493. T.Tanner, Bibliotheca Britannico-Hibernica (London, 1748), 11.

MS 176. In truth, Wood did not probe very deeply, yet his information was considered definitive for over two centuries.[5] Further illumination had to wait for Emden's competent thumbnail treatment in his biographical register.[6] In fact up to that time great uncertainty reigned over Ashenden's identity and writings. The Victoria History of Oxford erred so badly as to attribute John Gaddesden's Rosa medicine to Ashenden.[7] And Lynn Thorndike thought it prudent to distinguish him from a certain John of Essen who had never set foot on English soil![8]

By highlighting the persistent inadequacy of the historical tradition concerning Ashenden, I am not attempting to put antiquarians and historians to shame, but to show a need for reconsideration. In order to establish a measure of certainty about Ashenden's life, we should do what always has been the historian's first resort--return to the contemporary sources. The chief sources of biography in this case are the administrative documents of Merton College itself. They allow us to draw a skeletal chronology of Ashenden's career in the College. His writings (of which all are dateable) also provide some valuable information about his background and activities. One or two incidental points can be gleaned

[5] Historia et Antiquitates Universitatis Oxoniensis (Oxford, 1674), 172. And see, G.C. Brodrick, Memorials of Merton College, OHS 4 (Oxford, 1885), 200-201.

[6] BRUO i.56.

[7] W.H.Garrod, 'Merton College', in The Victoria History of the County of Oxford, eds. H.E.Salter and M.D.Lobel (London, 1954), iii.104.

[8] HMES iii.326.

from other sources. In all, we have enough to make Ashenden more than a name.

2. His Life

Direct evidence for Ashenden's early years is entirely lacking. It is probable, all the same, that he was born about the year 1310 (or shortly thereafter) in the vicinity of Ashington, Northumbria, from which he may have received his name. On the evidence of his own words in the Summa iudicialis we know that Ashenden hailed from Northumbria.[9] Of course it is dangerous to rely on the correlation of placenames and personal ones, for during the fourteenth century patronymics begin to appear as such with much greater frequency. Yet it does not seem imprudent to propose identification of Ashenden's local origin with the evidence of his name. While 'Ash-' placenames are numerous in the south of England, they appear infrequently north of the Humber; and Ashington is the most satisfactory candidate for our man's origin.[10] It might well have been that in his youth Ashenden was recommended to the College, having caught the attention of a fellow visiting Merton's northern properties. The appropriated church of Ponteland, a regular destination for these travelling fellows, was only a few miles removed from Ashington. Furthermore, it was a common practice to educate a few promising boys from the regions in which the College held property--a plan somewhat analogous to the

[9] 'Et hoc satis expertum est in partibus meis, scilicet in partibus borealibus Angliae sive in Northumbria.' Summa II.5.6, f.121vb.

[10] Eilert Ekwall, English Place Names (Oxford, 1960). Regrettably, the English Place Name Society survey for Northumbria has not yet appeared.

closed scholarship system of the more recent past.[11] Ashenden, then, is to be distinguished from a certain John Esyndon, a scholar *in villa* at Merton from 1321 to 1326 who came from Leatherhead, Surrey.

Ashenden first comes to light at Merton in an account of College disbursements to fellows on 2 February 1337, the feast of the purification of the Virgin.[12] It is likely that he had been in residence since the autumn of 1336. In any case, his appearance is interesting. At that time Merton College was dominated by scholars from the south of England; and relations between northerners and southerners had just reached a low point. There had always been tension between the two camps within the University, tension that led to conflict and occasionally to violence. The worst incident in the north-south rivalry took place in 1334 when a contingent of northern masters quit the University and attempted to establish their own *studium generale* in Stamford, Lincolnshire. Although the Stamford movement was suppressed by royal decree in the next year, it is worthwhile to point out that a leader of the secession, William Barneby, was himself a former Merton bursar.[13] There could have been better times for a young northerner to start out on an Oxford career. Whether Ashenden received a cool welcome at Merton we cannot say. He was nonetheless successful in establishing working relationships, if not outright friendships, with such southerners as Nicholas of Sandwich, William Rede and

[11] J.R.L. Highfield, 'The Early Colleges', HUO, 246-47.

[12] MCR 3671.

[13] A.B. Emden, 'Northerners and Southerners in the Organization of the University to 1509', Oxford Studies Presented to Daniel Callus (Oxford, 1960), 1-30. On the Stamford secession, see A.F.Leach, 'Schools', in the Victoria County History of Lincoln, ed. William Page (London, 1906), ii.468-74.

Simon Bredon (of whom we will have reason to speak later on). In fact these men were the core group of the *scientia astrorum Mertonensis*, as I have called it.

The question of Ashenden's educational career, more than his place of origin, has implications for his position in the academic milieu of fourteenth-century Oxford. There is no reason to suppose that his Oxford education proceeded other than *pro forma*. From the citations in his writings it is plain that Ashenden was familiar with the usual Aristotelian books of the Arts curriculum.[14] Ashenden incepted as Master no later than 1340, being styled *magister* in that year.[15] Despite his long stay in Oxford, some twenty years, he apparently received no other degree. The title *professor sacre theologie* found in a late fifteenth-century manuscript of his Summa is unsubstantiated.[16] He is likely to have studied in the Theology Faculty after his three years of regency, which at the latest extended to 1343. That he did not earn another degree is not extraordinary. The D.Th. course took nine or ten years and many who had begun did not complete it. Simon Bredon, for example, abandoned his studies having been in the theological schools for five years or longer. Ashenden's acquaintance with the important religious treatises, including the writings of Augustine and Peter Comestor (*Magister Historie*) suggests that he too had spent some time in the Faculty. He quoted

[14] In the Summa he refers explicitly to the Ethics, Physics, Metaphysics, De animalibus, De generatione et corruptione, and Meteorologica.

[15] MCR 487.

[16] Munich, Bayerische Staats-Bibl. MS 221, f.1. Nor is much credence to be given to 'Joannis Anglici Ordinis Minorum' noted by A.G. Little, The Grey Friars at Oxford, OHS 20 (Oxford, 1891), 160.

several theological works in his Summa, and he made use of the De causa Dei of Thomas Bradwardine, the philosophical consequences of which he was keenly aware.[17] In his astrological works, as we shall see, Ashenden proved sensitive to the issues of theology.

It is evident from his writing on the astrological theory of contagious diseases that Ashenden had an interest in medicine, but it is difficult to assess the extent of his medical study. What we have are two very intriguing statements of Ashenden's status as physician. First, Leland relates that before Ashenden looked up to the stars he had been occupied with the intricacies of herbal medicine.[18] It is regrettable that Leland did not provide the source of this tidbit. As it stands, there is no way of judging its validity. A second piece, coming from an unlikely source, is a medical recipe written in a fifteenth-century codex now in the Communal Library of Parma. The recipe, an antidote for poisons, is associated with a certain Johannes de Esen, physician to the King of England. This John has been tentatively identified with Ashenden.[19]

Be that as it may, Ashenden decided to commit himself to the study of the heavens. His initial contact with the

[17] De causa Dei contra Pelagium et de virtute causarum ad suos Mertonenses, ed. Henry Savile (London, 1618). This is arguably the most important theological work of the fourteenth century.

[18] 'Et rem herbariam medicinae cultor accuratius inspexit; postremo oculos et mentem ab sublimia ipsa erexit astra coelumque.' De Scriptoribus Britannicis, ed. Hall, 344.

[19] Bibl. Palatina, Misti MS B.26, described by G. Avarucci, et al., Catalogo di Manuscritti Filosofici nelle Biblioteche Italiano (Florence, 1982), iv.240-41.

field was in the normal university curriculum. Books with a bearing on theoretical astronomy, such as Aristotle's De caelo and Meteorologica, the Sphere of Sacrobosco, and a Theorica planetarum, were prescribed for ordinary lectures. It is most likely, however, that some cursory or informal lectures on Ptolemy's Quadripartitum, an astrological handbook, were the catalyst for Ashenden's interest in the stars. Unlike the ordinary lectures on set books, a cursory lecture was a reading or paraphrase of a text chosen by the master or bachelor. (Bachelors were allowed to present cursory lectures but not ordinary ones.) While the teaching of the Quadripartitum in fourteenth-century Oxford is not documented, cursory lectures on it were being given at the University of Paris. In Oxford, Simon Bredon may have lectured on the Quadripartitum; he did at all events compose his own paraphrase, in which he altered terminology and restructured passages to facilitate the understanding of the text. However Bredon communicated his study of Ptolemy, Ashenden benefitted directly from the scholarship of his colleague. He was later to incorporate parts of Bredon's Quadripartitum rendition in his Summa. Bredon, I would like to think, was the engine driving Ashenden towards the science of the stars.

Ashenden met Bredon early in his Merton career. They were together at the college meetings or scrutinies of 1338. Apparently the two were on friendly terms, as two years later Bredon appointed Ashenden (whom he called *magistrum dilectum*) to succeed him as one of the Merton proctors.[20] Perhaps Bredon wanted to free himself of the responsiblity, perhaps he thought Ashenden would do a good job. We cannot say. It was, however, a crucial time for

[20] MCR 487. November, 1340.

the College's northern interests. For in 1340 Merton attempted to take possession of Embleton church in Northumberland, to which it had a long standing claim. Unfortunately a claimant forwarded by Henry of Lancaster, earl of Derby, had already been presented. In the month of April, John Hotham, an officer of Merton, made the arduous journey to Embleton to announce the College's intention of prosecuting its rights. Yet when he appeared at the church, a hostile crowd headed by the earl's bailiff confronted him. Hotham was forced to withdraw 'in great anguish and fear of death.'[21] Ashenden was sent north in his capacity as proctor some months after Hotham's ejection. He certainly got as far as Stillington;[22] whether he played any real part in the dispute is not in the records. At all events, the College succeeded in its cause. On 14 November 1341 Hotham was admitted to the church in the name of the warden and fellows, and William Humberstan was made its vicar.

After the Embleton interlude Ashenden returned to a quiet and studious life. The single notice of him over the next three years is in the bursar's account of 1342.[23] No doubt he was mainly resident in the College and was furthering he astrological studies. He resurfaces in 1345, having composed a treatise interpreting the significance of a lunar eclipse and a conjunction of the three superior planets (Saturn, Jupiter and Mars) occurring in March of that year. The colophon in Digby MS 176 states that the tract was completed on 24 March. The authenticity of the 1345 *pronosticationes* was questioned

[21] E. Bateson, et al., A History of Northumberland (Newcastle and London, 1940), ii.58-63.

[22] MCR 3673.

[23] MCR 3674.

by Lynn Thorndike on the weight of a passage in a manuscript of the Summa:[24]

> Et ponamus tibi exemplum de anno Cristi 1345 in quo convenerunt 3 superiorum in 2a facie Aquarii et accidit id temporis eclipsis Lune universalis. Et iste conclusiones cum eclipsi significabant...magnos effectos et diu durabiles, sicud patet per ea que experimentis multis postea satis didicimus, sicud dicetur inferius. Nichil enim tunc tempus scripsi de significationibus earundem conclusionem et eclipsis Lune predicta quando illud idem eveniebat post infra paucos annos, nec aliqua scripsi nisi illa que sequebantur ex dictis astronomorum.

Thorndike took this to mean that Ashenden had not written anything in the year 1345, only later. But it seems clear enough that Ashenden meant that he had written nothing, at any time, that had not been founded on the sayings of the astronomers. Further, there is an abundance of evidence that the 1345 tract is indeed Ashenden's. He refers to it as his own elsewhere in the Summa as well as in the later prognostications.[25] Robert Walter, Rede's secretary, also explicitly attributes it to Ashenden in the table of contents of Digby MS 176: 'Johannes Aschenden pronosticavit'. We also learn that he had the cooperation of his fellow Mertonian, William Rede. Rede made the requisite astronomical calculations for the eclipse and conjunction horoscopes. Rede's mentor, Nicholas of Sandwich, took enough interest in the results to have a

[24] Summa II.12.2, f.213vb. Paris, BN nouv. acq. MS 3034, ff.297vb-98ra. Quoted by Thorndike, 'Notes on some Astonomical, Astrological and Mathematical Manuscripts of the Bibliothèque Nationale, Paris', JWCI 20 (1957), 162-3. I note that the passage occurs in all manuscripts of the Summa virtually as Thorndike has reproduced it.

[25] II.22-4, 299-304; IIIa.954-65.

copy made for himself. More will be said of Rede, Sandwich, and Digby MS 176 later on.

The 1345 *Pronosticatio* is a mature work. Ashenden demonstrates a thorough acquaintance with astrological conventions and reasoning. His grasp of the subject is already that of a full-fledged practitioner rather than a beginner. Following the *regulae* of Ptolemy and Haly, Ashenden determined that the influence of the eclipse would be felt most strongly in the north-east corner of the world; and he inferred that the effects would appear two months after the eclipse itself. Also, because the event had lasted some three hours and forty-two minutes, according to the calculations (he notes that it was overcast on the night of the eclipse), the consequences would be distributed over an eight and a half year period. The conjunction of planets was considered in two parts, as a coniunction of Saturn and Jupiter, and another of Saturn and Mars. The former was to affect the same quarter of the world as the eclipse, but its influence would commence in fifty-two months' time, i.e. toward the end of September, 1349.

The 1345 prognostications of human upheaval, warfare and death had a decisive effect on Ashenden's career of astrological exploration, because subsequent events appeared to agree with the forecasts. The next two years saw the conflict with France come to a head. In 1346 English armies gained signal victories, over the French at Crécy, and over the Scots at Neville's Cross; and in 1347 Charles of Blois was captured at Roche-Derrien, and Calais surrendered after a prolonged and tortuous siege. Encouraged (or as some would say, duped) by his apparent success, Ashenden commenced on his most ambitious work, the Summa iudicialis de accidentibus mundi, a lengthy volume in two books, each consisting of twelve distinctions. The Summa is primarily a compilation of

astrological theory concerning universal or wide-scale events, as developed by earlier, and on the whole more competent writers. Yet Ashenden wielded control over the broad outlines of the treatise. He undoubtedly intended the Summa to be an useful incorporation of diverse sources, a coherent reference and guide for the student of astrology. His efforts took the most part of the next two years.

Ashenden began composing the Summa sometime late in 1346 or early in 1347. The first book was finished on 20 July 1347, according to the colophons. His pace slackened somewhat as he worked on Book II. It was completed in seventeen months, on 18 December 1348. He penned the final three distinctions in relatively quick succession through the last three months of the year. Ironically perhaps, Ashenden began his discussion of contagious diseases (communicable through the corrupted air, as was commonly believed) at the very time of the the arrival of the Black Death in Britain. By the autumn of 1348 the plague had reached Oxford. Ashenden noted in the fifth and final chapter of the distinction that the most skillful Oxford physicians were attempting to stave off the pestilence with a medicine containing aloes, cinnamon, and other exotic ingredients.[26]

Early in 1349 Ashenden drafted another prognostication, concerning a lunar eclipse and a conjunction of Mars and Saturn. He completed this tract on 6 February. Ashenden judged from the celestial alignments that the essentially cold and wet nature of the Black Death would be counteracted by drier influences. The disease would become less contagious and, gradually, normal patterns of human health would resume.

[26] Summa II.9.5, f.178rb.

In the first half of the 1350s Ashenden surely would have liked to continue his studies and writing, but he noted with regret that 'I had to turn my attention to worldly concerns and responsibilities, which assailed me in many ways and kept me from my writing.'[27] He was called upon in the difficult times after the plague to help administer the Merton properties in the North: Embleton, Ponteland, Seaton-Carew and Stillington. These three holdings had always caused trouble for the College, and especially so in the changing circumstances of the 1350s. Agricultural revenue had severely declined in the face of a manpower shortage, which led to higher labour costs. The death of some of the College's most experienced estate managers had made the problem all the more acute.[28] The College badly needed to combat the threat to a large portion of its income. Although previously fellows who held no official College position had often met the casual requirements of administration, now greater demands were being made on them to take over supervision of the Merton properties. Ashenden was not altogether unsuited for adminstration. He was familiar with the northern lands put in his charge, experienced in College business, and sufficiently numerate to keep accurate books.

Between 1350 and 1355 Ashenden made several journeys to the North. On each occasion he was accompanied by one or two of the bursars--Billingham, Wauwayn and Rede are

[27] IIIa.70-72.

[28] As an example, the estate at Gamlingay was turning over a £6 3s. surplus in 1347/8. This became a £4 3s. deficit by 1350/1. Robert Oldman and Richard Bredon (a close relative of Simon as it appears), were two of the baliffs lost in the plague. Edith C. Lowry, The Administration of the Estates of Merton College, Oxford, in the Fourteenth Century, (Oxford, unpublished thesis, 1933), 173-5.

recorded as his companions. They collected revenues, audited local accounts, and probably supervised harvests, the tithing of wool and lambs. There is no doubt as to the responsibility for the accounting, as the reports are headed 'Compotus Magister de Eschynden'.[29] Within the University, Ashenden seems to have been regarded as an authority in northern affairs. He was a senior witness to a rental agreement for the Stanfordham manor of Balliol College. And on one of his journeys he delivered the personal effects of the recently deceased Robert de Elwyke, of University College, to Elwyke's brother in the North.[30]

Ashenden's travelling days were over by the end of 1355, and he returned to an academic routine. Shortly thereafter he began working on a new set of prognostications based on the up-coming astronomical events of 1357 and 1365. Ashenden completed the first version of his treatise on 10 March 1357. He seems to have

[29] The records of Ashenden's administrative activities in the North are as follows:

MCR 6026 Account, *post assumptionis* 1351; Accounts *in pascali* and feast of St. Michael, 1352?, with Wauwayn.
MCR 3687 Bursar's account, *in pascali* 1353: Ashenden and Rede *versus borealem.*
MCR 6031 Account, *de termine pentacoste* 1353; Indenture at Emeldon, 8 May 1354, with Wauwayn.
MCR 6032 Account *ad finem pascalis* 1355: with Billingham and Wauwayn.
MCR 6186b Two rentals of Stillington perhaps dating to Ashenden's period of administration.

[30] Balliol College Archives E.4.11a. University College, Smith MS x.30. Cf. BRUO i.649

revised and added to the treatise in 1365. Ashenden dedicated the final rendition to students of astronomy and specially to his colleagues at Merton.[31]

There is no further notice of Ashenden at Merton after 1357. He evidently remained in Oxford to the end of his days--he is not recorded as having received any benefice or taking to religious orders. Indications are, however, that he was still active during the 1360s. Some manuscript copies of the Summa contain a brief note on a conjunction of Mars and Jupiter preceding the pestilential outbreak of 1361. Chances are that the note was of Ashenden's making. And a theological codicil to his 1357/65 predictions can be dated to about 1365. In this piece Ashenden criticized those who would use astrological arguments as tools of prophecy. He observed that one colleague had made some unwise assertions about the end of the world when entering upon his biblical lectures. The master is identified as fellow Mertonian, John Aston, who was first recorded in the University in 1365.[32] A further prognostication of the weather for the years 1369-1374, entitled De tribus coniunctionibus, has been ascribed to Ashenden. In a following section I shall detail the reasons why he could not have written it.[33]

One good reason would be Ashenden's death before 1368. Nothing for certain can be said about it, but a little can be surmised from the actions of his colleagues. Simon Bredon, anticipating his own end, drafted a will in

[31] IIIb.1114-20.

[32] IIIb.1042. BRUO i.67. For the identification of Aston, see J.A.Robson, Wyclif and the Oxford Schools (Cambridge, 1961), 101-3.

[33] See pp.208-209.

October of 1368.[34] That Ashenden was already dead when Simon Bredon made his will may be indicated by the will itself. In it Bredon named several beneficiaries among his relatives and friends, including William Rede and the logician William Heytesbury. (Among other things, Bredon bequeathed his small astrolabe to Rede.) Ashenden's name, however, is conspicuously absent from the list. While it is by no means conclusive, this fact suggests that Ashenden was already deceased. Ashenden's relatively early demise would help explain why his later career is a blank, just as his near contemporaries Heytesbury and Rede were entering upon their first offices in the Church in the 1350s and early 60s. Although his northern background (and perhaps a lack of driving ambition) may have temporarily retarded his advancement, there is no obvious reason why Ashenden could not have followed the path of his fellow Mertonians, unless, of course, his productive life had been cut short.

3. Minor Writings Attributed to Ashenden

In addition to the authentic works, the 1368-74 predictions and the medical recipe attributed to him, we should discuss three other tracts which have been associated with Ashenden. The first two were observed by John Bale in the Merton College library about the year 1547. The third tract is noted somewhat obliquely in the prologue to John de Ponte's abbreviation of the Summa. Along with Ashenden's other works, copies of which bishop Bale found in various libraries, he recorded a De prognosticis aeris and a Regimen de preservatione a pestilentia, which he assigned to Ashenden. The incipit of the former piece, 'Temperiem autem quedam sibi invicem sunt...', exposes it as the weather treatise of William Merle. 1340, the date Bale gives for the tract,

[34] Printed in MBMC 82-6.

corresponds to that given in the colophon for Merle's De prognosticatione aeris in one of its manuscript copies.[35] The second piece, the Regimen, is more interesting. Its incipit, 'Ad honorem laudem et gloriam graciose ...', provides no clue as to its identity, but we may be confident that this is actually an excerpt from the Summa where the protection from contageous disease is discussed.[36] Whereas we may attribute Bale's previous mistake to bad notekeeping, we can still wonder about the manuscript containing the Regimen. It could well have been the Ashenden treatise allocated to an unspecified fellow of Merton in the *electio* of 1452. This book in turn is perhaps the same as no.10 of the Fitzjames indenture made in 1483.[37] Whether this volume was still college property by the middle of the next century, however, cannot be demonstrated.

As for the last of the three tracts, John de Ponte of Lyons appears to have been citing a treatise by Ashenden with the following words from his abbreviation of the Summa:

> Here begins an abbreviated opusculum extracted from the book called Summa iudicialis de accidentibus mundi which John Essenden composed...as one finds stated in

[35] Digby MS 147, f.125r, s.xv init. See below, p.49.

[36] Summa II.9.5. A pest tract, beginning 'Primo de epydimia secunda de perservatione eius...', which Thorndike linked with Ashenden, was edited by Karl Sudhoff, 'Pestschriften des *schwarzen Todes* 1348', Archiv fur Geschichte der Medizin 5 (1912), 42-6. I have examined this, and find no positive reason to associate Ashenden with it.

[37] From this indenture we learn that the Ashenden tract was bound up with Peter Helias's grammar book, De constructione. MBMC 197.

his treatise on the circle.[38]

Thorndike implied that de Ponte, having consulted a work by Ashenden on the circle (squaring the circle?), verified the authorship of the Summa through a reference to it in this other work. Unfortunately such a work, if it existed at all, has yet to be traced. For the time being, it is best to be sceptical, since as far as is known Ashenden showed no great interest in the details of geometry. Even if he had written a mathematical treatise on the circle there would have been little reason to refer to his Summa, a book entirely without formal mathematical content.

4. Ashenden's Character

These are dangerous waters. The judgement of the character of any medieval person is usually made on circumstantial evidence, which is readily manipulated to fit the historian's subjective designs. In Ashenden's case we have only the few external facts of his career. There are no personal papers, no correspondence, no intimate descriptions to draw upon. Yet I do not think it improper to speculate a little on what kind of man Ashenden was. It appears to me that he was a rather quiet, devoted, almost claustral man. The fact that he avoided the tumult of college and university politics is one indication. Amid the boisterous arguments reported in the minutes of the College scrutinies of 1338, Ashenden remained notably silent. Nor did he participate, as had several of his Merton colleagues, in the hotly disputed 1349 election of John Wyliot as Chancellor of the University. I have the further impression that he took on

[38] Thorndike's translation of 'Incipit opusculum abbreviatum a quodam libro vocato Summa iudicialis de accidentibus mundi extractum quam composuit Johannes Essenden anglicus prout in suo circulo repperitur scriptum.' BN lat. MS 7335, f.1r; HMES iii.330, 719.

administrative work out of corporate duty rather than enthusiasm. Through his later years at Merton he must have been viewed as a scholar of considerable standing and seniority; but he was also a leftover from a generation that had sought out the wider world of Church and State. The years overseeing the northern manors might have postponed his departure from the collegiate scene. It is just as likely that he was content with the relative security of an academic life. While his friends were eager to climb their own precarious career-ladders, Ashenden devoted himself to an unusual and perhaps introverted course of research. Towards the end of his Summa he exhorts the reader to be earnest in his studies, moderate in temperament, sober and chaste, and to shun avarice and ambition. We may imagine Ashenden striving to approach that ideal.

It must be true that the single most important element in Ashenden's life was his Merton fellowship. His existence would doubtless be much more obscure today but for the College records which provide at least a skeletal chronology of his Oxford years. For Ashenden his fellowship held great opportunities--the access to astronomical books and instruments, and the company of a host of astute thinkers. His entry into the College was fortuitous in its timing. Merton College of the 1330s and 40s comprised a group of scholars whose intellectual circle had no superior in fourteenth-century Europe. Its members excelled in the study of theology, logic, mathematics and natural philosophy. Ashenden, as it happened, had his own contribution to make to this 'Merton School'. His astrological endeavours often had implications for the astronomical, philosophical and theological matters of interest to his colleagues. Their studies in turn were of no small influence on him. As well as their common academic pursuits, the fellows of

Merton shared the friendship and personal rivalry that provides the dynamic of a small community. It was from this milieu of personal and intellectual intercourse that John Ashenden emerged as the leading English academic astrologer of the Middle Ages. In considering his scholarly attainments, then, we should keep in mind that they were as much the product of the academic climate in Oxford, exemplified by the Merton group, as they were of his own devices.

The next section, however, introduces the medieval science of the stars, or *scientia astrorum*. It also discusses how this medieval category comprised both astronomy and astrology, what the recognized branches of the science were, and finally, where its teaching fit into the Oxford Arts curriculum.

II

SCIENTIA ASTRORUM

THE MEDIEVAL SCIENCE OF THE STARS

> The heavens declare the glory of God,
> The vault of heaven proclaims his handiwork,
> Day discourses it to day
> Night to night hands on knowledge.
>
> - Psalm 19.1-2.

1. Astronomy and Astrology

Scientia astrorum, the science of the stars, is the term I use somewhat arbitarily to describe the unified science incorporating both of what we today would call astronomy and astrology. There is no equivilent modern terminology; the chasm between the scientific discipline of astronomy and the lingering superstition of astrology does not allow for one. This is well and good, but does not work to our advantage. The twentieth-century bias towards the science and against the superstition is excess baggage in any attempt to gain an understanding of medieval thought about the heavens. Admittedly *scientia astrorum* and 'the science of the stars' are rather ungainly turns of phrase. The object in proposing them is to introduce the medieval conception of astronomy, which should be held apart from our modern intuitive understanding. It should be foremost in our minds that during the Middle Ages astronomy and astrology were concomitants. Yet we would likewise be misled if we believed that a sharp distinction between the two was not recognized. I shall be reviewing

the opinions of some prominent medieval scholars. Their thinking will show of itself that by the High Middle Ages the two disciplines were viewed as twin branches of the same scientific tree. The main trunk of science could not feed one branch without in turn feeding the other. So far as I have seen, no serious medieval astronomer shunned the practice of astrology of one form or another, and no astrologer worth his salt made judgements without a having good footing in astronomy. As for the term, *scientia astrorum*, it is not my invention, nor is it altogether ahistorical. It arises, for instance, in the titles of Leopold of Austria's De astrorum scientie and the De scientia astrorum of Alfragani. (Both treatises were quite well known in fourteenth-century Oxford.) Likewise, students of *scientia astrorum* are mentioned in the statutes of 1440 of King's College, Cambridge.[1] That is not to claim that *scientia astrorum* was a classificatory heading widely bandied about in university circles. It was not. But the theoretical conception of an umbrella science of the stars did exist, as we shall see. The phrase, *scientia astrorum*, acting as a tag for that conception, can be an useful reminder of the organic nature of this medieval discipline.

To begin, it is pertinent to ask whether or not there was any semantic blurring of the definitions of astronomy and astrology in the mind of a fourteenth-century student.[2] A question mark arises immediately when we consult the manuscripts, as we find *astronomia* and *astrologia* used more or less interchangeably. This even

[1] J.B. Mullinger, The University of Cambridge (Cambridge, 1873), i.306.

[2] For background see S. Pines, 'The Semantic Distinction between the terms *Astronomy* and *Astrology* according to Al-Biruni', Isis 55 (1964), 343-49.

occurs with authors of the standard of Thomas Aquinas and Robert Grosseteste.[3] In the practice of writing, then, the terms were quasi-synonymous, or at least no uniform rule existed for choosing between them. Just how these words were construed by the medieval reader is quite another matter. We should give him due credit, I think, for correctly working out intended meanings of ambiguous *astronomia - astrologia* passages from their context. After all, there are no reported complaints about this peculiar terminological inexactitude; and the ambiguity (in our eyes, that is) remains virtually undisturbed up until the seventeenth century. Astrology and astronomy were not one and the same, and literate people knew it.

We can observe this among those medievals who were in the habit of giving definitions to things. The delineation between *astronomia* and *astrologia*, and the recognition of their symbiosis was being expressed with ever increasing clarity. Writing in the seventh century, Isidore of Seville began a tradition of the division of the two fields. Simply put, astronomy dealt with the motions, the risings and settings of the celestial bodies; astrology, which could be either natural or superstitious,

[3] R.Deferrari and M.Barry, A Lexicon of St. Thomas Aquinas (Washington D.C., 1948), i.93. Robert Grosseteste, Commentarius in VIII Libros Physicorum Aristotelis II; ed. R.C.Dales (Boulder, 1968), 37. More examples from British sources may be found in the Dictionary of Medieval Latin from British Sources, prepared by R.E.Latham (London, 1975), i.147-8.

drew interpretations from the motions.[4] However brief and inadequate Isidore's definition may have been, it carried a certain authority right through the Middle Ages. Two examples of his influence are sufficient here. The Didascalion of Hugh of St. Victor (1096-1141), a well respected manual on education, does no more than to offer Isidore's words in paraphrase; and the monumental Latin dictionary of John Balbus, the Catholicon (completed in 1286), serves up the Isidore definition verbatim.[5]

The influx of Aristotelian philosophy attending the wave of translations of Greek and Arabic scientific works altered the position of the sciences themselves, and changed the outlook of the thinkers who strove to define and classify knowledge.[6] The introduction of rather advanced mathematical sciences posed philosophical difficulties. The problem may be framed in this way. Mathematics operates with abstract quantities, continuous

[4] 'Inter astronomiam autem et astrologiam aliquid differt. Nam astronomia caeli conversionem ortus obitus motusque siderum continet, vel qua ex causa ita vocentur. Astrologia vero partim naturalis, partim superstitiosa est. Naturalis, dum exequitur Solis et Lunae cursus, vel stellarum certas temporum stationes. Superstitiosa vero est illa quam mathematici sequuntur, qui in stellis auguriantur, quique etiam duodecim caeli signa per singula animae vel corporis membra disponunt, siderumque cursu nativitates hominum et mores praedicare conantur.' Etymologiae iii.27; ed. Lindsay (Oxford, 1911).

[5] Hugonis de Sancto Victore Didascalion de Studio Legendi, II.10; ed. C.H. Buttimer (Washington D.C., 1931), 31. I have inspected the Catholicon, one of Ashenden's sources, in the unpaginated Augsburg edition of 1469.

[6] See J.A. Weisheipl, 'The Classification of the Sciences in Mediaeval Thought', Mediaeval Studies 27 (1965), 54-90.

or discontinuous, without reference to the natural world. However, natural science concerns real physical entities. Isidore had divided knowledge into physics, ethics and logic, and had put the four disciplines of the quadrivium (arithmetic, geometry, astronomy and music) under physics in a general sense, more specifically under mathematics. Classifiers during the age of translations had a different emphasis. Hugh of St. Victor placed physics itself under natural science, *scientia naturalis*, a field dealing with matter, its qualities and accidents. Mathematics, on the other hand, ruled the quadrivium (including astronomy) because these sciences have to do with forms and quantities apart from matter. Dominic Gundissalinus, writing about the year 1150, adopted a more satisfactory theory of intermediate sciences, *scientiae mediae*, from the Arabic philosopher Alfarabi.[7] These sciences bridged the gap between mathematical abstraction and the concrete world, that is they were dependent formally on mathematics as their method of demonstration, but also dependent materially on physical nature as their topic of discourse. Astronomy was an intermediate science because it considered real physical bodies, the stars and planets, in a descriptive mathematical sense. It is worth noting here that the concept of *mediae scientiae* was well nigh universally accepted by the mid-thirteenth century. Astronomy and optics were the most frequently cited examples of intermediate sciences.

Robert Kilwardby's classification of the sciences, set out in his De ortu scientiarum (ca.1250), is particularly relevant to the *scientia astrorum* of the Mertonians--not only because it gives a full, up-to-date definition of the science, but also because Kilwardby had a direct influence

[7] Intermediate sciences were of course an Aristotelian concept. Physics II; 194a8-13.

on the affairs of the College.[8] Kilwardby described the science of the stars (calling the general science *astronomia*) as the study of all aspects of the celestial bodies: their sizes and distances, their risings and settings, the velocity and accidents of their motion, their positions in the sky, conjunctions and oppositions, eclipses, their natural virtues, and connection with events in the inferior world.[9] As Kilwardby had it, the science was divisible into two or three parts. First, mathematical astronomy (*mathematica astronomia*), the intermediate science directly subordinate to geometry, as its demonstrations required a knowledge of the properties of circles and spheres; then natural astrology (*astrologia naturalis*) which considered the influence of celestial virtues on natural events: human health, climate and so forth. A third branch of the science, posing as a natural science but actually established on falsehoods and superstition, was the casting of nativities and the prediction of human fate. Those who professed these arts were called *genethliaci* or *matematici*. They were not to be confused with the *mathematici*, i.e. legitimate mathematicians and scientists.

[8] As Archbishop of Canterbury, Kilwardby held a visitation of the University in 1276, during which he took the opportunity to supplement the Merton Statutes. Injunctions of Archbishop Kilwardby, ed. H.W.Garrod (Oxford, 1929).

[9] 'Haec etiam scientia non solum caelestium corporum quantitates considerat et distantias, verum etiam ortus et occasus, velocitates et tarditates et cetera accidentia eorum motibus, situs etiam et coniunctiones et separationes ac naturales virtutes et effectus earum, cuiusmodi eclipses quae proveniunt ex coniunctione vel oppositione, similiter augmentum luminis et decrementum Lunae, quod provenit ex diverso situ eius ad Solem, et eventus naturales in his inferioribus, tempestatum scilicet et tranquillitatem, fertilitatis et sterilitatis et huiusmodi.' De ortu scientiarum XII §68; ed. Albert G. Judy (Oxford, 1976), 32.

After Kilwardby, Roger Bacon was the only Englishman in the Middle Ages to attempt to categorize the entire range of human knowledge. Bacon's efforts in this area differed from those of Kilwardby in that his classifying was never organized in one work, but spread through a number of treatises. He dealt with the science of the stars in many places, being most specific about its definition in his Communia mathematica. In a chapter entitled *de divisione scientia celestis*, Bacon spoke of the general science of celestial bodies. The discipline could be broken down into its practical and speculative (theoretical) parts. On the practical side was astrology, because its judgements had consequences for earthly affairs. Mathematical astronomy on the other hand was called speculative on account of its abstract nature. Nonetheless, it was the purpose of the mathematical astronomer to certify planetary positions, etc., by means of instruments and tables, so that astrological predictions could be made.[10]

With Kilwardby and Bacon we see an understanding of natural astrology within the framework of Aristotelian science. But what was its relation to mathematical astronomy? Astrology was patently not subordinate to geometry or mathematics of any kind, since it was a qualitative discipline ordered under natural science. Yet it was dependent on mathematics; for without mathematical astronomy, astrological knowledge was impossible.[11]

[10] 'Astronomo enim mathematico incumbit talia certificare quatenus tandem deveniat ad usum et experienciam cognoscendi futura presencia et preterita, ut mala cognita impediantur et bona promoveantur, tam reipublice quam persone.' Communia mathematica I.3.5; ed. Steele, 50.

[11] 'Et nota quod cum sit haec scientia naturalis,

Kilwardby's conclusion returns us to my initial suggestion that a well developed natural astrology could not have existed without mathematical astronomy. Conversely, medieval (and early modern) astronomy had astrological prediction as its first goal. Having said that, I will not go so far as to claim that a mathematical astronomer always had an explicit astrological end in mind when he was preforming his calculations. With some astronomers the concern with mathematical procedures served as a distraction, or even became an obsession. North speaks of the 'intellectual satisfaction' of master calculators tinkering with their tables, some of which contained tens of thousands of digits.[12] The effort put into copying, verifying and adapting these tables must have been enormous. Yet the fascination with operations of numbers could not have been sufficient cause for the astronomer's study of the heavens; and it remains that the single practical outlet for astronomical calculations was their use in astrology. The roles of mathematician and astrologer could be played by one and the same man, though oftentimes scholars either gravitated toward the mathematical side or preferred the art of interpretation.

tamen cum mathematica ordinatur eo quod sine ipsa mathematica astronomiae nullo modo sciri potest.' De ortu scientiarum XII §74; ed.cit., 35. 'Judicare quidem de rebus naturalibus et operari circa illas procul dubio pertinet ad naturalem philosophum et non mathematicum, et ideo est quedam astronomia naturalis, cui tamen omnino necessaria est astronomia que inter partes mathematice computatur; nisi enim illa inveniret tabulas et instrumenta et certificaret loca et alias condiciones stellarum et impressionum, astronomia naturalis non procederet ad effectum, nec posset fieri judicium de rebus hujus mundi nec opera astronomie magna et mirifica procurari.' Communia mathematica I.3.5; ed.cit., 50.

[12] J.D.North, 'The Alfonsine Tables in England', in PRISMATA. Festschrift für Willy Hartner, eds. Y.Maeyama and W.Saltzer (Hildesheim, 1977), 290.

Astrological predictions themselves fell into various categories, some more respectable than others. The standard distinction between licit and illicit astrology was drawn in the classificatory and bibliographical treatise, the Speculum astronomiae ascribed to Albertus Magnus.[13] He split the *magna scientia astronomiae* into its practical and theoretical parts. Concerning the theoretical side, astronomy, Albertus said little that had not been said before. In contrast, his breakdown of astrology was detailed. He first subdivided that practical science into general principles, *introductoria*, and the art of making specific judgements. Astrological judgements were of four kinds: revolutions, nativities, interrogations and elections. Revolutions were celestial cycles governing the overall state of the inferior world. The most obvious of these cycles involved the Sun and Moon. The diurnal motion of the Sun created night and day. The Sun's circuit about the Zodiac presided over the changing seasons. The lunar cycle or month held its influence over the ebb and flow of the tides and the vague patterns of the weather. Planetary conjunctions also had a cyclical nature, engendering the turning points of human history. Revolutions exerted forces on an universal scale. The consideration of personal fortunes centred on nativities. Celestial emanations, it was thought, participated in the development of the human foetus. If these forces could be gauged at one's birth (better yet, conception) then the qualities and fate of the subject might be discovered. Interrogations were the process of answering questions or solving mysteries (e.g. Who stole the my wallet?) by the consultation of a horoscope; and elections were the determination of propitious times for

[13] Edited by A.Borgnet, Alberti Magni opera omnia (1891) x.629-50. For the ascription to Albertus Magnus, see HMES ii.692-717.

any action. To elections Albertus appended the making of astrological images or amulets used for protection against diseases and curses.

Neither Albertus nor any other classifier attemped to rationally subdivide mathematical astronomy. Thomas Aquinas spoke vaguely of a *scientia de spera mota* apart from the rest of astronomy, but he failed to elucidate the distinction.[14] Branches of astronomical pursuit nonetheless existed and were implicitedly recognized in the Middle Ages. With thorough scrutiny of the manuscripts, Olaf Pedersen has identified a fundamental *corpus astronomicum*. The science had a tripartite division into (1) computistical studies, i.e. the reckoning of the ecclesiastical calendar, (2) spherical astronomy, considering the motion of the fixed stars and celestial spheres, and (3) planetary astronomy, the mathematical theory describing the motion of the planets.[15]

The reckoning of the calendar was the senior branch of medieval Latin astronomy. It stemmed from the ceremonial necessity--from the very beginning of the Christian church--of setting proper dates of moveable feasts. Easter was foremost. The task was made difficult by the reliance on the Jewish Passover tradition based on a lunar calendar, overlaying the Christian observance set in the Julian, solar calendar. Thus it became a matter of reconciling the incommensurable motions of the Sun and

[14] The Division and Methods of the Sciences, Questions V and VI of his Commentary on the *De Trinitate* of Boethius, transl. Armand Maurer (Toronto, 1986), 33, 43-4.

[15] Olaf Pedersen, 'The Corpus Astronomicum and the Traditions of Medieval Latin Astronomy', in Colloquia Copernicana 3 (1975), 57-96.

Moon. The history of compustistical writing is a long and involved affair and need not detain us here. It is enough to say that the Venerable Bede composed one of the standard works in the field; the principles embodied in his De temporibus ratione were amended and refined over the years by such men as John Garland, Robert Grosseteste and Roger Bacon.[16] Yet it was the succinctly written Computus of John of Sacrobosco which became the most common university text.[17]

In spherical astronomy too, Sacrobosco was responsible for the standard work. His Tractatus de spera was almost synonymous with this part of astronomy; hundreds of manuscripts of it survive.[18] The main cosmological doctrine embodied in the tract is the spherical structure of the universe, with the Earth, also a sphere, placed at its centre. Above the Earth the stars and planets were set on a series of concentric spheres--the Moon being on the lowest sphere, then Mercury and Venus, the Sun, Mars, Jupiter and Saturn. Beyond Saturn was the eighth sphere, on which were fixed the stars and constellations.

Planetary astronomy had made a great advance in the West with the translation of Ptolemy's Almagest and the adoption of astronomical tables along the lines of the

[16] See Bede, Opera de temporibus, ed. C.W. Jones (Cambridge, Mass., 1943); and Compotus Fratris Rogeri, ed. R. Steele (Oxford, 1927), Opera hactenus inedita Rogeri Baconi, fasc. VI, which also contains the Compotus of Grosseteste and the Massa Compoti of Alexander de Villa Dei.

[17] Computus ecclesiasticus (Paris, 1550), is the edition I have used.

[18] Edited by Lynn Thorndike, The *Sphere* of Sacrobosco and its Commentators (Chicago, 1959).

Arabic *zij*. The Almagest was the undisputed authority on mathematical constructions describing the apparent motion of the planets. But it was much too technical a work for teaching purposes. In the thirteenth century a number of concise abstracts of Ptolemaic planetary theory appeared. One of these summaries, the anonymous Theorica planetarum (though often attributed to Gerard of Cremona) gained currency and became the focus of elementary planetary studies.[19] The Theorica of Campanus of Novara was another, more thorough textbook.[20]

2. *Scientia Astrorum* in the Oxford Arts Curriculum

A few words must be said about the position of the *scientia astrorum* in the Arts curriculum. The conditions under which this discipline was taught in fourteenth-century Oxford were somewhat analogous to those of the teaching of medicine. Very little is known for certain about medical instruction during this period. Having much to tell about the Arts and Theology Faculties, the surviving medieval Statutes of the University, are all too brief with respect to medicine.[21] The inadequacy of offical university documentation does not afford us a strong basis for judging the extent of medical or

[19] Olaf Pedersen, 'The Theorica planetarum Literature of the Middle Ages', Classica et Mediaevalia 23 (1962), 225-32; 'The Origins of the "Theorica Planetarum"', Journal for the History of Astronomy 12 (1981), 113-23. Pedersen's English translation of the Theorica is found in A Sourcebook of Medieval Science, ed. Edward Grant (Cambridge, Mass., 1974), 451-65.

[20] Campanus of Novara and Medieval Planetary Theory. Theorica Planetarum, eds. F.S.Benjamin and G.J.Toomer (Madison, 1971).

[21] Statuta Antiqua 39, 41-2.

astronomical studies in the university. Perhaps the best testimony of medical activity comes from the exploits and writings of Oxford physicians--John Gaddesden, Nicholas Tingewick and Simon Bredon.[22] It is all the more telling that several Merton fellows distinguished themselves in the field though they were officially barred from its study! In the face of negative statutory evidence, scattered pieces of information reveal the surprisingly vital nature of Oxford medicine.[23] So too with astronomy.

Fortunately, the position of astronomy in the Arts curriculum is spelt out fairly clearly in the Statutes.[24] In them we find that before incepting for the masters degree, bachelors were expected to have attended lectures on arithmetic, part of Euclid's Elements, the computus, the Sphere of Sacrobosco, and the Theorica planetarum. At least this is the picture of the curriculum which historians usually paint. However, an essential time element is lacking; because the earliest extant Statutes, promulgated sometime before 1350, make no mention of the Theorica. This is also the case with the ordinances of 1409. Only in 1431 are the Theorica and/or the Almagest

[22] Gaddesden: BRUO ii.739, MPME 148-50. Tingewick: BRUO iii.1877, MPME 229.

[23] V.L.Bullough, 'Medical study in mediaeval Oxford', Speculum 36 (1961), 600-612.

[24] For an outline of the Oxford curriculum in Arts see J.A.Weisheipl, 'Curriculum of the Faculty of Arts at Oxford in the early Fourteenth Century', Mediaeval Studies 26 (1964), 143-85; and 'Developments in the Arts Curriculum at Oxford in the Early Fourteenth Century', Mediaeval Studies 28 (1966), 151-75. J.M.Fletcher gives astronomy extensive treatment in his D.Phil. thesis, The teaching and study of arts at Oxford c.1400 - c.1520 (Oxford, 1961), 57-63.

added to the *forma*.[25] That planetary astronomy was not accorded an official place in the curriculum until this late date does not mean it was left unstudied; it does show that the average student could go without it.

The amount of study of these books was not great.[26] The Arsmetrica of Boethius was studied for one to three weeks, while each of the computus and sphere were commonly given eight days of attention. Inceptors listened to between one and five weeks of lectures on geometry, covering up to six books (of thirteen) of the Elements; but it is unlikely that a full six books were digested by the average student in days when proposition I.5 was called *pons asinorum*, the asses' bridge, or *elefuga*, the flight of the miserable. Roger Bacon was exaggerating, but not that much, when he claimed that one was lucky to learn three or four propositions at best.[27] Surely the study time devoted to mathematics and astronomy compared unfavourably with that spent on logic or philosophy. The main Aristotelian texts in these fields were covered in six weeks or a full term; some books were studied twice over. Oddly enough, lectures on Aristotle's Meteorologica and De caelo may have imparted more hard facts about the stars than those on astronomical texts. When all is said and done it must be conceded that next to logic and natural philosophy, astronomy played only a subsidiary role in the formal Arts course.

[25] Statuta Antiqua 33, 200, 234.

[26] Much of this paragraph is based on the Oxford *formae* in H.Rashdall, The Universities of Europe in the Middle Ages, eds. F.M.Powicke and A.B.Emden (Oxford, 1936), iii.480.

[27] Opus tertium VI; ed. J.S.Brewer (London, 1859). And see The Thirteen Books of Euclid's Elements, transl. Sir Thomas L. Heath (New York, 1956), i.415-16.

The religious orders in Oxford, led by the friars, established their own *studia generalia* independent of the University. Provision was made for instruction in Arts as well as theology, and in this way the *scientia astrorum* entered the mendicant world. The substance of the astronomy course in the Dominican *studium* is represented by the treatise, De stellis, of Robert Holcot.[28] The work, an elementary textbook, incorporates elements of computistical, spherical and planetary astronomy. Holcot discusses the earth's shadow and eclipses, the motion of Sun and Moon, the length of the year, and the precession of the eighth sphere. The sources of De stellis were of high quality. Holcot gives references to Ptolemy's Almagest and to the Astronomia of Jabir ibn Aflah. Holcot's presentation, not surprisingly, was largely unmathematical. Natural astrology also enters into De stellis, with demonstrations of the causal links between the heavens and the inferior world. Holcot even goes into a short excursus on nativities, explaining that he would die a peaceful death since at his birth Jupiter had been in the house of Mars.[29]

In the University records of the fourteenth century nothing whatsoever is said of astrology. Although a few astrological bits and pieces could have been assembled by enterprising students from lectures on Sacrobosco and other sources, there was no systematic treatment of astrological topics; and the subject was certainly never required *pro forma*. All the same, there is reason to believe that cursory lectures were being given on astrological books. In the fifteenth century these

[28] BRUO ii.946-7. And see Lynn Thorndike, 'A New Work by Robert Holcot', AIHS 2 (1957), 227-35.

[29] Oxford, Corpus Christi MS 138, f.113r.

lectures were a noticeable feature in the Arts. Between 1448 and 1463, a period for which the register of the University Congregation survives, regent masters were granted leave to lecture on astrological texts in no fewer than five years.[30] Ptolemy's Quadripartitum and the Introductorius of Alchabitius appear to have set the standard. And there is record of fourteenth-century astrological lecturing at the University of Paris. The English Nation, for instance, licenced Robert le Normand to lecture on the Quadripartitum in 1358.[31] All the same, there is no positive reason for thinking that astrological lectures were a major affair at Paris or Oxford. They were permissible, but seem to have depended on rare personal initiative.

Such was the scope of the teaching of the *scientia astrorum* in fourteenth-century Oxford. In the scholar's diet, as Chaucer would have said, it was 'bread and milk for children'. However, we should note an institutional feature of university instruction in this area. The quadrivial subjects--mainly arithmetic, geometry and astronomy--were not the responsibility of the public schools of the University, but had been delegated to halls and colleges.[32] This was crucial, as a single hall or college might develop a speciality in the field while the standards of the University as a whole remained mediocre.

[30] The Register of Congregation 1448-63, eds. S.A. Pantin and W.T. Mitchell (Oxford, 1972), 101, 129, 153, 224.

[31] Chartularium Universitatis Parisiensis, Auctarium, eds. H. Denifle and E. Châtelain (Paris, 1897), i.225. See also, Richard Lemay, 'The Teaching of Astronomy in Medieval Universities, Principally at Paris in the Fourteenth Century', Manuscripta 20 (1976), 200.

[32] Statuta Antiqua, 200.

It could well be that Merton fellows acquired a reputation for their teaching of the *quadrivium*. This reputation would have attracted the most able and enthusiastic pupils, some of them with a particular interest in the heavens. (Others turned to logic and natural philosophy.) The healthy learning environment centred on Merton College gradually developed into what is now often known as the 'Merton School'.

III

THE MERTON SCHOOL

> The learned will shine as brightly
> as the vault of heaven,
> And those who have instructed many
> in virtue,
> as bright as stars for all eternity.
>
> - Daniel 12.3.

In this section I shall be drawing an outline of the *scientia astrorum Mertonensis*, i.e. the astronomical aspects of the 'Merton School' of the first half of the fourteenth century. To speak of a school presupposes some continuity of thought in an identifiable group of people. In the case of Merton College, it was not that research in a particular discipline was officially supported, but that the fellows developed into an informal coterie of friends who encouraged each other's study.[1] The Merton achievements in logic, natural philosophy and theology are well known--perhaps too well known.[2]

[1] W.A.Pantin, The English Church in the Fourteenth Century (Cambridge, 1955), 138-9.

[2] Some frequently cited texts and studies are: H. Lamar Crosby, Jr., ed. and transl., Thomas of Bradwardine, His *Tractatus proportionum* (Madison, 1955). J.A. Weisheipl, Early Fourteenth-Century Physics and the Merton School (unpublished D.Phil thesis, University of Oxford, 1956); Marshall Clagett, The Science of Mechanics in the Middle Ages (Madison, 1959); Curtis Wilson, William Heytesbury: Medieval Logic and the Rise of Mathematical

It is my first task, then, to show that over a period of fifty years or so a line of fellows, including Ashenden, not only dealt with but specialized in celestial matters. The participants in the science are fascinating in themselves, and their individual accomplishments were not inconsiderable. It is for us to investigate the extent and manner of the exchange of information and ideas amongst themselves and with others. How the Mertonians got along personally is harder to judge, and in fact is not really at issue. However, an examination of the wider contours of learned Oxford society, with special reference to the astronomers and their books, is a central purpose of this survey.

1. From John Maudith to Thomas Bradwardine

It is impossible to set an exact date for the beginning of the Merton School. The first recognized specialist in astronomy was John Maudith, who entered the college in 1309. In the *catalogus vetus* he is described as a good astronomer and physician.[3] Maudith compiled tables, dated to 1310, for the rising and setting times of stars. In 1316 he drafted a star catalogue, adjusting stellar positions in line with Thebit ibn Qurra's theory of trepidation. This was a difficult process, about which most medieval astronomers had only a vague understanding; but as J.D. North has shown, Maudith calculated the trepidational adjustment correctly.[4]

Physics (Madison, 1960); Edith D. Sylla, 'The Medieval Quantifications of Qualities: The "Merton School"', Archive for History of Exact Sciences 8 (1971), 7-39. Clauda Kren provides much more bibliography in Medieval Science and Technology (New York and London, 1985), 64-89.

[3] BRUO ii.1243-44. MPME 170.

[4] NRW iii.155-8.

It has to be said that during the first two decades of the century more significant astronomical work was being conducted outside Merton College. Walter Odington, monk of Evesham and sometime Oxford scholar, flourished during this period, ca.1306. Odington wrote on arithmetic, geometry, optics and alchemy as well as chronology and the movement of the eighth sphere.[5] Richard of Wallingford, far and away the greatest mathematician of his time, was also at Oxford (between 1308 and 1317) though not a fellow of Merton.[6] His Quadripartitum and De sectore were the first systematic works on trigonometry in medieval Europe. Richard had a comprehensive understanding of mathematical astronomy derived from a close study of the works of Jabīr ibn Aflaḥ and Ptolemy's Almagest. Also a designer of astronomical instruments (the *Albion* and *Rectangulum*), he constructed a mechanical clock at St. Albans, where he became abbot. In another field, his Exafrenon was a notable piece of astrological writing. Oxford science was proceeding as yet without Merton College as its centrepiece. That was later to emerge. There is reason, all the same, to believe that Maudith had some personal contact with Richard of Wallingford. Richard almost certainly wrote a canon, or introduction, to Maudith's tables; and he also took over Maudith's star catalogue for use in his tract on the Albion.[7] The works of these two men gave impetus to the gathering interest in astronomy.

[5] Not to mention music. F. Hammond has collected the available biographical material in his article, 'Odington, Walter', in The New Grove Dictionary of Music and Musicians (London, 1980), xiii.502-3.

[6] There is nothing for me to add to North's admirable treatment of Richard.

[7] NRW i.3-19.

Thomas Bradwardine was perhaps the real initiator of the Merton School. He is best known nowadays for his pioneering work on mathematical proportions, and for his dogmatic theology.[8] In both areas he opened avenues of thinking for others. Bradwardine also contributed to the movement in *scientia astrorum*. Wallingford and Maudith were both first-class mathematicians. Their efforts helped introduce a rigorous form of trigonometry to medieval Europe. Bradwardine was a different creature. Although his knowledge of geometry was substantial, his grip on the discipline was not as tight as that of his two predecessors.[9] This fact impaired Bradwardine's entry into the higher levels of Ptolemaic astronomy, yet his teaching of mathematics was an important contribution.

Between about 1323 and the early 1330s Bradwardine was an energetic teacher of the quadrivium, writing textbooks in geometry, arithmetic, and perhaps astronomy. In the fourth book of his Geometria he dealt with the properties of spheres, and mentioned the use of an armillary sphere as a teaching device (IV.44). His enquiry into the concepts of proportions had a direct bearing on physics,

[8] BRUO i.lviii, i.244-46, iii.xv. For an overview of Bradwardine's mathematical work, see the article by John Murdoch, DSB ii.390-97.

[9] Weisheipl pointed to the tract De continuo for 'concrete proof' of Bradwardine's skill in geometry. 'Ockham and some Mertonians', Mediaeval Studies 30 (1968), 192. However, A.G. Molland found that in the Geometria speculativa, Bradwardine's 'standards of rigour sometimes fall to a very low level', and at other times he shows 'almost complete neglect of postulates and proofs of constructability.' Geometria speculativa (unpublished Ph.D. dissertation, University of Cambridge, 1967), 18-20. See also Molland, 'An Examination of Bradwardine's Geometry', Archive for History of Exact Sciences 19 (1978), 113-175.

specially in problems of local motion; yet in his Tractatus proportionum IV.2, the section on proportions of velocity, Bradwardine implies an astronomical purpose when speaking of the 'equinoctial radius' of a sphere. He discussed the motion of rotating bodies, and set out a method for measuring their velocities. (The potential for astronomical applications was, however, never fully explored.) Bradwardine also concerned himself with a theory of the distribution of the elements (earth, water, air, fire) within the sublunar sphere. Reading from the Islamic astronomers Alfragani and Thebit that the radius of the whole sphere is 33 times the earth's radius, and assuming that the elements were in continuous proportion to one another, Bradwardine was able to draw four conclusions: (1) The proportion of any element to the element immediately beneath it is greater than 32:1. (2) The proportion of the sphere of fire to the three lower elements is greater than 31:1. (3) The radius of the sphere of air is between 10 and 11 times greater than the radius of the earth. (4) A point halfway between the sphere of the heavens and the center of the earth will be well beyond the sphere of air.[10]

Quite apart from his reckoning of proportions, Bradwardine showed an enthusiasm for the compilation and use of astronomical tables. About the year 1328 he learned of the efforts of the Cambridge astronomer-lawyer, Walter Elvedene.[11] It is most likely that he was the owner of Elvedene's tables now to be found in Digby MS 176. Bradwardine is said to have drafted his own set of tables; but writing in his De causa Dei, in 1344 or a little earlier, Bradwardine spoke admiringly of the ease with

[10] Tractatus proportionum IV.3; ed.cit., 133-141.

[11] BRUC 210-11.

which one could find planetary positions with some recently compiled tables. He was alluding almost certainly to the Oxford tables (epoch 1340) of William Rede.[12] After he transferred to the theology faculty, Bradwardine experienced a sort of conversion to religious studies. His devotion to theology culminated in the already mentioned De causa Dei, a work of the first magnitude. Although concerned with a divine topic, Bradwardine had not forgotten his earlier preoccupations. The De causa is an important source of knowledge of the great mingling currents of thought that fourteenth-century scholars were transversing. We will have reason to return to it later.

2. Men and Books, Stars and Clouds

A notable grouping of Merton fellows concerned with the science of the stars emerged after the main period of Bradwardine's Oxford career. The main characters of this group were Simon Bredon, William Rede, Rede's mentor Nicholas of Sandwich, William Merle, Reginald Lambourne, and John Ashenden. These men were active between 1330 and 1365. Their interests and writings spanned from astronomy to medicine; but as we shall see, the Mertonians and associated scholars had a penchant for meteorology.

In 1330, five years before Bradwardine resigned his fellowship, Simon Bredon is named in the College records.

[12] Henry Savile recorded planetary and lunisolar tables among the works of Bradwardine. De causa Dei (London, 1618), a2v. About certain tables, probably Rede's, Bradwardine wrote: 'Quod si quis velit praecise et demonstrative habere, potest faciliter revolvendo motus eorum, vel facilius per tabulam ad hanc et omnes coniunctiones nuper factam.' De causa Dei I.i.35; ed. Savile, 73.

Bredon distinguished himself not only as an astronomer, he was a mathematician, physician and man-of-the-world. Above all he was versatile. He is credited with fourteen scholarly works, though some of them are of dubious ascription.[13] Perhaps earliest in his career Bredon wrote expositions on the Arithmetic of Boethius and the Massa Compoti of Alexander de Villa Dei. He diligently enquired into spherical geometry, collecting most of the treatises then available on the subject. And in time he drafted a mathematical commentary on the first three books of the Almagest. The Latin translations of Ptolemy's astrological opus, the Quadripartitum, Bredon found to be confusing and contradictory. He attempted to render an improved text. At a later point in his studies he turned to medicine. His gigantic Trifolium was designed as an all-encompassing physician's compendium. But he was remembered principally for his astronomy, as these lines of verse about him testify:[14]

> Qui cupis astrorum septem bene scire sophiam
> Hunc lege tractatum qui continet astronomiam
> Namque domus Merton hoc fecerat arte potitus
> Astronomus Bredon consocius atque peritus
> O Deus astripotens animi Bredon miserere
> Cum sanctis statuas qui dicunt kyrie khere.

[13] BRUO i.257-8. MPME 320-22. Sarton iii.673-4. A full monograph on this remarkable man has yet to be written. For the time being we must settle for the article of C.H. Talbot, 'Simon Bredon', British Journal of the History of Science I (1962), 19-30.

[14] Oxford, Corpus Christi MS 132, f.54v, and Digby MS 48, f.96r. B.W.Henderson, reporting on the authority of Brian Twyne, identifies Ashenden as the versifier. There is no way of substantiating the attribution. Merton College (London, 1899), 40.

The tract referred to in the second line is a Theorica planetarum attributed to Bredon, but more probably the work of another, later Mertonian, Walter Brit (for whom see below, p.62). However that may be, Bredon's commentary on the Almagest inspired English students of astronomy for over two centuries.[15]

Bredon was also a man of worldly accomplishment and ambition. In 1333 he pleaded the University's case at the Papal Curia in the interminable dispute with the archdeacon of Oxford. He subsequently became a Proctor and one of the keepers of the newly created Langton Chest. When he left Merton around 1341 he entered upon his medical practice, which, as far as we can know, was very lucrative. Among his patients were counted Joanna, Queen of Scots, Richard, Earl of Arundel, and Elizabeth, Lady of Clare. From 1358 he was Warden of the Hospital of New Work at Maidstone. Spending his earnings, Bredon built up an admirable collection of books--his will of 1368 names sixty volumes in his possession.[16] His library was strong in medical works, including two copies of Avicenna, two volumes of Galen's works, the Lilium of Bernard Gordon, and Gaddesden's Rosa. Representing his enthusiasm for astronomy were, among others, the *fructus Ptolomei* (the Almagest, Quadripartitum and Centiloquium), the Introductorius of Albumasar, and the Astronomia of Jabīr ibn Aflaḥ. These books were not only for personal use; Bredon often lent them to other scholars. John Dyggeswell

[15] In the mid-fifteenth century John Farley entered some of Bredon's remarks in his copy of the Almagest. New College MS 281, ff.8v-9r. Lewis of Caerlyon possessed a portion of the commentary, now in CUL MS Ee.3.61, ff.43-45r. About the year 1559 John Dee had a copy made for himself. Digby 178, ff.15-87.

[16] MBMC 82-6. Cavanaugh i.127-134.

is known to have borrowed ten volumes, William Merle one.

William Rede, raised from childhood by Nicholas Sandwich, probably came up to Oxford in the mid-1330s.[17] He seems to have been particularly taken with computations and book collecting. On the computational side, we are told that Rede calculated his solar tables as early as 1337. (He appears in the Merton records only in 1344.) Sometime around the year 1340 Rede adapted the up-and-coming Alfonsine Tables to the latitude of Oxford. This was no great leap of abstract thought, but Rede's tables effectively established the Alfonsine standard in England, a standard that was to last for about two hundred years.[18] In addition, as we shall see, Rede made numerous calculations for astrological purposes, and was probably responsible for the 1341-46 almanacs in Digby MS 176. As for his book-collecting, with the help of his mentor Nicholas of Sandwich, Rede established a personal library of some 300 volumes![19]

The most junior man of the group, Reginald Lambourne, fellow of Merton in 1353 and still in 1357, also took to the study of the stars.[20] He seems to have been a pupil of William Rede. After he had left Oxford to become a Benedictine monk, Lambourne continued a correspondence with his former master. In 1363 wrote an epistle on the two lunar eclipses of that year. And shortly after Rede was elevated to the see of Chichester, in 1368, Lambourne

[17] BRUO iii.1556-60, Sarton iii.1499-1500.

[18] J.D. North, 'The Alfonsine Tables in England', 274.

[19] Cavanaugh ii.688-714.

[20] BRUO ii.1086-7.

sent him a weather forecast covering the years to 1374.

Unlike the others, William Merle was never a fellow of Merton. From 1331 to his death he was rector of Driby, Lincolnshire; but he was granted licence to study at Oxford from 1335 to 1341 and in 1346/7.[21] The weather was Merle's interest; he practised a system of meteorology based on observation. Merle kept a weather diary for the years 1337-44 (noting events from as early as 1331) and made forecasts from the 'signs' of changing weather patterns.[22] He kept to the simple and practical side of affairs, checking the shapes of clouds, the colour of the sky, the appearance of the sun and moon, and the reactions of animals. He was in fact concerned with the application to farming, observing if rainfall had penetrated the top level of soil, noting the accelerated growth of crops in warm weather, and lamenting losses caused by flooding. Merle additionally recorded fog, frost, snow, temperatures (hot, cold), dry periods, thunder, lightning and hail, and the force and direction of prevailing winds. On 28 March 1343 he reported an earthquake felt in Lindesay. It was powerful enough to topple chimneys and lasted long enough for one to recite the prayer *salutato angelica*.

[21] BRUO ii.1264-5; Sarton iii.674-5.

[22] Digby MS 176, ff.3-10. Merle's MS. *Consideraciones Tempriei pro 7 Annis*, transl. G.J. Symons, (London, 1891). HMES iii.141-45. However, E.N. Lawrence, 'The earliest known journal of weather', Weather 27 (1972), 494-501; and G.T. Meaden, 'Merle's weather diary and its motivation', Weather 28 (1973), 210-11, are of little value.

In 1340 Merle composed the De pronosticatione aeris, a guide to weather prediction.[23] He recommended two ways of learning about the weather, 'per inquisitionem per expertos et secundo per auctores'. The experts Merle took to be sailors, shepherds and farmers, people whose livelihoods depended on weather conditions. Compelled by the necessities of their existence, those who were engaged in these professions had, by long experience and acquaintance with traditional lore, the skill to recognise the weather signs. The 'authors' recorded the most useful of the techniques, and had, at least partly, explained their significance theoretically.

His Regule ad futurum aeris temperiem pronosticandum was a later work. Previously he had explored the inferior weather signs, now he listed the steps in making an astrological weather forecast. Ashenden recommended Merle's procedure in the final distinction of the Summa. It would be valuable to know whether the two men knew one another. Certainly Merle had correspondents in Oxford; and since he borrowed a medical book from Bredon, at least one firm association with Merton is indicated.

Of course Merton College had no monopoly on the study of *scientia astrorum*. Contemporaneous with the Bredon-Rede circle, an Oxford Franciscan, Simon Tunstede, was very active in the field. Tunstede was a careful student of the writings of Richard of Wallingford. He produced a revision of Wallingford's treatise on the Albion, and supplemented the geometrical proofs in the Quadripartitum.[24]

[23] Surviving in several manuscripts. I have used Digby MS 147, ff.125v-138v.

[24] NRW ii.137-248 (Albion, synopsis and commentary).

Between 1328 and 1350 he composed his Questiones meteorologicae, which build on Oxford traditions in natural philosophy.[25] On the theory of rainbows he utilized the ideas of Robert Grosseteste. It is noteworthy too that Tunstede cited Bradwardine on the proportional distribution of the four elements within the sublunar sphere. William Batecombe was another non-Merton scientist. It is probable that it was he who compiled the 1348 Oxford tables. Batecombe authored a number of guides to the operation of astronomical instruments.[26] Simon Bredon owned a copy of Batecombe's tables of planetary latitudes.[27]

Outside Oxford learning in astronomy was concentrated in only few places. One important centre was St. Augustine's Abbey, Canterbury. This great Benedictine house possessed a magnificent library. In the first half of the fourteenth century its collection of astronomical titles increased significantly. Two monks were largely responsible, Michael of Northgate and John of London.[28] Northgate is well known to modern scholarship for his

[25] Printed among the works of Duns Scotus, Joannis Duns Scoti...Opera omnia, ed. Luis Vivés (Paris, 1891), iv.3-263.

[26] BRUO i.130. An Operatio spere solide, In astrolabio and Equatorium abbreviatum cum canonibus Badcomb are recorded in the library of John Erghom. Cavanaugh i.307, 321. A De spera concava ascribed to Batecombe is in Paris, BN nouv.acq. MS 625, ff.85vb-9rb.

[27] Digby MS 178, ff.5-8v.

[28] A.B. Emden, Donors of Books to S.Augustine's Abbey Canterbury, Oxford Bibliographical Society Occasional Publications no.4 (Oxford, 1968), 11-12, 14.

rendering of the devotional work, The Ayenbite of Inwyt, completed in October, 1340.[29]

He also gave the abbey twenty-four books, many of which were of a scientific nature. Three of these have been identified: CUL MS Ii.1.15, Bodley MS 464, and Corpus Christi College, Oxford, MS 221. Dated to about 1318, Bodley MS 464 is particularly interesting. Northgate penned much of the volume himself, copying several tracts on astrological weather forecasting. John of London was an even greater benefactor of the library--his gift was of eighty-three books. His collection of scientific writings was truly renarkable; it comprised almost every major astronomical and astrological work then known. Of recent material the works of continental and Parisian astronomers were best represented: the almanac of William of St. Cloud, John Harlebeke's De spere solida, the commentary of William of Aragon on the Centiloquium, the Alfonsine tables with canons by Philip Albinus, and Canones super tabulas and Oppositiones et coniunctiones of John of Lignères. London was himself styled *magister*; had he studied at Paris and returned with the latest texts?

At all events, communication with Parisian astronomers was irregular. Merton logical writings, and pieces like Bredon's Arithmetica and Ashenden's Summa, appear to have been transmitted to Paris in short order. Yet after the transmission of the Alfonsine tables sometime in the 1320s, few Parisian works in the *scientia astrorum* made it to the Mertonians across the Channel. For instance,

[29] Dan Michel's Ayenbite of Inwyt, ed. Richard Morris; introduction, notes and glossary by Pamela Gradon (London, 1866 and 1979), EETS 23, 278.

composing the Summa in 1347/8, Ashenden showed no awareness of two major works produced the in the previous decade: John of Saxony's Commentum super textu Alchabitii, written in 1331, and Firminus de Belavalle's Repertorium de mutatione aeris, of 1337.

To return to the Mertonians, one indication of their interest in the stars is their ownership of astronomical and astrological books. John Reynham (fellow 1335, still 1358) possessed a manuscript of the Theorica planetarum of Campanus, with other astronomical items.[30] John Gilden (fellow 1344) owned or at least read a book containing works by Albumasar and Alexander Aphrodisiensis, which came into the hands of Rede.[31] The northerner, Thomas Farnelow, held a copy of Sacrobosco's Compotus, and is said to have written his own Kalendarium.[32]

It could be said that the Mertonians were a fellowship maintained by the sharing of books. The College library was well stocked and fellows, according to seniority, were able to elect books for their personal use. From what we find in the records, it seems that fellows were quite jealous about their rights. In the scrutiny of 1338 for instance, a complaint was made that books of philosophy were being kept by those not concerned with the subject.[33]

[30] BRUO iii.1570-71. Reynham's book is now Cambridge, Corpus Christi MS 37.

[31] Merton MS 281 (O.3.1). MBMC 181. BRUO ii.768. Gilden's name appears in the manuscript, but it is by no means certain that he was its owner.

[32] BRUO ii.668. Cavanaugh i.328-30.

[33] For the complaint, see Brodrick, Memorials of Merton College OHS 4 (Oxford, 1885), 343-4. On the system of election see N. Ker, 'The Books of Philosophy distributed at Merton College', in Medieval Studies for

Through the early years of the century, the Merton library was accumulating a small but substantial corpus of astronomical books. The pre-1325 library catalogue records these titles among the *libri mathematicales*:[34]

1. Averroes, De substantia orbis
2. Ptolemy, Almagest (two copies)
3. Ptolemy, Planispherium
4. Alfraganus, De scientia astrorum
5. Plato, Timaeus with commentary of Chalcidius
6. Toledo tables
7. De cursibus planetarum
8. Opus astrolabii
9. Liber septem planetarum atque draconis
10. Theorica planetarum with tables
11. Marcianus Capella, De septem artibus
12. Tractatus tertius de celestibus

It would be satisfying if we were able to attach the names of donors to these books. (It is very unlikely that one man was responsible for them all.) If nothing else, this short listing illustrates that Merton fellows were reading about the heavens quite outside the meagre Arts curriculum. And, with the exception of Oriel, no Hall or College in Oxford had anything to compare with it.[35]

Independent of the resources of the College library, books circulated as objects of trade and fountainheads of scholarly conversation. The attitudes of literate university society were exemplified in this respect by Richard de Bury, the bibliophile bishop of Durham. It was said that de Bury's house was so full of books that anyone

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J.A.W. Bennett, ed. P.L. Hepworth (Oxford, 1981), 347-94.

[34] MBMC 49.

[35] The Oriel catalogue was printed by C.R.L. Fletcher, Collectanea, OHS 9 (Oxford, 1885), i.59-70. The catalogue dates to about 1375, but John Cobbledik, the main donor of astronomical material, was dead by 1337. BRUO i.449-50.

entering his room had barely enough space to stand without knocking up against them.[36] The books did not go unread either--as generations of historians have been at pains to point out--since de Bury assembled in his household a number of learned clerks and engaged them in evening readings and discussion. De Bury's circle included some prominent Mertonians, Bradwardine, Walter Burley, Richard Kilvington, and Maudith among them.[37] Conjecture on de Bury's relations with Merton is tempting. He may have stayed at the College when serving on the commission enquiring into the 1334-5 Stamford secession. Powicke and Denholm-Young ventured to guess on Bradwardine's role in communicating the influence of the Bishop of Durham.[38] Certainly de Bury was prominent on the Oxford scene; and his love of books set the fashion for personal libraries, a fashion in which the Mertonians were glad to participate insofar as their purses allowed.

There was quite a difference between de Bury's bookishness and Merton scholarship. The former was concerned mainly with elegance of style, while the latter dealt mainly in the substance of learning. De Bury's famed salons produced little apart from the Philobiblon, a stylish celebration of the book-cult.[39]

[36] 'Tot libri jacebant sparsim in camera qua dormivit quod ingredientes vix stare poterant vel incedere, nisi librum aliquem pedibus conculcarent.' William de Chambre, Continuatio historiae Dunelmensis, in Historiae Dunelmensis scriptores tres, ed. James Raine (London and Edinburgh, 1839), 130.

[37] N.Denholm-Young, 'Richard de Bury (1287-1345)', Trans. Royal Hist.Soc. iv, 20 (1937), 160-63, 165.

[38] ibid. 160-61. MBMC 25.

[39] Philobiblon, ed. and transl. E.C.Thomas, ed. M.Maclagan (Oxford, 1960).

Bredon and Rede were outstanding book collectors too, but they left separate marks in their writing and teaching. They learned by the written word and number, and by word and number they bound their thinking with the thoughts of others.

3. Digby MS 176

As the Mertonians had such a passion for books it is fitting that the single most revealing document of the Merton circle is itself a book, Digby MS 176, a miscellaneous collection of astrological works brought together by William Rede.[40] The booklets that make up the present codex were bound as one volume sometime between 1369 and 1382, i.e. after Rede's accession to the bishopric of Chichester (October, 1368) and before the drafting of his will (August, 1382). The volume possibly was made in or after 1374, when Rede prepared an indenture with Merton concerning the dispostion of one hundred of his books. Around this time Rede set his mind to the dispersal of his entire library, numbering about five hundred volumes, to various institutions. Indentures with Merton and Exeter Colleges survive. Digby MS 176 cannot be identified with any of the volumes in the Merton indenture or even Rede's will, but from an inscription in the book itself it is manifest that Rede bequeathed it, under the trusteeship of Merton and Exeter College, to his kinsmen studying in Oxford.[41] About the early possession of the codex by Rede's kin nothing can be said. Sometime in the fifteenth century it became the property of the Merton

[40] For description, see Appendix A.

[41] H.W. Garrod, 'An Indenture between William Rede, Bishop of Chichester, and John Bloxham and Henry Stapilton', Bodleian Library Review 10 (1978), 12.

library outright, and is recorded as one of the books reserved for Warden Fitzjames in 1483.[42]

The contents of Digby MS 176 are remarkable as a cross section of the *scientia astrorum Mertonensis*. Included are William Merle's weather records, the prognostications of Ashenden, Lambourne and others, and various almanacs, horoscopes, brief tracts and notes. As said above William Rede compiled the volume, but its constituent booklets were originally held by different hands. According to the table of contents written by Robert Walter, Rede's secretary, Nicholas Sandwich contributed a section, while other parts were acquired from the executors of Thomas Bradwardine and Richard Campsale, and still other portions Rede wrote or had scribes write.[43] Just who owned which booklets is a knotty problem; since Powicke's time the assumption has been that it is an impossible one.[44] A close examination of the gatherings or quires and their contents allows the knot to be unravelled at least partly.

The manuscript contains eighteen quires. Quire III, comprising the 1345 predictions, presents the key to its ownership at the bottom of the very first side (f.9r), where the name 'Sandwych' appears. Quire X, various tracts on weather forecasting, was one of Rede's portions. This quire includes a *tabula Solis ad annum* for

[42] MBMC 213.

[43] 'Liber M. Willelmi Reed Episcopi Cicestrenses cuius partem habuit ex dono reverendi domini sui M. Nicholai de Sandewyco, partem emit de executoribus reverendi patris domini Thome de Bradwardine Archiepiscopi Cantuariensis, partem emit de executoribus M. Richardi Camsale, partem ipse M. Willelmus scripsit et partem scribi fecit.' f.1v.

[44] MBMC 167. Lynn Thorndike, 'The Problem of the Composite Manuscript', Studi E Testi 126 (1946), 100.

1341-44. Walter Robert attributed the solar tables to Rede, and stated unequivocally that Rede both calculated and penned them in 1337. Gunther expressed reservations about the ascription, observing in one of Bredon's manuscripts, parts of which were in Simon's own hand, an identical table.[45] In view of Walter's positive statement of the authorship of Rede, and in the absence of any tangible conflicting evidence it is best to lay aside Gunther's doubts. Consequently, we may suppose that Rede had been in Oxford for some years before entering upon his Merton fellowship. Did his numerical aptitude help him secure a place in College? Do the relatively elementary solar tables tell us anything about the date of Rede's Oxford-Alfonsine tables?

Campsale, who inherited some of Bredon's astronomical books in 1372, must himself have died later in the decade.[46] To him we may plausibly assign the almanac of John of Saxony (for 1349-1380), which stands out from the Rede-Sandwich sections of the manuscript in the type of parchment and handwriting. The almanac was possibly written abroad. It cannot reasonably be associated with Bradwardine, who died early in 1349.

It is possible that the Merle articles in quires I and II were originally with Simon Bredon (the only Merton fellow for whom we have any records of dealing with Merle) and later were passed on to Campsale; but there is no reason to believe that Rede or Sandwich would not have had

[45] R.T. Gunther, Early Science in Oxford (Oxford, 1923), ii.59.

[46] This Campsale is not to be confused with Richard Campsale, fellow of Merton, the philosopher and theologian. BRUO i.344-5. Emden, Donors of Books, 13, 21-2.

the chance to copy this material. A very down-to-earth link exists between quires I-II and quire III, that possessed by Sandwich, for bookworms have eaten corresponding holes through their pages, holes that do not match with any other part of the manuscript. Whether wormholes constitute historical evidence is open to question.[47] I am inclined to associate these quires with Sandwich in any event.

A suspicion that Bradwardine owned quires IV and XII is based on certain items in them whose dates correspond roughly with the period of Bradwardine's astronomical activities, the 1320s and early 1330s. Quire IV comprises two sets of tables by Walter Elvedene, the first being the Lords of the months from 1332 to 1357. These tables were originally drafted to begin in 1328, but the entries for 1328-31 were left blank, a sure sign that the Digby copy was produced around 1332. After all, last year's planetary data would be of no use in predicting rain this month. Quire XII contains dated or dateable items as well. A table for the year 1331 is at f.89v, and at ff.90v-91r a nativity of 1317. The natal horoscope was prepared in great detail; the subject of the exercise, regrettably, is a mystery.[48] Other notes in the quire present a range of astrological enquiry, from medical judgements to advice on taking a wife. The most fascinating of these is the astrological interpretation of the murder of Walter Stapledon, bishop of Exeter, at the hands of rioting Londoners in March, 1326. This item, which is very brief, cites Stapledon's demise as an example of the rule that if

[47] Perhaps not. It has been said that worms are usually more accurate than scholars!

[48] J.D. North, Horoscopes and History (London, 1986), 138.

Mars in joined with the Moon in Capricorn at the Sun's entry into Aries, surely a major prelate would die in the coming year.[49]

The final six quires (XIII-XVIII) are filled with horoscopes of new and full moons, including eclipses, for the years 1341-46. Each year occupies one quire. These were drafted with so much precision that it is probable that professional scribes executed them. Interestingly, though five of the sets of horoscopes were calculated for the Oxford meridian, the figures for 1342 had been adjusted to London. Notes to the eclipse computations of 1341 tell that they were done according to the Alfonsine parameters and 'secundum longitudinem et latitudinem Oxonie.'[50] 1341 must then be a *terminus ad quem* for Rede's tables.

4. Limitations and Achievements

The contents of those booklets bound together by Rede can only hint at the activities of the Merton astronomers. No doubt much more was happening than we can ever know. Yet despite the liveliness of the *scientia astrorum Mertonensis*, we must pay attention to its limitations. Foremost of these was the lack of constructive dialogue between the astronomers and the

[49] 'Item quando contingit Martem fore in Capricorno cum Lune in ingressu Solis in Arietis significat mortem alicuius magni prelati in illo anno futuro; sic fuit quando Walter episcopus Exonie interficiebatur London.' f.88r. The hapless Stapledon was beheaded with a breadknife. Mark Buck tells the story in Politics, Finance and the Church in the Reign of Edward II (Cambridge, 1983), 217-23.

[50] f.98v. Lunar eclipse predicted for 23 November, 11h 21m 23s; and a solar eclipse, 8 December, 20h 11m 52s.

natural philosophers in this College. Men of the likes of Dumbleton, Heytesbury and Swineshead were living in close quarters with Ashenden, Bredon and Rede without giving rise to any synthesis of their disciplines. This might say something about personalities, or perhaps about the embryonic condition of medieval science. Bradwardine stood between the astronomers and natural philosophers, yet his energies were turned too soon to other concerns. An important limiting condition was the simple fact that astronomy was a pursuit of the youthful; and the years of productive study were brief. Rede, at most, was in his mid-twenties when he compiled his Oxford-Alfonsine tables. Bradwardine and Bredon were also more concerned with astronomy in the earliest stages of their careers. All three scholars continued study in other disciplines; and after their university days they entered positions in Church and State. 'Astronomer', even with its astrological connotations, was not a paying profession in fourteenth-century England, inside or out of university. At Oxford as elsewhere the curriculum was intended to lead to the higher faculties: Medicine, Law and Theology. Not only were these subjects higher in the order of learning, but they offered greater prospects in the outside world. Richard de Bury spoke with dismay about the prevailing attitude towards scholarship:[51]

> They [the ancients] gave up all their lives to philosophy; while nowadays our contemporaries carelessly spend a few years of hot youth, alternating with the excesses of vice, and when the passions have been calmed, and they have attained the capacity of discerning truth so difficult to discover, they soon become involved in worldly affairs and retire, bidding farewell to the schools of philosophy.

[51] Philobiblon, ed.cit., 100-101.

The theology schools were as devastating as the prevalent careerism to studies in the Arts. For as scholars became immersed in theology later in their academic lives, they tended to put aside, amend or even reject altogether the interests they had adopted during their study in the Arts.

The dissolution of the Merton group was by gradual attrition, and was by no means complete process. Bredon was the first to leave, vacating his fellowship about 1341-2, and taking a benefice in Sussex in 1348. He was still in communication with the Merton in 1350, when he borrowed a horse from the College; so although he was out of Oxford, he was not entirely out of touch with his colleagues. A more permanent loss was by the death of William Merle by March, 1347. Remarkably, none of those who remained perished in the Black Death of 1348-9. Rede stayed on until 1359, Lambourne had departed two years before that. Ashenden remained into the 1360s.

In truth it is difficult to claim that after this recognized group dissipated that astronomical activity declined in Oxford. The manuscripts testify to the calculations of various sorts through the 1370s to the end of the century.[52] Later actions of the Merton circle had some impression on the study of astronomy in the latter part of the fourteenth century and through the fifteenth. The foundation of New College, Oxford, is a case in point. Bishop Rede helped the fledgling college library get off the ground by donating 58 books. And his acquaintanceship with William Wykeham, the founder of the

[52] Table of eclipses, 1370-90, Rawl. MS D.1227, ff.91-101. Eclipses 1376-90, Digby MS 57, ff.119v-120r. *Radices planetarum* 1374-1405 (completed to 1380 only), Digby MS 57, f.22v-23v. Motion of the eighth sphere in 1388, Digby MS 114, f.58v.

College, probably had more than a little to do with the allowance in the original statutes for two scholars in astronomy.[53] This stipulation bore at least one fruit in the shape of John Walter, a diligent calculator of astronomical tables, who strove 'to demonstrate the certainty of the doctrines of master John Mawdith.'[54]

The Bredon-Rede circle also influenced other notable astronomers. At Merton itself, Walter Brit, a fellow in 1377, authored a revised Theorica planetarum which remedied some of the inaccuracies of the 'original' Theorica, giving, for instance, a correct account of planets' stationary points. Further, the tract shows signs of Brit's awareness of Oxford developments in kinematics. It circulated as a textbook for the next hundred years or so.[55] Two other inheritors of the astronomical spirit were John Killingworth and John Holbroke. Killingworth was admitted to Merton in 1432 and remained a fellow to his death in 1445.[56] He formulated tables that, on account of the ingenious algorithm for extracting planetary positions, were especially useful for

[53] I am indebted to Roger Highfield, librarian of Merton, for his thoughts on this matter. On Wykeham's pattern, the 1440 foundation statutes of King's College, Cambridge, similarly reserved two fellowships for astronomers. J.B. Mullinger, The University of Cambridge, i.308.

[54] G.F.Lythle, 'Wykehamist Culture in pre-Reformation England', in Winchester College Sixth-Centenary Essays, ed. Roger Custance (Oxford, 1982), 137. Walter was fellow of New College in 1386, still in 1393. BRUO iii.1972. For his works, see North, Horoscopes and History, 126-30.

[55] BRUO i.270-71. Olaf Pedersen, 'Walter Brytte', DSB ii.550-51. Brit's Theorica is extant in no fewer than twelve manuscripts.

[56] BRUO ii.1049-50.

drafting almanacs or ephemerides.[57] Holbroke was also a tabulator on the Merton model, though a fellow and later Master of Peterhouse, Cambridge.[58]

On the astrological front, Ashenden's writings were the chief representatives of Merton scholarship. Among fifteenth-century astronomers the Summa was a common reference book. Holbroke was not alone in possessing a personal copy. The work was printed in 1489, and continued to be read and studied well into the seventeenth century. Now we come to an examination of Ashenden's epic compilation, to see what it might reveal about the *scientia astrorum Mertonensis*.

[57] North, 'Alfonsine Tables', 285-88.

[58] BRUC 309.

IV

ASHENDEN'S

SUMMA IUDICIALIS DE ACCIDENTIBUS MUNDI

THE GOTHIC UNITY OF ASTROLOGICAL TRADITIONS

Disappointment is bound to be the reader's first reaction to the Summa. For a work of such grand proportions and such intricate design, on the surface it yields so little of interest. Paging through the Summa is very much like traversing a wide desert--it is a barren, inhospitable landscape, seemingly endless and altogether dead. There are more comfortable roads for the historian-traveller, roads leading to more charming destinations. The Summa is the medievalist's Central Asia rather than his Majorca. One of the difficulties of the Summa is a problem of perspective. If we want to find in it a document of fourteenth-century Oxford thought, even thought of the astrological variety, then we must be willing to undertake a long journey. Ashenden compiled the Summa to form a solid guide to astrology, not a guide for us, but for his contemporaries. This was a matter of collecting source material rather than expounding on contentious issues or illuminating personal beliefs. The wide contours of medieval astrology, as they had emerged over a thousand years, Ashenden left undisturbed (there was never an ounce of revolutionary in him); he concentrated instead on the realm of minutae. We must go there too. So far as we are concerned the Summa's saving feature is its richness and curiosity of detail. The purpose of the following account is to extract the essence

of this detail, without, I hope, losing our bearings in a wasteland of facts.

1. Intentions and Format

The Summa iudicialis de accidentibus mundi is a compendium of the astrological theory of large scale or universal events in the world. (Admittedly, most of these happenings were catastrophic: tempests, floods, earthquakes, famines and wars.) As such it contains paraphrases and verbatim quotations of sources recognised as authoritative. The Summa, at all events, is an encyclopedic work in the scholastic manner. While Ashenden was often content to reproduce the texts of his authorities in a florilegial manner, he was in no way a passive compiler. Indeed, he found it expedient to select, arrange and comment on a wide range of material. The Summa falls between what we might call the florilegial and exegetical traditions in the scholastic method, florilegial to the extent that it is a compendium, a selection of copious extracts from various texts; exegetical in so far as it is a distillation of arguments lost in a difficult and unintegrated whole, the corpus of astrological judgement.[1]

Notwithstanding the farrago of doctrines over which he was presiding, from the very outset Ashenden was shaping the Summa to meet a specific objective. He made his

[1] Concerning florilegia, see B.L.Ullman, 'Classical Authors in Medieval Florilegia', Classical Philology 27 (1932), 40. A fine example of the use of florilegial material by a Merton man is Walter Burley's De vita et moribus philosophorum, ed. John Stigall (unpublished Ph.D. dissertation, University of Colorado, Boulder, 1956), a copy of which is in the library of Magdalen College, Oxford.

purpose and attitude explicit with the first words:

> My intention is to compile in this book the opinions of the astrologers concerning the prognostication of the accidents that occur in this world according to the revolutions of the superior bodies through the disposition of the air in heat, coldness, humidity and dryness...I hope to compile opinions and regulations in this book, not adding anything myself unless it follows from the statements of the authorities, and not wishing to be considered the author as much as the compiler of this work.[2]

From the above it is manifest that Ashenden had no presumption about being the originator of the doctrines expressed in the Summa. He was no more than a humble compiler, and his aim was to collect the *sententiae* of the true astrological authorities. In this he resembles earlier compilers in the field: John of Seville, Leopold of Austria, and Guido Bonatti. Ashenden, to be sure, saw fit to exploit the Quadripartitum of John of Seville and Leopold's Compilatio scientie astrorum (Guido Bonatti's Liber introductorius ad iudicia stellarum was unknown to

[2] 'Intentio mea in hoc libro est compilare sententias astrologorum de accidentium pronosticatione que accidunt in hoc mundo ex corporum superiorum volubilitate secundum diversam aeris dispositionem in calore, frigore, humiditate et siccitate...sententias et regulas in hoc libro meo intendo compilare nichil de capite proprio pro posse meo adendo nisi ea que ex eorum dictis videntur sequi, nolens in hic opere omnino auctor sed tantummodo compilator reputari.' Summa I.prologus, f.1va. The physician John de Mirfeld (died 1407), in the epilogue of his Breviarium Bartholomei, provides a striking parallel for Ashenden's intent: 'Protestor...quod de omnibus que in hoc traculo continentur nichil quod est ad propositum de meo apposui...Sed simipliciter philosophorum et phisicorum autenticorum verba et practicorum sententias collegi.' Johannes de Mirfeld, Percival Horton-Smith Hartley and H.R. Aldridge (Cambridge, 1936), 94.

him), but as we shall see, the Summa owes very little of its content to them. There is a quite important difference in substance and attack--whereas Ashenden's predecessors attempted to incorporate the whole of judicial astrology in one volume, Ashenden consciously restrained the breadth of his survey.[3] He probably did so for two main reasons. First, it made the Summa a manageable proposition. The act of compiling the work must have been laborious enough as it was. (Ashenden complains of the tedium more than once.) More importantly, Ashenden's restraint was consistent with the opinion that only certain varieties of astrology were worthy of such effort.

Ashenden did not adhere to every branch of judicial astrology, of which he mentioned that there were four: universal predictions, nativities, elections and interrogations.[4] Universal predictions were the focus of the Summa. As Ptolemy said, in order to grasp the subject fully the student must learn its general principles before moving on to its particular operations. And the subject of a nativity is by definition a particular. Although the casting of birth-charts was an noble art, it could be extremely difficult, as well as misleading, unless exact information about the time of conception or birth was available.[5]

[3] As did his French contemporary, Firminus de Belavalle (fl. 1335), whose Repertorium de mutatione aeris (*Editio princeps*: Paris, 1539) was if anything more elegantly written than the Summa. Concerning Firminus, see HMES iii.268-80; Sarton iii.657-9. There will be further opportunities for comparison of the Summa and the Repertorium.

[4] Summa II.proem, f.85va.

[5] 'In nativitatibus etiam magna curiositas est et

As for elections and interrogations, both of which Ashenden considered 'ignobiliores et minus utiles', they could not be accorded any validity, having been condemned by the most reliable authorities: Ptolemy, Haly Abenragel and Haly Ridhwan.

The Summa was intended for an audience of students already grounded in mathematics and astronomy. Unlike the works of Leopold of Austria and Firminus, Ashenden includes no introductory section on the fundamentals of astronomy. It is apparent from the matter-of-fact references to epicycles and deferents that a good qualitative knowledge of the Ptolemaic system was assumed. Ashenden did nonetheless advise the reader to study the mathematical side of the science.[6] He betrayed no worry that the reader might be confused when the theory of trepidation or the Alfonsine tables are mentioned.

The method followed throughout the Summa was the progression from general principles (*universales, generales*) to detailed operations (*particulares*). Book I endeavours to set out the basic concepts: significant astronomical cycles, their place in the chronology of the world and relation to universal accidents. Book II, as we might expect, focusses on particular phenomena liable to celestial influence: rain, drought, floods, earthquakes,

magnum tedium operandi. Quamvis enim fetus in utero hora conceptionis et natus in hora nativitatibus quedam influentiam suscipit a supercelestibus. Unde et natus ille ad virtutes aut ad vicia sic dispositus et inclinatus cum haec scientia, scilicet nativitatum a sensibus nimis remota est, et nimiam curiositas scientie huius latentiam nec scire cupias quod scire non licet. Summa II.12.3, f.218va.

6 'Atque in philosophia, arithmetica, geometria probabiliter fueris instructus et motus planetarum iuxta doctrinam Ptolomei in circulis suis in libro Almagesti agnoveris.' Summa II.12.3, f.218vb.

storms, pests, disease and war. The structure of Book I itself is somewhat awkward. Ashenden begins rather unexpectedly with an account of biblical chronology, and continues with the theories of great conjunctions and eclipses; the *introductory* chapters, i.e. those discussing the fundamental qualities of the planets and constellations, appear in the final distinction of the book. His excuse that he was merely following the natural order of the subject is not very convincing.[7]

Book II adheres to a stricter organization. Each distinction considers a single type of natural phenomenon. If explanation is necessary, the first chapters of the particular distinction describe the phenomenon in question and give the immediate causes for its generation. (Thus these chapters are entitled *De generatione*) Subsequent chapters present the astrological *regule* for predicting the phenomenon, in order of

[7] 'Et ne mireris de hoc quod in fine istius tractatus pono introductorium meum. Nam sicut frequenter dictum est ille regule que traduntur de rebus mundi accidentibus in hoc primo tractatu non sunt particulares sed universales sive regule generales. Ille autem que ponuntur in tractatu huius libri particulares erunt nec erit iudicium completum de aliquo accidente mundi nisi per illas regulas particulares. Et iam pono in distinctione hac partem introductoriam libri mei et eorum qui tradentur in eius tractatu 2° ad maiorem elucidationem. Et quia videbatur mihi in principio libri determinare de principio mundi et qualiter dividitur tempus a mundi creatione usque ad eius finem, deinde de coniunctionibus magnis, deinde de eclipsibus, postmodum de revolutionibus annorum mundi et de singulis coniunctionibus, oppositionibus et quadraturis luminarium, ut scilicet esset ordo naturalis procedendo ab universalibus ad particularia, non posui illam partem introductoriam libri mei in principio istius tractatus primi sed modo in fine ut sit quasi complectens istum primum tractatum et secundum tractatum in eo.' Summa I.12.1, f.67va-b.

decreasing time scale. Great conjunctions influence natural dispositions over tens, even hundreds of years. The Sun's entry into Aries occurs once a year. The Moon's circuit of the heavens defines the month. And various celestial alignments are changing from day to day. The final chapter deals with other significators of the phenomenon--the flights of birds, the disposition of farm animals, the shapes of clouds. The relation between the two halves of the Summa causes some problems for Ashenden, since he is forced to cover the same ground twice, from cause to effect and from effect to cause.

This compartmentalized yet repetitive treatment of source material was common among schoolmen writing scientific treatises, and is notable specially in the medical compendia of the day.[8] The Trifolium of Simon Bredon in Digby MS 160, with its prolix *differentiae* and *particulares* makes a good comparison. As for astrological tractates, we need only place the Summa alongside the De mutatione aeris of Firminus de Bellavalle to see that Ashenden's approach to organization was typical. Firminus also chose to treat phenomena, chapter by chapter, in order of decreasing time-scale. Firminus too leaves the common-sense weather signs for the end of his treatise.

However well Ashenden succeeded with respect to his own guidelines, the resulting book is longwinded, repetitive, and eminently tedious. This is not simply a modern reaction to scholastic discourse. Ashenden himself realised that the Summa might be tiresome even for the most enthusiastic reader. All the more reason to exhort the student to persevere--*Nec te tedeat o lector!*--so that

[8] See Luke Demaitre, 'Scholasticism in compendia of Practical Medicine, 1250-1450', Manuscripta 20 (1976), 81-96.

he may gain a complete understanding of astrological principles. Fundamental rules must be reiterated in every context to illustrate their application. Intricacies must be allowed to turn in the reader's mind until they are fully apprehended.[9] Criticism of the didactic attitude implicit in the Summa was not long in coming. John de Ponte of Lyons, who read the book in the 1370s, felt compelled to produce an abbreviated version because 'there were so many allegations and so many duplications with some other superfluous matters that they disturbed the mind of the student.'[10] It is no wonder, then, that abbreviations and partial copies outnumber complete texts in the manuscripts. (See Appendix C.)

The prologue to Summa Book I is essentially a complaint of the hardships which faced Ashenden as he

9 'Sis ergo experimentator assiduus et regulas quas pro maiori parte veras esse cognoveris in corde tuo teneas, in mente tua frequenter revoluas. Et nec te tedeat o lector si quedam regule que in hoc tractatu secundo ponuntur plures in eodem hoc tractatu, que et etiam in primo recitabant.' Summa II.proem, f.85rb. John de Mirfeld's amplified account clearly echoes these pedagogical sentiments: 'Nec tediosum obsecro tibi videatur si unam et eandem auctoritatem in diversis hic capitulis inveneris recitatam, cum sepe una clausula pluribus conveniat materiis; nec dicas propter hoc esse nugacio que est inutilis repeticio unius et eiusdem. Quoniam secundum venerabilem Bedam non ab re est sepius verbum repetere quod semper est necesse animo retinere. Et ut ait Ovidius decies repetita placebunt.' Florarium Bartholomei, eds.cit., 118.

10 'Causa enim que me movit ad istam abbreviationem ordinandum fuit quia in summa predicta erant tot allegationes et tot dupplicationes cum aliquibus aliis superfluis sic quod animum studentis perturbabant. Et qui aliquis hoc habet pro malo vel non bene facto, rogo quod michi parcat et ipse recurrat ad originale si voluerit.' BN lat. MS 7335, f.1ra, quoted in HMES iii.719.

laboured in the service of natural astrology--first, the opposition of certain detractors of the noble science, then the difficulty in making forecasts according to rational procedures, and thirdly the onus of collecting the numerous works on the subject and attempting to reconcile conflicting opinions. Ashenden admitted that the most difficult obstacle to overcome was the criticism of the sceptics particularly those who claim that astrology is of no use whatsoever. If astrologers actually had powers of accurate prediction they would achieve great wealth and fame. Ashenden's response was to illustrate the efficacy of the art with a few *fabulae* or morality tales of a sort, which chiefly had to do with stellar images. Abraham and Moses were said to have had great knowledge of the heavens; and Peter Comestor related that Moses escaped an entanglement with an Ethiopian wife by fashioning rings of occult power activated by the stars.[11] Likewise, a learned saracen treated scorpion bites with an image made when the stars were properly aligned. The most interesting of these little stories was reported by a certain reverend doctor who, while in Paris, became acquainted with a physician knowledgeable in astrology. With an amulet this man successfully treated a townsman suffering from gout; but when no recompense was forthcoming he took back the device, allowing the condition to relapse. The burgess was thus forced to pay up before his health was restored.

[11] This episode was also related by Bacon in his Opus Maius, ed. J.H.Bridges (Oxford, 1897), i.392. And it was the subject of a *questio* of Peter of Auvergne concerning stellar images: 'Utrum imagines quae fiunt per astrologos secundum illorum scientiam habeant efficaciam in naturalibus, puta an annuli oblivionis quoas Moyses dicitur fecisse habebant virtutem oblivioni inducendi.' P. Glorieux, La Littérature Quodlibétique (Paris, 1935), i.259.

I do not think Ashenden expected the reader to put much store in these moralities. Certainly they were nothing to obstruct the true sceptic. Those who would continue to belittle the Summa would come up against a much greater obstacle--they would have to oppose the entire body of astrological scholarship, the time-tested opinions of many respected authorities, who are listed from Ptolemy and Hermes to Grosseteste and Hermann of Carinthia. If Ashenden seems defensive at this juncture, he probably was. Defensive, yes; embattled, no. His plantive prologue aside, Ashenden gave notably little space to the defence of astrology. Nor was his defence especially emphatic. It tells that he was relatively secure in his position, and in all likelihood was writing in a supportive environment. Great medieval apologists of astrology such as Guido Bonatti and Roger Bacon were probably adamant because they had themselves to defend as well as their art! Guido devoted fourteen chapters to astrology's defence in his Introductorius; and in his Opus Maius Bacon made lengthy protestations about the lack of understanding of astrology.[12] It did not help their reputations. Bonatti was condemned to the Inferno by Dante; and some writers complained that Bacon had distracted students from legitimate studies.[13] Ashenden's name was never blackened by associations with the *ars notoria*.

At all events, he was ready to concede the great difficulty of harnassing the potential of astrology.

[12] Introductorius ad iudicia stellarum I; Savile MS 15, ff.229rb-232ra. Opus Maius, ed.cit., i.238-49, 394-403.

[13] Dante, Inferno XX.118. For Bacon's predicament, see A.G. Molland, 'Roger Bacon as a Magician', Traditio 30 (1974), 453, 459.

Astrologers were human and prone to error. And in such a complex matter little inaccuracies added up to a bad result. Uncertainties were a natural part of the physical world. Earthly limitations often hindered the action of the immortal soul, which, if left to its own devices, would easily apprehend the most difficult complexities of the science.[14] A state of total knowledge was not possible in this existence; yet despite the numerous pitfalls of human reasoning, the utility of astrological prediction was great enough to deserve attention.

Some critics maintained that astrological predictions had no certainty whatsoever. For instance, predicting the weather by the stars could not take account of local climatic variations. On the same day the weather can be fair in town while it rains in the surrounding countryside. Ashenden noted that even Ptolemy, in his De dispostione orbis, insisted that astrological forecasting was not a demonstrable science in the sense that geometry is demonstrable through formal proofs.[15] This was not to say that astrology was ineffectual; for Ashenden it meant that the prediction of universal events had the most value. For although minor celestial influences varied from place to place, the greater effects were more perceptable. To observe the large-scale implications of celestial action was the primary duty of the astrologer. Moreover, celestial forces were historical forces. They helped determine the character of peoples and nations, the

[14] 'Igitur si ipsa anima quae immortalis est a vitiis etcorruptionibus terreni corporis fuerit separata ac suae originis constantiam retinens vim atque virtutem suae essentiae agnoverit omnia quae difficilia sunt et miranda in astronomia.' Summa I.proem., f.1va.

[15] The Pseudo-Ptolemaic De dispositione is discussed below, p.118.

fertility of the land and the bounty of the seas, and the cycle of life and death.

The problem remained that a multitude of books written on astrology was available. Ashenden did not exaggerate the abundance of source material for astrology. A near-contemporary listing of authorities in an English manuscript gives sixty-one titles pertaining to the field.[16] The great number of astrological items (perhaps one hundred titles) in the library of John Erghom also shows how much there was for the book collector to amass.[17] The Summa, with its numerous sources, is a sort of bibliographical map charted by Ashenden for the student who would navigate the sea of literature. The reader was warned from the outset that a great proportion of astrological texts was useless, or worse yet dangerous. Unlearned and misguided astrologers did the science an injustice with their monstrous judgements; and so-called teachers often led their pupils astray. The writings of these people should be burned. As for the works of genuine astrology, which were numerous enough, a study of these offered its own challenges. Ashenden himself paled at the thought of all the inconsistencies and ambiguities in the literature. And yet the immense task of forging something coherent out of true authorities was precisely his object--because he knew of no one who had gathered together all the necessary constituents of a comprehensive system of astrological prediction.[18]

[16] Royal MS 12 F.xvii, f.156, s.xv in. The Summa is included in the list.

[17] Cavanaugh, i.292-322.

[18] 'Tertium vero quod me ab isto scribendi studio dubia trepidatione revocat et retardat, est librorum astronomie et contrarium opinionum astrologorum honerosa

We can almost imagine Ashenden scrawling notes, with stacks of books piled on his desk. In the face of the extensive literature Ashenden's punctilious and accurate references to source material are one of the extraordinary features of the Summa. He provided author, title, chapter and verse in virtually every citation of his authorities. Even untitled pieces, or those whose author was unknown, were recorded as fully as possible. Ashenden conveniently identified several minor works by their incipits. In most instances he clearly marked quotations, so checking on his references has been straightforward. More often than not, what Ashenden has reported is spot on. There are

multitudo. Tot enim sunt libri inutiles et tot auctores imperiti que regulas superstitiosas et vanas inconsultis antiquis astrologis prenominatis cotidie multiplicant, inexperti ad iudicia tam temere procedunt quod ipsam scientiam preclarissimam turpiter dehonestant et suis monstruosis tales auctores ab actu scribendi in ista facultate forent suspensi, quod omnes eorum libri essent combusti; tunc enim scientia astronomie que nunc suppeditatur et contemnitur redderetur magis preciosa et facilius cum minori tedio ac profundius foret investigata; et scripta fructuosa antiquorum astrologorum diligenti studio forent inspecta et a quamplurimis intellecta. Sed in antiquorum libris tot ambiguitates et tot contrarias opiniones reperio, tot etiam materias difficiles de aeris mutatione perpendo quod dum intimo mentis scrutinio ingenis mei tenuitatem ac fragilitatem meam, quia omnium insufficientiam reminiscor contremisco et contremescens palesco in tantum quod in hoc libro dubitationis desperatione conturbatus non audeo de temperie aeris aliquam regulam de novo condere nec aliquam sententiam de capite meo promulgare. Et si auderem non sufficio sed aliorum astrologorum opiniones et sententias ac regulas tam univerales quam particulares intendo meliori ordine, quo potero, ad communem utilitatem in hac scientia studentium in quandam summam redigere...Maxima vero causa quare hoc opus agressus sum est ista...sunt multi namque astrologi antiqui et moderni multa et varia de temperie aeris et de his que continguunt in mundo documenta scribunt et modum pronosticandi docent. Sed inter omnes nullum invenio quin in suis libris omittat aliqua que in huiusmodi iudiciis forent necessaria et iudicantibus multipliciter possent valere.' Summa I.proem, f.2ra.

exceptions. Where he has used the works of his colleagues, he made a less exact reference to the source. Authors go unnamed. At times he gave no indication that a borrowed passage is anything but his own work. For example, his borrowings from William Merle, which were considerable, go by entirely unmarked. Nor is material taken from Bradwardine's De causa Dei accorded any recognition. Notes on the movement of the eighth sphere, taken from 'someone famous', are found elsewhere to have originated from Simon Bredon.[19] And another unnamed compatriot is acknowledged for his help with a diagram relating the constellations to regions of the Earth.[20] At all events, I am disposed to think of Ashenden's reluctance to name colleagues as less of a sign of plagarism than an indication of the free sharing of information within the Merton circle. On a wider front, and to our benefit, the Summa is an exceptional bibliographical document of the *scientia astrorum* in fourteenth-century Oxford.

[19] Summa I.7.1, f.37vb; II.4.3, f.106vb. Bredon reckoned that in 1340 the eighth sphere had moved 18[since Ptolemy's time. Cf. IIIa.523-25.

[20] Summa I.8.3, f.45rb.

2. Chronology

The Summa begins somewhat unexpectedly with a consideration of the problems of biblical chronology, the Creation and age of the world. I say *unexpectedly* not only because to us the attempt to build an exact chronology from the vague and tangled web of biblical tradition may seem a fruitless task, but also because this popular medieval theme appears infrequently in the context of astrological handbooks. For Ashenden, however, it must have been quite sensible to commence with these matters. Ashenden took essentially the same view as Roger Bacon, namely that theology could be well served by the findings of other branches of scholastic pursuit. One key to the understanding of the Bible was the knowledge of its unfolding historical presentation--God's will related through the story of his chosen people and their prophets.[1] By affirming the utility of astronomical tools in the interpretation of biblical history, he not only believed he was acting in the aid of theology, but as well he was building his Summa on the surest of foundations, the authority of the Bible itself.[2] Ashenden's first objective was to present the theory of great conjunctions

[1] Opus Tertium XXX; ed. Brewer, 204.

[2] That this motivation was still powerful centuries later is attested by the famous chronological determinations of James Ussher, Annales veteris et novi testimenti a prima mundi origine deducti, (Geneva, 1722), and Issac Newton, The Chronology of Ancient Kingdoms Amended (London, 1770), new ed. I hasten to add that Voltaire was impressed with Newton's chronology as well as with his law of gravity.

as an unifying principle for human history. For the cycle of planetary motion to act as historical clockwork, however, it had to be provided with an initial point, the creation of the world. Thus, in pursuit of these two aims (the biblical and temporal anchors so to speak) the first distinction was given over entirely to the determination of the age of the world.

For Ashenden, as for any for any scholar attempting to lend order to the subject, universal chronology was a great morass of confusion.[3] Before we sink into this quagmire ourselves, I wish to make it plain that I shall be restricting myself to the salient features of Ashenden's chronological discourse; for fear of being entirely lost, I shall not be going any deeper than necessary into the history of biblical chronology.

The distinction on chronology is a *tour de force* of the medieval art of compilation. It is a glorious jumble. Sources are set against one another, and out of the discord is forged a difficult harmony of opinion that, on account of its omissions and inconsistencies, is not always satisfying. Ashenden's building blocks, in any event, were altogether conventional. The key authority for all investigations was, of course, the Bible. From this common point of departure writers extrapolated figures using various philosophical and astronomical arguments. Yet the text of the Bible itself was problematic. Two main versions were available, the

[3] A thorough introduction to chronological speculations may be gained from J.D. North, 'Chronology and the Age of the World', in Cosmology, History, and Theology, eds. W.Yourgrau and A.D.Breck (New York, 1977), 307-33. Two book-length studies are F.C.Haber, The Age of the World: Moses to Darwin (Baltimore, 1959); and F.E.Robbins, The Hexaemeral Literature (Chicago, 1912).

Vulgate, which had been rendered into Latin from the Hebrew by St. Jerome, and the old Latin version derived from the Greek *Septuagint*. Had Ashenden attempted any meaningful comparison of the texts he would have been out of his depth in short order. He was after all compiling an astrological treatise and not a piece of biblical criticism. It is interesting that he expressed a preference for 'Hebrew' authority, because the Hebrews had witnessed the deeds of the prophets, and had chronicled them in the Hebrew language. Yet on several occasions Ashenden was content to accept at *prima facie* the reports of his secondary sources on biblical matters. In this respect he did not live up to Bacon's ideal of chronological scholarship.[4]

A plethora of Church Fathers is conspicuous in Ashenden's discussion: Ambrose, Augustine, Bede, Basil, John Damascene, Eusebius, Jerome, Isidore, Marianus, Methodius, Orosius and Rabanus all come to the fore. Of the writings of the Fathers, St. Augustine's De civitate Dei may have been the only one Ashenden consulted directly. Citations to many other devotional works he probably found in intermediary reference books in the Merton library. The Speculum historiale of Vincent of Beauvais, a portion of the grand encyclopedic enterprise, Speculum maius, was one of Ashenden's main cribs.[5] Another, the Polychronicon, was an universal history by Ranulph

[4] For Bacon's preoccupation with the text of the Bible, see Beryl Smalley, Study of the Bible in the Middle Ages (Oxford, 1941), 241-5.

[5] Roger de Martival bequeathed the Speculum in four volumes to Merton about the year 1330. These are now Merton MSS 123-6 (M.2.7-10); see MBMC 110. There are other early editions.

Higden.[6]

Some Jewish authorities--Josephus, Maimonides, Rabbis Joshua and Eliezer--appeared as well. The citations to the Guide for the Perplexed and glosses on Joshua and Eliezer are fairly minor.[7] I cannot tell where Ashenden came across these; the odds are long that he gleaned them from direct reading. The historian Josephus is another story. Though Ashenden included snippets of Josephus's Antiquitates iudaicae that had been utilized by a long line of chronologists, he seems to have personally verified the book and chapter of Josephus references. A copy was available *in libraria* from which he could have worked.[8]

Ashenden was fortunate to have been preceded by a number of Oxford scholars who had written about chronology. Indeed, the discussion in the Summa appears to have been a reaction to the De etate mundi of Walter Odington, monk of Evesham.[9] Odington had digested quite a lot of material. He compared the accounts in the Vulgate and Septuagint Bibles, finding them in disagreement. He surveyed the opinions of the Church Fathers and examined *compotus* literature, reviewing the astronomical

[6] Polychronicon Ranulphi Higden Monachi Cestrensis, eds. Churchill Babington and J.R.Lumby (London, 1865). Merton College obtained a copy through the gift of Thomas of Buckingham. MBMC 113. For Higden, see Antonia Gransden, Historical Writing in England c.1306 to the Early Sixteenth Century (London, 1982), 43-57.

[7] Summa I.1.2, ff.5rb, 8va.

[8] Sometime before 1339 Nigel de Waver (BRUO iii.2000) presented Merton with a copy of the Antiquitates, which is now MS 317 (M.2.11). He instructed that it be chained in the library. MBMC 122.

[9] The De etate mundi is preserved in CUL MS Ii.i.13, ff.181v-84r.

foundations for chronology from the times of Ptolemy. Ashenden admired Odington's work, but he rejected the monk's final solution of the chronological problem. two Oxford friars, Robert of Leicester and Roger Bacon were also prominent in their contributions to Ashenden's deliberation. Robert of Leicester produced a fair account of the Hebrew calendar and its relation to other calendrical systems in his Compotus hebreorum aptatus ad kalendarium of 1294; and to that he added the Compotus hebreorum purus and De ratione temporum, each of chronological value.[10] Roger Bacon's treatise, 'which he sent to Pope Clement', is likewise noted. Bacon sent three important works to the pontiff, the Opus maius, Opus minus and Opus tertium. I am disposed to believe that the Opus maius was intended; in Bacon's triptych that work contains the most extensive exposition on chronology. At all events, Bacon's contribution consisted of some weighty if general remarks on the significance of chronology, rather than technical detail. As mentioned above, it was Bacon who emphasized the part of astronomy in the rectification of biblical chronology. However, the Opus maius did more to inspire an effort than to provide solutions.

Chapter one of this distinction treats the problem of dating the Creation itself. Ashenden initiates the discussion with Hermes Trismegistus and Firminus Maternus. These two worthies were of the opinion that the world had no certain day of origin. At least there was no one around at the time to observe the event of creation; and despite all the power of human reasoning that had gone into a determination, no one had been able to conceive or

[10] All three are preserved in the Merton book, Digby MS 212, ff. 2-18r, s.xiv. On Robert, see BRUO ii.1142.

explain the origin of the universe.[11] On biblical authority, however, a scholarly consensus affirmed that the Earth came into existence on the third day in the week of Creation. By astronomical convention the entry of the Sun into Aries defined the beginning of the celestial cycle known as the year; the world might have been created at that point, the vernal equinox. Robert Grosseteste for one held that the equinox was the most appropriate time for the Creation because that day represented the beginning of Spring, the season of growth and development.

In his Compotus, Sacrobosco testified that the world was created at the equinox, which was on 15 March, with 'G' as the dominical letter. Robert of Leicester and others reported the day as 18 March (15 kal. April), the dominical letter also being 'G'. The difference was due to varying accounts of the 'slip' in the calendar.[12] Ashenden observed that in 1347 the equinox occurred on 13 March, and the winter solstice, which at the birth of Christ was on 25 December, by 1347 had slipped to the 14 December (or, 13 days, 5 hours and 25 minutes having been completed). The doctors of the Church agreed that, at the Creation of the Sun and Moon, the Sun was at the vernal equinox and the Moon was full, given that it rose at the *onset* of the fourth night. Such could only take place in the 6th, 12th, 17th or 23rd solar years of the 28-year cycle. God, however, would have created the luminaries at the beginning of their cycles. As a result, Leicester was

[11] Summa I.1.1, f.2vb.

[12] The use of the word 'slip' in this context, and the astronomical frame of the calendar are explained by J.D.North, 'The Western Calendar--"Intolerabilis, horribilis, et derisibilis"; Four Centuries of Discontent', in Gregorian Reform of the Calendar, eds., G.V.Coyne, M.A.Hoskin, and O.Pedersen (Vatican, 1983), 76-80.

convinced that placing the Creation in April was incorrect. If not the vernal equinox, then perhaps the autumnal equinox. Vincent of Beauvais found that the Egyptian and Islamic years began in September. Had these peoples institutionalized the Creation in their calendar systems?

Vincent thought that a good case could be made for an autumn creation.[13] God created everything in a state of perfection. And what time of year was more perfect than the autumnal equinox, when the fruit of the land comes to full maturity? It was important too that Adam and Eve would have had something to eat. If Creation had occurred in the spring Eden might have been in full flower, but it would not have been ready to provide subsistence for the original sinners. Ashenden, however, saw this line of argument as disposable. First, it was not obvious that autumn was the most perfect season. Autumn leads on to winter and the corruption of the earth's generative powers. In contrast, during spring every creature is growing towards its fulfilment.[14] Ashenden mentioned the autumn alternative out of fairness, although he remained loyal to the 18 March date because most theologians and astronomers had accepted it. Yet Ashenden felt compelled to state that there was no conclusive proof for this or any theory on the date of the Creation. Only divine

[13] Speculum historiale VII.88

[14] 'Pro isto dici potest quod in equinoctio autumnali fructus non sunt in sua maxima perfectione quia tunc perfectum est in diminutione; et non obstante quod tunc arbores fructus habeant maturos et cetere plante eorum tamen perfectio cito deficit, eo quod tempus illud appropinquat hiems que corruptionis occasio est rerum inferiorum. Sed in equinoctio vernali omne tendunt ad suam perfectionem et ad crementum nec ex tunc maiori parte anni vernalis tempestas nocebit.' Summa I.1.1, f.4va.

revelation could provide a certain answer. Failing that, the matter was unresolved.[15]

At this juncture Ashenden concentrated on an even more trivial detail. He asked the question: was the Moon full on its first appearance? Robert Grosseteste in his Hexaemeron, reported that the Septuagint Genesis passage that the Moon was created 'full with light' could be interpreted as meaning that the Moon was full--God would certainly not produce anything imperfect. Augustine, nonetheless, had been none too sure about this line of argument, because in absolute terms one side of the Moon is always illuminated (except during eclipse); the waxing and waning phases are mere appearances.[16] Other sources indicated the Sun and Moon to have been in conjunction at the Creation. An anonymous compotus with the incipit, 'Omnis compoti ratio...',[17] followed the Hebrew tradition that when Adam woke to life he saw the 'first' or early crescent moon, which would be consistent with a moon about three days after new.

15 'Nunquid tamen sunt ista vera nescio et eque stat Lunam creatam fuisse coniunctam Soli, sicut plenam et econtra pro aliquo quod ego. Et tanta est ratio ad unam partem sicut ad aliam, quia qualitercumque quod Deus creavit omnia satis perfecte fuerunt ipsa creata. Unde per rationes non possumus devenire ad veritatem unius; et si veritas inquiritur hoc erit solum per revelationem vel per inspirationem spiritus sancti, nec etiam per alias rationes scire possumus quo tempore anni mundus fuit creatur. Ideo non videatur melius quam reliquere hoc sub dubio. Summa I.1.1, f.4vb.

16 Grosseteste, Hexaëmeron V.xvii.1-2; eds. Dales and Gieben, 167-7.

17 Summa I.1.1, f.3va. ThK 996. This may the same as ThK 1002, 'Omnis ratio computi...', surviving in Vienna, Nationalbibl. MS 1180, ff.220-223v, dated 1346.

Astrological traditions of diverse origin gave differing accounts of the situation of the planets at the Creation. All came to Ashenden at second hand. For example, Helpericus, in a book he wrote on astronomy, recited the belief of the Ishmaelites and Chaldeans that the Sun had been created in the first part of Aries; Saturn, in Capricorn, emerged 90° from the Sun; Jupiter, in Sagittarius, was 120° removed; 150° separated Mars, in Scorpio, from the Sun; Venus was 30° away in Taurus, and Mercury 60° away in Gemini.[18] Macrobius registered an Egyptian theory that the planets first emerged in the fifteenth degree of their respective domiciles--the Sun in Leo, the Moon in Cancer, and so on. Omitting the degrees, Grosseteste reiterated this doctrine in his De impressionibus aeris.[19] Finally, Walter Odington testified to the 'Indian' tradition that all planets commenced their revolutions in the first degree of Aries.

The history of the world up to medieval times was commonly divided into six or seven ages. Ashenden took up the convention of six ages since Augustine and Grosseteste had adopted it.[20] The First Age of the world lasted from the Creation to Noah's Flood. The Flood was perhaps the greatest dividing line in world history. The Second Age stretched from the end of the Flood to the birth of Abraham. From Abraham to the commencement of king David's

[18] The printed text of the Compotus of Helperic, PL cxxxvii.17-48, does not contain such a passage.

[19] Macrobius, Commentarius I.21.25-7. Grosseteste, De impressionibus aeris, edited by L.Baur, De philosophischen Werke des Robert Grosseteste, Bishofs von Lincoln (Munster, 1912), 43.

[20] A. Luneau, L'Histoire du salut chez les Pères de l'Eglise: La Doctrine des ages du monde (Paris, 1964), 285-407.

reign was the Third Age. The Fourth Age embraced the years between David and the destruction of the first temple. Starting with the Babylonian Capitivity, the Fifth Age ended with the birth of Christ. The period from the Nativity and continuing through the present is the Sixth Age. The length of the respective ages (except the sixth) could be estimated by counting the generations as given in the Bible. Genesis specifically ennumerated ten generations, from Adam to Noah, before the Great Flood. Some doctors counted 1656 years in the period. Robert of Leicester found this figure to be 87 lunisolar cycles plus three years. Was there something to that correlation? Other commentators, however, arrived at an altogether different length for the age. Isidore of Seville calculated the First Age to have lasted 2242 years; and Augustine reckoned 2262. The Septuagint Bible and Vincent of Beauvais (quoting Eusebius) agreed on the figure 2242. The Polychronicon, on the other hand, reported that Jerome took 2000 years to be the correct figure. Ashenden regarded the discrepancy among the estimates to be unbridgable, and left the matter for future investigators to puzzle over.[21]

The Second Age stretched from the end of the Flood to the birth of Abraham. Again, there was more than one estimate of the duration of this age. Jerome, Josephus and the Hebrews gave the period as 292 years consisting of ten generations; the Septuagint, followed by Augustine and Rabanus made it out to be 1072 years and eleven generations. The two reckonings differed by 780 years and a generation. Bacon referred to certain latin codices

[21] 'Que autem dictarum opinionum sit vera sub dubio relinquo...sufficiat ad presens diversitatem opinionum recitare pro communi utilitate eorum qui hanc materiam voluerunt pertractare.' Summa I.1.2, f.6ra.

that lent credence to the Hebrew version. Odington, however, concluded that the span of the six generations between Arphaxat and Nachor had been miscalculated by the Hebrews. Somehow one hundred years was subtracted from each generation. This made up for six lost centuries. The Hebrews also seemed to have omitted a generation, Caynam, son of Arphaxat, whose life accounted for another 130 years. But a half-century discrepancy remained and others arrived at still different figures. Accepting the longer generations and omitting Caynam, Eusebius settled on a Second Age of 942 years. Bede proposed 522 years. The discord was complete; there was no satisfactory way of reconciling the divergent accounts.

The expanse of the Third and Fourth Ages was somewhat more definite. The most sources agreed that the Third Age, from Abraham to David, extended over 942 years. In fact only Isidore of Sevile raised a dissenting voice; and his complaint fell on deaf ears. The Hebrews reckoned the Fourth Age at 473 years, six months and ten days precisely. The Septuagint added twelve years, because it gave slightly longer reigns to Amon, Ahaziah, Joash and Amaziah. Odington, following Rabanus, credited the Fifth Age with 589 years and fourteen generations. Bede gave 545. Isidore had operated from the same information as Bede; but he thought that the reign of Ptolemy Philometer and the preceding regency had been missed out. This was an additional forty-three years, making his result 588 years. Higden had it at 591.

Completing his exercise in futility, Ashenden considered the validity of various chronological accounts. None of them, he thought, was set on particularly secure foundations. As material towards a more definitive chronology Ashenden noted ten errors which

often turned up in the calculations.[22] In the first place he observed that many investigators, working again from varying sources, did not take account of differences among calendar systems in their reckoning of the year. A case in point was the evolution of the Roman calendar. Before Caesar's time no standard calendar system was used throughout the western world. King Numa Pompilius had introduced a lunar year of 355 days comprising ten months. It was only much later that the Julian (solar) calendar was adopted. The solar year was not the equivalent of twelve lunar months (only 354 days). Reconciling solar and lunar calendars was a matter for the computists. Yet even when the solar year was applied throughout a chronological determination, a systematic error existed because of uncertainty over the precise length of the year. The Julian calendar took the year to be 365 1/4 days, but this value had long been perceived as inaccurate. Ptolemy's value was 365 1/4 days less one hundredth of a day. The Alfonsine tables, whose determination Ashenden favoured, reckoned the solar year at 365 days, 5 hours, 48 minutes and 16 seconds.[23]

A third problem was in defining the point at which the year commences. Great confusion had stemmed from the judgements in multiple sources. Some chronologists had also miscounted the generations listed in the Bible; and there was uncertainty about the lengths of reigns of

[22] Summa I.1.3, ff.9rb-12ra.

[23] Ashenden also supplied values said to be from Albategni, Thebit, the Indians, Persians, and the Arzachel tables. Despite his preference for the Alfonsine value, he believed a more accurate determination possible. 'Nullus adhuc invenire potuit veram anni quantitatem et ideo mirum non est si illi qui de tempore ab origine mundi tractaverunt in huiusmodi temporum calculatione erraverunt.' ibid., f.9vb.

biblical kings. Speculation abounded on the possible significance of certain mystical numbers. What was the meaning behind Daniel's 70 hebdomades? Could they be interpreted as 490 lunar years? Similar questions were raised about the length of human life before the Flood. Did men actually live for hundreds of years? There were further queries. How long did the Flood itself last? No one had definitive answers. Finally, those who were accustomed to splitting hairs would have to take into account the ten lost hours when God held the Sun motionless for Joshua.[24]

In a real way, Ashenden was mocking the inaccuracies of the biblical chronologists; but he was also calling attention to the grey areas of chronology itself. Some of these difficulties could never be surmounted by biblical exegesis alone, simply because necessary information was not to be found in the Scriptures. The exegete was left with insufficient premises and groundless conjectures. Astronomers were much better equipped to take a stab at the vexed questions of chronology, for as Bacon and the computists had shown, astronomical calculations provided the only means of establishing an exact chronology.[25]

Odington determined the period between the Creation and the birth of Christ to have been 4320 years. He came to this conclusion solely on the grounds of astrological

[24] Joshua 10.12-13. Ashenden cited the remarks of Peter Comestor, Historia Libri IV Regum XXX; PL cxcviii.1411-12.

[25] 'Sed, ut dixi, nulla scientia certificat de temporibus, nisi astronomia; quia eius est considerare revolutiones motuum coelestium, qui fiunt in temporibus certis; et similiter renovationes eclipsium, quae non cadunt nisi ad tempora certa, et in his non potest errare.' Opus Tertium LIV; ed. Brewer, 208.

doctrine. Given the value of 360 years for the so-called *orbis magnus* (one year symbolically equalling one degree on the circle).[26] Odington perceived a larger cycle of great years. Each *orbis magnus* was thought to be governed by a sign of the zodiac, commencing at the Creation with Aries. Thus the rulership would return to Aries at the end of the twelfth great year, or 4320 (360 x 12) solar years. Odington naturally sought confirmation of his theory from independent sources. He found the 4183 year period suggested by Marianus to be close enough to his 'correct' value as long as further years were added as Josephus, the Dionysian tables and John of Garland had recommended.

In Ashenden's mind this was hardly satisfactory. One result of Odington's theory was that the First Age, the period from the Creation to the Deluge, had to be compressed to only 1218 years, a figure which did not correlate well with the biblical account of the generations before Noah. Adam alone was said to have lived 930 years. The least estimate made for the First Age was 1565, and many theologians accepted figures over 2000 years. Odington had recognized the problem and forwarded a radical solution--that the years mentioned in the Bible were only half the length of a solar year. The idea was not new that 'years' in Genesis were somehow shorter than calendar years. Odington's novelty was his physical explanation. The Holy Land, he argued, was situated near the tropics, where two sets of winter and summer solstices were experienced within the space of twelve months. The

[26] The concept was from the Arabic world-year *tasyir*. E.S. Kennedy, 'The World-Year Concept in Islamic Astrology', Proceedings of the Tenth International Congress of the History of Science, Ithaca 1962 (Paris, 1962), 27.

ancients had presumably shaped their time reckoning to this double phenomenon, and therefore came out with units of half a year.[27] In his criticism Ashenden made no attempt to examine the phenomena upon which Odington had based his claim; instead he took a rather unexpected turn, consulting writers on the geography of the Holy Land in order to prove that the region lies far north of the tropics where such phenomena were thought to be observable.[28] His geographical sources are intriguing--the De locis terre sancte of an otherwise unknown William; a tract of the same title by Peter Diaconus and a De locis terre habitabilis of Arculf, bishop of the Gauls![29] Astronomical tables, however, were more useful. The Arzachel tables gave the latitude of Jerusalem as 31° 56′. The Sun at the tropic of Cancer reached only 23° 29′. Thus the Holy City was 9° 27′ north of the tropics. Campanus had figured one degree of latitude as 56 2/3 miles on the Earth's surface; so Jerusalem was about 540 miles north of the Tropic of Cancer.

Though in the end it had proved untenable, Odington's thesis had offered a numerically elegant account of world history up to the birth of Christ. There were many other attempts at ordering time on a numerological basis. Among several cultures the most famous of these was the system

[27] The double-solstice phenomenon between the tropics was recognized by medieval astronomers. W.H.Worrell, 'Qusṭā ibn Lūqā on the Use of the Celestial Globe', Isis 35 (1944), 292. And see Robert Holcot, De stellis, Corpus Christi College, Oxford, MS 138, f. 119v.

[28] Summa I.1.3, f.11ra-b. A list of medieval works on Holy-Land geography has been compiled by P.Donatus Baldi, Enchiridion Locorum Sanctorum (Jerusalem, 1955).

[29] PL clxxiii.1115-34. PL lxxxviii.779-814. Peter Diaconus and Arculf respectively.

of millenia, the structuring of the divine plan through successive 1000-year intervals.[30] Ashenden keyed in on the Christian formulation. Units of thousands were clearly indicated in the Bible. Peter spoke of a day as a thousand years, and a thousand years like a day (II Peter 3.8). And it was revealed in the Apocalypse (20.2) that Satan would be chained for a thousand years. The number of millenia in the plan was taken as six or seven, corresponding to the days of the week of the Creation. Ashenden tells us that he read on the seven millenia in the De fide et legibus of William of Auvergne.[31] Since five ages had pasted between the Creation and the Nativity, Ashenden adopted 5000 years as a benchmark to judge estimates of the world's age. All estimates of less than 5000 years, Ashenden reasoned, could be discarded.[32] Several estimates over 5000 remained:

Septuagint	5169
Eusebius et Orosius	5199
Magister Historiarum	5330
70 prout dicit Odington	5210
Isidore	5500
Secundum Grecos secundum quosdam codices ut dicit Odington	5530

[30] For the Zoroastrian doctrine of millenia, see E.S. Kennedy and David Pingree, The Astrological History of Māshā'allāh (Cambridge, Mass., 1971); and D. Pingree, 'Astronomy and Astrology in India and Iran', Isis 54 (1963), 238-9, 243-6.

[31] De fide et legibus II.4, in Guillieli Alverni Opera Omnia (Paris, 1674), i.34.

[32] 'Reiciendi sunt igitur omnes numeri annorum positi in capitulo precedenti a creatione mundi usque ad nativitate Christi que se non extendunt ad 5000; et ego omnes numeros quos ponit Leistetensis in computo suo que omnes non continent 4000 annos.' Summa I.1.3, f.11vb.

Appraisals resting mainly on biblical interpretation differed by nearly as much as four hundred years. Obviously some of them were far wrong. Astronomers, on the other hand, enjoyed much closer agreement. Albumasar had arrived at a figure of 5328 years, 16 days, 18 hours and 30 minutes! Ashenden did not say that a claim in such accuracy was warranted, but he was impressed with the relatively insignificant divergence among astronomical estimations; for another computation yielded 5328 years, 6 days, 8 hours and 30 minutes--a difference of a mere 10 days and 10 hours! King Alfonso's result was just under 5344 years; and the figure Odington had extracted from the Septuagint, 5330, sat well with the astronomers' estimates. The three figures, of Albumasar, Alfonso, and the Septuagint, differed by about 15 years. The gap was sizable, but not nearly so large as that separating the determinations of the Church Fathers. Whether the astronomers' figures approached the truth was another question. At all events, Ashenden felt it prudent to follow the astronomical alternative, since it appeared to represent an improvement in accuracy, and (as it must have been in the back of his mind) it side-stepped the intractable problems of biblical textual analysis. Further refinements would have to await divine inspiration.[33]

[33] 'Unde isti numeri scilicet cribrati ulterius positi sunt inter omnes alios numeros predictos et ideo omnes aliis numeri sunt reiciendi. Nunquid tamen aliquis numerus de annis mundi istorum scilicet sit verus et precisus nescio nec determinare volo nec audeo sufficio. Credo tamen quo illi 3 numeri collecti ab Albumasar et Alfons. quorum perspicatio non videtur somniasse et qui multum nitebantur precisioni in omni materia maxime inter ceteros numeros accedunt veritati, sicut supponendum est. Nunquam tamen illi numeri sint veri aut quis eorum sit verius aut plus accedit veritati nescio. Et omnia pro dubio relinquo ut in hac materia aliquam veram scientiam

One consequence of uncertainty on the age of the universe was that astrologers could not pass judgement on world history in its entirety. The earliest astronomical event that could be fixed in time was the conjunction of planets before Noah's Flood. Albumasar, the great Islamic astrologer, reckoned that the conjunction had taken place some 287 years before the Deluge. However, another determination of 279 years had wider approval.[34] It was possible, then, to know which *orbis magnus* one was in with respect to the epoch of this first conjunction, but not in respect to the Creation. Thus Ashenden found that the year 1345 A.D. was the forty-fifth year of the thirteenth *orbis magnus* from conjunction.[35]

anni a diluvio ad Christum 3102
coniunctio significans diluvium + 279
anni a coniunctione 3381
anni Christi completi +1344
4725

magnus orbis 13
360 | 4725
45 remanet indivisi

Ashenden proceeded to treat the relative of the *orbis magnus*, the *annus magnus*, the Great or World Year. The Great Year was a period at the end of which the universe would be destroyed and fashioned anew. The notion that Ashenden was bringing up had its roots in certain

scio provulgare; nec aliquis hoc terrenus scire potest, ut estimo, nisi diminitus sibi fuerit inspiratum.' Summa I.1.3, f.12ra.

[34] Summa I.1.4, f.12rb. The determination was made by Aomar, who will be identified below, p.112. Albumasar's dating of the epoch was indeed confused. Kennedy, 'The World Year Concept', 24-6.

[35] Summa I.1.4, f.12r. Abstracted from the marginal calculations in Ashmole 576.

interpretations of Plato's Timaeus. Plato himself did not express a coherent theory of an all-inclusive chronological unit; nor did he suggest a value for such a period. But he did advance the idea that *time* was a consequence of the cyclical motions of the heavens. Computists nodded in agreement. Sacrobosco said that the Great Year was the amount of time in which all the stars and planets would return to their initial positions at the Creation. The anonymous computist of 'Omnis compoti ratio' said much the same. He also contributed the term *perigenesis*, the natural circuit of the heavens, to describe the consummation of world history.[36] At some early date the figure of 36,000 solar (i.e. tropical) years attached itself to the doctrine. Ashenden rightly observed that neither Plato nor Calcidius (by whose commentary a fragmentary Latin version of the Timaeus was preserved for the Middle Ages) had anything to do with the 36,000 year period.[37] Precisely why 36,000 was originally chosen remains obscure. Later, the fortuitous correlation with the findings of Hipparchus on the movement of the eighth sphere were seized upon. And there seemed to be overall agreement with series of planetary conjunctions. For the Capud Draconis was together with Saturn and Jupiter once every in 144 conjunctions of the two superior planets. Twelve times that number, 1728, would represent this extremely rare alignment occurring in each sign of the Zodiac. Given that Saturn-Jupiter conjunctions take place every 19 years, 314 days, this great round of conjunctions would span 34,416 years--a number not far

[36] 'Et dicitur perigenesis a *peri* quod est circuitio et *geneos* quod est natura, quasi circuitio seu revolutio naturalis.' Summa II.2.2, f.14ra. See below, p.113.

[37] See Timaeus a Calcidio translatus commentarioque, ed. J.H. Waszink (London and Leiden, 1962).

removed from 36,000, at least in Ashenden's mind.

There were, in any event, competing values for the Great Year. Ashenden observed that Macrobius and an unnamed commentator on the Timaeus[38] posited a Great Year of 15,000 solar years. Hermes and Firmicus defined the *apocatastasis* (return of the stars) as 300,000 years.[39] How these figures were arrived at, no one volunteered to explain. The more serious contending value of 49,000 years, was a parameter from the Alfonsine tables; but Ashenden mentioned it only in passing.

Ashenden mentioned a number of shorter chronological units. A certain Johannes Rocensis claimed that all the heavenly bodies return to the same relative positions every 535 years.[40] This appears to be a mistake for the 532-year cycle (19 x 28) used in perpetual Easter tables. Also mentioned is a 640-year period founded on the theory of trepidation of Thabit ibn Qurra, but the details of this were provided by Albumasar. The sphere of the fixed stars was thought to oscillate through a range of about eight degrees over eighty years. Eight repetitions of the oscillation, each representing one of the stellar or planetary spheres, was 640 years. The period was reputed

[38] That commentator was, almost certainly, William of Conches. Glosae super Platonem I.3; ed. E. Jeauneau (Paris, 1965), 187-8. William had lifted his description of the Great Year from Macrobius, Commentarius II.11.10-11.

[39] 'Presertim cum trecentorum milium annorum maior apocatastasis id est mundi redintegratio, per pyrosim vel per cataclismum' Summa I.2.2, f.14rb

[40] 'Et magister Joannes Rocensis (*Cretensis* ed.) dicit quod post 535 (*525* ed.) annos omnes stellae et omnes planetae ad eundem punctum redeunt et per easdem lineas ut prius vadunt.' ibid.

to have significance in royal and religious affairs.[41] In his book on conjunctions Albumasar also made use of a period of 300 years, which approximates ten revolutions of Saturn in its orbit. The interval between Alexander the Great and the Nativity supposedly bore the mark of one of these Saturnian cycles. Finally, Ashenden borrowed Albumasar's table of the planetary-years, known as *anni fardarii*.[42] These units were to be applied later in reckoning the lasting power of celestial influences of astronomical events.

However interesting these speculations might have been--and there are good reasons for thinking that some scholastics regarded them highly--it was plainly not Ashenden's intention in the Summa to delve into computistical and astronomical digressions when their applications were controversial. We shall see later that Thebit's trepidation in particular was taken up by those who professed an interest in the 'science' of prophecy. That was not Ashenden's department.

41 'Alii etiam ponunt magnum annum continere 640 annos in quo scilicet tempore debent contingere mutationes regnorum et sectarum et illud sumunt accessionis et recessionis octave spherae secundum viam Thebith...Et iam dixerunt imaginum domini quod orbis celestis habet motum 8 gra. in quibus accedit et recedit, et quod accessus eius in omnibus gradibus et recessus erit in omnibus 80 annis.' Summa ibid.

42 Introductorius maior VII.8. And see Kennedy, art.cit., 28-30.

3. Astrological Texts and Theory

The numerous writings Ashenden brought together in his Summa can be roughly divided into three categories: treatises of theoretical importance, introductions to astrological judgements, and minor tractates. Some writings stood naturally higher than others; and some, though of intrinsically small stature, perched themselves high on the shoulders of the true giants. We cannot know whether Ashenden wished to lift his reputation by perching on others' shoulders; but it is clear that he sought out the authorities who spoke most reasonably about astrology. Indeed, he made a list of recommended reading:

1. Ptolemy, Quadripartitum, specially book II.
2. Messahalla, De coniunctionibus et de revolutionibus annorum mundi
3. Albumasar, De coniunctionibus magnis
4. Aomar and Alkindi in the Liber novem iudicum
5. Abraham Judeus (ibn Ezra), De revolutionibus annorum mundi
6. John of Seville, Quadripartitum
7. Albumasar, Experimentorum
8. Albumasar, De floribus
9. Haly Abenragel, De iudiciis, book VIII
10. Albertus Magnus, De proprietatibus elementorum
11. Albertus Magnus, Liber metheororum (commentary on Aristotle's Meteorologica)

Each of the eleven named works, it is true, had a role to fill in the Summa; together they represent nearly half of all the citations in Ashenden's book. Yet it would not be sufficient for us to categorize authorities solely by the number of citations, when Ashenden's hierarchy of authority was not nearly as straightforward as that, particularly among the minor tracts. At least at the top of the heap of sources the matter is discernible. Two

great and dominating sytematic treatises, the De coniunctionibus magnis of Albumasar, and Ptolemy's Quadripartitum, formed the bulwark of the Summa. These writings took the upper place because they enunciated the theoretical principles which were fundamental to natural astrology; and further, these works were invariably accepted as definitive. Beneath Albumasar and Ptolemy rested a stratum of authors of introductory or encyclopedic writings that provided necessary grounding in the details of astrology. A lower tier of authority comprised the aphoristic tracts and other minor veins yielding useful knowledge.

i. Albumasar and Ptolemy

To begin, let us work from the top. Without a doubt, Albumasar (Abū Ma'shar, died A.D.885/6) was the foremost authority of astrological doctrine in the Summa.[1] Ashenden utilized all of his significant works: the Introductorius maior, De coniunctionibus magnis, Flores and Liber experimentorum. Of these, the De coniunctionibus magnis supplied one of the pillars of Arabic astrology transmitted to the West--as its name implies, the theory of great conjunctions. Albumasar asserted that the movement of the planets in their spheres could be related to three types of natural motion: about the centre of their spheres, toward the centre, and away from it. For Albumasar, the motion about the centre was the most significant; for the cycles of this planetary motion provided a celestial clockwork by which events on earth could be explained and placed in the order of time. The

[1] Carmody 88-101. David Pingree's offers a good account of Abū Ma'shar and his astrological writings in DSB i.32-39.

orbit of each planet defined a certain time-unit for the universal clock. Mercury and Venus travelled more or less along with the Sun, making their circuit in roughly a year. The superior planets--Mars, Jupiter, and Saturn--moved more slowly; Mars with a period of about 1.88 years, Jupiter 11.86 years, and Saturn 29.46. (These are modern determinations.) Another convention stipulated that the greater the period of revolution, the greater the significance of the celestial influence. Thus the orbit of Saturn had greater force behind it than did the orbit of Mercury. The motion of individual planets lent itself well to astrological symbolism. However, Albumasar and other astrologers of the Arabic inheritance underlined the importance of planetary conjunctions (the gathering of planets in a certain part of the sky), as indicators of momentous occasions in history. It was discovered that conjunctions of the superior planets occurred with a regular periodicity. Mars and Saturn would pass close together in the space of two years or so. Jupiter and Saturn would meet once in twenty years. In a series of twelve conjunctions the two planets would meet in the same set of three zodiacal signs, known as a *triplicity*; in approximately 240 years the conjunction pattern would change triplicity. The first conjunction after the such a change was known as a great conjunction (*magna coniunctio*). A 'greatest conjunction' (*maxima coniunctio*) would occur when Jupiter and Saturn met in the first sign of the Zodiac, namely Aries. This happened once in a period of 960 years. The trick was to relate conjunction cycles to events in human history. Conjunctions of Jupiter and Saturn were reputed to signify such things as the rise of prophets, the establishment of new religions, and the fall of kings. Conjunctions of Mars and Saturn (*coniunctio duarum infortunarum*) invariably signified disasters: war, famine, earthquakes, floods, and

pestilence.[2]

Indications are that Ashenden closely studied the De coniunctionibus magnis. The work is cited frequently in every part of the Summa; and at least one point Ashenden remarked on the condition of the Latin text.[3] Normally, when he spoke of the universal accidents of the world, in the Summa or his prognostications, he meant the events signified by conjunctions; and conjunctions were always associated with the name *Albumasar*.

If Ashenden was obliged to accept the centrality of the theory of great conjunctions enunciated by Albumasar, he yet felt more sympathy for the doctrines of Ptolemy, and held his Quadripartitum (Book in Four Parts, *Tetrabiblos* in Greek) in highest regard.[4] Ptolemy's treatise had the greatest number of citations in the Summa, being mentioned in eighty chapters--despite the fact that Ashenden studiously avoided the judgements on nativities in Quadripartitum III and IV. However, the Quadripartitum did not stand on its own; the commentary by Haly Ridhwan ('Alī b.Riḍwan, died ca.1068) made a strong showing in Ashenden's usage of Ptolemy. In a majority of his references to Ptolemy's treatise Ashenden noted Haly

[2] I avoid any dull recitation of the countless *regulae* by which these events were predicted. For a good survey of this material, see J.D.North, 'Astrology and the Fortunes of Churches', Centaurus 24 (1980), 181-211.

[3] He complained of scribal errors and obscure language. Summa I.2.11, f.18r. Ashenden was working from the translation made by John of Seville.

[4] 'Ptolomeus enim quem inter omnes reputo valentiorem in libro Quadripartito valde rationabilis procedit hac materia.' Summa I.proem, f.2rb. F.E.Robbins compiled a handy edition of the Greek text with an English translation for the Loeb Classical Library, Tetrabiblos (Cambridge, Mass. and London, 1940).

with the same penstroke, as if Ptolemy and Haly were co-authors of a unified work. That the two were virtually inseparable in his eyes indicates that he considered the Quadripartitum text accompanying Haly's commentary the authoritative 'edition'. (Of course we are speaking of the Latin translations here.) Nonetheless, an allowance for authority did not prevent Ashenden from consulting other texts, or from pondering other readings. As we shall see, he was enterprising enough to look into matters just that little bit further.

Our knowledge of Ashenden's reading of the Quadripartitum is supplemented by the highly annotated copy of it, with the commentary of Haly, possessed by Simon Bredon, i.e. Digby MS 179. I have suggested above, on the evidence of the contents of this manuscript, that Bredon was giving cursory lectures on the Quadripartitum during the 1330s and/or 1340s. At the very least Bredon had made a thorough study of text, as is indicated by his paraphrase and marginal notes. Two texts were available to Bredon: one anonymous translation made directly from the Greek, and the version set with Haly's commentary.[5] Obviously indebted to these texts (but depending far less on the Greek translation), Bredon's version differed from them in so far as he did not use their exact wording. His only substantive change, so far as I have been able to tell, was to simplify the terminology of zodiacal triplicities. Aegidius used both *triangulus* and *triplicitas* to refer to these groups of three signs. The anonymous translator has *triplicitas*, *trigonalitas*, and *trigonum*. Bredon chose to use *triplicitas* exclusively.

[5] Carmody 19. According to Carmody, Henry Bates quoted from the anonymous translation in 1281. The commmentary version was translated from Arabic by Aegidius de Tebaldis.

Whether Ashenden was working directly from Digby MS 179 or from other notes, the rendition of the Quadripartitum he incorporated into the Summa shows signs of Bredon's influence in its wording. On the other hand, the commentary of Haly had its role to play in the presentation of Ptolemy's mind. Ashenden mixed and matched Bredon and Haly to achieve his own paraphrase, as we can see from the passage below. The words of the anonymous translator are included here for comparison:

Bredon Quadripartitum II.3 Digby 179, f.50r (margin)	**Ashenden Summa I.8.2**
Quam igitur ita sunt habitationisque nostris locus in quattuor partes dividitur que triplicitatibus in numero equales; eiusque latitudo dividitur a linea que transit per nostrum mare et incipit a loco qui vocatur transitus Abrucalis pervenitque ad flumen quod dicitur Citicon et est in dorso montano quod ei ex orientali parte subsequitur. Et per hanc lineam dividitur quod est inter septentrionem et meridiem.	Deinde dicit Ptolomeus quod locus habitationis in quattour partes dividitur secundum numerum triplicitatum sicut prius dictum est. Dividitur etiam eius latitudo per lineam equidistantem equinoctiali diei separantem medietatem eius meridionalem a medietate eius septentrionali; et incipit hec linea in parte occidentis a passagio Hercolis procedens ad brachium maris vel a flumen que dicitur Citicon, et est in dorso montano quod ei ex parte orientali subsequitur.
Text in commentary. Digby 179, f.50rb:	**Anonymous translation.** Digby 179, f.181ra:
Et postquam hec ita sunt et locus habitationis nostre dividitur in quattour quarta equalia cum numero trigonorum eius latitudo dividitur per lineam que transit per nostrum mare et incipit a loco qui dictus est passagium Eruclis	Hiis ita se habentibus, et divisa habitabili que secundum nos in quattuor quartas numero equales trigonalitatibus secundum quid a mari quod scilicet nos agabibus Herculi usque ad Issicum sinum et deinceps usque ad orientem per mundana a qui-

et vadit usque ad brachium maris quod vocatur Citacio. Et est inespaldis serarum que se tentent cum illo de parte orientis. Et per hanc lineam dividitur id quod est a parte meridiei et eius de septentrione.

bus distinguitur australis et borealis ipsius pars...

The Summa rendition is clearly under obligation to both Haly and Bredon. Following Bredon, Ashenden adopted the term *triplicitas* for *numerum triplicitatum*.[6] And the passage *dicitur Citicon...subsequitur* was borrowed verbatim. However, Bredon's garbled *transitus Abrucalis* is rejected in favour of *passagio Hercolis* along the lines of Haly. As for the body of water called *Citicon*, it was either a river--according to Bredon--or an arm of the sea, as Haly had it. Since there was no way of telling the truth of the matter, Ashenden gave both possibilities.

The outstanding feature of the Summa text here is Ashenden's restructuring of the passage. His sentence describing the line dividing the habitable world into North and South, *Dividitur...septentrionali*, corresponds with the final sentences in the Bredon and Haly passages; but Ashenden put it earlier in the discussion, arguably in a more logical position. He also added his own point of clarification--that the line of latitudinal division runs parallel with the equator. Haly in his commentary remarked on Ptolemy's intended meaning concerning the dividing line: '[Ptolomeus] Vult dicere quod hec est linea que dividit habitationem terre per duo media, unum septentrionale et alium meridionale.' Perhaps on the

[6] I should point out that Ashenden was not consistent in his use of *triplicitas*. He evidently did not feel Bredon's desire for terminological exactitude. As a rule, Ashenden was content to employ the language of the authority of the moment.

weight of this statement, Ashenden wanted to make clear that the line divided the inhabited world into two equal *halves*.

In the above passage there is no correlation between Ashenden's version and that of the anonymous translator. On other occasions when confronted with a corrupt or difficult text, Ashenden turned for guidance to the anonymous translation, and even to a fourth version, specially when the Bredon and Commentary renditions were at odds. A case in point: In the description of Scorpio, the commentary text has that the sign's leading portion creates thunder and is of a dry nature, *facit grandinem et est sicca*. As Bredon rendered it, this part of Scorpio is suffused with wind and snow, *comixte cum vento et nive*. Ashenden then summoned the anonymous version, reporting it as 'unum alium textum', which gave this part a cloudy nature, *est nebulosa*. That appears to be Ashenden's understanding as well; and he introduced a fourth text in support, reading *est humida, nubilosa*. The choice was reasonable, but Bredon's rendering was more accurate. Robbins' translation from the Greek reads: 'The sign of Scorpio as a whole is marked by thunder and fire, but taken part by part, its leading portion is snowy, its middle temperate, and its following portion causes earthquakes.'[7]

Ashenden's attention to detail illustrates his experience with the Quadripartitum text and its associated tradition. His textual criticism, if we may call it that, was a cut-and-paste procedure. Its objective was to save the phenomenon of Ptolemy's intent, and not necessarily his words. In any event the kernel of astrological doctrine, the theory of eclipses, was preserved. Ptolemy

[7] Tetrabiblos II.11; transl.cit., p.205.

regarded eclipses as momentous because they supposedly focussed the diverse virtues of the celestial spheres on the Earth. For an eclipse to occur, the centres of the Sun and Moon had to form a straight line with the Earth. The alignment effectively served to mix solar, lunar and stellar influences. The luminaries naturally were the principals of any eclipse, but a large part of the force upon the Earth depended on the virtues of celestial bodies that might be implicated.[8] Eclipses had major and minor effects. They had a temporary effect on the climate. These weather changes were considered minor results, because any celestial event could exert an influence on the atmosphere. Eclipses had consequences in other areas; and they normally signified happenings of epic proportions such as wars, pestilences, famines, floods and earthquakes. Although eclipses could have beneficial effects, more often than not they represented impending disaster.

Not only did Ashenden follow the general doctrine of eclipses, but he took to heart Ptolemy's suggestions on the methodology of astrological predictions. This will be discussed in a later section. Presently, we turn to other conventional fountainheads of judicial astrology from which Ashenden gleaned his material.

[8] 'Illud idem contingit in oppositione eclipsali quando virtus cuiuslibet eorum provenit ad terram super unam rectam lineam quae transit per duo centra eorum et per terram, et de eis sit una mixtio et similiter omnes virtutes stellarum hora qualibet commiscentur. Accidet tamen quod alia hora erit fortior commixtio et alia hora debilior et virtus specialis tendit ad virtutem stellae maioris posse unde in eclipsi concurrunt similiter virtutes aliarum stellarum et fit tunc virtus magna.' Summa I.3.1, f.19r; cf. Quadripartitum II.4.

ii. Introductoria

On a level of worthiness, in Ashenden's eyes, just below that of the Quadriparititum and the De coniunctionibus magnis, was a class of introductory astrological manuals. These dealt with the working principles and conventions of astrology: the division of the sky into twelve houses, the temperament of the zodiacal signs, planetary influences, operations of the fixed stars, and so on.[9] Of no mean substance, the *introductoria* were normally products of scholars of repute. Still, Ptolemy and Albumasar contributed many details in their own writings, Albumasar in his own Introductorius, but I intend here to recognize the other authors of whom Ashenden took note.

The Liber introductorius of Alchabitius (Abu's-Ṣaqr al-Qabī'ṣī, active in Mosul in the mid-tenth century), translated by John of Seville, contributed a whole spectrum of fundamental information on universal prognostications.[10] Despite its utility as a handbook of Arabic astrological practice, the Introductorius does not figure conspicuously in the Summa. It rises to some prominence in Summa I.12; elsewhere it appears but sparingly. Ashenden gave little thought to Alchabitius' position as an independent authority. His testimony stood in the shadow of opinions forwarded by Albumasar and Ptolemy. Evidently Ashenden never got sight of John of Saxony's commentary on the Introductorius, to which there

[9] The tools of the trade are described in many places. My basic reference has been Michael R. Meyer, A Handbook for the Humanistic Astrologer (Garden City, 1974).

[10] Sarton i.669. Carmody 144-49.

is absence of any reference in the Summa. Completed in Paris in 1331, the treatise of John of Saxony acquired a good reputation and made Alchabitius fashionable among astronomers. It is noteworthy that in fifteenth-century Oxford, Alchabitius was the most regularly lectured-on astrologer next to Ptolemy. No less ironic is the fact that Ashenden himself was named as an Alchabitius expert in a later commentary on the Introductorius.[11]

The De iudiciis astrorum of Haly Abenragel ('Alī ibn abi 'r-Rijal, died after 1040 A.D.)[12] was another work with considerable impact on the Summa. Strangely enough Ashenden extracted only from the final, eighth book. There is no good reason to think that this was all that was available. In the manuscript tradition of the De iudiciis, so far as it is known to me, there is no tendency for the last book to be separated from the balance of the work. Two surviving fourteenth-century copiesof English origin have the complete text.[13] It is evident, then, that Ashenden found Book VIII of greater utility for his purposes than other sections of the De iudiciis; and a survey of Haly's composition will tell us why. The first three books are devoted to astrological questions or interrogations, together with some material on dreams and alchemical procedures; Books IV and V cover nativities, and Book VII elections. The expressed understanding of Ashenden was that these topics lie outside the realm of the Summa.[14]

[11] Venice, Bibl. Marcianna MS VIII.30, dated 1393. HMES iii.600.

[12] Sarton i.715-16. Carmody 150-52.

[13] BL Royal MS 12 F.xvii, ff.5-171r. Corpus Christi College, Oxford, MS 151, dated 1380.

[14] Summa II.proem, f.85rb-va.

We are still left to wonder why Ashenden passed over De iudiciis VI in silence. That book deals with celestial cycles, *de revolutionibus*, which would seem very pertinent; but for one reason or another he neglected it in favour of VIII. The attractiveness of Book VIII itself is readily apparent. A generous compendium of doctrines on universal accidents, it made a good quarry for Ashenden's citation digging. In it he found judgements on harvests, wars, kings, commoners, plagues and storms. Yet Ashenden was particularly taken with Haly's treatment of the geographical aspects of astrology. Astrological geography supposed a correspondence between locations on the Earth and celestial movers. Determining the correspondence was preliminary to judging the locality influenced by any astronomical event. Additionally, the temperament of the native people of any region could be defined in terms of reputed planetary and zodiacal emanations.[15]

Now we turn our attention to those introductory writings used less extensively by Ashenden. These were without exception astrological works of high standing; but stored in themselves either less material of independent value, or were not directly relevant to the discpline of universal predictions. As a prime example of the former category we have the Quadripartitum of John of Seville, which played a surprisingly minor part in the Summa despite being on Ashenden's list of recommended reading. Seville's work probably received its commendation for the orderliness and succinctness with which it was written. The Quadripartitum also gave fairly complete treatment of astrological judgements. In short it made the perfect

[15] Ashenden discussed astrological geography in Summa I.8. He cites De iudiciis astrorum VIII.8, 10, 34, 36-7; and Quadripartitum II.2-3,5.

vade-mecum. Yet winning marks for presentation did not hide the fact that the Quadripartitum was derivative in content. Whatever John of Seville said had been previously formulated elsewhere.

A treatise described as the Introductorius of the twelfth-century astrologer, Roger of Hereford, is mentioned by Ashenden three times.[16] None of Roger's extant writings bears that title, but his De iudiciis, itself a fairly obscure work, may have been intended. Alternatively the citations may have been from a misattributed copy the Introductorius of Michael Scot.[17] On the other hand, the catalogue of John Erghom's library records excerpts from an Introductorius of Hereford.[18] Ashenden's references, which are of a minor character, do not provide much evidence for us to pursue the matter further.

The Introductorium of Zael (Sahl b. Bishr, Zahel Benbriz, a Jewish astrologer active about 800 A.D.), turns up in the Summa with the same frequency of Hereford's treatise.[19] However, Zael's tract represents quite a

[16] Summa I.12.4, I.12.6-7.

[17] No fewer than four versions of Roger's De iudiciis exist in the manuscripts; and it is quite possible that they do not represent a unified work. C.H. Haskins, Studies in the History of Medieval Science (Cambridge, Mass., 1924), 124-126. J.C. Russell, 'Hereford and Arabic Science in England about 1175 - 1200', Isis 18 (1932), 14-25. On Scot's Introductorius, see Lynn Thorndike, Michael Scot (London, 1965), passim. Bodley MS 266 is a copy.

[18] Cavanaugh i.314.

[19] Summa I.7.13, I.12.2. I.12.7. For Zael, consult HMES ii.390, Sarton i.569, and Carmody 40-43.

different genre of astrological learning. Primarily a work on interrogations, the Introductorium was out of place in the context of the Summa. It seems that Ashenden was more than willing to consult writings of all types in his search for material relevant to universal predictions. Notices in the Summa of the De nativitatibus of Aomar (Aṭ-Ṭabarī, died in Bagdad, ca. 815/16)[20] and a treatise of Abraham ibn Ezra (died 1164) by the same title[21] reveal that Ashenden had dug into other treatises which were not immediately germane. And his excavations yielded some ore. From Zael Ashenden extracted judgements on the qualities of the twelve houses. Ibn Ezra added his opinion on the rulership of Mars over the wild Scots, while Aomar's account of the 'magnus orbis' was taken as superior to that of Albumasar.[22]

It is noteworthy that Digby MS 212 is, in all probability, the very book in which Ashenden read Ibn Ezra, as well as the Roman astrologer Julius Firmicus Maternus (fl. ca.340). Formerly in the Merton Library and dating from the mid-fourteenth century, Digby MS 212 contains Ibn Ezra's astrological works, including the De nativitatibus just mentioned; and books I-IV of the Mathesis of Firmicus.[23] But we are well advised to be cautious. Ashenden reproduced his sources with a good deal of accuracy. In the case of Ibn Ezra he used two

[20] Carmody 38-9.

[21] Summa I.4.4, I.7.13, I.8.4, I.9.5. Lynn Thorndike, 'The Latin Translations of the Astrological Tracts of Abraham Avenezra', Isis 35 (1944), 296-7.

[22] Summa I.1.4.

[23] Not to mention Robert of Leicester's three-part Compotus. Ker lists Digby MS 212 among the books of Merton. MLGB 148.

forms of the name, *Abraisinus* and *Avenazre*. This just possibly indicates the use of two different copies or versions of the Ibn Ezra material.

It is striking that two venerable texts, the De sex rerum principiis ascribed to Hermes Trismegistus[24] and the Mathesis of Firmicus Maternus, were nearly always cited together in the Summa. Ashenden found it expedient to quote them on such diverse topics as the Creation and the motion of the wind. Silverstein, the editor of the Hermetic tract, found numerous correspondences between Firmicus and the De sex rerum principiis. It is illustrative of Ashenden's scrutiny of the literature that he too recognized some of the correlating passages.[25] The Hermetic text is interesting on a further count. In a discussion on the Creation in his De causa Dei, Thomas Bradwardine referred to a De celo et mundo of Hermes, which is none other than the De sex rerum principiis. Silverstein was able to confirm that the text available to Bradwardine belonged to the tradition of Bodley MS 464, which in the fourteenth century was possessed by the Benedictine monk, Michael of Northgate, of St. Augustine's Abbey, Canterbury. Moreover, Ashenden quotes the same passage as Bradwardine. This is an entriguing, if tenuous, indication of a link between Ashenden and Bradwardine, and between Oxford and Canterbury.

[24] Theodore Silverstein, ed., 'Liber Hermetis Mercurii Tripliciis De vi Rerum Principiis', AHDLMA 30 (1955), 217-302.

[25] For instance Summa II.6.5: De principiis IV.2 and Mathesis II.11. Summa II.8.2-3: De principiis II.1, Mathesis III.1.9. I have checked the Summa and Hermetic passages against the edition of W.Kroll and F.Skutsch, Iulii Firmici Materni Matheseos, vol. I (Leipzig, 1889).

iii. Minor Tracts

Attributed to Ptolemy, the Centiloquium (*fructus*, or *karpos* in Greek), is a listing of 100 aphorisms on astrology, regularly appearing in the Latin versions with a commentary of Haly Ridhwan.[26] The main value of the Centiloquium, and the genre it inspired, was that it supplied terse, quotable maxims. Even so, Ashenden was not too keen to litter the Summa with these little jewels. He had more of a head for long expositions than a heart for quick, pithy phrases. So when he does cite one of Ptolemy's propositions the remarks of the commentary are always to be found nearby. Ashenden had occasion to cite ten of the propositions (nos. 1, 12, 24, 50, 58, 63, 64, 98, 99, 100). Of these he leaned most heavily on 99 and 100, those dealing with the nature of comets.

A number of minor tracts emulated the aphoristic style and numbered propositions of the Centiloquium; and picking through these *opera*, Ashenden uncovered a few mentionable items. A Centiloquium of Hermes is quoted four times in the Summa. The Hermetic Sermo de accidentibus, a collection of thirty-eight sayings, also caught Ashenden's attention. The text of the Sermo is embedded in Haly's commentary on the Quadripartitum; only in later manuscripts does it appear independently.[27] Also in the centiloquium genre we find the Capitulorum, 150

[26] Carmody 16. Sarton iii.431. It has been determined that Aḥmad ibn Yūsuf was the author of the Centiloquium.

[27] Carmody 55. HMES ii.222. Both take it as an independent work. Thorndike interpreted a copyist's remark in Harley MS 3731, 'rescriptus ab Haly' as meaning that the Sermo was rewritten by Haly before it was translated into Latin. But the scribe obviously meant that he was extracting this from the Haly commentary.

propositions of Almansor or Rhazes (Ar-Razi), twice cited by Ashenden.

Messahalla (Māshā'allāh ibn Atharī al-Basrī, died ca.815) added two little treatises to Ashenden's bibliography.[28] His De rebus eclipsium, known to Ashenden (and rather confusingly for us) as the Epistola in eclipsibus lune et coniunctionibus, drew references in no fewer than 22 chapters in the Summa. It was a unique source of information on the import of so-called minor conjunctions of Mars and Jupiter. Messahallah's De revolutionibus annorum mundi specialized on the fortunes of kings and kingdoms. Consequently, its application in the Summa was limited to the final distinctions on famine and warfare. Abraham ibn Ezra composed a tract which in Latin was also entitled De revolutionibus annorum mundi.[29] Ashenden quoted from twelve of its twenty chapters. Two more of Albumasar's works, his Flores and Experimentorum, found a place in the Summa. Both are tedious, if relatively brief; and both list the effects of hypothetical celestial alignments.[30]

[28] See Lynn Thorndike, 'The Latin Translations of Astrological Works by Messahalla', Osiris 12 (1956), 62-6.

[29] Thorndike, 'Astrological Tracts of Abraham Avenezra', 294-5.

[30] Carmody 92-4.

Other small-scale works noted in the Summa include a Liber de stellis, herbis et lapidibus 15 associated with the name Hermes *Abhaydimon*[31] and the Flores super Saturno whose author Ashenden called 'Sem filius Haym'. It is likely that this text was an offshoot of the first chapter of Albumasar's Flores, but a copy formerly owned by the Oxford Franciscans grants authorship to Sem.[32] A De existentia planetarum sub radiis of 'Haly' received greater attention.[33] The De existentia operated on the assumption that planets lost their effectiveness when they came into conjunction with the Sun. This figures into some of the judgements in Ashenden's prognostications.

One of the Summa's most intriguing sources is the so-called Liber novem iudicum (LNI), an anonymous compilation from the doctrines of Abenaiat, Messahallah, Dorotheus, Jergis, Aristotle, Albumasar, Aomar, Alkindi, and Zael--hence the title, the Book of the Nine Judges. The work dates from the late twelfth century, surviving, as Carmody would have it, in two recensions (naturally, I

[31] Summa II.4.3. For the De quindecim stellis, see Carmody 56; Thorndike, 'Traditional Medieval Texts concerning Engraved Astrological Images', in Mélanges Auguste Pelzer (Louvain, 1947), 224-227. L.Delatte edited the tract in Textes latins et vieux français relatifs aux Cyranides (Liège, 1942), 241-275. I suspect that the copy on Ashenden's desk was closely related to the text represented in Ashmole MS 341, another manuscript of St.Augustine's, Canterbury. MLGB 45.

[32] Digby MS 93 ff. 1-2r, s.xiv. Carmody 97. Cited in Summa II.6.7, II.9.3, II.10.3, II.11.2.

[33] Summa I.4.1-7, II.1.1, II.2.1, II.3.1, II.4.2, II.5.2, II.6.6. Carmody gave the title Tractatus de subradiis and attributed the piece to Alkindi. Attributions to Messahalla and Hippocrates also exist. Carmody 81-2.

and II).[34] Ashenden mainly extracted from LNI - II, chapters 482-494, containing the opinions of Alkindi, Aomar, Albumasar, Dorotheus and Jergis on weather predictions.[35] As it happens, the chapters associated with Aomar, LNI-II 482-487, bear a startling resemblance to Haly's De iudiciis astrorum VIII.26-31, in which the name *Atabari* appears. Ashenden used both in close proximity, in Summa II.2.2 for example, but did not remark on their relatedness.

Other minor writings were attributed to ancient Greek authors. Ashenden refered once to a certain book ascribed to Aratus. Whatever be the truth of its authorship, this book is to be identified with the Opusculum de ratione spere now found in a Digby manuscript.[36] The Opusculum received its title and the attribution to Aratus from its concluding section, dealing with the sphere, in which Aratus is mentioned. In both substance and form this work has more to do with the De astronomia of Hyginus than with Aratus. B.S. Eastwood has also identified some Plinian influences.[37] For the risings and settings of certain stars, Ashenden consulted an epistle said to have been

[34] Carmody 103-112. For the dating of the earliest fragment of the Liber novem iudicum, All Souls MS 332, see MMBL iii.591-2. The manuscript antedates emperor Frederick II, to whom the LNI was reportedly sent by Ashraf, the Sultan of Damascus.

[35] Two fourteenth-century copies of LNI-II are Digby MS 47, ff.104r-127v, and Cambridge, Pembroke College MS 227, ff.107-115.

[36] Digby MS 83, ff.76., s.xii init. The Opusculum is cited in Summa II.8.2, f.153rb.

[37] Cf. Hygin L'Astronomie, ed. and transl. André Le Boeuffle, (Paris, 1983). B.S. Eastwood, 'Plinian Astronomy in the Middle Ages and Renaissance', in Science in the Early Roman Empire: Pliny the Elder, his Sources and Influences, eds. R.French and F.Greenway (London, 1986), 205.

composed for a certain Ariston (or Heristhon) by Ptolemy, King of Egypt, who was to be distinguished from Claudius Ptolemy, the celebrated astronomer.[38]

A De dispositione orbis et temporis, considered in medieval times a Ptolemaic treatise, offers us a rather unexpected addition to the astronomical writings of Antiquity transmitted through Islam to the Medieval West. The De dispositione is in fact a Latin version of the Isagoge of the Greek astronomer, Geminos, perhaps translated by Gerard of Cremona.[39] Ashenden, to be sure, was obvious to its true identity, yet from the citations to it in the Summa we can speculate about the constitution of the Latin version available in Oxford. In the prologue to Summa Book I, Ashenden gave the initial words of (a chapter of) the De dispositione as: 'Sermo de nubibus apud homines vulgi...'. This matches the beginning of Isagoge, Book XVII. Simon Bredon included some pieces of the De

38 'Et nota quod iste non fuit idem Ptolomeus qui scripsit Almagestum et librum Quadripartiti sed fuit unus de regibus Egipti.' Summa I.10.12, f.62va-b. Also cited in Summa I.12.1, f.67vb; II.4.3, f.109rb; II.6.7, f.139ra. Peter Liechtenstein edited the tract under the title, Liber diversarum rerum (Venice, 1509). It was also called De iudicia, and often was attributed to Aristotle. See C.B. Schmitt and Dilwyn Knox, Pseudo-Aristoteles Latinus, Warburg Institute Surveys and Texts XII (London, 1985), 35-7.

39 Introduction aux Phénomènes, ed. Germaine Aujac (Paris, 1975) is the most recent edition of the Greek text. The De dispositione was known to Grosseteste, Albertus Magnus and Roger Bacon. It also went by the titles De dispositione spere and Introductorius ad artem sphericam. At least five manuscripts of the Latin translation survive. Aujac, civ-cviii. ThK 442. I have seen it in a photocopy of BN lat. MS 16198, ff.166-177v, s.xiv.

dispositione in his miscellaneous notes.[40] . The two men might have read from the same exemplar, perhaps containing Book XVII alone. At least one manuscript copy shows that the portion beginning with Book XVII stood on its own.[41] However, other references to the De dispositione in the Summa have Isagoge Book II as their origin.[42] On the strength of this, I am inclined to think that Ashenden had the complete Latin text. The transparent reason for his special interest in Book XVII, which dealt with meteorology, was his particular interest in its subject matter. That leads us to Ashenden's treatment of meteorology itself.

[40] Digby MS 178, f.14r. Excerpts from Isagoge XVII.21-49

[41] Klagenfurt MS XXX.d.4, ff.139-42v, 149v-50v?, s.xv/xvi, with incipit as given by Ashenden. (Cf. ThK 116) The colophon reads: 'Sequitur nunc compendium de stellis fixis quod ad mutationem aeris facit secundum intentionem Ptolomei et antiquorum sapientium observationem extractum de tractatu Introductorii in artem sphaere.'

[42] Quotations in Summa II.6.5, ff.132vb, 133rb, correspond to Isagoge II.8 and II.9 respectively.

4. Meteorology

We come now to the central theme of the Summa, namely, the state of the atmosphere. Ashenden approached the matter from three not entirely complementary angles. He first considered the natural causes of various weather phenomena, explaining them in accordance with the Aristotelian physical system of the day. Then he furnished the astrological *regulae* for predicting each phenomenon in turn. And finally the 'traditional' or natural signs of weather change were set forth. Each of these aspects of the discussion (natural philosophy, astrological rules, weather signs) was virtually compartmentalized. That is, the three strands were not spun together but remained separate and parallel--Ashenden made no concerted attempt to validate astrological forecasting in terms of natural philosophy; nor were the natural signs treated with reference to astrological ones. Had he written a proper commentary on Aristotle's Meteors, no doubt his opinion of physical theories would have been better illuminated. But he did no such thing.

Common reference books lent a scholastic backdrop to Ashenden's treatment of the weather. For in spite of the expanding range of academic literature in the later Middle Ages there existed certain texts of established reputation or common currency among scholars. It was quite natural then that Ashenden used some of the most prominent medieval encyclopedists as the cornerstones for his meteorological discourse. His procedure was to elicit from these authorities simple definitions and descriptions of weather phenomena, to which he added the more detailed opinions of specialist natural philosophers. Isidore of

Seville's authority on the meaning meteorological terms seems to have carried some force. For further elucidation of the terminology Ashenden sought the aid of the Catholicon, a Latin dictionary prepared by Johannes Balbus of Genoa. With his De natura rerum the venerable Bede contributed a somewhat fuller account of the phenomena.[1] Ashenden also found the De rerum proprietatibus of Bartholomaeus Anglicus relevant on more than one occasion.[2]

i. The Physical Construct

For a full-blown physical explanation of meterological phenomena Ashenden turned to Aristotle, and specifically to his Meteorologica and Problems with the commentaries of Albertus Magnus and Peter of Abano respectively.[3]

[1] PL xc.187-292. Ashenden knew the De natura rerum as book I of a De temporibus. This is most likely because in his source manuscript the De natura rerum was brought together with Bede's computistical works--and the collection was represented as one treatise, as occurs in BL Royal MS 13 A.xi. See, C.W.Jones, 'Manuscripts of Bede's De Natura Rerum', Isis 27 (1937), 430-40.

[2] Summa II.6.3, II.7.1, both times refering to De rerum proprietatibus X, which I have checked against the Frankfurt edition of 1601 (reprt. 1964).

[3] Meteorologica, transl. H.D.P.Lee (Cambridge, Mass., 1952). Albertus Magnus, De meteoris, edited by A.Borgnet, B.Alberti Magni...opera omnia (Paris, 1891), iv.477-808. Peter of Abano, Aristotelis Stagirite philosophorum summi problemata atque divi Petri Apponi Patavini eorundem expositiones (Mantua, 1475). Concerning the Expositio, see Nancy Siraisi,'The *Expositio Problematum Aristotelis* of Peter of Abano' Isis 61 (1970), 321-39; and Lynn Thorndike, 'Peter of Abano and Another Commentary of the Problems of Aristotle', Bulletin of the History of Medicine 29 (1955), 517-23.

William of Conches' De philosophia mundi added several observations on the nature of wind, rain, thunder and lightning.[4] Albertus Magnus was the chief authority, no doubt because of his good reputation and the availability of a good manuscript copy of his De meteoris.[5]

Ashenden ordered all weather phenomena into eight headings; and to each category he devoted a separate distinction: (1) heat, (2) cold, (3) serenity, (4) rain and cloud, (5) snow and hail, (6) winds and storms, (7) thunder and lightning, (8) floods and earthquakes. The first three received no physical explication in the Summa, presumably because Ashenden held the fundamental qualities of heat and cold, dryness and humidity to be self evident. They were the basic elements of climate. Thus, with heat and cold he could pass over *bona temperantia aeris,* or serenity (which, when mentioned, always implied dryness), without further ado. On the other hand, rain and all forms of precipitation required consideration because they were rooted not simply in the principle of humidity, but in a complex pattern of alternating states of humidity.

The Venerable Bede stated that rain was the excess moisture in clouds when they became conglomerated in a large mass. The excess fell to earth.[6] According to Isidore rain, *pluvia,* was so named because it flowed like a river, *fluvia.* Rain developed from exhalations off bodies of water, which, at a great height in the air, were compressed into droplets either by the Sun's heat or the

[4] PL clxxii.75-84.

[5] Merton MS 285, ff.269ra-306vb, s.xiv partly in the hand of John Wyliot. BRUO iii.2119.

[6] De natura rerum, PL xc.253.

force of the wind.[7] These rather vague notions about precipitation were superseded by the treatment of William of Conches. For him, although rainfall might result from a number of causes, it stemmed principally from the cycle of evaporation and condensation of water. The heat of the Sun evaporated water on the earth's surface. The water vapour then rose into the atmosphere, where it cooled and condensed into droplets. When the droplets became too heavy to remain suspended in the air they would fall as rain.[8] This theory, not surprisingly, had come straight from Aristotle who regarded the Sun as the efficient cause of precipitation. The Aristotelian theory also recognized that the evaporation-condensation process formed a continuous natural cycle. 'One should think of it as a river with a circular course, which rises and falls and is composed of a mixture of water and air...and in this order the cycle continues indefinitely.'[9] Albertus Magnus observed that the principle of cold was essential to all types of precipitation. Water vapour would condense when the atmosphere was colder than the earth's surface. As Algazel put it, a layer of cold air at a certain altitude acted like a cover over a pot of boiling water--it would stop the ascent of rising vapours, and on its bottom side the vapours would coalesce into liquid.[10]

[7] Etymologiae xiii.10.

[8] William cited other causes of rain, and Ashenden noted them: the direct mutation of air into water, the falling of some water which the sun had raised for its own nourishment (!), and the blowing of water from the surface of lakes or seas. De philosophia mundi III.4; PL clxxii.76.

[9] Meteorologica I.9, 347 a 1-6.

[10] Albertus Magnus, De meteoris II.1.19.

Differences in temperature and the stratification of the atmosphere also accounted for other types of precipitation. Snow was simply vapour or cloud that froze before it could fully coalesce into water droplets. Robert Grosseteste thought that vapour was frozen when clouds rose into the second, cold layer of air.[11] When the amount of heat was small in proportion to the amount of evaporating moisture, the water vapour could not rise far above ground level, and it would fall again at night. This phenomenon was called dew. Frost occurred when these dew-forming vapours became frozen. An explanation of hail was less obvious. Hail was made of ice; yet it was observed that hailstorms commonly took place in warm weather during spring and autumn, and only rarely during the cold of winter. Aristotle suggested that in times of warm weather, pockets of cold air were be compressed by the heat surrounding them. This concentration of cold air, if sufficiently intense, would cause the rapid condensation and freezing of water vapour, thus forming hail.[12]

The winds were among the best classified and the least understood of all meteorological phenomena in the Middle Ages. By most commentators wind was simply defined as moving air. It seemed to Ashenden that a more careful definition was needed. He found the required precision in Seneca's words: Wind was flowing air, and 'anything that

[11] 'Et Lincolniensis in tractatu suo de generatione impressionum dicit sic: Cum vero ascendit nubes ad secundum intersicium aeris fit maior abstractio calorum, et destrituitur ampulla aque in nube penitus a calore sucessive cum quasi molle est quod relinquitur sicut lana et fit nix.' Summa II.5.1, f.117rb. Grosseteste, De impressionibus elementorum, ed. Baur, 89.

[12] Meteorologica I.12, 347b 34--349a 12. Summa II.5.1.

flows, flows in one direction. No one says that water flows if it moves simply within itself, but only if it is carried in one direction.'[13] Thus it made sense for the Greeks to have ordered the winds according to the directions of the compass. There were twelve winds in all: four primary winds associated with the cardinal directions, and eight collateral winds. The causes of these winds, however, were not obvious. Seneca thought that wind was caused by the movement of water vapour rising against mountains which channelled or redirected its flow. Bede concurred. Hermes emphasized the Sun's heating of the air as the main cause; but winds also blew from great underground caves. William of Conches agreed with this account. It was said that Ciclia was a windy region because of its many caverns. The sea also influenced the winds, for the Zephirus normally prevailed at high tide, and the Eurus at low.[14]

Comets likewise came under the heading of meteorological phenomena, since they were believed to exist in the upper reaches of the atmosphere. The main prospective source on the theory of comets was, as before, Albertus Magnus; but Ashenden turned instead to the writings of Perscrutator (sobriquet of Robert of York) and Robert Grosseteste. It seems likely that Ashenden

[13] 'Fluit in unam partem fluit nemo aquam fluere dicit sed tantum intra se movetur, sed si in unam partem.' Summa II.6.1, f.122va, quoting Seneca, Naturales Quaestiones V.1.4; ed. and transl. T.H.Corcoran (Cambridge, Mass., 1972), ii.77. It is noteworthy that Ashenden went to the primary source rather than depending on Albertus Magnus' report on Seneca. Albertus conveyed the same meaning, but did not use the same words, cf. Meteoris III.1.6.

[14] The causes of wind are debated in Summa II.6.1., ff.122ra-124va.

preferred their emphasis on observational experience rather than the letter of doctrine.[15]

The theory of Perscrutator had a certain alchemical ring about it. According to him, comets formed out of watery vapours that rose to a height where they became agitated by planetary forces. The process of agitation itself would generate the comet's light. The truth of this, so Perscrutator said, was borne out by a simple experiment. If one took ordinary water, filled a black bowl with it, and at night stirred the contents, it would glow with its own light![16] Ashenden was not impressed. But it is unlikely that he ever tried the water experiment; at least in the Summa he said nothing to dispute Perscruatator's claim.

Straight Aristotelian theory maintained that comets originated from exhalations of a hot-dry nature rather than a humid one. Hot-dry vapours were believed to be highly flammable; and because they were more subtle than water vapour, they could rise to greater heights. When these exhalations rose to the upper reaches of the atmosphere, they would be ignited by the friction of the rotating heavenly spheres. Often the burning vapours were

[15] Aegidius of Lessines, author of a tract on the comet of 1264, also noted the contrast in approach between Albertus Magnus and Grosseteste. 'Expositio autem Alberti videtur conveniens textui Aristotelis secundum translationem que de arabico est, sed expositio Lincolniensis fundatur super exemplum experimentale.' De essentia, motu et significatione cometarum, ed. Thorndike, in Latin Treatises on Comets Between 1238 and 1368 (Chicago, 1950), 109.

[16] 'Similiter ex quo omnis aqua lucem habet in se, ut patet, si in nocte agitetur aqua in vase nigro apparebit lux, sic dum planete superiores dictam materiam agitant, lucet et non aliter., Summa I.11.2, f.63va-b.

consumed immediately or pushed downward by masses of cold air. These short-lived torches were the commonly known as falling stars. When the burning was sustained and a fanning tail developed, the object became a full-fledged comet.[17]

Ashenden seems to have had a special regard for the De cometis (or De generatione cometis) of Robert Grosseteste.[18] Grosseteste amplified the basic Aristotelian doctrine with his syllogistic reasoning. Comets come into being and fade away; they must as a consequence belong to the sublunar world. (The heavens themselves were eternal and unchanging.) Comets are luminous bodies. Fire is the only source of light in the inferior world; thus comets are composed of burning material. A sphere of fire exists above the other elements, but since it is the nature of fire to move away from the earth's centre, the fire of a comet descending towards earth cannot be part of the fiery sphere. We do not observe combustible matter rising towards higher spheres, so, as Grosseteste would have it, some terrestrial matter must be sublimated (in a way similar to the evaporation of water). The process of sublimation is affected by celestial bodies, which exert a pull on matter of certain complexions, in a way similar to the attraction of iron to the loadstone. The 'celestial nature' sublimated by the impression of one of the planets is naturally of the same temperament of the respective

[17] Meteorologica I.4, 341b--342a 33; I.6-7, 342b 25--345a 10.

[18] The text of the De cometis reproduced in the Summa conforms with the one established by S.H. Thomson, 'The Text of Grosseteste's *De cometis*', Isis 19 (1933), 19-25; and its supplement in 'Grosseteste's *Questio de calore, De cometis* and *De operacionibus solis*', Medievalia et Humanistica 11 (1957), 34-43.

planet. If a comet is formed under the auspices of Mars, the comet is an indicator of Martian forces operating upon the earth. In the case of Mars, warfare and mortality are indicated. The accompanying comet, however, is not a cause of these inferior events; it is a special sign denoting the action of Martian causality.

In the opinion of Albumasar, Mars had sole power over the generation of comets.[19] Grosseteste used the influence of Mars as an example, but there is no indication that he believed it was the only celestial mover of comets. Perscrutator was willing to admit the influence of other planets in conjunction with Mars; but Mars in every case remained the dominant celestial force. Mars itself governed the development and direction of cometary tails. If Mars was in the eastern hemisphere of its epicycle, the tail would point eastward, if in the western hemisphere, then westward. Centiloquium proposition 99 identified nine types of comet; they were given the names Miles, Asconae, Matuta (or Aurora), Argentium, Nigra, Rosa, Veru and Pertica, each with its own distinctive appearance and power over the inferior world. Every so often a comet would exert a positive influence on the world; normally they were signs of future catastrophe.

The comet of 1313 was a prime example of a comet as herald to disaster. Perscrutator, presumably observing from York, first spotted the comet at the time of a conjunction of Jupiter and Mars. The object initially appeared in the northeast, and was seen to move southwestward. Since it was visible from Scotland and the north of England, and since Mars was plainly involved, hostilites between the English and the Scots were significated. Further, the Scots were to have the upper

[19] De coniunctionibus magnis VIII.1.

hand. True enough, the following summer Edward II led his army northward to relieve the seige of Stirling castle. At the approaches of Stirling the English were duly met by the Scottish host of Robert Bruce; and in the ensuing battle of Bannockburn the Scots obtained an important victory.[20]

Such was the treatment of comets. The movement of the tides was another phenomenon celebrated for the elusiveness of its precise nature. That is not to say that medieval scholars were lacking in advanced theories of tidal inequalities; but a doctrine that was both comprehensive and satisfying had yet to emerge. As he had been following the meteorological dictates of Albertus Magnus, Ashenden recited the formulation of Albertus, which, as our compiler appreciated, was a repetition of Albumasar's theory in virtually every detail.[21] This theory stipulated that the Moon was the primary cause of ocean tides. The lunar influence was said to derive from three

[20] 'Quando fuit coniunctio Jovis et Martis in exaltatione particulari in 3° gradu Cancri anno Christi 1313 apparuit stella cum cauda multa et necessario apparuit in loco qui sibi correspondet, Scotie et parti septentrionali Anglie. Est enim civitas Eboraci sub gradu 54 ab equinoctiali integro. Pars igitur in qua fuit coniunctio correspondet terre predicte et quia Mars tunc fuit retrogradus traxit secundum motum suum stellam cauda precedente, et movebatur a parte orientali boreali ad partem occidentalem australem. Ideo necesse fuit Anglos in conflictu Scotie devinci. Est enim terra Scotie in respectu terre Anglie in situ orientali boreali et hoc exemplum valet ubique.' Summa I.11.3, f.65va. Cf. De impressionibus aeris; CUL MS Ii.i.1, f.22vb.

[21] Summa II.8.2, ff.152vb-3va, citing Albumasar, Introductorius maior III.4, and Albertus Magnus, De proprietatibus elementorum I.2.5-6; which was edited by Hossfeld under the title, De causis proprietatum elementorum (Ashendorff, 1980), 68-72.

factors: The sunlight reflected from the Moon's surface, the humid nature of the Moon itself, and the situation of the Moon above the local horizon. The strength of the lunar force varied according to five conditions: (1) The angular separation of the Moon from the Sun; (2) the proximity of the Moon to the sea, i.e. the place of the Moon its its orbit, eccentric and epicycle; (3) the Moon's position above the horizon--its power increases as it approaches the meridian; (4) the time of year; and (5) the Moon's situation with respect to certain humid stars, e.g. the Pleiades. These conditions did nothing to explain why there were two tidal cycles every day, instead of only one. Albumasar surmised that a correspondence existed between parts of the sky exactly opposite from one another, so when the Moon was directly under foot, at the *imum celi*, it caused a second high tide as if it were at mid-heaven, the *medium celi*.

Examining all the existing doctrines on the tides would have taken more space than Ashenden was willing to permit the subject. He alerted the reader to the fact that the question was by no means closed. This allowed Ashenden to proceed to the subject of floods, on account of which he had mentioned the tides in the first instance.[22] Floods were caused by abnormally high tides or heavy rains; hence the business of predicting floods was subordinate to that of predicting the tides, or rain. Discovering the causes of universal deluges, such as Noah's flood or the fiery conflagration that would end the

[22] 'Has vero duas causas secundi fluxus et secundi refluxus maris quas ponit Albumazar non multum approbo nec reputo multum rationabiles; nec intendo determinare ad presens veritatem in ea parte nec scio nec sufficio nec ad me pertinet...Multi quidem alie cause fluxus et refluxus maris ponuntur ab eiusdem...et ab aliis philosophis quas ad presens dimitto.' Summa II.8.2, f.153ra-b.

world, was a potentially more rewarding field. That subject, Ashenden decided, belonged more to the supernatural than the natural realm. The Summa was no place to discuss God's will for the fate of creation.[23]

ii. Astrometeorology

Forecasting the weather on the basis of reputed celestial indications is now widely known as 'astrometeorology'. Although a rather specialist subject within astrology, astrometeorology attracted no small amount of interest in medieval times, and a great deal of the Indo-Arabic astrometerological tradition was transmitted to Western Europe. The medieval Latin writings in this field were recently reviewed by Jenks.[24] Ashenden, who had access to a sizeable portion of this material, enthusiastically collated a number of astrometeorological tracts, which he included wholesale in the Summa.

A major difficulty in studying Ashenden's reliance on the Arabic tradition of astrometeorology is that our knowledge of the texts is hardly better than his was. These brief works of little individual flavour are chiefly taken up with recitations of formulae--'If a certain planet is dominant while the Sun and Moon are in this alignment, such-and-such will result'. In manuscript they were easily split up and recombined. Some tracts are anonymous, others are dubiously assigned authors. One flagship of this genre is the De pluviis firmly attributed

[23] Summa II.8.2, ff.153va-155rb. More will be said later on the fascination of astrologers with eschatological prophecy.

[24] Stuart Jenks, 'Astrometeorology in the Middle Ages', Isis 74 (1983), 185-210.

to Alkindi. Yet apparently Ashenden never realized that another tract, which he cited by its incipit, 'Cum substantia Veneris...', was actually chapter eight of the De pluviis.[25]

We might forgive him for his oversight, since again in the case of the De imbribus attributed to a Jafar Indus, an associated text beginning, 'Sapientes indi...' provided a measure of confusion. Through a careful and detailed parallel analysis Burnett was able to discern these Latin tracts as two quite different translations of a single Arabic work.[26] Further, Carmody identified the writings attributed to Jafar as four separable tractates (I,II,III,IV), whose relatedness is as yet uncertain. It is fair to say that tract IV, which gives an account of the lunar mansions, does not belong to a hypothetical original and unified work, because the mansions were also treated in full in tract II.[27] Again it is uncertain if another tract, known to Ashenden as De apertionibus portarum, represents a self-contained work or a splinter from the Jafar or Alkindi texts. The De apertionibus was occasionally appended to the De pluviis of Jafar, as it happens in the astrological miscellany of Michael of Northgate which is now Bodley MS 464.[28] But Ashenden treated it as he probably had found it in manuscript, a

[25] ThK 345. Cited Summa II.4.5, II.7.6,

[26] Jafar is otherwise unknown, but perhaps to be identified with Albumasar. Charles Burnett, 'Arabic into Latin in Twelfth Century Spain: the Works of Hermann of Carinthia', Mittellateinisches Jahrbuch 13 (1978), 123-4.

[27] Carmody 85-6.

[28] On the other hand, the Aperto is attached to the De pluviis of Alkindi in Erfurt MS O.84, ff.53r - 65r. Carmody 81.

work in its own right.

One of the principal doctrines Ashenden caught in his tangled net was the just mentioned Mansions of the Moon. Some background is required. The lunar mansions were stations, normally 28 in number, marking the moon's daily progress through its monthly cycle. Each mansion possessed its own temperament and influence, which it would impart when the Moon entered that part of the sky. On these points the astrologers agreed; on the location and size of the mansions there was a variety of opinion. John of Seville began the first mansion at 16° Aries. Ibn Ezra put it at 22° Pisces.[29] Without mentioning its competitors, Ashenden espoused the 27-mansion convention of Jafar Indus. Jafar's system was unusual in that it subtracted a mansion. The rationale for this was that the space occupied by the Sun at any one time no longer pertains to the Moon but comes under direct solar control.[30] The 27-mansion system was also convenient because each mansion was of equal extent, 13° 20'. A table of mansions was supplied; otherwise the Summa account is uncharacteristically brief for such an important topic.

We have seen that eclipses and planetary conjunctions were believed to have a significant impact on climatic conditions. In Summa, Book II, Ashenden more or less

[29] Firminus de Belavalle gives a full explanation of the different systems. Repertorium I.2; ed. 1539, f.5.

[30] 'De mansionibus autem Lune unam intactam preteruit cum enim 27 eas continent totius circuli gradus inter ipsas eque parcientes, harum unaquequam 13 gradus et tertia gradus partem vendicant. Ob hoc autem predicta mansio toti numero detrahitur quam Luna ut asserunt eandum cum Sole occupans mansionem ea conventus mansio nullum proculdubio effectus retinent ducatum.' Jafar, De pluviis III; Savile MS 15, f.176rb. Cf.Summa I.10.9, f.59vb.

repeated what he had presented in Book I. Not surprisingly, forecasting the occurrence of rain was an important feature of the weather rules. The chief doctrine of the Indo-Arabic tradition about rain went under the title *apertiones portarum*, the opening of the portals. Ashenden claimed that he had often applied the rules of *apertiones portarum*, and found that they worked well.[31] The general idea was that moisture was accumulated and released in line with the lunar cycle. The cardinal points of the cycle--conjunction, quadrature, and opposition--were particularly significant. At new Moon (conjunction) the Sun enforced the principle of dryness; but as the Moon approached quadrature (at first-quarter), dryness and humidity would reach a fleeting equilibrium. When the Moon opposed the Sun (full Moon) its humidity became dominant. As the Moon waned, humidity and dryness again appeared in equal measure, and then the solar power would take control once more. Of course the observed pattern of rainfall was not nearly as regular as the Moon's circuit through the heavens, thus further considerations were added. The Moon's position in the Zodiac and among the lunar mansions, its aspects with the other planets and conjunctions with humid stars: all were additional factors. Haly Abenragel, and Aomar in the Liber novem iudicum, posited certain angular separations of Sun and Moon, degrees of *attazir*, which supposedly released moisture in the skies.[32]

[31] 'Item frequenter expertus sum regulas de apertionibus portarum fore veras quando iste apertiones contingerunt circa coniunctionem vel oppositionem vel quadraturam luminarium.' Summa II.12.2, f.213ra.

[32] *Attazir* occurred at separations of 0, 12, 45, 90, 100, 135, 168, 180, 192, 225, 270, and 315 degrees. LNI 485. De iudiciis astrorum VIII.29.

Rules existed for predicting rainy days, and some astrologers claimed to forecast the very hour of precipitation. Ashenden presented their guidelines *en masse*; but he reserved the right to doubt the prudence of such forecasts. Ptolemy, after all, had not attempted to make statements about the weather for periods less than a quarter of a lunation. He taught instead to forecast according to the inferior signs (*signa pronostica*).[33] The margin for error in daily forecasts was too small for the astrologer to place reasonably much confidence in them.

By the mid-fourteenth century the Medieval Latin tradition of astrometeorological writing had been going for some two hundred years. It, however, developed in fits and starts, beginning with those who emulated the authors of the Arabic tracts. One of Ashenden's sources was the earliest original work in the field by a Western scholar, the De imbribus composed by twelfth-century translator Hermann of Carinthia. It is fair to say that Hermann was more the editor than the author of the De imbribus; but his collection of weather rules made an independent mark.[34] Long after Hermann's time, predicting the state of the atmosphere was still not a high priority for western astrologers. When, in 1271, Leopold of Austria wrote his Compilatio de astrorum scientie, weather

[33] 'Omnes etiam regulas astronomiae de quotidianis himbribus non multum reputo approbandas eo quod Ptolomeus, 2° Quadripartiti capitulo 12°, non ponit modum pronosticandi de temperie aeris pro minori tempore quam sit quarta unius lunationis. Sed de himbribus quotidianis sive duorum dierum vel trium docet pronosticare per nubes et parelias et per huiusmodi signa pronostica de quibus determinatum est sufficienter et hoc tractatu 2°.' Summa II.12.2, f.213rb.

[34] C.H. Haskins, Studies in Mediaeval Science, 49-50. Burnett, 'The Works of Hermann of Carinthia', 123-4.

forecasting was the least of his concerns. The chapter in which he treated astrometeorology was by far the shortest in the Compilatio (only eight sides in the *editio princeps*).[35] If nothing else, Leopold well organized what he had to say. He divided the subject into five parts, first outlining the general qualities of the zodiacal signs as they related to the weather, then introducing the import of the lunar mansions, and reciting the forms of planetary influence, giving miscellaneous *regulae* for individual circumstances, and finally dealing with the nature of the winds. Interestingly, of Leopold's Compilatio Ashenden only extracted from this brief chapter. This fact appears to underline Ashenden's wish to scrutinize all the meteorological texts he could lay his hands on.

The most influential treatise on astrological weather prediction written in the West was the De impressionibus aeris of Robert Grosseteste.[36] This concise treatise was original in its simplicity. It provided a foundation course in astrology, explaining the qualities of planets, houses, terms and triplicities. It also gave a lesson in the geometry of planetary aspects and the mixing of planetary forces. Towards the end, Grosseteste presented a simplified method of judging the disposition of the atmosphere by weighing and comparing planetary strengths. Finally, two examples, for dates in 1249 and 1255 respectively, were given to illustrate the practice of this system. The De impressionibus aeris, it seems, gave an impetus to English astrometeorlogy. Grosseteste's treatise served as a model for another of Ashenden's

[35] Compilatio Leupoldi ducatus Austrie filii de astrorum scientia VI (Augsburg, 1489), unpaginated.

[36] Edited by L.Baur, op.cit., 41-51.

sources, the Exafrenon, now generally regarded as the work of Richard of Wallingford.[37] Said to have been written in 1325, the De impressionibus aeris of Perscrutator, was the most recent astrometeorological piece found in the Summa.[38] Ashenden was specially fascinated with Perscrutator's bold theory of the mixtures of primary elements and their celestial counterparts. He nonetheless viewed the theory cautiously, since its operation had not been thoroughly tested.[39]

Ashenden reports that he had used astrological rules frequently (*frequenter sum expertus*) in predicting the weather. This should mean that over the decade or so of his academic life before the composition of the Summa he made very many forecasts. Needless to say, a detailed record of his predictions would be valuable. None exists. Ashenden did, however, register his opinion on certain *regulae*. He found most of the Arab material useful, but three regulations especially so. He observed that in winter it would snow when Mars and Saturn were in a strong aspect with a cold zodiacal sign. Rain was most

[37] NRW i.179-243 (text), ii.83-126 (commentary). Ashenden considered the Exafrenon a revision of Grosseteste's work. 'Exaffenon...nam ille liber fuerit extractus de tractatu predicto Lincolniensis.' Summa II.3.4, f.98ra.

[38] HMES iii.103-118. I have consulted the work in CUL MS Ii.1.1, ff. 13-24vb.

[39] 'Unde et in isto libro intendo recitare regulas quas ipse docet, non tamen ad presens volo ipsas regulas approbare eo quod non puto ipsum multum autenticum nec multum audivi de magna eius experientia in hac materia, sed regulas eas ponam in libro meo inter regulas multorum valentium astrologorum ut hi qui hunc librum perlegere voluerint regulas suas cum aliis experiantur.' Summa I.10.11, f.61va.

likely to come when the Moon was in conjunction with Saturn; but it was also a reliable sign of precipitation when the Moon and the star cluster known as the Pleiades were conjunct. Ashenden noted less reliable rules too. Those of Perscrutator were only to be used with caution. And Ashenden found that changes in the sign of the ascendent were not good indications of weather change.[40] An empirical attitude of sorts is shown at work in Ashenden's discussion of the driving forces behind the winds, the *motores ventorum*.[41] The relationships between certain planets were thought to guide the direction and force of the wind. As usual Ashenden began with a review of authoritative *sententiae*, including those of Jafar, Peter of Abano, Ptolemy, Alkindi and Aomar in the Liber novem iudicum, Albertus Magnus, Perscrutator, Leopold of Austria, Julius Firmicus and Albumasar. Not only were these found to be in various stages of disagreement (as might have been expected), but on this occasion Ashenden was not convinced that anyone had yet come close to the truth of the matter.

In his De pluviis, Jafar gave the control of the winds to the Sun, Mars and Mercury. But Peter of Abano, commenting on the 26th book of Aristotle's Problems, accepted the opinion of 'the astronomers' that the relative positions of Jupiter, the Moon and Cancer were all important. Neither approach carried as much weight as that of Ptolemy and Albumasar, who were in general agreement--the quality of the wind at any time was directed by the planet that was dominant at that time. Alkindi and Aomar, as represented in the LNI, concurred. Perscrutator maintained that it would be reasonable to

[40] Summa II.12.2, f.213rb.

[41] Summa II.6.4, ff.130ra-134va.

expect the winds of the cardinal directions (North, South, East and West) to operate according to planetary and zodiacal governors. The system of governors outlined in the Quadripartitum was fully endorsed by Haly, who claimed to have experienced its validity at firsthand.[42]

In many of its details this system was inconsistent, and it did not conform to conditions observed in Britain. Ptolemy wrote that Jupiter, in keeping with its natural properties, must drive the temperate North winds. That, however, was not consistent with experience in Scotland and England, where the North wind was not so mild, rather it blew unwelcome, wintry-cold air. Likewise, the southern winds (Austers) were considered hot and moist in temperament. Over them Ptolemy placed Mars. But Mars had a dry nature, which was not compatible with the humid Austers. The nature of the triplicities, as they were generally understood, also did not fit well into Ptolemy's pattern. For example, the second triplicity, the triplicity of the earthy signs (with cold, dry attributes), was put over the Austers, which, as we have just seen, consisted of warm and moist air.

Albumasar and Alchabitius offered an elaborate alternative construction for the *motores* of the cardinal winds. In this scheme one planet directed a certain wind by day, another planet directed it by night. A third planet was associated with the wind by day and night; and its alignments with the primary movers either accentuated or diluted the basic nature of the wind in question. Thus according to Albumasar, the East wind (hot and dry) was

[42] Summa II.6.4, f.133ra, citing Haly Ridhwan, Comm.Quad. I.19: 'Verba Ptolomei magis credenda sunt quia veniunt per experientias multas cum naturalibus argumentis et hoc ut dicit ipsemet est expertus.'

dominated by the Sun during the day and Jupiter at night, with Saturn in the subsidiary role. Yet this Arab formulation left Ashenden as dissatisfied as Ptolemy's system had. He was perplexed over the mechanism of changing rulership between night and day. Why was this necessary? And he wondered if the planets were mismatched with winds of contrary nature, as they had been by Ptolemy.

Ashenden proceeded to offer his own system for the *motores ventorum*, one which was to square with both personal experience and firm reasoning. He began by apportioning the domains of celestial influence to sections of the earth. As most astrologers maintained, the Moon dominated the western hemisphere, while the Sun controlled the eastern hemisphere. The influence of Venus was seen to lie mainly in the West, in opposition to the eastern regions under Mars. And notwithstanding the objections of the astrologers, Ashenden placed Saturn over the cold northern hemisphere, and Jupiter over the mild south. The intersection of these spheres of influence accordingly divided the Earth and the winds into quarters, each with its corresponding pair of planetary movers. The south-east quarter was hot and dry; the south-west hot and humid; the north-west cold and humid; and the north-east cold and dry. This construction met with the approval of Messahalla.[43] and agreed with Ashenden's experience. Ptolemy, Ashenden observed, had lived on the shores of the Mediterranean, not the North Sea. Perhaps his construct for the *motores ventorum* satisfied conditions in the third clime, while other rules applied in northern regions. After all, Hermes and Aristotle found that the same wind would bring rain to one district and not another. So the

[43] De revolutionibus annorum mundi IX.

qualities of the winds necessarily varied according to the situation (*situs*) of a place among the climes.[44]

Ashenden placed some importance on *situs*, the situation of a locality, in the nature of local weather patterns. *Situs* had two aspects: the clime or latitude of a place, and its topographical qualities. Celestial forces acting on a locality were intensified or dispersed according to the geography of that locality. That is, weather patterns differred between two places, even within the same clime, as their geographical prospects (for instance, the relations with elevated land masses and large bodies of water) differred. This notion of place was not original with Ashenden, but for once he did not cite his authorities. I am inclined to think that he was influenced by the De natura loci of Albertus Magnus, and the De dispositione orbis; at least these treatises were readily at hand.[45] In any event, personal observation supported the conclusions of book learning. The main example Ashenden related concerned his home region, Northumbria. The east coast of Britain commonly enjoyed temperate weather when the wind was predominately from the west, but suffered tempests when the easterlies blew. Conversely, west-facing shores experienced their best weather as the wind came from the east, and its worst when the westerlies blew. The reason for this dichotomy was simply that the winds coming off the sea effected most strongly the lands on the coast. Thus the winds that ravaged the west coast were lessened by the time they

[44] 'Omnes venti variantur, temperantur et distemperantur secundum situm climatum.' Summa II.6.4, f.135ra.

[45] The De natura loci was available in Merton MS 285, ff.135va-141ra.

reached Northumbria. [46]

Merle's weather diary also recorded a difference in weather between places. One day in June, 1342, when it rained heavily at a spot some seven leagues from Oxford; in the town the rainfall was described as moderate, and six leagues from town in an opposite direction, very light rain was reported. Merle appreciated contrasts existing on a larger scale. He recorded more or less continuous rain in southwest Lincolnshire toward the end of July, 1343; yet he learned (presumably from correspondents in Oxford) that other parts of the country remained dry in the same period.

iii. Inferior Signs of Weather Change

The practice of intrepreting signs of future weather from portents in the air or from the behaviour of animals is a very ancient one. The Greek poet, Aratus of Soli (fl. 300 B.C.) was perhaps the first western writer to collect this lore--lore that until his time had solely belonged to the realm of folk wisdom. Many of the

[46] 'Item nota quod regiones quedam ratione situs sunt sicciores, quedam sereniores. Nam ut communiter loca montuosa sunt magis pluviosa quam plana. Et in partibus meis scilicet in parte boreali Anglie que intercipitur inter duo maria, videlicet orientem et occidentem, nos qui habitamus super mare orientale, scilicet Northumbria, frequenter habemus serenitatem flante vento occidentali quando hi qui habitant super mare occidentale in partibus habentibus tempestatem flante eodem vento; et econtra ipsi serenitatem frequenter habent flante vento orientali nos vero tempestates valides. Unde et nobis ventus occidentalis est maxime temperatus illis vero frequenter pluviosus. Huius causa potest esse quia ventus occidentalis propellet eis a mari occidentali tempestatem que attingere non possunt usque ad nos. Et ventos orientalis econtra propellit tempestatem nobis a mari nostro scilicet orientali que tempestates ad eos non preveniunt. Unde et nobis ventus orientalis est magis temperatus eis vero econtra.' Summa II.3.5, f.99va.

aphorisms have survived two thousand years of use; while over the years the number of signs continued to grow. Ashenden's recitation on the signs is a witness to the medieval heritage of this popular lore.

The De pronosticatione aeris of William Merle was the immediate source which Ashenden tapped for weather lore. Merle gathered most of his information from authors of classical antiquity: Virgil, Pliny the Elder, Aristotle and Ptolemy. Ashenden utilized broadly the same material; but whereas Merle paid little attention to giving his references, Ashenden made sure that his references were explicit. Ashenden's demand for precision has its benefits for us today. It emerges that Merle collected weather signs attributed to Pliny from a tract entitled De signis pronosticis aeris. In fact this is an example of an extract which assumed a life of its own when separated from its mother text. In the case of the De signis, it is identifiable as a section of Pliny's Natural History XVIII.[47] The tract was well known. Firminus de Bellavalle employed it his Repertorium; and among the several fourteenth-century manuscripts of the work, is a copy in Digby MS 176 (entitled Plinius de temporibus). Next to Pliny, Merle and Ashenden drew weather signs from the first Georgic of Virgil. Ashenden gave a new dimension to Merle's account by looking into the Georgics commentary of the fourth-century grammarian Servius.[48]

[47] To be more specific, XVIII.78-89, §342-365. Unaware of its identity, Thorndike edited the tract under the title De tempestatum presagiis. HMES iii.707-714. And see Schmitt and Knox, Pseudo-Aristoteles Latinus, 79-80.

[48] Servii Gramaticii qui feruntur in Vergilii carmina commentarii, eds. G.Thilo and H.Hagen (Leipzig, 1902), iii.128-216. L.A.S. Jermyn, 'Weather-signs in Virgil', Greece and Rome 20 (1951), 26-37, 49-59.

The signs proffered by Virgil and Pliny were of three types: the appearance of the Sun and Moon, the behaviour of animals, and other natural portents. Sunrise and sunset were optimum times for judging the weather. A clear sunrise promised fine weather ahead; if however the Sun's rays shone weakly or appeared to attract they indicated future rain. Prognostics from the Moon were specially good when the Moon was a thin crescent between three and four days old. Should the horns of the crescent appear blunted, it would be a sign of rain; if sharply pointed, a sign of wind. If the full Moon were surrounded by a circle of cloud, it would signify wind in the direction in which the circle was broken. A double halo about the Moon indicated a storm.

Animals gave their own signs of impending weather change. Cows sniffing at the air or licking themselves against the nap of their hair, and swine rooting about in their bedstraw were portents of coming rain--as were frogs croaking loudly and ants carrying eggs from their nests. These were difficult signs to interpret; perhaps the actions of birds were more easily observed. Cranes flying high in silence foretold clear weather; if the cranes were flying inland, a storm at sea was ahead. It was a portent of serene conditions when rooks played in the trees. When they sensed approaching rain they would sing in bursts of three or four notes.

At this point Ashenden injected a question from Servius on how birds and animals were able to sense weather changes, while man was generally unable. Man, after all, had the gift of reason; he alone of all God's creatures could discern the causes of things. Yet in animals it was not the ability to reason but the temperament of the atmosphere that directed behaviour. This fact made animals excellent indicators of those same dispositions. By observing animal behaviour man was able

to divine the prevailing mixture of moisture, dryness, heat and cold in the air.[49]

There were other common weather signs. When a tolling bell could be heard at a greater distance than was usual, it was a sign of impending rain. The sputtering and crusting of a lamp indicated a gathering storm. There were very many other signs. Merle, and in turn Ashenden, reported nearly all of the classical ones. Merle added a few more local traditions. The call of the woodpecker (*wodewale*, or *raynfughl*) for instance, was taken as a portent of rain; and when robins (*rudduck*, or *robinet redbrest*) kept to their nests a storm was brewing.[50] Merle observed too a regularly mild period of a week or two on either side of the feast of St. Michael, 27 September. What he was describing is now called 'Indian Summer'.

[49] 'Sed notandum quod Servius super libro Georgicos Virgilii ubi supra dicit quod Virgilius movet dubitationem accerrimam ubi docet pronosticare per aves de temperie aeris: Cur scilicet homines quos constat esse prudentiores animalibus per se non sentiant qualitatem aeris futuram sed eam magis ex aliis animalibus colliguntur. Et dicit Servius quod Virgilius soluit hanc dubitationem per hoc quod dicit: Homines prudentiam naturalem habere et suo iudicio posse vel letos vel tristes esse que res in animalia minime cadere possunt que nihil nisi suam quam habent naturam aeris sequuntur. Nos vero et leti esse inter nubila possumus et in serenitate soliciti. Hec Servius.' Summa II.3.5, f.99rb, quoting Servius, Comm.Georgic. I.415; eds.cit., 209.

[50] De pronosticatione aeris III; Digby MS 147, f.130v. Summa II.4.6, f.116rb.

With these weather signs our overview of Ashenden's meteorology comes to a close. To be sure, the first purpose of judging the disposition of the atmosphere, by whatever means, was to forecasts weather changes. The atmosphere was also thought to influence the human condition, both psychological and physical. A case in point was the airborne transmission of contagious diseases, including pestilential fever. That is the topic of the next section.

5. The Plague and the Heavens

In the later Middle Ages the study of astrology was closely associated with medical practice. The timing of surgical operations and the determination of critical days of fevers were among the medical topics for which a knowledge of celestial affairs was desirable. In fact doctors treated astronomy as an integral part of medical education. The saying, 'He is not a perfyte leche that knowth not astronomy' was a commonplace. Though not a physician himself, Ashenden was probably well versed in the medical theory of the day; and it is even more probable that he was fully aware of the moot points shared by medicine and astrology. In the Summa, however, his treatment of the astro-medical common ground was confined to the generation and transmission of infectious diseases, and above all universal epidemics.

Composed in the autumn of 1348, at the onset of the Black Death in Britain, Summa II.9 is noteworthy as one of the very earliest pest tracts to take great plague into account.[1] It bears some resemblance to the De pestilentia of the Italian physician, Gentile da Foligno, who was writing during June of 1348, while the plague was raging in Perugia. Da Foligno, however, was a practising

[1] For an idea of the great number of pest tracts written in the later Middle Ages, check D.Singer and A.Anderson, Catalogue of Latin and Vernacular Plague Texts (Paris, 1950); and Karl Sudhoff, 'Pestschriften aus dem 150 Jahren nach der Epidemie des *schwarzen Todes* 1348', Archiv für Geschichte der Medizin, 4-9, 11, 14, 16-17 (1911-33).

physician attempting to treat plague victims. He died while the epidemic was going on, though whether from the disease or exhaustion it is not known.[2] It is difficult for me to imagine Ashenden taking such an active role. He seems content to keep to his writer's desk!

i. Medical Sources

The writings of the Greek physicians Hippocrates and Galen were the touchstones for all that Ashenden had to say on medical matters. Of the Hippocratic corpus, the De aere et aqua and the Aphorisms contributed much on the nature of diseases.[3] Haly Ridhwan used the Arabic version extensively in his commentary on the Quadripartitum. From him Ashenden stold at least one reference to the De aere et aqua.[4] Nonetheless, the quotations in Summa II.9 were certainly taken directly from the Latin translation. The Aphorisms were the primary text for the teaching of medical theory in Oxford and elsewhere.[5] For his part Ashenden paid them special attention with additional references to the commentary of Galen. The Hippocratic De epidemiis came to light in a similar fashion, through the commentary of Johannes Alexandrinus.[6]

[2] HMES iii.242. De pestilentia, ed. Sudhoff, Archiv fur Geschichte der Medizin 5 (1912), 83-6.

[3] The Latin text of the De aere et aqua appears under the title De aeribus regionum, edited by H. Diller, Die Uberlieferung der Hippokratischen Schrift *Peri Aeron Idaton Topon* (Leipzig, 1932), Philologus, supl. 23.3.

[4] Summa I.8.5, f.46rb.

[5] Pearl Kibre, 'Hippocratic Writings in the Middle Ages', Bulletin of the History of Medicine 18 (1946), 371-412.

[6] An Egyptian-Greek physician of the early seventh

Among the medical works of Galen, Ashenden employed the De morborum differentiis (he knew it as De morbo), the De differentiis febrium, and the Microtegni with commentary by Haly Ridhwan.[7]

The classics of Islamic medicine made a strong showing in the distinction.[8] Ashenden drew chiefly from the Canon of Avicenna (Ibn Sina, A.D.980-1037)[9] , from Avenzoar's work on pathology, the Liber Tazir, and from the Colliget of Averroes. From Rhasis (Rhazes, aṛ-Ṛazī) came the Almansorum. The Persian doctor, Haly Abbas ('Alī ibn al-'Abbās, died ca.994) wrote the Libri Pantegni sive theorice known to Ashenden as the De regali dispositione. A free translation of the Pantegni by Constantinus Africanus, which was hardly discernible as the same as Haly's work, made a separate, but parallel impression in the Summa. Finally, the practical manual of Isaac Judaeus (Is'haq ibn-Salayman al-Isra'ili), De febribus, also found a mention.

The only western physician to whom Ashenden referred was Bernard Gordon, whose Lilium medicine won wide acclaim.[10]

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century A.D. See Iohannis Alexandrini Commentaria in Sextum Librum Epidemiarum, ed. C.D. Pritchet (Leiden, 1975).

[7] Galeni Opera (Basel, 1529), De morbo transl. Guilielmus Copus, ff.285-60. The Microtegni was printed in Articella (Venice, 1523), ff.84v-155r.

[8] The biographical data on the Arab physicians in this paragraph is from Manfred Ullmann, Islamic Medicine (Edinburgh, 1978), 41-54.

[9] I have checked Ashenden's citations of the Canon against the Latin edition, Avicennae medicorum Arabum principiis Liber Canonis (Basel, 1566).

[10] The reader should turn to the exemplary monograph

It is initially perplexing why Ashenden did not use the Rosa medicine of his fellow Mertonian, John Gaddesden. Gaddesden would have been the natural first choice for an authority, since he was far and away the best-known English medical writer of the fourteenth century.[11] It is even not impossible that Ashenden and Gaddesden knew one another. Yet, as it happens, Ashenden had no reason to use the Rosa in his discussion because that work contains no material on pestilence, although it does has a section on fevers in general.[12]

Ashenden's pest tract is derivative on two levels. First, Ashenden extracted its contents from a number of medical sources. Underneath this veneer Peter of Abano's exposition on the Problems of Aristotle formed a kind of substratum. In the first book of that treatise Peter examined various medical questions in detail, and, more importantly, with numerous citations of the medical authorities. Ashenden's use of source material is so like Peter's that there is little room for doubt that Ashenden was introduced to the topic through the Expositio problematum. Several medical authorities found in the Summa account--Avicenna, Galen De morbo, Rhasis, and Johannes Alexandrinus among them--had surfaced in the same contexts in the Problems commentary. That is not to say that Ashenden worked entirely through this intermediary. The punctilious documentation of the Summa shows that he followed Abano's leads, which could be rather vague at times, by examining the primary texts themselves. Also,

of Luke Demaitre, Doctor Bernard de Gordon: Professor and Practitioner (Toronto, 1980). I have checked Ashenden's references to the Lilium against Ashmole MS 1410, s.xv.

[11] BRUO ii.739. MPME 148-150. H.P.Cholmeley, John of Gaddesden and the *Rosa Medicinae* (Oxford, 1912).

[12] Rosa anglica practica medicine a capite ad pedes (Vencie, 1502).

Ashenden had recourse to authors not mentioned in the Expositio, Bernard Gordon for one. All the same, we may admire Ashenden for his checking and cross-referencing while making no apology for his substantial debt to Peter of Abano.

ii. Symptoms and Aetiology

To begin as he had done in earlier chapters of the Summa, Ashenden set out to define the subject at hand, in this case pestilential disease.[13] Generally speaking, ancient and medieval doctors categorized the preponderance of transmissible diseases as fevers. According to all the authorities the pest was a contagious fever generated by corruptions in the air or water. Humans were infected when they inhaled corrupt air or drank corrupt water. Ashenden specially noted the distinction Alexandrinus had drawn between endemic and epidemic diseases. Pestilence was virtually synonymous with epidemic. For while most fevers attacked persons individually, and other fevers seemed to occur regularly in certain districts, pestilential fevers spread across large areas and afflicted entire populations.

Ashenden muddied the waters in naming several types of illness without providing definitions or descriptions for them. So although the fevers *tertiana, quartana, quotidiana* and *sudor* frequently appear in his discussion, they were not explicitly differentiated from one another,

[13] Summa II.9.1, ff.159ra-160vb. The authorities come thick and fast here--they include: Isidore Etymologiae IV.5; Bede De natura rerum XXXVII; John Balbus, Catholicon; Peter of Abano, Expos.Prob.Arist. I.7; Bernard Gordon, Lilium I.10; Constantinus, Pantegni V.9; Haly Abbas, De regali dispositione V.5, 9; Avenzoar, Tazir III.1; Rhasis, Almansor X.16; Avicenna, Canon IV.1.4.4.

or for that matter from pestilential fever. We learn that as a rule fevers varied according to five geographical circumstances. 'Prima est ipsa pars terre, secunda regionum elevatio et altitudo et humilitas, tertia montium vicinitas, quarta maris, et quinta terre ipsius regionis.' The fever *ptisis* tended to afflict mountain communities; *fluxus ventris* valleys and low-lying areas.

Pestilence might also be distinguished clinically from other fevers by scrutinizing its symptoms. Unfortunately for the patient, the outward signs of the disease were insidiously slow to appear. By the time they became identifiable he was already in great danger, since the pest would fix itself to every part of the body before making itself known. The symptoms when they appeared were these: a high temperature, dryness of mouth, difficulty in breathing, then nausea or loss of appetite, with stomach pains and inflamation of the spleen. The patient would become restless and finally delirious; towards the end he would not recognize even close friends or relatives. The mortality rate was high. Just as the fever was coming to a head and it seemed that the patient might pull through, the disease would take its last, fatal turn. Ashenden gave a fairly complete conspectus of the plague's outward signs, taken lock stock and barrel from the medical books. That he added nothing by way of personal observation is evident from the one notable omission in the symptoms. Lacking is any mention of the grotesque erruptions under the skin, the buboes themselves. Elsewhere in the pest tract Ashenden used the terms *bubones* and *pustules*, but they were never linked with a species of contagious fever. Such were the limitations of book knowledge.

For medical purposes the atmosphere was considered a homogeneous body of elemental air. The temperament of this mass was subject to change according to substance or

according to quality.[14] Mutation in substance occurred when impure vapours mixed with the atmosphere. On account of its impurity this polluted or corrupted air constituted a hazard to life. Mutation in quality was linked to variations in air temperature and moisture. Regardless of its purity, hot-dry air was believed to have different health implications than did cold-wet air. Corresponding to mutations in substance and quality were the supposed modes of corruption which would give rise to fevers, namely the putrefaction of certain earthly (i.e. organic) matter, and also celestial influences.

In order to apprehend the idea of corruption in its medical sense, we should grasp of the doctrine underpinning the whole of ancient and medieval academic medicine, the pathology of the four humours. For just as the material world was thought to comprise four elemental opposites--fire, air, water, and earth--the living body was supposed to comprise blood, phlegm, yellow bile and black bile. The blood was hot and wet in nature, plegm cold and wet, yellow bile hot and dry, black bile cold and dry. When the humours (and thus their natures) were at equilibrium, the body was healthy. When, as might happen, the delicate balance was upset, disease would result.

Noxious vapours were seen as the major terrestrial cause of epidemic diseases. A number of sources released corrupt fumes: decaying flesh or rotting vegetable matter, stagnant bodies of water, and battlefields where the dead and dying have been abandoned. Additionally, caverns and fissures in the ground were said to emit dangerous vapours. Albertus Magnus stated that plagues often followed earthquakes because such vapours were violently

[14] Summa II.9.1, f.160ra. Ashenden read this in an unidentified book, possibly the Trifolium of Simon Bredon.

expelled from their subterranean reservoirs.[15] So long as he was treating inferior causes, Ashenden could not resist retelling a story from Albertus Magnus about Philip of Macedon and Socrates.[16] There once was a mountain pass in Armenia which travellers had forsaken because all who journeyed that way were overcome by a mysterous ailment. Hearing of this, Philip instructed Socrates to discover what was behind the peril of the place. The sage designed a special mirror that allowed the viewer a panoramic vision; and he had it placed atop a watch tower near the pass. From this vantage point, and with the aid of the mirror, the king observed two fire-breathing dragons. They had set themselves on the mountains overlooking the pass, and the noxious fumes of their breath had caused the travellers' affliction!

The bodily humours would normally adjust themselves to the complexions of the atmosphere, which change with the seasons of the year. Usually the shifts in complexion were gradual enough for the humours to mutate without ill effect. When weather conditions shifted in a sudden or unseasonal way, the balance of humours was disturbed. The body would become liable to corruption.[17] The period of infection, hence the threat of fatality, was proportional to the duration of unnatural weather conditions. The permutations of corrupt elements and qualities were numerous, but air that was excessively hot and humid regularly led to putrefaction, and in turn to pestilence. Outbreaks of pestilence could take place at any time of year, but were more probable in the autumn. In that season the heat of the year, which has accumulated over

[15] De meteoris III.3.15.

[16] De causis proprietatum elementorum I.2.2; ed. Hossfeld, 95.

[17] Galen, In Hipp.Aphor. III.1, from Peter of Abano, Expos.Prob.Arist. I.15; ed.cit., f.9ra.

the summer, was infused with a humid quality.[18] Serene, calm weather was specially to be feared because it allowed corrupt vapours to settle near the ground. Constant wind would scatter pestilential air masses. The Austers were an exception. Due to their hot-wet nature, they were carriers of ill-health. Aristotle insisted all the same that the Austers bore pestilence only when they blew dry air, contrary to their natural disposition.[19]

Throughout much of his essay, Ashenden did not make it clear to the reader whether air was the sole agent of contagion, or other agents could transmit disease. Peter of Abano had had his doubts, and judged that corrupt water was actually more frequently the carrier of disease than bad air.[20] Avicenna observed, according to Peter, that pure water itself was in no way detrimental to human life; only when mixed with other elements did water have the potential for corruption. Yet mixtures often occurred in nature. The waters of lakes, rivers and springs would dissolve some of the earth with which they were in contact; under certain circumstances they could acquire a poisonous quality. Further, Aristotle was said to have regarded poisoned water as more dangerous than corrupted air. Water, after all, was a material nourishment for living tissues. When taken into the body it was disseminated to every limb, where it would remain for an extended period. Air, in contrast, was ventilated by the lungs within a very brief time span, and only certain organs came in direct contact with it. If ingested water possessed any detrimental qualities, it would cause

[18] Avicenna, Canon I.2.2.4, from Expos.Prob.Arist. I.15.

[19] Hippocrates, Aphorisms III.5, III.17; Aristotle, Problems XXVI.16, I.23-24. Ashenden took neither reference from Peter of Abano.

[20] Expos.Prob.Arist. I.13.

chronic health problems. Corrupted air troubled the body acutely, but without great effect. Ashenden reported this line of argument, but he also disagreed with it. To counter it, he called upon the testimony of Avenzoar, who emphasized the central role of the heart (and the air it reputedly processed) in maintaining life. Avenzoar explained that a man could survive for quite some time if forced to do without food or water. Deprived of air, the very stuff of the soul, the same man would die within minutes. This was sufficient demonstration for Ashenden that corrupt air had the greatest share of responsibility for pestilence.[21]

An unique feature of Summa II.9 among pest tracts is its detailed account of how the disease assaulted the body.[22] To prepare his ground Ashenden examined some theoretical statements in Galen's De differentiis febrium and Bernard Gordon's Lilium. Galen explained that the fever impeded bodily functions because the air received and processed by the heart lacked some of the ingredients necessary for sustaining life. An unnatural, excessive heat rises within the body; and because buboes and pustules develop around the small blood vessels, the expulsion of this heat is obstructed. As Gordon described it, the pest did not change the state of the body simply or directly, but altered the composition of the food and water ingested and the air inhaled. Bodily functions were thus corrupted with impure ingredients. Gordon inferred, then, that the corrupting agents could enter the body through respiration or digestion. Nonetheless, in the common opinion of physicians as Ashenden knew it, the pest

[21] Summa II.9.1, f.165vb, citing Avenzoar, Tazir III.2.

[22] Summa II.9.1, ff.164vb-165rb.

was an infection the heart incurred exclusively through respiration.

A partial description of the respiratory and cardiovascular systems followed. Air, being necessary for life, was taken in by the lungs which transport it to the heart. The heart was thought to comprise two chambers, the ventricles, one on the left side, the other on the right.[23] The right ventricle received air from the lungs and separated it into pure and impure constituents, 'ex calore cordis alteratur et separatus ab eo purum ab impurum'. Some of the impurities were then exhaled from the lungs, while others were excreted as perspiration through pores in the skin. The left ventricle took the purified air and from it distilled the *spiritus vitalis* or innate heat, the animating force of life. The innate heat was then disseminated to all parts of the body via the bloodstream. This was more or less the Galenic theory of the operation of the heart, as simplified by the Islamic doctors.[24] Ashenden, in any event, conspicuously fails to name the authorities for his description of the heat. It might well be that Simon Bredon's Trifolium was the immediate source.

[23] Of course the heart has four chambers, two auricles as well as two ventricles. (See note immediately following.) Ashenden used the term *auricule* for the heart's chambers, rather than *ventres* as they were usually rendered. Cf. Avicenna, Canon III.11.1.1; ed. 1566, 508.

[24] Ullmann, Islamic Medicine, 64-9. Galen was acquainted with the four chambers of the heart, but regarded only the ventricles as forming the heart itself. The auricles were considered appendices of the bloodvessels leading into the main chambers. C.R.S. Harris, The Heart and Vascular System in Ancient Greek Medicine (Oxford, 1973), 273-386.

If the lungs took in air that had been corrupted, the healthy purification process would be frustrated. The right ventricle would be unable to filter out impurities completely, hence some corrupt elements would pass on to the left ventricle, which would distil a *spiritus vitalis* that could not sustain the body. Meanwhile, the impurities that could not be processed in the ventricles would accumulate in the heart until it was suffocated. The patient then expires. Most suspectible to pestilential fevers were those who already had an inbalance of humours. Prior inbalances sympathetic with the nature of the corrupted air would allow it to gain entry into the body more readily and to spread more quickly. The medical writers concurred that these inbalances stemmed from unhealthy and excessive activities. Unrestrained alcohol consumption and over-frequent sexual intercourse were related to humoral upset. But social evils could not be held solely responsible. Poor eating habits and a lack of cleanliness also entered the equation. A healthy personal regimen would fortify the body's defences by keeping the humours in balance. Still, nothing could be done to halt the transmission of airborne corruptions. At best one could only prepare for the nature's onslaughts.

Some people were thought to be specially vunerable because the stars had predisposed them (if not their humours) to corruption. Geoffrey of Meaux reckoned that the Black Death had afflicted the peasantry to a greater extent than the nobility because the significating planetary conjunction occurred in Aquarius, a constellation without stars of the first magnitude.[25] Ashenden found little room in his essay for that kind of

[25] Digby MS 176, ff.27r, 28v. About Geoffrey, see below, p.182.

astrological reasoning. He seemed more interested in an aside about the notion of climacteric or critical years. Firmicus Maternus reported that every seventh and ninth year of a man's life marked a crisis point.[26] During a climacteric year he was particularly liable to every sort of misfortune. If he passed through the times of crisis successfully, his extistence would be on a sure footing until the next climacteric. It is extraordinary that in support of this thesis Ashenden snatched two excerpts from the very rare Noctes Atticae of Aulus Gellius. So far as I can tell he did not find these Gellius quotations from the usual intermediaries, but discovered them on his own initiative.[27] These speculations were more than a little out of his way--not because they did not pertain to contagious disease but because they were about the course of individual lives and not universal health concerns.[28]

iii. Perservatives and Cures

Prevention was seen as the best strategy for surviving the plague.[29]

[26] Mathesis IV.20 (IV.9 according to Ashenden); eds. Kroll and Skutsch, I.257-60.

[27] Noctes Atticae III.10, and XV.7. Summa II.9.3. Gellius manuscripts were scarce in Northern Europe in the Middle Ages, thus 'quotations' usually originated from intermediaries such as John of Salisbury or William of Malmesbury. P.K.Marshall, Janet Martin and R.H.Rouse provide discussion in, 'Clare College MS. 26 and the Circulation of Aulus Gellius 1-7 in Medieval England and France', Mediaeval Studies 42 (1980), 353-394.

[28] 'Isti vero anni predicti non sunt ad propositum meum in hac distinctione eo quod infortunia accidentia in eis non sunt universalia sed solum accidunt in individuo.' Summa II.9.3, f.169ra.

[29] Summa II.9.5, ff.177vb-179rb.

The object was to counteract or limit the imbalance in corrupt air in one's living area. To this end Rhasis prescribed a dietary regimen. He directed people to eat foods that were acidic in nature, citrus being notably effective; but wine, confectionaries, and meat were to be avoided. Rabbit or fowl, however, were permissible. Avicenna suggested that it was best to shelter in cool rooms with windows facing to the north. Living quarters should also be fumigated with camphor, sandalwood, and other aromatics. It was advisable, at all events, to evacuate contaminated places, and to avoid contact with infected persons.

For infected persons, physicians offered various treatments. According to Avicenna the patient should be sprinkled with doses of salt, rose water and camphor. Rhasis suggested that a plaster made of a base of camphor and rosewater be applied to the chest. And Haly Abbas praised camphor as the active ingredient of anti-pest medicaments. Ashenden noted that for internal use Rhasis recommended a medicine of aloes, saffron, and myrrh. Oxford physicians took this formula and added further ingredients. Their concoction included aloes, aloes wood, myrrh, cinnamon, saffron, cloves, mace, and mastic.[30]

It is difficult to assess just how the medicines reported by Ashenden compared with actual treatments.

[30] 'Et anno Christi 1348 in tempore scilicet maxime mortalitatis peritissimi medici in Oxonia hanc maxime approbabant medicinam inter alias tamen ad reprimendum maliciam ipsius aloem aliqam alia addiderunt. Receperunt enim aloes, mirre, 3j; cinamomi 3, tres croci, gariofilorum, macis, ligni aloes, masticis, ana dragmam semis, feceruntque pulverem quod sumpserunt de eo omni die in principio mortalitatis pondus duorum denariorum et oboli cum modico vini aqua mixti multum profuit.' Summa II.9.5, f.178rb-va.

There is at least one praticising physician, albeit of a later generation, who serves as an useful witness. John Malverne, physician to Henry IV, was one to register an honest opinion on the medical advice commonly given about the plague.[31] He composed an epistle, De remediis spiritualibus et corporalibus contra pestilentiam,[32] after seeing a public notice recommending the prescriptions of expert doctors. A formula for a preservative was set out, but in a way that only the physicians themselves could understand. It seemed to Malverne that this was no help at all. The population at large needed comprehensible yet practical advice. In his tract Malverne did what he could to redress the situation.[33] Malverne directed that patients be bled once a month (if they survived that long), and that the incision be made in the right arm or foot. Vomiting was to be induced only during the warm seasons. At all times one was to keep to a modest diet and avoid taxing regimens. Tormentil root, cinnamon, cockles, treacle, white wine and rose water seemed to hold the pestilence at bay. Those medicines containing aloes, saffron, and myrrh prescribed by the ancients were likewise effective. Regrettably, modern doctors had changed the recipes, without improving them. (This could

[31] On Malverne see BRUO ii.1211. MPME 166-7.

[32] Singer and Anderson, Plague Texts, 30. The De remediis perhaps dates from the plague of 1405-7. The work exists in three manuscripts, each of the fifteenth century: Digby MS 147, ff.53v-56r (the one I have used); Digby MS 95, ff.136r-139v; and BL Sloane MS 59, ff.186-189.

[33] 'Nemo miretur quod in materia phisicali tam plane seu expresse scripserim in terminis litteratorum communitati notis quam ad hoc laboravi ut ab omnibus intelligerer qui omnibus proficere in hoc opusculo peroptavi.' Digby MS 147, f.56r.

be refering to the Summa recipe.) Of course the best strategy was to flee infected areas.[34] Such was the advice of a man of experience. I imagine that not all of his wisdom came out of a medical book, whereas Ashenden was bookish to a fault.

iv. Predicting Epidemics

Epidemics on the scale of the Black Death, as Ashenden read, were engendered by planetary conjunctions.[35] Albertus Magnus determined that conjunctions of Mars and Jupiter in the sign of Gemini were specially conducive to the plague. The inner logic of this was not far to seek. Gemini was part of the aery triplicity and signified the disposition of the atmosphere. Jupiter was hot and humid in nature, disposing the air to those qualities. Mars was hot and dry, but its dryness did not impede the Jovian influences in this position. The planet served rather to draw up unnatural vapours. A notice interpolated into some Summa manuscripts (for which, see appendix C) at this point testifies to the value of Albertus' judgement:[36]

> Coniunctio Jovis et Martis. Nota bene quod hec coniunctio de qua loquitur littera presens, scilicet coniunctio Jovis et Martis in signo Geminorum, facta est anno domini nostri Jesu Christi 1360, die 10 Septembris. Et eodem die erat coniunctio Solis et Lune cum Mercurio in quarto aspectu Jovis et Martis;

[34] 'Multi modernorum multa adiciunt sed rar fides...Unum remedium preservatium inter alia infererem videlicet quod fugiendum esset a loco ubi regnat mortalitas ad alium locum in quo non haberet sedem.' MS cit., ff.55v-56r.

[35] Summa II.9.2-3, ff.166ra-176va.

[36] Summa II.9.1, f.163r.

> et continue duraverunt idem Jupiter et Mars coniuncti in eodem signo Geminorum per stationem et retrogradationem usque fere ad mension Marcii. Et Saturnus erat eis commixtus per duos menses quarto aspectu et consequenter in estate proxima consecuta est magna mortalitas hominum concorditer cum littera hic scripta. Incidentia hec est vera.

There was consensus among astrologers that Saturn, Mars, the Sun and Mercury governed the occurrence of pestilences, epidemics, and various other infirmities due to the corruption of the air. The opposing forces of temperate, healthy conditions were represented by Jupiter, Venus and the Moon. Firmicus went so far as to claim that man would be immortal if Jupiter had the power to keep the corrupting influences of Mars and Saturn in abeyance. God, alas, did not make it so.[37] The patterns of celestial influence were fixed in a way, but in the inferior world the cycle of generation and corruption wheeled ever onward. The Sun's motion was restricted forever to the ecliptic, yet it determined the changing seasons of the year.

In forecasting pestilence, Ashenden wrote, one should examine the revolutions of the year for the alignment of the governing planets.[38] In keeping with the *regule* concerning this astrological procedure, specific outbreaks in the future can be known by the disposition and strength of the governors. Perscrutator also recommended as special indicators the nebulous stars of Ptolemy's star catalogue. When a conjunction took place in the vicinity of one of these stars, an epidemic was signified:[39]

[37] Mathesis II.12.

[38] Summa II.9.2, ff.167ra-168va.

[39] Summa II.9.2, f.168va. Ashenden noted that Perscrutator's star positions did not correspond to

Pleiades	18° Taurus
Sagitta	15° Sagittarius
Cauda Capricorni	12° Aquarius
Casus aquae Aquarii (four stars)	26° Aquarius - 4° Pisces

It was universally agreed that comets and aurorae were the tell-tale signs of the build up of dangerous vapours. But these phenomena were relatively rare. Close observation of the weather was another standard way of forecasting patterns of illness. According to Avicenna there were signs for each season. If at the beginning of spring it were unnaturally cold and dry, and a period of unsettled weather followed, then a week of clear skies with warm days and cold nights, an epidemic would develop. A cool summer with changeable conditions. Autumn with the south winds blowing for several days. And in winter when the skies were dark with clouds full of moisture, yet there was no precipitation. Alexandrinus claimed that if winter was warm and wet, and spring cold and wet, a plague would surely break out in the summer immediately following.

The tragedy of the Black Death lent the distinction on contagious diseases a timeliness that the Summa as a whole did not possess. Other scholars took a greater interest in the Summa as a result. When viewed dispassionately, however, the pest tract is no less derivative, no less long-winded, than any other part of Ashenden's compilation. Having seen what he had to say about the plague, let us now look to what he compiled on pastoral and martial themes.

Ptolemy's. Cf. De impressionibus aeris VII; CUL MS Ii.1.1, f.24rb.

6. Ploughshares and Swords

Besides the visitation of deadly epidemics, the celestial spheres were thought to oversee the growth of crops and matters of human violence. The first of these was a logical step from acknowledging celestial influence on the weather. Anyone could see that climate had an overriding effect on the forms of agriculture and their year-to-year success. That the planets had a say in the patterns of warfare among nations was far less obvious. Yet if Virgil could sing pastoral and martial themes in juxtaposition, Ashenden could expound on the same themes as two adjoining distinctions in the Summa (II.10-11).

i. Famine

So far as he was concerned with agriculture, Ashenden's purpose was to judge the celestial forces determining the success or failure of a harvest. A poor harvest meant adversity at best, famine at worst. There were two sorts of famine, general and particular. Both stemmed mainly from various sorts of crop failure. Selective failure might affect one species, while other varieties would escape; or all plantings might be destroyed. A poor harvest might be limited to a small, isolated locale, or there might be a general failure over an entire clime. Broadly speaking, there were five root causes of the failure of the supply of staple foodstuffs. At the head of the table was poor cultivation (*ex defectu culture*). Unseasonably cold weather held the second place. Drought and excessive moisture could inflict severe damage on crops. But even if the harvest was good,

the purveyance or 'abduction' of foodstuffs in time of war was a cause of hardship.[1] The listed causes of famine show a recognition that deprivation could result from man's failures as well as from the acts of God. At a later point Ashenden mentioned the deleterious effects of locusts and vermin, and mildew (*ex rore quodam consumptive*) as further causes of poor harvests.[2]

The amount of water naturally available is the key limiting factor to the agriculture of any district. Too little moisture retards plant growth; too much and rot could develop. As a matter of course, Merle, whom Ashenden followed, treated the matter within his experience, that is to say the cool, wet conditions of northern England. In this district the threat of drought was considered to be negligible. (We might wonder what Ashenden and Merle would have made of the dry English summers of 1976 and 1984.) Prolonged and excessive rain, however, was a great danger. That prospect was, as it still is, always threatening the English harvest. Hence it was natural that Merle should consider in detail the effects of overabundant moisture.[3] He enumerated ten ways in which rains could be disruptive: (1) Rain could impede traders from getting their produce to market--a rare occurrence; (2) A great amount of rainfall over the year was perceived as generally detrimental to crops. (3) A driving wind combined with rain could flatten crops to the

[1] It is worth remembering that the north of England suffered at this time from looting at the hands of Scottish raiders as well as from the purveyors for English armies.

[2] Summa II.10.4, f.190vb.

[3] De pronosticatione aeris XII; Digby MS 147, ff.136v-137r. Summa II.10.1, f.179rb.

ground. This combination is rare, but happened less infrequently in hilly areas. (4) Choking weeds tended to sprout after rainfall. (5) Prolonged rain could delay the maturation of crops. (6) Rain disrupted harvesting, and (7) made plowing and (8) planting difficult. (9) Excessive moisture lowered the quality of the crop, and (10) could deter budding or flowering of young plants.

Stuart Jenks has cited farmers as a potential audience for astrological crop predictions.[4] It would be exciting to hear of estate managers forecasting the prospects for their harvests. Unfortunately, if they ever did such a thing on a regular basis, it has yet to come to light. Despite the relative sophistication of some contemporary manuals on land management, nothing is said in them about the weather.[5] Merle did ask some old men about the occurrence of famine in the past. They reported that a notable famine would take place about every thirty years. In Ashenden's mind this was a clear indication of the influence of Saturn, whose orbit took approximately thirty years to complete.[6]

The sight of dying animals or the appearance of

[4] Jenks, 'Astrometeorology', 193-5.

[5] Some of the finest manuals, including one ascribed to Robert Grosseteste, were edited by Dorothea Oschinsky, in Walter of Henley and other treatises on estate management and accounting (Oxford, 1971).

[6] 'Et dicunt antiqui nostri quod numquam in istis regionibus septentrionalibus spatium temporis multum maius 30 annis absque fame notabili pertransire. Hoc autem convenit cum dictis astrologorum qui dicunt accidentia grandia ut famem, mortalitatem et pestilentiam et guerras et quandoque regnorum mutationes in qualibet revolutione saturnina quae est spatium circiter triginta annorum redire.' Summa II.10.3, f.190va.

beggars were two common signs of impending famine. Merle also saw the market price of grain as an indication of the harvest. He found that if the value of a standard measure (*quarterium*) exceeded one mark sterling, a scarcity of grain was indicated. Ashenden repeated the statement.[7] It is difficult to say how closely these rules were observed in real cirumstances; but the price of grain was quoted with reference to the above rule at least once. Someone entered a note at the end of Merle's De pronosticatione to the effect that in the summer of 1369, a standard measure was selling for 32 shillings in London and vicinity.[8] It must have been a bad year.

Ashenden's borrowings from Merle are by far the most notable feature of the discussion in the Summa concerning the harvest. The astrological rules for predicting feast or famine came from the usual authorities, and were recited with a passive if workmanlike devotion; but they lacked any character of their own. Merle's active mind combined with his interest in observation revealed the potential utility of abstract knowledge to something as mundane as farming. Ashenden may not have fully comprehended the uses of meteorology in agriculture, yet I cannot help but think that he was paying Merle a personal tribute by quoting him so extensively on this subject.

[7] 'Et nota quod caristia notabilis in regionibus nostris septentrionalibus et precipue in Anglia est cum venditur quarterium frumenti pro una marca sterlingorum vel amplius.' De pronosticatione aeris XII; MS cit., f.138r. Summa II.10.3, f.190va-b.

[8] 'Hic nota quod anno domini 1369 vendebatur quarterium frumenti London et partibus circumadiacentibus iuxta festa sancti Johannis Baptiste pro 32 solidis.' MS cit., 138r.

ii. Warfare

When speaking of the disposition of man to conflict, Ashenden began with remarks on the superior and inferior causes. Among the inferiors he recognized the struggle between neighbouring peoples or their rulers for the control of land as the most immediate and acute cause. The competition for land, and the wealth it represented, was not easily resolved, and led to deaths and destruction. This had been the way of the world from time immemorial. The stars, however, had only an indirect role in inciting men to violence.[9]

The distinction between the strong inferior cause and the vague superior one was a significant one. Ashenden was not prone to great metaphysical speculations when treating the causes of warfare, or anything else for that matter; nor did he make extravagant claims about predicting the outcome of individual battles or foreseeing who was to die in battle. The astrologer could divine the

[9] 'Cause autem guerrarum sunt multiplices, nam quedam inferiores et quedam superiores. Cause autem inferiores efficientes guerras sunt divisiones terrarum et possessionum vendicatio iuris regni et dominii et habitationum, atque terrarum et possessionum caristia magna victualium et aliarum rerum pertinentium ad usum hominum. Ex quibus omnibus causis et multo pluribus accidunt lites et contentiones et rixae et irae inter homines et precipue inter reges et principes diversarum regionum et proveniunt inter eos guerre et combustiones domorum et hereditum sanguinis sicut satis patet et expertum est. Cause autem guerrarum superiores sunt certe constellationes et coniunctiones supercelestium corporum moventes homines et eorum spiritus ad malum de quibus in hac distinctione intendo loqui.' Summa II.11.1, f.190vb.

movement of great lines of conflict, nothing further. We would like to know more of Ashenden's thinking on the celestial direction of violent actions, and indeed on the human psyche overall. Unfortunately, this is the part of the Summa in which he engaged his authorities least. He settled on stringing together a huge array of rules for prediction with scarcely an intruding word of his own. The vast majority of these *regulae* do not bear repeating. It almost goes without saying that the planet Mars was considered the special director of violent behaviour, but Saturn too had a malignant part to play.

We can divine something of the compiler's attitude by exploring the texts that he included in his work. The strength of leadership, that is, the king's ability to pursue the aims of war, was all important. A king's death was specially critical. Ashenden reviewed the celestial signs of royal power listed by Haly Abenragel and Messahalla, in chapters entitled 'On the signifcators of the king and his subjects' and 'Fear about the king'.[10] To examine a king's good or bad fortune might be construed as treasonable. Ashenden did not approach the subject too closely, which is more than can be said for some fifteenth-century soothsayers. In 1441 the Oxford masters Thomas Southwell and Roger Bolingbroke were prosecuted for conspiring with Eleanor, the duchess of Gloucester, to enquire 'by the black arts' into the manner of death of Henry VI. Southwell, the most fortunate of the two, died in prison. Bolingbroke was convicted and was hanged, drawn and quartered for his crime.[11]

[10] Messahalla, De revolutionibus annorum III: In significatore regis et subitorum eius. IV: In timore super regem.

[11] Carey 265-6.

To illustrate celestial influence on human strife, Ashenden pointed to occasions when celestial phenomena foreshadowed military actions. Of these phenomena, comets were the most dramatic. The comet of 1313 preceded the defeat of Edward II at Bannockburn, and another comet observed by Haly Ridhwan presaged a defeat of the Moors.[12] Albumasar observed that the revolutions of the years aided the Arab conquests in spreading Islam.[13] Next to these astrological determinations, and not without a little pride, Ashenden set his *pronosticatio* based on the lunar eclipse and planetary conjunctions of March, 1345. The astronomical events of 1345, as he interpreted them, disposed the English to victories at Neville's Cross and Crécy, at which, respectively, the King of Scots was captured and the King of Bohemia killed.

What more needed to be said? With the distinction on human strife Ashenden brought the main body of the Summa to a close. From his own experience he was confident that man's inclination towards violence was directed by celestial forces. Yet he kept his own presumptions from growing out of control. The reflections at the very end of the Summa are hopeful, yet tempered with a realistic modesty.

[12] Comm.Quad. II.9, citing in Summa II.11.3, f.211rb.

[13] Summa ibid., citing Albumasar, Experimentorum.

7. Final Considerations

The twelfth and final distinction of Book II is entitled 'The Way of Prognosticating the Accidents of the World through the Doctrines Presented in Books I and II, and the Rules which are Most Reasonable; and Under What Conditions One Who Desires to Prognosticate Should Operate.' Among other subjects (but most importantly), the second and third chapters present a checklist of the elements of any prediction, and an astrologer's code of conduct.

Ashenden evidently believed that the success of predictions could be enhanced if astrologers systematically considered all the factors which came into play. With this end in mind, he included a checklist, devised by William Merle, of eight steps in making a judgement:[1] (1) Each planet should be examined in isolation. Its characteristics and intensities should be determined. (2) The planets' positions in the Zodiac should be analyzed. (3) The aspects between planets, especially conjunctions and oppositions, should be considered. (4) The position of each planet in its orbit and on its epicycle should be checked. (5) Look for comets and falling stars. (6) Take into account the nature of the seasons. (7) Determine whether predicted accidents are of compatible natures, and (8) compare the strengths of opposing forces to find which is dominant.

[1] Summa II.12.2, ff.212va-213ra. Merle's original checklist is preserved in Digby MS 176. See Appendix A.

For an exemplar of a successful prediction, Ashenden outlined his *pronosticatio* of 1345. (The details of this will be discussed later.) He did not say whether or not he had followed Merle's procedure; he did imply that a good astrologer carefully examined all indicators before making his pronouncements.

Chapter three lays out an astrologer's code of conduct.[2] In a very real way this is the most personal section of the Summa. Ashenden addressed the reader directly, and the text gives the impression that he was speaking from his own experience. Although the moral injunctions are akin to monastic rules, they also owed a debt to other astrological writers, chiefly Ptolemy and Firmicus. Ashenden instructed the reader to disregard praise and to avoid presumption. The astrologer should not boast of his work, since arrogance lowers even the most sublime topic. He should be earnest in his studies, and be moderate, sobre and chaste.[3] Avarice and ambition were to be shunned. Ptolemy in his Centiloquium emphasized that emotion must be kept at bay.[4] One must also avoid verbosity; the true scholar used few words. Woodenness of expression was a mark of an unlearned man. (Are these, I wonder, self criticisms?)

As he had said repeatedly throughout the Summa, one could place more confidence in universal predictions than in specific ones. In an additional note of caution, he

[2] Summa II.12.3, ff.217vb-218vb.

[3] Cf. Firmicus, Mathesis II.30.

[4] 'Amor et odium removent homines a rectitudine. Magnaminus parvipendit magna. Pusillanimus vero magnificat parva. Et est equalitas inter utrumque.' Centiloquium prop. 12.

underscored the need to eschew the illicit, ineffective and disreputable arts of necromancy, geomancy, interrogations and elections. The earnest student should devote himself to philosophy, arithmetic, geometry, and above all, the astronomical theory of Ptolemy. He believed that no one could suggest that the astrological doctrines in the Summa contravened any teachings of the Church. What catholic scholar, he asked, would deny that celestial forces shaped the weather? Who would deny that corruptions in the air transmitted disease? And who would deny that superterrestrial bodies influenced the dispositions of living things, plant, animal and man?[5] Following the generations of before him, Ashenden insisted that the study of natural causes and effects had a profound value of its own. The astrology of universal accidents was a part of the continuing study of nature.

[5] 'Quis enim unquam catholicus negaret quin calor et frigus siccitas et humiditas et omnes impressiones tam humide quam sicce in regione aeris generatae ex corporibus supercelestibus generentur?...Quis negaret etiam quin quedam constellationes disponet homines quandoque ad lites et adiurgia moventes eorum spiritus licet ad malum?' Summa II.12.3, f.218vb

At last, having completed his labours when the Earth was still being ravished by the plague, Ashenden wanted it to be known that he had not compiled the Summa out of presumption or for vainglory, but that he dedicated his work to his fraternal colleagues. With an invocation of the eternal glory of God, the Summa comes to an end.

* * * * * * *

At this juncture a brief assessment of the Summa is called for. In drafting the treatise, Ashenden must have felt that he was contibuting to scholarship. Admittedly, his own ideas were a fairly small component of the work; but in his eyes, inherited material was more valuable than new material. Nonetheless, the works of his compatriots Bredon and Merle left their respective impressions; and in all likelihood Rede and Sandwich contributed by lending Ashenden their books. In any case, the mass of astrological literature beckoned him to preserve and order it for the benefit of future readers. The fact that he chose to compile rather than to create suggests that Ashenden was a scholar of humble talents. Occasionally, he could uncover a surprising reference (those to Servius and Aulus Gellius, for instance) or clarify an obscure point; yet despite the critical stirrings he may have experienced, even within a context of his own making Ashenden could seldom bring himself to question received wisdom. Hence the Summa may not be merely an annotated bibliography, but as a document of fourteenth-century thought it leaves something to be desired.

V

PROGNOSTICATIONS 1345-1368: *OPERATIO REI SCIENTIAE ASTRORUM*

> You know how to read the face
> of the sky,
> but you cannot read the signs
> of the times.
>
> - Matthew 16.3

Ashenden's close associate, Simon Bredon, wrote that the principle of any subject (*principatio rei*) was acquired by reasoning, but the operation of the same (*operatio rei*) was gained by experience.[1] Bredon was thinking specifically of the theory and practice of medicine; but the aphorism works equally for the science of the stars. We have seen the principles of natural astrology enshrined in the none too pristine Summa. Now it is time to see what the actual predictions were like.

The *scientia astrorum*, as I said earlier on, was a partnership between the mathematician and the astrologer. Among the Mertonians the direct relation between calculation and prediction was nowhere more explicit than in the canon to William Rede's Oxford tables of 1340:

[1] Paraphrasing Galen via Avicenna. Trifolium, Digby MS 160, ff.176v-77v.

> For those who wish to prognosticate future effects of the planets on inferior bodies, first it is necessary to calculate, according to the operation of astronomical tables, the diversities of their motions so that there may be a natural progression from speculative science to the practical.[2]

Rede's tables were a popular success with English calculators--calculators who had astrological predictions in mind. The Kalendarium of Walter Elvedene[3] , almanacs of planetary positions, tables of houses, etc., were compiled for like purposes. We may safely infer from the number of these astronomical student-aids that a great amount of figuring was being done, and that a great many horoscopes were being cast. It is unfortunate that while fairly numerous in the manuscripts, horoscope charts are seldom accompanied by an explanatory texts or have only a very few words with them. Hence Ashenden's *pronosticationes* are specially important. Their extensive texts give clear astrological interpretations based on calculated planetary alignments. The analysis follows a step-by-step procedure, and at all times Ashenden drew his conclusions with immediate reference to authoritative opinions.

1. The Spectrum of Astrological Practice

Before scrutinizing Ashenden's forecasts of universal accidents it would be convenient to give a brief survey of fourteenth-century astrological and divinatory practice

[2] 'Volentibus prenosticare futuros effectus planetarum in inferioribus primo secundum opus tabularum oportet calculare ipsarum motuum diversitates ut a speculativa ad practicam fiat progressio naturalis.' BL Harley MS 1009, f.3r.

[3] I have consulted this in Fairfax MS 27.C.

(folk-arts and beliefs aside). The main practices can be listed as chiromancy, geomancy, nativities, interrogations and the casting of images. Of the non-astrological procedures, chiromancy and geomancy were fashionable curiosities of aristocratic society.[4] Practised by men who moved in those high circles, these arts were ornaments of refinement and passed as learning. Simon Bredon owned a volume on geomancy; and we do not have to press our imaginations very hard to see him performing geomantic operations for the satisfaction of noble patrons. The finest exemplar of the favour with which geomancy was viewed is the deluxe manuscript produced on the order of Richard II.[5] In the Summa, however, Ashenden classed geomancy and chiromancy as illicit sciences. He would have nothing to do with them.

As for the casting of nativities, though, no doubt Oxford masters engaged in the art, there is little hard evidence of them practising it. Robert Holcot spoke of the disposing influence of planets at his birth, and Bradwardine discussed the case of a man inclined to homosexuality by his nativity.[6] From his remarks it seems that Ashenden tried his hand at drafting birth charts; but he was not enthusiastic about them. He complained of the tedium of the necessary operations; and doubted the theory because it was so far removed from sensory experience.[7]

[4] For the details of geomancy, see Thérèse Charmason, Recherches sur une technique divinatoire: la géomancie dans l'occident médiéval (Geneva and Paris, 1980).

[5] Bodley MS 581. Cf. Carey 172-85.

[6] De causa Dei II.3; ed. Savile, 450-51.

[7] 'In nativitatibus etiam magna curiositas est et magnum tedium operandi...et natus ille ad virtutes aut ad vicia sic dispositus et inclinatus cum haec scientia,

Others had more zeal, particularly if a royal subject were involved. During the fourteenth century horoscopes were cast for Edwards I and II, the Black Prince, and Richard II. Sadly, the responsible scholars have not been identified.[8] The only nativity in our period that can be associated with any probability with Merton College is the one in Digby MS 176, dated 1317 (see Appendix A).

Two common types of stellar divination were interrogations and the casting of images. The extent of the practice of these arts in Oxford or elsewhere is hard to gauge. It is plain nonetheless that at a university level they were controversal subjects. At Paris in 1336 the chancellor of the University, Robert de Bardis, condemned divination by interrogation. Robert's attack solicited a heartfelt reply (by an anonymous scholar) in defence of the method. The supportive epistle was worthy of having multiple copies.[9] No English examples of interrogative consultations survive from the first half of the 1300s. But a good deal of interest must have existed in academic circles. Treatises on interrogations such as Zael's Introductorium and the De intentionibus secretorum of Messahalla are copied in several manuscripts of the period. One interrogation from the later part of the century is extant--a horoscope dated 5 July 1376, enquires whether the young Richard of Bordeaux would become King of England.[10]

scilicet nativitatum. A sensibus nimis remota est, et nimiam curiositatem relinquit.' Summa II.12.3, f.218va.

[8] North, Horoscopes and History, 139-41.

[9] Lynn Thorndike, 'Traditional Medieval Texts concerning Engraved Astrological Images', in Mélanges Auguste Pelzer (Louvain, 1947), 220.

[10] These words are written above the horoscope: 'Vide quod eventus rei correspondet figura secundum libros

Concerning astrological images or amulets, one source close to the Mertonians, Robert Holcot, represented a position that in all likelihood was not uncommon. Holcot voiced an uneasy scepticism, wholehearted neither in condemnation nor in support. On the one hand, he wrote that astrological images were not to be equated with necromancy or other illicit sciences, as some might imply.[11] On the other, the utility of fashioning these images was questionable; though at least one man, a Londoner, was reportedly cured of quartan fever with a golden amulet cast in the shape of a lion under the right constellation.[12] If anything secured the niche for image engraving, it was the linkage between astrological and medical theory. Practising physicians must have used the device on occasion; however, the documentation of this medical activity is slight, and what is known to exist has not yet been collected and studied.

iudicales de interrogationibus.' Inside the figure itself: 'Utrum Richardus de Burdegal. possidebit regnum Anglie hoc questio cum sua figura facte erat cito post mortem Edwardi principis Wallie et ante mortem Edwardi regis tertii post conquestum.' Rawl. MS D.1227, f.2r.

[11] 'Haec autem est differentia inter imagines astrologicas et necromanticas. Quod necromanticae fiunt per expressam invocationem daemonum, astrologicae per pacta tacita figurarum vel characterum.' In Librum Sapientiae Regis Solomonis, 17, verse CXC.7-9 (Basel, 1586?), 626-7.

[12] 'Dubium est an liceat tales imagines facere, et tales factis uti, sicut temporibus meis quidam in Londonia dicebatur curari a quartana per imaginem leonis auream, secundum certam constellationem factam. Hoc est difficile dicere quod sit veram, propter mirabiles operationes corporum coelestium quia hoc est certum quod nihil est homini illicitum quod per naturam compleri.' ibid. 13, verse CLX.17-19; 530.

If the practice of these arts was scarcely documented, no more can be said of weather forecasting by astrological means, a central interest of the Merton astronomers. Apart from the worked examples in the De impressionibus aeris of Grosseteste, and excepting the tracts ascribed to Ashenden and Lambourne, only two English 'forecasts' are known to me. One, a notice found in a Cambridge manuscript, concerns the weather on 31 March 1321.[13] The day is described in the past tense, so even this little note was *ex post facto*. It is difficult to read, but I gather that the planets disposed the day to be calm and pleasant. The conclusion appears to have been derived by the method of giving weights to planetary influences as in the De impressionibus aeris. The second notice, perhaps coming from William Merle, cites a rule that if Saturn is in opposition to or conjunction with the full or new Moon, thunder will be heard. On 28 May 1340, it says, Saturn opposed the new Moon, and thunder duly sounded.[14]

Most astrological predictions were low-key affairs: a few scribbled calculations, a chart, and perhaps a note outlining the judgement. No doubt tens if not hundreds of predictions scrawled on loose pages or in flimsy notebooks are now lost to us. It was through Nicholas of Sandwich that Ashenden's first *pronosticatio*, of 1345, escaped the fate of most. Sandwich in all likelihood encouraged Ashenden to take up the project; and it was he who had the

[13] CUL MS Gg.6.3, f.138v.

[14] 'Notandum quod tonitruus accidit communiter quando Sol et Luna sunt in coniunctione vel in oppositione, si pro hunc Saturnus eis coniungatur vel opponatur, et sic accidebat anno Christi 1340 in 28 die Maii quando Sol et Luna coniungabantur in Geminis et in opposito Saturno existente in Sagittario. Experimentum.' Digby MS 97, f.129v, immediately following the Notula magistri Merla.

copy written which later passed on to Rede and was preserved in Digby MS 176.

It is in the field of universal predictions that we reap the greatest harvest of sources. This is the only medieval astrological genre whose practice is open to detailed study. All of Ashenden's *pronosticationes* are universal predictions; and in addition to his tracts we can point be a mass of material, ranging from scholarly treatises to popular poetry to the notes of chroniclers.[15] In the scholarly category, we have the judgements of the Parisian astronomers Geoffrey of Meaux, John of Murs and Firminus de Belavalle for 1345. John of Murs also wrote a tract on the conjunctions of 1357 and 1365. He sent his conclusions in an epistle to Pope Clement VI.[16] This material deserves greater attention than I can give it here. We proceed directly, then, to the writings of Ashenden.

2. General Characteristics of the *Pronosticationes*

Ashenden's 1345 Pronosticatio was never widely distributed. The only other (imperfect) copies were made by John Dunstaple. When others noted Ashenden's predictions of 1345 they always referred to the account given in the Summa (II.12.2). Knowledge of the original tract was limited to a small group of people. That does

[15] See HMES iii.303-317.

[16] The 1345 texts have been edited by Hubert Pruckner, Studien zu den astrologischen Schriften des Heinrich von Langenstein (Berlin, 1933), 215-226. The epistle of John of Murs has not been printed. I have seen it in a photocopy of BN lat. MS 7443.

not imply that the work was purposely kept incognito, but rather that it was never thought of as a populist treatise or even a university text. It was an academic or personal exercise, in keeping with the general nature of predictions. The 1349 Pronosticatio also did not see any kind of circulation. It is known only by Rede's personal copy, again in Digby MS 176; later astrologers, so far as I have been able to tell, show no knowledge of this work.

It is likely that the prognostications were part of a wider program of astrological endeavour among the Mertonians. We find that Ashenden's forecasts were composed in either February or March--as it happens, around the beginning of the astronomical year, when the Sun enters the first degree of Aries. It seems that Merton men regularly drew up almanacs for the approaching year. Examples of these are still to be found in the manuscripts. Particular attention was paid to full and new moons, while other astronomical events were calculated separately. Evidently, weather forecasts had much to do with almanacs. According to the table of contents of Digby MS 176, William Rede made the astronomical calculations on which Ashenden based his predictions in 1345 and 1357. But for the eclipse calculation for 1357 at least he made use of Walter Elvedene's Kalendarium.[17]

Ashenden's prognostications stand out among extant fourteenth-century judgements because they display thorough methodology quite remarkable for the period. In essence they follow the procedural guidelines of Ptolemy, for the supposed influence of each astronomical event is treated along four lines of enquiry: (1) where on earth the influence will be felt, (2) when its effects will appear and their duration, (3) what sort of effects will

[17] IIIa.1347. Cf.Fairfax 27.C, f.87r.

be produced, and (4) whether the outcome will be for good or ill.[18] Ptolemy had directed his attention principally to the significations of eclipses; thus he developed his procedure with them in mind. Ashenden, however, was equally interested in planetary conjunctions; but he was aware of the value of using a standard method in every prediction. Ashenden's move towards generalizing the system of Ptolemy had some merit. That is not to say that Ashenden followed a consistent procedure in all of his writings. For instance, Merle's checklist quoted in the Summa, the *considerationes* pertaining to an astrological judgement, is hardly in evidence in the prognostications. As with judgements in law, astrological predictions were open to a wide latitude of interpretation. Ashenden occasionally raised certain *dubitationes* to the case he was developing in his predictions.[19] In each instance, however, he raised a doubt only to show that it was misplaced.

The chief drawback of the *pronosticationes* is that they were written in the same pleonastic style that overwhelms the Summa. Ashenden had a knack for making what he says forgettable. He constantly repeats himself, quotes unnecessarily, and seems reluctant to draw any firm conclusion. For the amount of information they contain, the prognostications are much longer than they need have been. Confronted with these lengthy documents, some copyists preferred to abbreviate. Seldom was any significant detail ever lost.

[18] Quadripartitum II.4. Cf. Summa I.3.1-4.

[19] II.491-509. IIIa.1027-1059.

3. The *Pronosticatio* of 1345

Ashenden's first *pronosticatio* was completed on 24 March 1345. He added a concluding paragraph sometime late in 1348. The addendum sought to account for the Black Death in terms of a gathering of the three superior planets in the sign of Aquarius. (We shall look into that a bit later.) The original prognostication explored the significance of a lunar eclipse and three conjunctions. All of the events occurred as Ashenden was writing in that same month of March. The following synopsis, if not concise, is at least considerably abbreviated when set against the Latin text.

The consideration of the lunar eclipse begins with the statement of Ptolemy's four categories: the where and when, kind and quality of the event. First, since the eclipse commenced in the sign of Libra, it was evident that the eclipse would affect the middle of the northeast portion of the habitable world.[20] This because Libra was the middle sign of the third triplicity, which signified the northeast. As the eclipse started an hour and thirty-five minutes into the night, its effects would first appear about the middle of the second month after the eclipse itself (May, 1345). Ashenden estimated that the effects would last eight years and six months (or to November, 1353). The calculation of this figure was somewhat involved: Ptolemy stated that the effects will continue for as many months as hours that the Moon is eclipsed. On this occasion eclipse lasted approximately three and two-thirds hours, so without other mitigating

[20] I.22-35.

forces the influence of the eclipse would be felt for three and two-thirds months. However, the conjunction of Saturn and Jupiter, taking place nearly simultaneously with the eclipse, markedly enhanced the lasting-power of the effects. Haly argued that the period of influence in this case should be multiplied by a factor of 1000, 100 or 60, depending on the significance of the conjunction. Ashenden decided that under the circumstances 60 was the proper factor; and as the conjunction was not occurring at the exact moment of the eclipse but two days and nine hours later, he multiplied only by 30. Thus the result was 110 (30 x 3 1/3) months, which is eight years and six months.[21]

The type of effects that would result from the eclipse could be known by the examination of five items: (1) the position of the eclipse itself, (2) the influence of the dominant planet, the lord of the eclipse, (3) the lord of the preceding angle, (4) the lord of the following angle, and (5) the fixed stars in the direction of the eclipse, and in the direction of the preceding and following angles.[22] If the analysis of all these was not involved enough, there was an additional complicating factor. The heavens, over the nearly four hours of the eclipse, travelled a significant portion of their daily circuit about the Earth. Hence, from the beginning to the end of the eclipse different constellations had come into the picture, and would contribute to the final outcome. In order to get any idea of the effects, each of the forces acting with the eclipse had to be isolated, and their

[21] I.35-66.

[22] I.69-75. Ashenden has generalized the doctrine of *prorogation* which Ptolemy had used in the context of the length of a man's life. Quadripartitum III.10.

quality evaluated in aggregate. For the sake of convenience I list the items in a tabular form:

Lunar Eclipse, March 1345, 18 days, 9 hours, 40 minutes completed. Eclipse occurs in Libra, whose lord is Saturn, which is in Aries at the time of the eclipse.

Preceding Angle

I. Beginning of eclipse: Leo, whose lord is the Sun, which is in Aries
II. Mid-eclipse: Virgo, Mercury, in Aries
III. End of eclipse: Libra, Saturn, in Aquarius

Following Angle

I. Beginning of eclipse: Libra, Saturn, in Aquarius
II. Mid-eclipse: Scorpio, Mars, in Aquarius
III. End of eclipse: Sagittarius, Jupiter, in Aquarius

Constellations

I. In the direction of Libra: Hercules, Bootes, Serpens, part of Draco, Centaurus and Lupus
II. In the direction of Aquarius: Cygnus (Gallina), Delphis, Equus prior and posterior, part of Draco, Piscis Australis (retinens aquam Aquarii)
III. In the direction of Aries: Andromeda, Cassiopeia, Cepheus, Cetus and Eridanus

Since Aries, Libra and Aquarius figured in most facets of the matter, they were to be scrutinized most closely. Libra and Aries, being equinoctial signs, signified the effect of the eclipse on all things that grew in the earth. The sacred rites of the Church would also be under pressure of change. Aquarius represented earthquakes; and as a fixed sign it indicated lasting effects. The constellations in the direction of these signs represented the forms of things to be influenced by the eclipse. So men and women (Hercules, Bootes, Cepheus; Andromeda and Cassiopeia), fish and fowl (Piscis, Delphis, Cetus; Cygnus), and other creatures (Draco, Lupus, Equus, Serpens

and Centaurus) were particularly indicated.[23]

The nature of the celestial influence in this case would be overwhelmingly negative, because Saturn predominated throughout the eclipse. Furthermore, Saturn's position was secured by its lordship over the following great conjunction.[24] Its malignant emanations would set into action wars, mortality, periods of great cold, rain and snow, corruptions of the air, and famine. That the eclipse occurred in the sign of Libra meant that harvests would fail; spring plantings would be blighted as they sprouted and flowered.

By examining the changes in the lordship of the preceding and following angles, Ashenden was able to construct a general chronology of the reputed effects of the eclipse.[25] At first, the power of the Sun, lord of the preceding angle, would temper the worst of Saturn's influences. However, during the middle period when Mercury assumed the lordship Saturn's control would be virtually unbridled. There would be many infirmities in man and animal, feverish diseases and tempestuous weather. Towards the end of the eclipse, Saturn becomes the ruler the preceding angle, and the saturnine evils would be correspondingly intensified. The following angle during the initial period was Libra, which is controlled by Saturn. Again, the Sun exerted a beneficent influence. At mid-eclipse Mars succeeds as ruler. Throughout the period of martian rulership there would be widespread upheaval, warfare, great winds, and poor harvests because of heat and drought. The 'hot' nature of Mars would be

[23] I.118-151.

[24] I.182-92.

[25] I.199-315.

intense enough to overcome Saturn's coldness. On account of the martian lordship Saturn itself would disseminate a dry influence *per accidens*.[26] Over the final portion of the eclipse Jupiter would preside, reestablishing a temperamental balance in the sublunar world.

Over a half of the 1345 *pronosticatio* is devoted to the lunar eclipse. The remaining portion deals with the gathering of the superior planets in Aquarius.[27] The gathering was separable into three conjunctions, the first of which, between Saturn and Jupiter, occurred on 21 March. All three conjunctions were sited in Aquarius; as that was so, their influence fell mainly on the first clime, particularly some obscure countries of the distant east, but also rivers, seas and other bodies of water. Throughout the duration of the conjunctions, however, the eclipse would be the predominant celestial force. This force, then, would direct the influence of the planets onto regions of the Earth which pertained to it. The upshot of this was that northern lands would be excessively humid, and drought would prevail in the South. The conjunction of Saturn and Jupiter nonetheless did not prefigure a great upheaval in the course of history, according to Albumasar's definition, because there had been no change in triplicity since the last conjunction.

Ashenden reckoned the duration of the conjunction's effects in accordance with the rule of Albumasar. Simply, the number of degrees the place of conjunction is removed from the ascendent is proportional to the affected period in years. The conjunction in this instance was three signs and four degrees (94°) from the ascendent. What

[26] I.257-67.

[27] I.451 seq.

then was to be the proportion between years and degrees? Albumasar permitted three values: a one-to-one correspondence of degrees to years, the same correspondence degrees to months, or one-to-one signs (30°) to years. Evidently Ashenden did not rate this conjunction too highly, because he chose the third and least value. Therefore, he predicted, the effects would last slightly more than three years (for the three signs and four degrees).

The effects of the conjunction depended on certain factors: the location of conjunction (house and sign), and the sign of the ascendent. In this case, Saturn and Jupiter were joined in Aquarius and the tenth house. Ashenden reasoned from this that the English would enjoy beneficial celestial influences. The tenth house was the House of Kings, i.e. it represented the elevation of kings, their lordship, triumph and good fortune. Aquarius ruled over watery areas. Britain, by virtue of being an island was closely associated with water. With a bent logic Ashenden inferred that the king of England would obtain victory over his enemies. According to Messahalla, a kingdom under Aquarius should become rich with famous nobles and mettlesome knights. The deeds they would now perform, never before attempted, would earn them fame and honour among the people.

Saturn, unfortunately, was the Lord of the conjunction. The hallmarks of that planet ranged over the spectrum of calamity: famine, war, fatality, disease, death of kings, destructive winds and earthquakes. Prospective mitigating forces were Venus and the Sun. Venus, the planet nearest the ascendent, would bring to bear some power for good. The Sun, in sextile aspect with the conjunction was also strongly placed; but Saturn, participating in the conjunction itself, lord of conjunction and lord of year, projected an unassailable

and destructive force onto the world.

Well before the eclipse and the conjunction of Saturn and Jupiter two lesser conjunctions occurred, a meeting of Saturn and Mars, and one of Jupiter and Mars.[28] The conjunction of Saturn and Mars indicated to Ashenden the coming of war and great effusions of blood. He found, by the established procedures, that the effects of this conjunction would begin in two years time and last for one year. The signs were, then, that a great conflict would flare up in 1347-8. The combination of Saturn and Mars would induce consistently colder, drier weather. Pisces, on the ascendent, significated detriment to fish. The meeting of Jupiter and Mars, Ashenden does not mind saying, was small fry compared to the other celestial events of 1345.[29] Its main effect would be to bolster the influence of the other conjunctions over the discord among kings and the corruption of the air. Mars would overpower Jupiter, tipping the balance towards evil effects.

With the remarks on the third conjunction the original *pronosticatio* came to an end. To summarize, Ashenden predicted the success of the English king and magnates in future warfare. In England cold, damp weather would predominate over the coming years. Excessive humidity would have its consequences, namely poor harvests, famine and the outbreak of disease. Those were the only conclusions explicit enough to be any use. But a thick shell of words encased that tiny kernel of thought.

Whilst composing the final distinction of the Summa late in 1348, Ashenden reexamined what he had said of the

[28] I.714 seq.

[29] I.775-93.

1345 events. He had previously handled the conjunctions of Saturn and Jupiter, Saturn and Mars, and Jupiter and Mars as separate entities. Horoscopes had been computed for each. In 1348 he changed his interpretation fundamentally. According to Messahalla the greatest possible conjunction was when all three superior planets gather in one face (10° or one third) of a sign.[30] By virtue of Aquarius having been the location of this conjunction, a terrible pestilence was significated. Aquarius, an airy sign, was in a human form--thus the air was corrupted in such a way as to inflict mankind with this terrible pestilence.

The 1345 prognostication was Ashenden's one moment in history. That his was an illusory triumph for astrology is now beyond question; that is not at issue. We can, however, imagine Ashenden's confidence growing as he observed the events that seemingly agreed with the gist of his forecasts. Yet he could hardly have failed to notice that while his predictions had made out the general outline of things to come, they were not too successful when it came to particulars. For one, he had expected the effects of the Saturn-Jupiter conjunction to begin to emerge around September, 1349; but each of the happenings, which had so greatly encouraged him, had taken place well before that time. Ashenden, I believe, was willing to dismiss such inaccuracies as a lack of refinement in his own astrological judgement. In order to improve his skill, he desired a complete mastery of theory. The Summa was a natural development of that desire. We might think too that Ashenden gained some understanding of contemporary affairs, chiefly the Anglo-French conflict. Ashenden hoped, in vain, that a thorough knowledge of

[30] In chapter nine of De revolutionibus annorum mundi, which Ashenden called Epistola de coniunctionibus.

astrological doctrine and of human events would enable him to make more specific predictions, and more accurate ones.

Ashenden did not foretell the Black Death, he merely convinced himself that it would have been possible to forecast it from celestial signs. By adding the final paragraph to the original tract, he betrayed the fact that in 1345 he had no idea, when he spoke of infirmities and mortalities, of the form in which they would manifest themselves. Even in the Summa account no mention was made of buboes or pustules. Ashenden evidently made no attempt whatsoever to relate causally a specific disease with its heavenly antecedents. Perhaps from his view, the less said the better. From our perspective it looks as if Ashenden was sweeping his troubles under the carpet. This is precisely where his careful use of astrological doctrine and method failed to bring him closer to the truth.

4. The End of the Plague

Less than two months after completing the Summa Ashenden was working again on a set of predictions. Calculation had shown that during 1349 Mars would enter into a conjunction with Saturn and then Jupiter, and that there would be a lunar eclipse. These events were astrologically momentous in themselves, but Ashenden was further interested in the altering forces they would exert on conditions as shaped by the events of 1345.[31] He first examined the horoscope of the astronomical year 1349.[32]

[31] II.39-42.

[32] II.43-118.

Ashenden found that the Sun was the lord of the year. Saturn, he observed, being in a detrimental house and under the Sun's rays, was acutely disadvantaged at the start of the year. The remorseless heat of the Sun posed the threat of drought and famine. The frigidity and humidity directed by Saturn, temperaments prevailing in the aftermath of 1345, would be counteracted; and this very process would prevent the heat of the Sun from doing much damage. The good aspects of Venus and Jupiter were also a moderating influence. Mars and Mercury, however, together in Pisces, would add to the evil side. As a result, the significations of the year were finely balanced. The celestial powers would remain especially fluid as Scorpio, a mobile sign was on the ascendent as the year began. Because Mars, Saturn, Mercury and the Sun were to be closely placed during the first three months of the year, thunder and hailstorms would take place frequently over that interval. Between the storms the weather would be hotter and drier than usual.

Eleven days after the Sun's entry into Aries, Saturn and Mars would join together in the sign of the Ram.[33] As Aries was a fiery sign, the conjunction would produce a great amount of heat. Southern climes would particularly experience oppressively high temperatures. On the whole, northern lands would enjoy moderate conditions. Of course there were other effects of the conjunction. With citations to Albumasar, Ptolemy, Ibn Ezra, Haly Abenragel and Mansor, Ashenden reeled out all the generalities: human conflict, war, bloodshed, disease, death of the peasantry, arguments among kings, storms, winds, rain, earthquakes, floods. These disasters and others would afflict various parts of the world, principally in the third clime and in eastern lands, but also in the north

[33] II.182-379.

and west. In Ashenden's assessment, the main consequence was to be the discontinuance of the great plague. Critics, however, might have cause to doubt his judgement on the conjunction.[34] Specifically, an objection could be raised to his assessment of the strength of Mars. As the planet was under the rays of the Sun at the time of conjunction, the martian influence should be sequestrated. Ashenden claimed that while the force of Mars was subsumed by the Sun, this would not reduce the amount of heat communicated to the inferior world.

The Black Death, it was claimed, had been spawned during the period, 1345-48, disposed to the cold-wet temperament of Saturn. Ashenden reported that the weather over these four years had indeed been miserably wet and cold, in England at least. All the same, the Jupiter-Mars conjunction was to change the weather pattern, removing the conditions that had promoted the development of pestilential fever.[35] This was a reasoned argument, and not a bad one for its time. Curiously enough, the disease behaves in an opposite sense. *P.pestis*, the plague bacterium, is excited by warm temperatures, and is quiescent at near freezing temperatures. Its activity too is restricted by certain humid conditions. Thus the plague displays seasonal variations in its attack, with a distinct trough during the winter.[36] Ashenden was writing in January and February, a time at which the spread of the disease would have slowed.

[34] II.491-509.

[35] II.267-99.

[36] Shrewsbury, A History of the Bubonic Plague in the British Isles (Cambridge, 1970), 2-3.

His tract continues with a discussion of a lunar eclipse and a conjunction of Jupiter and Mars. In the second hour of the night of 2 July, an eclipse of the Moon was to occur. Ashenden's brief notice put aside the intricate treatment he had given the 1345 eclipse. Instead he pared down his comments to a minimum.[37] The Moon would pass through the Earth's shadow in three hours, fourty-six minutes and twenty-six seconds.[38] From the procedures already mentioned, Ashenden reckoned the impact of the eclipse would descend on the world after a month's time; the effects would endure four months. Eclipsed in the tenth house, the Moon would touch upon both sacred and secular affairs. Mars and Saturn, at that time would be near the meridian, strengthing the influence of the eclipse in line with the force of the previous conjunction. Dissention and war would result. Yet since Jupiter was to be well placed, the summer weather would be conducive to the growth of crops. On 7 August, Jupiter and Mars were to participate in a minor conjunction in the sign of Cancer.[39] Messahalla judged that this type of event indicated rain, storms and war. Jupiter would be in its exaltation, but Mars, dominant in the previous conjunction, would stand north of Jupiter in celestial latitude, giving it the upper hand. Hot, dry conditions would prevail. Saturn, in aspect with the conjunction added malignant overtones. On that pessimistic note, we leave Ashenden's predictions of 1349.

[37] II.380-430.

[38] Elvedene had calculated 3h 31m 30s. Fairfax MS 27.C, f.78r.

[39] II.431-59.

5. The *Pronosticationes* of 1357 and 1365

In Thorndike's opinion, the Pronosticationes of 1357 and 1365 comprised a single work, albeit in two parts, written at once in the earlier year.[40] It is true that in the Digby and Ashmole manuscripts the predictions have the appearance of a unified tract; moreover, at the close of the 1365 piece in Digby MS 176 the colophon plainly states that it was finished on 10 March 1357. All the same, there are indications that Ashenden revised and added to the Pronosticationes in 1365.

The one stretch in all of Ashenden's writing that pretends to be literary is the introduction to the combined 1357/65 tractate. He tells the reader that he has been waiting for someone else to take up the subject. Apparently no one had. He too has been delayed by worldly concerns. Now back to his writer's desk, Ashenden hoped to redress the deficiencies of the ignorant astrological practitioners, who miserably defame the science with their erroneous predictions. As he had done in the Summa, Ashenden vowed to follow the doctrines of reputable authorities, not those of his own imagination. 'Who am I?' he asks, 'or what faculty of mind do I possess, to treat such a matter as arduous as it is difficult, concerning the great conjunctions of the superior planets, which, among all parts of judicial astrology is the most difficult?'[41] The answer, though he does not say as much, is that he is not actually equal to the task. Ashenden pleads in advance for forgiveness of the errors he might commit. He will put himself to the judgement of the wise and prudent, and the true professors of the science; they

[40] HMES iii.338.

[41] IIIa.59-62.

alone can estimate the value of his work. As for malicious detractors, Ashenden has no fear of them; just as the apostles freely suffered the oppression of their foes. But no human invention is without some imperfection. All Ashenden can do is to proceed as best he can.

The main event of the astronomical calendar, 1357, was a conjunction of Saturn and Mars in Cancer, the sign of the Crab, on 8 June--or as it is in the *pronosticatio*, 7 days, 22 hours and 30 minutes of the month having been completed. The conjunction would have dire effects because both planets are badly placed in that sign--Cancer is the 'fall' of Mars and the detriment of Saturn. Such an alignment, then, would lead to the depopulation of regions, conflicts and wars, the change and death of kings. Albumasar said that the prophet Mohammed revealed himself after a similar meeting of planets in Cancer.

A thorough analysis was made according to Ptolemy's four considerations.[42] First, the affected countries. Cancer, the location of the event, represented lands in the seventh clime, and certain countries in North Africa and the Near East. Virgo, the ascendent, ruled over Mesopotamia, Greece and Crete. The main planetary force would be Mars, because Mars was above (i.e. north of) Saturn in the conjunction. Hence, the lands in the Martian domain would be affected: Britain, Germany, Rome, Turkey, Palestine and Egypt. Indications were, however, that northern countries would bare the brunt of the conjunction's influence. Both Cancer and Virgo lie north of the celestial equator; the latitudes of Mars and Saturn too were north. It followed astrologically that the seventh clime was specially indicated. That included

[42] IIIa.132-778.

England, France (its northern portion, if no more), Scotland and Ireland.

The planetary emanations would first be observed some fifty days after the conjunction, about 5 or 6 May, 1357. Minor effects were to appear earliest. Greater influences would descend on the Earth after three months' time, the gravest effects over several years. In all, the impact of the conjunction would spread over forty years. Having said that, Ashenden was quick to point out that the inlfuence of the 1357 conjunction would fall under the great conjunction due in 1365. The later conjunction would be the chief director of the complexion of things beyond that date; so the effective period of influence of the first conjunction would be the eight years, 1357 to 1365.[43]

As the conjunction was situated in Cancer the Crab, fish and other aquatic animals (including sea-birds) would be affected. Cancer was the sign of the summer solstice; that season would have a particular relation with the conjunction. As a feminine sign, Cancer represented effects on the females of all species; and as the sign of the Moon it indicated an abundance of rain and strong winds. Changes in human *mores* were similarly represented by Cancer. With the Moon it particularly disposes the English to change. Law and order would be threatened. Some men would lay aside the law of the realm, adopting foreign customs; robberies and other transgressions would become more frequent. Also situated in the eleventh house, the conjunction would preside over churchmen and potentates. Virgo, the ascendent, implicated winged creatures as well.

[43] IIIa.274-457.

Constellations in the direction of Cancer figuring in the conjunction were Ursa Major and Minor, Bootes, part of Draco, Argo and Canis Major; in Virgo's direction, Leo, the tail end of Ursa Major, Serpens and Argo. Ashenden noted that these 'fixed' stars had shifted in position, with respect to the ninth sphere, since Ptolemy's epoch. Here Ashenden names Simon Bredon, who equated the movement of the eighth sphere with the greatest diligence. He found the shift to amount to 18° in the year 1340. By 1357 it was 18° 17'.[44]

The fourth consideration was whether the conjunction signified good or evil.[45] The question was decided by the temperament of the ruling planets. Mars, positioned above Saturn in conjunction, would be one; the Moon, whose sign was Cancer, another. Mercury was also participating, because it was presiding over the ascendent. On balance the three ruling planets represented negative effects. The Moon would be in Pisces, bringing on heavy rain, floods, poor harvests and illnesses that would compel men to flee from their homes. Mars in Cancer would denote conflict between East and West; fevers, and stomach and heart disorders, absence of rain, and great heat. Mercury, in agreement with Mars, signified thunder and lightning, dry exhalations, earthquakes, actions by the force of arms, the death of noblemen, wrath of kings, and public disturbances. The dry temperament of Mars and Mercury would corrupt bodies of water, spark fires, engender locusts and destroy crops.

Ashenden understood that the astrological *regulae*

[44] IIIa.520-25. Ashenden was assuming a shift of one minute of arc per year.

[45] IIIa.546-778

suggested contradictory effects; for lunar influences encouraged abundant rain, while Mars and Mercury signalled drought. Which force would prevail? He believed they would cancel each other out, leaving behind temperate conditions which were beneficial to the growth of crops, and the harvest. The dry exhalations mentioned before might produce falling stars and comets in some areas. Earthquakes were also a possibility. There was little to fear from such tremors in England as they were an extreme rarity in northern regions.[46] As for the weather in 1357, conditions would be generally fair through May, June and July, but around new and full Moons storms would develop. The conjunction would be one cause of these tempests, but the immediate cause would be the 'opening of the portals', aspects among planets releasing small-scale celestial emmanations. These processes were outlined in the Summa to which Ashenden refers the reader.[47] Weather in the later half of the year would be shaped by a partial eclipse of the Moon taking place on 1 August. From August to November celestial forces would promote clouds and fog, contrary winds and low temperatures. Rain would lead to flooding. The shift in temperament would cause various fevers and other infirmities, bringing death to the elderly. These things would come to pass by virtue of Saturn's dominance in the eclipse.[48]

The main segment of Ashenden's forecast has to do with more dramatic human affairs, namely an impending English conquest of France.[49]

[46] IIIa.1165-71, 1231-8.

[47] IIIa.1269-87.

[48] IIIa.1340-1403.

[49] IIIa.679-1059.

In the view of Haly, Messahalla, Albumasar and Ibn Ezra, a conjunction of Saturn and Mars in Cancer denoted upheaval, war and disaster in certain kingdoms. Cancer was the sign ruling over Britain, but since the guardian planet of the English, the Moon, was well placed during the conjunction there was no chance of England's early demise. This interpretation was supported by the amicable positioning of both Jupiter and Venus. It seemed reasonable to Ashenden that if calamity were not to strike the English, then the French would be its next target. In charge of France was Mercury. At the time of the conjunction, unfortunately, Mercury was only three degrees from the Sun. Under the intense solar rays at that proximity, the francophile planet would be combusted and altogether drained of its influence. Some might argue that the Sun, as the generative principle of all things in the inferior world, could not by its own nature act as a destructive power. The masters of astrology, nonetheless, concurred that the Sun's power was overwhelming when in conjunction with other celestial bodies.[50] At this point a quasi-optical doctrine, which Ashenden took from Albumasar, Alchabitius and Hermes, comes into play.[51] It happened that under certain circumstances the light of one planet, hence its celestial virtue, might be transferred to another planet. In the present scenario, the virtues of Mercury were taken up by the Sun. The Sun did not retain these virtues, but passed them on to the location of the conjunction, where Mars and Saturn were residing. Neither Mars nor Saturn was the lord of the conjunction, so yet again the mercurial light was sent along and would finally rest with the Moon, the dominant planet. The

[50] IIIa.787-826.

[51] IIIa.832-41, citing Albumasar, Introductorius maior VI.26; Alchabitius, Introductorius I; and Hermes, Centiloquium prop.26.

practical upshot of this scheme was that the possessions represented by Mercury, i.e. the kingdom of France itself, would be transferred to the English, represented by the Moon. Thus Ashenden contrived to foretell Edward III sitting on the French throne!

However momentous Ashenden believed the 1357 events to have been, 1365 was to be a red-letter year in his book; for in that year the Saturn-Jupiter conjunction cycle was moving into a new triplicity, marking changes of the highest order on Earth. The two planets were to come together in the constellation Scorpio on 30 October 1365, heralding such things as the victory of kings, the rise of prophets and the metamorphosis of religions.

The particulars were as follows: Saturn and Jupiter would meet at 8° 22' of Scorpio, 29 days 14 hours and 29 minutes of October having been completed. Simultaneously, the Sun, Venus and Mercury would be residing in Scorpio, and the Moon would be in the opposite sign, Taurus. The conjunction would project its influence on virtually all countries, north and south. A good deal of the impact, though, would fall in the North, because in conjunction both Saturn and Jupiter would stand north of the ecliptic. Among northern peoples Scorpio specially represented the wild Scots. Albumasar and Ptolemy did not include Scotland in their astrological geographies; Ibn Ezra, however, in his De annorum revolutionibus gave a clear picture of the Scots and their celestial relations: That race was crude, licentious, untrustworthy, warlike and faithless, thus it agreed in kind with the Scorpion, most treacherous of constellations. This evaluation was seconded by Master Henry de Fenby, a capable English astronomer.[52]

[52] 'Valens astronomus Anglicus.' IIIb.188-91. Also

France was also implicated as Mercury, its celestial guardian, was the lord of Virgo, the ascendent at the moment of conjunction. (The 'auld enemies' were again brought onto the celestial stage.) The first and least momentous results would appear shortly after the conjunction itself. Rain, destructive winds and storms would be unleased. Ships would have to risk storms at sea. On land, flooding would threaten the harvest. Famine was a distinct possibility. An epidemic was also likely. These were the immediate effects. As the conjunction was a very major one and would be taking place in a fixed sign, its chief effects would emerge after some three years, and would continue for about seventy years. But what were these epoch-making events to be?

Ashenden decided that the conjunction was the signal of three major events: the overthrow of Islam, the destruction of the kingdom of Scotland, and conflict between the Pope and secular rulers. He commenced with the question of Islam.[53] In his mind, the imminent obliteration of that false sect was not as ludicrous as it seemed. After all, Albumasar too had forecast Islam's demise. The reasoning was obscure, but the renowned Arab astrologer had predicted that the religion would endure only 693 years. Reckoning that Mohammed had begun his ministry in A.D.622, Ashenden observed that had Albumasar been correct, the worship of Allah would have ceased in 1315, some forty-two years before this conjunction. Clearly, his timing was off; the essence of his forecast, however, deserved examination in light of the 1365 event. First, Saturn and Jupiter were to affect all the great Moslem realms in Arabia, Syria, Asia Minor and North Africa. Secondly, such conjunctions normally prefigured

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mentioned in Summa I.8.4, f.46ra. Otherwise unknown.

[53] IIIb.482-570.

the rise of new sects and/or the fall of old ones. Thirdly, Venus, the significatrix of Islam, would be drained of all her powers, in the house of Mars, the term of Saturn, and overwhelmed by the rays of the Sun. Christian nations, Ashenden was sure, would be responsible for the overthrow of the Mohammedans. The sword was the means, depopulation of Moslem lands and occupation by Christian forces, the result.

The unruly Scots were also to be humbled by celestial forces.[54] In the heavens, Mars and Saturn represented Scotland; and at the time of the conjunction both planets held nothing but evil portents for northern Britain. There were two alternatives--either the country would be devastated by war, or there would be a change of kings. Some kind of military engagement was likely. Because the constellation Sagittarius was implicated in the conjunction, archers (*sagittarii*) would be involed. Ashenden implies, I think, English longbowmen. As for the Pope, amongst the spheres his fortunes were likewise mirrored by Jupiter.[55] Saturn, however, overpowered Jovian forces in the conjunction; and Mercury, the representative of certain kings (most obviously the French king) would have the upper hand over Jupiter. Therefore, the Pope and Roman Curia would be oppressed by secular rulers during the period of the conjunction's effectiveness.

Those, in brief, were the *pronostications* Ashenden enunciated from the astronomical events of 1357 and 1365. Appended to the 1365 predictions is a theological codicil in which Ashenden denied that his astrological

[54] IIIb.571-634.

[55] IIIb.735-59.

speculations had anything to do with common prophecies.[56] The details of this will be discussed later on, as will the implications of some of his political forecasts.

5. Reginald Lambourne and Weather Forecasting

Apart from the tractates of Ashenden, the only Merton astrological predictions extant are two epistles by Reginald Lambourne.[57] The first letter concerns the lunar eclipses in March and September of 1363. Lambourne completed it on 27 February of the same year. The second note, perhaps written in October, 1368, purports to foresee the state of the weather over the years 1368-74. Both letters are addressed to his *master* and *most reverend lord*, who is unnamed. At some time in the recent past, Lambourne tells, he had initiated his astrological studies under the supervision of this master. Lambourne admits his inexperience and requests correction should his master find his judgements to be erroneous.

Who was Lambourne's master? At the end of the 1363 letter the name *John London* is found.[58] It is not at all certain what association it may have with Lambourne or his letters. It is possible that *John London* refers to the astronomically minded John of London, monk of S.Augustine's, Canterbury. Carey observes that 'it would be entirely appropriate for the two Benedictines to have exchanged letters on the subject of astrology, and for

[56] IIIb.787-1130.

[57] My discussion of Lambourne and his predictions is based partly on Carey, 84-91. Lambourne's epistles are found in Digby MS 176, ff.50-53v (1363), and ff.41-41v (1368-74).

[58] 'Domino Johanni London' written in a hand different from that which penned the letter. Digby MS 176, f.53v.

Lambourne to have visited London in Canterbury.'[59] True enough. It would also be in keeping with my own suggestion that of a line of communication existed between the Mertonians and the abbey's scholars. (And further, John of London had a demonstrated interest in eclipses.) The question remains, if Lambourne's letters were posted to London, how did William Rede get hold of them? Lambourne was writing not long after vacating his Merton fellowship. It is likely that Rede was the true mentor.

As for the predictions themselves, Lambourne calculated three horoscopes, one for the Sun's entry into Aries, the others for the two eclipses. He found that the Sun entering Aries would create a beneficial amount of rain, although accompanied by destructive winds. Humankind was to suffer general unrest, with particular strife among prelates and the nobility. In Lambourne's opinion the eclipse in March signified continuing winds, heavy storms, rain and hail. The tempestuous weather would begin in June; April and May, however, would be dry months. Signs were that cold and wet conditions would prevail that next winter, causing infirmities and many deaths. The September eclipse was to drive yet more winds. As a consequence of a poor harvest after the eclipse, market prices would be abnormally high.

All things considered, Lambourne's epistles show a distinct lack of polish. Not only does their latinity verge on barbarism, but they are devoid of the methodical treatment that Ashenden had deemed necessary for successful prognostications. Lambourne's main resource, though he does not mention it, was the Summa. There are tell-tale signs: his tidy citations of Ptolemy on eclipses; and his confidence that the 'correct' interpretation of the eclipse of 1345 had vindicated this sort of prediction.

[59] Carey 85.

Of greater interest is a weather forecast for the years 1368-74, entitled De tribus coniunctionibus. It is ascribed to Ashenden in a manuscript of the mid-fifteenth century.[60] The treatise is addressed to a high ecclesiastical official; in fact he may have been William Rede, who was elevated to the see of Chichester in October, 1368. On that occasion Reginald Lambourne sent Rede his own predictions for the same years, 1368-74, beginning, 'Reverendissime domine ut recentius nunc perficiam...'. The two tracts are quite similar, both deal concisely with each of the six years, giving the probable weather conditions without much comment or supporting material. The predictions, in all, were not optimistic. Lambourne foresaw 'multa infortunia terribiliaque' beginning with floods, then drought, and excessive rain once again. The other tract predicted inundations, warfare, poor harvests and other evils, from which there was no escape 'unless almighty God, hearing the prayers of his church, acts supernaturally in the celestial spheres.'[61]

Both sets of predictions were apparently intended for Rede. It would have been natural, for Ashenden, as a friend, to have presented something to the newly elevated bishop. However, the evidence is against Ashenden's authorship of the 1368-74 forecasts. First, the predictions are based for the most part on the conjunction of 1365, the calculations for which differ from those Ashenden had utilised for his earlier considerations of this event. Ashenden had placed the ascendent for the conjunction at 21° 39′ Virgo (171° 39′) while the De tribus put it at 3° Capricorn (303°). Would Ashenden have

[60] Text IV, and see the introduction to the edition.

[61] IV.234-6.

had reason to change the figures? Furthermore, the writer of the De tribus admits in his preface that he is unpractised in giving astrological judgements.[62] Would Ashenden, a scholar of twenty-years standing, have written to his colleague in such a way? As for the predictions, they are uncharacteristically brief. Ashenden loved to dwell on a topic and repeat his conclusions, and he regularly littered his treatises with citations of the authorities. The De tribus alludes but once to 'omnibus libris iudiciis.' There are none of the references to chapter and verse, so common in every one of Ashenden's works. Perhaps there was no need to document each opinion in this tract, since Rede was quite familiar with the material. But it does not seem possible that Ashenden would have composed such a weak and ill-formed tract in honour of his colleague and friend. At least there is room for doubt of the ascription.

6. Before and After the Fact

We have no idea how well the 1368-74 forecasts compared with the actual weather over those years. It is a good bet that they fell wide of the mark. (The unexpected 'hurricane' of October, 1987 is instructive in this regard.) Attempting to pronounce the future carries the risk of exposing one's humiliating fallibility. Today, as in the fourteenth century, it is more convenient for one's reputation to observe phenomena as they occur, and then to explain them according to existing doctrines. Medieval astrologers often took this soft option. Perscrutator associated the comet of 1313 with Bannockburn well after (perhaps twelve years after) the day of the

[62] 'In talibus dandis iudiciis exiliter nimis sim institutus sicut veraciter fateor.' IV.9-10.

battle. At the request of his bewildered friends Geoffrey of Meaux sought a cause for the Black Death. The celestial spheres were easy to blame. And Ashenden doctored his 1345 *pronosticatio* three years later in order to include an astrologically correct intrepretation of the plague's significators.

When the astrologer was not looking into the past but into the future, he was wise to keep abreast of current events. Ashenden, for one, was evidently well informed. With the capture of king Jean II at Poitiers in September, 1356, the French war must have seemed all but won. Surely when patriotic Englishmen heard the news they thought that the kingdom of France itself, the crowning glory of Edward III's war efforts, was within reach. Ashenden had only to rationalize from the stars what had already become a common presumption. As he read them, the stars promised victory and warned of false truces and French deceptions. Here again Ashenden turns the universe to meet with human experience. In the prosecution of the French War to that time several truces had been concluded, usually toward the end of campaign seasons. Despite the hand of the Papacy arranging cease-fires and the appointment of wardens to enforce the terms, these agreements were regularly violated, or at least complaints of infringements were numerous.[63] Ashenden simply reckoned that peace pacts would be made and broken in the future as they had been in the past.

From these few examples I want to propose something we might call the 'current events rule'. That is, astrologers made their predictions follow the general trends in recent history. Whether the rule is firmly

[63] Kenneth Fowler, 'Truces', in The Hundred Years War (London, 1971), 184-209.

established or not, I hope to apply it to the problem of dating the prognostication of 1365 (IIIb). One of the conclusions of the prognostication was that Islam would be overthrown by the forces of Christendom. Ashenden was plainly thinking of a crusade. If he were writing in 1357, his statement would have been out of the blue; at that time there was no crusading movement afoot. The last serious talk of an expedition to the East had been in the 1330s, when Benedict XII tried to patch together an Anglo-French reconciliation with the idea. Only in the 1360s did the project come alive once more. Elected in 1362, Pope Urban V exploited the temporary peace between England and France to promote a new crusade. The crusade found another tireless advocate in king Peter of Cyprus. Through 1363 and 1364 Peter toured the royal courts of Europe, pleading the case for the expedition, scheduled for 1365. In the autumn of 1363 he made a visit to Edward III in London, was entertained lavishly and was promised support. In truth the English contribution to the crusade was minimal, but Peter's chivalric image aroused much curiosity. We cannot say what Ashenden knew about Peter or the crusade; but what better time to predict the defeat of Islam than when a crusade is being organized? A crusading host was indeed assembled. Alexandria was the agreed target, and in due course the Christian force took the city. The campaign, however, was a damp squib. Once reports of a relieving army were heard, the crusaders gathered their loot and quit the city while the going was still good.[64]

Ashenden's prediction of conflict between Church and State is more complex in its unravelling. The Pope and Church were in danger of secular oppression, he said. But

[64] A.S. Atiya, The Crusade in the Later Middle Ages (London, 1938), 319-378.

who was the oppressor? Since the turmoil surrounding Louis of Barvaria had died down in the 1340s, the Papacy enjoyed cordial relations with the Empire. Nor were the Spainish kingdoms or England a threat. The French, however, were prospective culprits. From the beginning of the century the Popes had been compelled to reside in Avignon. It was a new Babilonian captivity and in French costume. The French had infiltrated the College of Cardinals. Popes were becoming the lap-dogs of the kings of France. Now Urban V offerred the hope of change; he showed a desire to escape the French sphere of influence and transport the Curia to its rightful seat, Rome. When did Urban declare his controversial intentions? Why, in 1365.[65]

I would like to think of Ashenden as primarily a cleric and an Englishman. He was concerned about the Papacy because he was a member of the Church. He was boastful of English triumphs not because he was feeding off a royal patron, rather because he was earnestly patriotic. Ashenden's posture was consistent with the effervescent nationalism ofthe times, as the chroniclers witnessed.[66] As there is no evidence from any quarter that Ashenden ever approached a prospective patron or was approached by one, I think it reasonable to say that career motives did not enter his forecasts in any meaningful way.

This fact becomes more distinct when we compare Ashenden with contemporary politicized forecasters. Giovanni da Legnano, for one, was a high-ranking academic

[65] For Urban's ill-fated journey to Rome, see G. Mollat, Les Papes D'Avignon (Paris, 1949), 109-117.

[66] Antonia Gransden, Historical Writing in England, ii.58-117.

astrologer, having been professor of Civil and Canon Law at the University of Bologna.[67] The preface to his treatise on the laws of war, De bello, contains five astrological *cause* dating from 24 October 1350 to 12 April 1357. Each represents a stage in the political crisis in Bologna during the rebellion of Giovanni Visconti da Oleggio. Here is an astrologer intimately involved in the body politic, rather than a disinterested scholar. Da Legnano engaged himself in civic and ecclesiastical affairs. He became papal vicar general for Bologna; and after the disputed 1378 election of Pope Urban VI, he deposed the local bishop for supporting the French cardinals against Urban. Maintaining the validity of the election, da Legnano composed the De fletu ecclesiae in which he incorporated three horoscopes supporting his legal arguments. The treatise was immediately dispatched to the University of Paris, and thereafter was published throughout Christendom. Separately, he made a favourable judgement from the stars at Urban's coronation.[68] The election of anti-pope Clement VII did nothing to sway da Legnano's loyality, for which he was offerred the cardinal's hat. Upon his death in 1382 he received a state funeral and a monumental tomb.

Ashenden and da Legnano were like apples and oranges--they are difficult for us to compare on equal terms. In any event, the political element in Ashenden's

[67] A full biography of Giovanni can be found in the introduction to Tractatus de bello, de represaliis et de duelo by Giovanni da Legnano, ed. T.E.Holland (Oxford, 1917). For da Legnano's interest in the heavens, see HMES iii.592-97; this account is supplemented by John P. McCall, 'Chaucer and John of Legnano', Speculum 40 (1965), 486n.

[68] Harley MS 1006, ff.238v-239r.

pronosticationes may be set against something closer to their home. The so-called prophecies of John Bridlington make for a more telling contrast. Actually the creation of John Erghom, the prophecies were written soon after 1361 and dedicated to Humphrey de Bohun, earl of Hereford. The 'prophecies' come in sets of verses with prose commentary, also by Erghom. The work as a whole is a set-piece of prophetic writing, full of double meanings and obscure passages, with some astrological and numerological symbolism thrown in for good measure. The prophecies had no obvious purpose. Modern scholarship has judged them as a cryptic satire on Edward III's reign.[69] They are, in any event, a delightful menagerie composed for a noble patron--a far cry from the serious academic pieces Ashenden had turned out. The difference in motivation is all the more apparent when we recall that Erghom possessed a marvelous library of astronomical and astrological books.[70] And significantly, the trend of astrological or divinatory practice was in Erghom's favour, against the scholasticism of Ashenden.

Astrological prediction was being pulled down from its academic pedestal and was landing in the lap of political commentators, seekers of fame and later-day prophets. Predictions of the fifteenth and sixteenth centuries, such as those of Johannes Lichtenberger published in 1488, developed a mixed, astrologico-prophetic character.[71]

[69] Printed in Political Poems and Songs relating to English History...from the accession of Edward III to that of Richard II, ed. Thomas Wright (London, 1859), 123-215. On Erghom's authorship, see P. Meyvaert, 'John Erghome and the *Vaticinium Roberti Bridlington*', Speculum 41 (1966), 654-64.

[70] See Cavanaugh i.292-322.

[71] D. Kurze, Johannes Lichtenberger (Lubeck and

Increasingly, they belonged to the public domain, as education or merely entertainment. Ashenden could not have foreseen the metamorphosis, nor would he have appreciated the direction in which his type of universal predictions was growing. Astrological methods were still applied to weather forecasting, and for centuries to come, but the position of natural astrology among the sciences was being eroded by its vulgarization.

Hamburg, 1960) is the definitive study on this Renaissance astrological prophet.

VI

ASHENDEN AND FOURTEENTH-CENTURY SCIENCE

> For our knowledge is imperfect
> and our prophesying is imperfect;
> but once perfection comes,
> all imperfect things will disappear.
>
> - I Corinthians 13.9-10.

Having distinguished Ashenden from astrologers who professionally retailed their baseless art, we are in a position to ask whether he was, in any sense, a scientist. This question is a difficult one. The pedantic would require another thesis on the philosophy of science itself; and did science as we intuitively understand it yet exist in the fourteenth century? The simple question remains of how we should address ourselves to this man whose scholarly craft is so alien to twentieth-century scientific practice. Let us be clear at the start that his work does not anticipate any development in the modern sciences, including astronomy and meteorology; instead it represents an intelligent medieval response to ancient astrological traditions. Ashenden did not have a seventeenth-century mind, or a twentieth-century one, but a good fourteenth-century one.[1] He maintained a great but not an absolute respect for

[1] I am paraphrasing what David Lindberg had to say about Bacon, in Roger Bacon's Philosophy of Nature (Oxford, 1983), liii.

written authority; and he possessed enough self-confidence to believe in the truth of his own experiences. He had some of the makings of a scientist, but, lacking the rigorous and quantitative analysis that makes for modern science, his scholarship was indicative of the weaknesses of medieval scientific enquiry.

1. His Attitude toward Mathematics

Mathematics is the language of modern science. We should then consider Ashenden's mathematical ability. He has been accused of incompetence, since none of his works is of a mathematical nature;and some of the horoscopes for his prognostications are known to have been calculated by others, namely Rede and Elvedene.[2] It is not my place to defend Ashenden on the charge of ignorance, but to enquire about his attitude toward mathematics. As for the fundamentals of arithmetic, Ashenden could add, subtract, multiply and divide. Where he does so his answers are correct. This was all that was required for the use of astronomical tables, so he would have been perfectly able to compute planetary positions and house cusps. It is not impossible that he calculated the 1349 horoscopes, or indeed many other (lost or unidentified) horoscopes for himself. We should remember too that scholars with greater reputations for mathematical prowness were liable to make mistakes. Bradwardine, as one, wrongly equated 108[of longitude with 6 1/5 hours of time.[3] The diurnal motion progresses at a rate of approximately 15 degrees per hour. 15 x 6 1/5 is 93, not 108.

[2] Carey 77.

[3] De causa Dei I.1.42; ed. Savile, 138.

Nonetheless, indications are strong that Ashenden was not inclined to analyze problems quantitatively. A case in point is his hodge-podge treatment of the Great Year cycle. I believe that Ashenden felt uncomfortable with the notion of the Great Year, if, for no other reason, because there was no generally accepted value for such a period. Figures ranged from 15,000 to 49,000 solar years. Inspite of the great descrepancy, Ashenden stopped short of repudiating the idea. He did not possess the intellectual tools to do so. Within a few years of the composition of the Summa, other scholars found mathematical grounds for an attack on the Great Year--the incommensurability of the motions of celestial bodies. Nicholas Oresme was the outstanding proponent of the incommensurability argument.[4]

On another important celestial matter Ashenden either did not recognize or did not take up a clear opportunity for mathematical analysis. The central premise of astrology was that the heavenly bodies exerted some kind of force on the Earth.[5] The nature of this force was, for all practical purposes, undefined--just as the nature of gravity remains elusive even to twentieth-century science. Ashenden deliberated at length on the varying force of planetary influences.[6] It was taken as given that the force of a certain planet varied according to the planet's position along its deferent and on its epicycle.

[4] See Oresme's Tractatus de commensurabilitate vel incommensurabilitate, ed. Edward Grant (Madison, 1971).

[5] J.D. North, 'Celestial influence - the major premiss of astrology', *Astrologi hallucinati. Stars and the End of the World in Luther's Time*, ed. Paola Zambelli (Berlin and New York, 1986), 45-100.

[6] Summa I.6.1, f.53r; I.12.6, f.77r.

The Sun provided the most simple and obvious example. If the Sun maintained a constant distance from the Earth, the seasonal differences experienced throughout the year would not exist because the Sun's heat and light incident on the Earth would remain constant. Planets exerted influence by their heat and light. The velocity of the planets and their distance from Earth were in constant flux. The intensity of light incident on an object was related to the proximity of the light source. Light falling on Earth from, say, Mars would be most intense when Mars was in the lower hemisphere of its epicycle and at *oppositio augis*, i.e. when in its revolutions the red planet was nearest Earth. When Mars was in the upper extreme of its epicycle and at *aux*, the Martian radiation would be at its nadir. Heat was generated in proportion to the planet's velocity. When Mars was travelling at its maximum velocity it would transmit the greatest amount of 'heat'. Venus and the superior planets moved most quickly when they were at *aux* and in the upper extreme of their epicycles, and most slowly at *oppositio augis* and in the lower portion of their epicycles.

Which then was more important, proximity to the Earth or velocity? Grosseteste asserted that velocity was foremost. After all, the Sun directed the greatest amount of heat to the Earth during mid-summer, when it was farthest removed but travelling fastest. Likewise, tides were higher when the Moon was at *aux*, and they would drop as the satellite approached *oppositio augis*. So too with the planets, as they moved faster and farther away their influence would increase.[7]

However that might be, Ashenden doubted that planetary influence varied *simpliciter* with the motions of the

[7] De impressionibus aeris, ed. Baur, 48-9.

revolutions.[8] This was a lame excuse. It seems to me that mathematical representations of the problem were available. In fact Bradwardine's proportions would have done nicely. But Ashenden, who was someone in the position to recognize the utility of quantifying planetary forces, shied away (intentionally or not) from the challenge. We might blame him, or wonder why no one else took it up.

2. A Follower of Grosseteste

On the ambundant evidence of the Summa we can be sure that Ashenden revelled in his study of authority and tradition. By compiling the Summa he hoped to establish a framework of authority that future scholars would heed. Yet as Pico della Mirandola observed, Ashenden was not an altogether uncritical follower of *sententiae* fossilized by tradition. He could on occasion raise a dissenting voice. Mirandola, a celebrated foe of astrology, perhaps overestimated Ashenden's respect for solid reasoning above unsubstantiated authority.[9] But Ashenden made an explicit statement on how astrological knowledge might be advanced. The astrologer, he maintained, could understand the nature of the heavens empirically, arguing from observed effects to their causes, and by this method only,

[8] 'Eadem ergo ratione est numquam tamen simpliciter fortius agunt in terra planetae cum fuerint directi, aut cum fuerint retrogardi, aut cum fuerint in auge epicicli, aut in auge eccentrici sui, vel in opposito augium eorundem, nescio; eo quod nobis est dubium quam virtutem autem fortitudinem suscipiat planeta existens in auge eccentrici sui et epicicli propter eius propinquitatem spherae nonae et octavae.' Summa I.12.6, f.77rb.

[9] 'Concessit Aschendensis astrologus, auctor Summae quam vocant Anglicanam, plus credens rationi prorsus indissolubili, quam astrologorum omnium auctoritati.' Disputationes adversus astrologiam divinatricem VIII.3 (Florence, 1946), ii.262.

unless one was inspired by divine revelation.[10] The foundation of this line of enquiry Ashenden knew as *experientia*. This is an entriguing word--implying a gradually acquired wisdom of the common sense variety rather than observation of a phenomenon under regulated conditions.

Within the framework of authority he set a few of his own ideas. If they were not a part of the authoritative corpus itself, they at least were there to stimulate the reader to question authority, and to prove the value of authority in the reader's mind. Apart from its additive function to knowledge at large, personal experience was a criterion by which one could choose between authorities. Firminus de Belavalle, faced with three contradictory systems of reckoning the lunar mansions, decided that the only way of selecting the best system was to subject all three to extended use. Only then could a true comparison be made.[11] In Ashenden's case, the question of *motores ventorum* is an exemplar of *experientia* in action. Ashenden was not convinced that the existing astrological doctrines stood to reason. He proposed a more coherent system, and asked that it be put to the test--it might well prove useful. In Ashenden's words:

> Because [my] position contradicts the opinions of astronomers in part, I do not wish to express, assert or authorize it; but since it seems reasonable to me I include it here so others who diligently wish to carry out experiments and

10 'Nam astronomi omnes sic invenere naturas omnium planetarum arguendo ab effectibus ad causas et nullo alio modo...Non poterunt aliter devenire ad naturas astrorum nisi modo habuissent revelationes a Deo.' Summa II.6.4, f.134va.

11 'Ideo si volueris scire que opinio sit melior et verior, oportet quod per longem expertiam hoc expertus sis.' Repertorium I; ed. 1485, f.4v-5r.

> predictions of the weather may use this method in order that they might better investigate the driving forces of the winds.[12]

When I first encountered this passage I saw it as a token of weakness of Ashenden's mind. He clearly lacked the backbone to assert an independent thought. Since reading Richard Southern's intellectual biography of Robert Grosseteste, I have thought again. For Southern counts the 'tentative approach' as one of Grosseteste's positive virtues, one of the symptoms of an independent mind.[13] It was a sort of attitude that flew in the face of scholastic method, the method that reached for definitive and conclusive statements of fact. Ashenden, not having the equipment to formally prove his system of the *motores ventorum*, suggested rather than asserted it. At least a future scholar might benefit from his hypothesis.

It would be imprudent to draw too many parallels between Ashenden and Grosseteste on the weight of this one example. That would serve only to distort our picture of reality; but I think there is little question that he inherited some of the spirit of the bishop of Lincoln. Ashenden's reading included the Hexaëmeron, De impressionibus aeris, De impressionibus elementorum, De cometis, and possibly some other writings of the master. His reading and outlook at least were such that he may be

[12] 'Et quia haec prositio contradicit pro parte opinionibus astronomorum, ideo nolo expresse eam asserere et auctorizare. Sed quia mihi videatur rationabile posui eam hic, ut alii qui diligenter voluerint insistere experimentis et pronosticationibus temperiei aeris hanc praedictam viam de ventis experiantur ut si per eam melius possint veritatem investigare de motoribus ventorum.' Summa II.6.4, f.134va.

[13] Robert Grosseteste. The Growth of an English Mind in Medieval Europe (Oxford, 1986), 35-7.

called an investigator in a Grossetestean sense.

Grossetestean investigation, if I might venture to generalize, sought to establish an *universale experimentale* by which relationships between cause and effect could be formally demonstrated. The epistomology was laudable. It would, all the same, be a mistake to think that this was commitment to programmatic experimentation or observation.[14] Some of the inheritors of the bishop's scientific legacy, the Merton natural philosophers (Bradwardine, Dumbleton, Heytesbury and Swineshead among them) embraced an epistemology founded on logical or logico-mathematical techniques which were compatible with the demonstrative science enunciated by Grosseteste.[15] New approaches were made to the problems of motion and the quantification of qualities (e.g. heat and light intensity). John Murdoch has said, all the same, that these matters were not explored with increasing attention to experimental procedure; rather the Mertonians worked *secundum imaginationem*, or according to imaginative constructs of natural situations. In a word, fourteenth-century natural philosophy was not concerned with nature![16] That may be an extreme way of putting it. The Mertonians did observe nature, as, for instance, Richard Swineshead observed that a single candle could

[14] William A. Wallace, Causality and Scientific Explanation (Ann Arbor, 1972), i.42.

[15] For Grosseteste's influence on Oxford scholarship, see A.C.Crombie, Robert Grosseteste and the Origins of Experimental Science 1100-1700, 2d impression (Oxford, 1971), 135-232.

[16] John E. Murdoch, 'The Analytic Characteristics of Late Medieval Learning: Natural Philosophy without Nature', in Approaches to Nature in the Middle Ages, ed. Lawrence D. Roberts (Binghamton, 1982), 174-5.

adequately light a small area, but not an entire room.[17] The problem was not that the they neglected to observe natural happenings, but that they did not scrutinize them in a critical manner. The natural philosophers were not alone with this shortcoming.

Astrological observers were accustomed to putting their speculations to the test of actual circumstances; and their observations were not isolated case studies, but repeated experiences of natural phenomena. William Merle, we should recall, kept his weather diary for seven years. Presumably, he had every opportunity to check astrological and traditional methods of forecasting against the real weather patterns. Ashenden himself spoke of his success, or lack of success, in forecasting with different procedures over the years. Did they learn much from their efforts? Unfortunately, it seems that the investigators with more regular observational experience also lacked consistency in their methods and analyses. Ashenden and Merle, to their credit, attempted to rectify the methodological deficiencies of their art. Ashenden sought to normalize predictions to the Ptolemaic standard of 'the four questions'; and further, he accepted William Merle's list of essential considerations in any astrometeorolgical forecast. These efforts, however, were scratches on the surface of a profound dilemma.

If we were optimistic we might claim that Ashenden was proceeding inductively, i.e. he was reasoning from sensory experience to general principles, from effect to cause. Induction was a well-worn concept in medieval logic, but I think it is generous to speak of a medieval observer of natural phenomena as using induction; for the

[17] Calculationes Suiseth anglici VII (Padua, 1498), f.29va. Immediately following the candle observation, Richard reports the experience of a man lifting weights, 'ut apparet experimentaliter'.

conclusions drawn from observation were seldom more than a common-sense variety. The understanding and application of what Ashenden and others called *experientia* confined. Conversely, the premises on which theories were deduced were never subjected to any real experimental test. When Ashenden exhibits his capacity for critical thought, whether on the basis of reasoning or experience, it is negative criticism--questioning an old theory without formulating a convincing new one. This only left him in a tentative position, as in the case of the *motores ventorum*.

3. Authority as the Gradual Revelation of Truth

On another point of theory Ashenden felt it necessary to make his opinion known. The preponderance of astrological writers had marked the ascendent as the most significant point in the heavens. While conceding the weight of authority against him, Ashenden submitted that mid-heaven or *medium celi* was demonstrably the most efficacious part of the sky.[18] He called upon geometrical proof and everyday experience in support of his case. The stars, as it was widely believed, affected inferior bodies only through their heat and light. Alhazen had shown that light rays incident on a surface have greater intensity

[18] 'sed hic oritur dubium qui angulorum quattuor sunt fortiores et qui debiliores. Dicit autem Julius Firmicus libro 2[capitulo 7[, et Albumasar in libro suo De floribus in principio et similiter in libro Experimentorum suorum in principio, et auctor Novem iudicum in introductorio libri sui, et similiter cum eis concordant quasi omnes astronomi dicentes quod fortissimus angulus est ascendens et deinde decima domus deinde septima postea quarta. Et licet tot astronomi huic assentiant, tamen mihi videatur quod ratio magis est in contrarium videlicet quod decima domus multum fortior sit quam aliquis alius locus predictorum.' Summa I.12.3, f.70rb.

when falling directly rather than obliquely; and the light of a celestial body falls most directly on any place when that body touches the local meridian.[19] Consequently this point was where celestial forces took their greatest effect, as could be substantiated by personal experience--the heat of the day was greatest when the Sun was at its height. Yet since all astrologers used the ascendent as the definitive point, Ashenden pushed his conclusions no further. For if the ascendent was not the most influential part of the celestial sphere, it nonetheless signal the changing states of heavenly forces. Every star appeared first along the eastern horizon. Arguing in this way Ashenden was able to disarm his own reservation to the traditional approach. But there were other difficulties with the use of the ascendent as a primary indicator, it did not appear to be very useful. Ashenden noted having applied several astrological rules *ad experientiam*. In particular he thought he observed the influence of the lunar cycle on weather patterns. When it came to the indications of the changing ascendent, Ashenden observed no relation between it and the weather.[20] Again, he did not assert his point; he was content to mention it.

Overall, Ashenden held a very tentative posture toward contributing any of his own thoughts to the Summa. He saw himself as a small cog in the ancient and continuing tradition of astrological learning, whereby the truths of

[19] No doubt Ashenden is refering to the Perspectiva (or De aspectibus) of Alhazen; but he does not give an exact reference. I am inclined to think that he was working from a secondary source.

[20] 'Nihilominus ut mihi videtur iudicium temperiei aeris que non deberet variari secundum omnem variationem ascendentis' Summa II.12.3, f.213va.

the heavens had been and were being gradually revealed. This was a common attitude. John of Saxony noted the difficulties in judging the influence of celestial events, because one man could rarely observe twice a phenomenon under the same circumstances. In particular, the cycle of great conjunctions extended far beyond the human life span. There was also a tendency for medieval astronomers to mistrust the accuracy of timings or measurements based on direct observations. (No doubt they were all too aware of the limitations of their instruments.) Ashenden was typical in his outlook, pointing to the opinion of Abraham ibn Ezra that one should rely less on the observed hour of a conjunction than on its time calculated from astronomical tables.[21] Consequently, only when observations were recorded over a long period of history was the accumulation of astrological knowledge possible.[22] Generations of scholars had proven the value of Ptolemy's and Albumasar's observations; the suppositions of John of Saxony and Ashenden had not yet the benefit of hindsight. Ashenden himself warned against adopting any of Perscrutator's methods, or those of other moderns, unless one was certain of valid applications.[23]

21 'Magnitudo vero rei manifestabitur in certo medio quod est hora coniunctionis vere per tabulas accepta et non hora coniunctionis visa.' Summa II.11.1, f.195ra, citing De coniunctionibus et annorum revolutionibus VIII.

22 'Et breviter virtus verborum est quod homo in modico tempore potest experiri illa que communiter occurrunt sed quantum ad alia que raro fiunt, sicut sunt coniunctiones magne debent nobis sufficere dicta predecessorum nostrorum.' John of Saxony, Commentum super textu Alchabicii (ed. 1485), f.3v.

23 'Sed non multum soliciteris circa regulas de temperie positas a fratre qui vocat se Perscrutatorem nec alicuius moderni nec presumptuose scribentis nisi eius regulas fueris magis expertus.' Summa II.12.2, f.213vb.

However, the efficacy of any method of prediction could be evaluated by the repeated application of the method.[24] Accepting that those before him had tested and refined their methods, and that he was in a way continuing the testing process, Ashenden satisfied himself of the validity of astrological *regulae*.

In the fourteenth century, the search for truth had to do with theology as much as, if not more than, it had to do with science or pseudo-science. The seventh and next section is devoted to the meeting points of theology and astrology; and stance of certain Oxonians about those points.

[24] 'Et his igitur satis liguet quod pronosticationes temperiei non sunt parvipendene, sed propter maximam earum utiliatem diligenti studio et experientia diuturna a nobis sunt perequirende.' Summa I.proem, f.2ra. 'Applicabis semper regulas tuas ad experimentum, ponerando ea que sunt magis poneranda, et dimmittenda dimittendo ea que sunt.' Summa II.12.2, f.213va.

VII

PROBLEMS OF FAITH AND SCIENCE

> Or has the sight of the Sun in its glory,
> or the glow of the Moon as it walked the sky
> stolen my heart, so that my hand
> blew them a secret kiss?
> That too would be a criminal offence,
> to have denied the supreme God.
>
> - Job 31.26-8

A sword of Damocles hung in the form of theological orthodoxy over the head of the astrologer.[1] Occasionally the sword would fall, as it did on Cecco d'Ascoli, who taught that angelic spirits could be brought down by incantations during great conjunctions. He was condemned and died in flames at the stake in 1327.[2] For although astrology was popular in university circles, it also had the potential to arouse suspicion of illicit arts, magical operations and false prophecies. On one hand astrology was considered, and rightly so, a science of the Medieval-Aristotelian mainstream; on the other it could

[1] The great Moslem historian, Ibn Khaldūn, observed that 'the sword of religious law hangs over them [astrology and related disciplines] and prevents the choice of them.' The Muqaddimah, An Introduction to History, transl. Franz Rosenthal, ed. N.J.Dawood (London, 1967), 373.

[2] Thorndike concludes that astrology was more of a pretext than a reason for Cecco's fiery end HMES ii.948-68.

appear as a tool of the enemies of the Church, the heretic and infidel. This dichotomy at times irritated the sensitive nerve of the theology schools. In the present section I will treat three aspects of the relationship Oxford theology had with an academic pursuit that aspired to natural science, astrology. As the subject of a thousand volumes, the controversy about God's foreknowledge of future contingent events and the freedom of human will comes first to mind. We shall see that the spirited fourteenth-century debate on these points was important, but so far as the history of science is concerned, is largely a distraction from the basic questions on the efficacy of natural causation, the principal object of our enquiry here. Thirdly, the persistent irritant of eschatological prophecy, for its part, inflicted some pain on theologian and scientist alike.

1. Bradwardine, God and Stellar Determinism

The theology of Thomas Bradwardine has been treated in numerous historical studies, a few of whose findings are relevant to the present discussion.[3] This is no place to discuss the wider significance of his position in the predestination debate, but we should at least review the difference of opinion in its intrepretation among modern scholars. Bradwardine's stance, if we are to accept what Oberman and Weisheipl have said about it, was that God's

[3] I have consulted G.Leff, Bradwardine and the Pelagians (Cambridge, 1957), H.A.Oberman, Archbishop Thomas Bradwardine, a Fourteenth Century Augustinian (Utrecht, 1957), J.A.Weisheipl, 'Ockham and the Mertonians', HUO, 607-658, Weisheipl and Oberman, 'The *Sermo Epinicius* ascribed to Thomas Bradwardine (1346)', AHDLMA 25 (1958), 295-329.

prior will and foreknowledge could and did coexist with man's freedom of choice. Exactly how this was feasible was one of the great Christian mysteries, as, for instance, the unified nature of the Trinity.[4] If this were Bradwardine's true position, then it was soon misconstrued by virtually everyone--by, among others, the hungry bachelors of the theology schools. It is not a good sign that John Wycliff was one of his few supporters.[5] Leff contended (and I am bound to agree with him) that Bradwardine's doctrine left scarcely any room for freedom of choice between good and evil. Bradwardine had refused to harmonize or synthesize the nature of man with the order of grace. It was not that he denied man's liberty, but that he, as Moody put it, 'tried to uphold the thesis that the human will could be free even while being a necessary consequence of the predetermined causal order stemming from divine will'.[6]

Be that as it may, the possibility of the stars determining human thought, rather than God doing so, was on the periphery of the fourteenth-century theological battleground. Bradwardine had been eager to include it in his disputations, but the subject is competely absent from the theological writings of his immediate adversaries. This holds true for his chief rival, Thomas of Buckingham. On several occasions Bradwardine and Buckingham exchanged rhetorical blows over predestination, grace and free will. Their writings appear as rejoinders to one another--Bradwardine emphasizing God's foreknowledge and grace giving, and Buckingham attacking the 'antecedent

[4] Weisheipl, 'Ockham and the Mertonians', 651.

[5] Anthony Kenny, Wyclif (Oxford, 1985), 31-41.

[6] A.E.Moody, review of Oberman's Archibishop Thomas Bradwardine, in Speculum 34 (1959), 496.

necessity' of any predetermined knowledge of the future. In 1343 they joined in a public disputation in Paris. The following year Bradwardine unveiled his *magnum opus*, the De causa Dei, and shortly thereafter Buckingham replied with a dissenting critique in his De futuribus contingentibus.[7] Although Buckingham had an abiding interest in the natural philosophy of his day, I have found no substantial evidence of concern with issues of astrology in his two main theological treatises.[8]

It is notable all the same that Bradwardine, the most formidable English churchman of his time, showed more than a passing interest in the science of the stars. He was familiar with the writings of Albumasar, Hermes and Ptolemy; and more than once did he introduce astronomical principles to add insight to a theological problem. It was Ptolemy, after all, who declared that astronomy was a noble science simply because it drew the mind closer to heaven. While theology, the most sublime discipline, operated according to its own principles, its objectives could not be fully attained without some preparation in astronomy, which itself required the study of arithmetic and geometry.[9] Hence the quadrivial subjects were vital fields of endeavour, though not an end in themselves--they were dialectial prerequisites for real theological

[7] Weisheipl, 'Ockham and the Mertonians', HUO, 650-57.

[8] Questiones super quattuor libros sententiarum (Paris, 1505), and the Tractatus de futuribus contingentibus, in New College MS 134, ff.324-438va.

[9] 'Quia inentio ultima in hac scientia est cognitio gubernationis Dei...ad quam scientiam impossible est pervenire nisi per cognitionem astrologiae ad scientiam vero astrologiae nemo potest venire nisi per scientiam arithmeticae et geometriciae.' De causa Dei II.3, ed.cit., 468.

knowledge. Another *raison d'etre* for the study of the heavens was the understanding of the possibilities for error, and the recognition of false teachings. Of the legitimate paths of knowledge astrology seemed particularly open to abuse. The weather predictions and medical judgements of the Mertonians were arguably valid, but many scholars (or non-scholars) were turning to the popular cousins of the true science, the worthless arts of fashioning talismans and casting nativities.

Bradwardine condemned vulgar astrology and other kinds of fatalistic practice in his masterful Sermo epinicius, a sermon celebrating the English victory at Crécy, delivered in late October or in November of 1346. The central theme of the sermon is that God's will, not the stars, not fate or blind fortune, but God's will determined the outcome of the battle. Bradwardine ushered forth a number of erroneous opinions which he would confute. The first of these was that the power of the stars had fortified the English army at the critical moment of battle. Yet God, the creator of the heavens, had dominion over the firmament, as was attested in Baruc 3.34-5: 'The stars shine joyfully at their set times: when he calls them, they answer "Here we are"; they gladly shine for their creator.'[10] Nor did God play dice with the universe, that is, blind chance or fate does not rule. As it was said in the poem De vetula attributed to Ovid, he is the fool of fools who follows fate.[11] What was often called fate was really the word of God. Even Hermes Trismegistus realized that all events were ordained in Heaven and proceeded from

[10] Sermo epinicius, eds.cit., 308.

[11] 'Ita est fatum fatuum; fatui, qui fata sequuntur.' ibid. 314, quoting De vetula I.490; ed. D.M.Robathan (Amsterdam, 1968), 34. This verse also turns up in Summa II.12.2, f. 218rb.

the divine will. God, who freely gives man his grace, was the source of victory, not the stars, not fate, not even man's unaided efforts, but the grace of God.

Bradwardine focussed with great intensity on the same point in De causa Dei II.3. The core of his attack on reputed stellar influences on man was Augustinian in character. Augustine had expressed his discomfort with astrology in certain terms: if men acted under pressure of celestial constraint, what room was left for the judgement of God?[12] To that Bradwardine added some more recent arguments. As the heavenly bodies were material entities and therefore irrational beings, he reasoned, they could in no sense compel the human will to any action, as the will was both a rational and immaterial being, existing on a more higher plane. That the stars possessed no guiding souls or 'intelligences' which could bear on the will, had been proven by the doctors of the Church; and opinions to the contrary had been condemned in Paris and Oxford in 1277.[13] Ptolemy and Hermes (whom Bradwardine called the father of philosophy) themselves did not maintain that the stars necessitated human actions. Heavenly bodies, to be sure, contributed to each individual's physical make-up, the features and health of one's body. It was through the human body that celestial forces acted upon the soul, which requires a material dimension to exist in the inferior world; but whereas the power of celestial bodies might create physical circumstances favourable to a certain mental actions, this influence had no bearing on

[12] See A.A. Long, 'Astrology: arguments pro and contra', in Science and Speculation, eds. J.Barnes et al. (Cambridge and Paris, 1982), 190-91.

[13] See Edward Grant, 'The Condemnation of 1277, God's Absolute Power and Physical Thought in the Late Middle Ages', Viator 10 (1979), 211-44.

man's judgement or his rational faculty of discerning good from evil.[14] The stars did not set our course, because God alone was our steersman.

After all that Bradwardine did to highlight the superiority of God's direction of the soul over the stars' influence, his thoughts do not stand out so conspicuously from other English scholars and theologians. In fact *no prominent Oxford academician seriously proposed that celestial forces were determining causes of man's action.* Quite the opposite, refutations of stellar fatalism issued repeatedly from every corner. Roger Bacon categorically stated that only false 'mathematicians' excluded free will; true astrologers had always distanced themselves from that error. Unhappily, he thought, recent theologians had not appreciated the fact.[15] The Mertonians, from all indications, stood in the camp of the true science. I shall deal with Ashenden a bit later, but Simon Bredon marked for special interest an injunction against stellar fatalism in Haly's commentary on the Quadripartitum. Man's destiny was forged in accordance with the will of God (*omnia qui inter nos accidunt sunt propter voluntatem Dei*); and though the movement of the stars regulated the natural world, man's freedom of action remained, (*potest aliquam facere*).[16] Bredon's attitude was an expression of what had been the prevailing opinion since the time of Grosseteste. In his Hexaëmeron, the bishop of Lincoln put the argument in its classical form. He wrote that man was subject to two sources of influence: the passions of his immediate environment and stellar

[14] De causa Dei II.3, ed.cit., 449-51.

[15] Opus maius IV; ed. Bridges, i.240-42, 246-9.

[16] Digby MS 179, f.91rb.

impressions. Both acted solely on a material level, and in all events the immediate passions had greater impact than the distant celestial emanations. Both movers, however, could be overcome by the resolve of the virtuous and rational man. That is, a strong soul can prevail over the weaknesses inherent in a physical body.[17] This doctrine allowed a measure of leeway. A wise man might triumph over the stars by the fortitude of his rational faculties. However, the common crowd, engulfed in its own unthinking multitude, was habitually led by base physical motives to actions such as robberies, murders and warfare. Once the causes of such events were understood in the light of celestial impressions, the disorders which follow in this world could be anticipated.[18] Ashenden evidently shared that belief.

We discover just how fully aware Ashenden was of the determinism issue by examining a passage in his Summa taken from Bradwardine's remarks, though slightly refashioned:

[17] 'Sed eciam istis dicendum est, quod corpus humanum velud duobus subiacet motoribus. Recipit enim multas passiones et impressiones sideribus, et recipit eciam motus et impressiones ab anime proprie accionibus. Et cum anima secundum eandum vim imperare virtutibus inferioribus, et potencior est in afficiendo corpus proprium quam sint corpora celestia...Quapropter cum non cadat sub astronomicum iudicium mens racionalis bene ordinata, nec cadet sub idem iudicium animus secundum inferiorum potenciarum passiones vel actus; nec eciam corpus secundum affectiones corporales que possunt communiter et ex stellis et ex anime imprimi accionibus.' Hexaëmeron 5.x.4; eds. Dales and Gieben, 168.

[18] For the opinions of William of Auvergne and Thomas Aquinas to this effect, see A.Murray, Reason and Society in the Middle Ages (Oxford, 1978), 242-3.

Bradwardine, Sermo epicinius, edd.cit., 309.	Ashenden, Summa II.12.3, f.218r.
Istam quoque artem iudicialem per astra una cum suis artificibus atque iudicibus beati Augustinus, Gregorius et ceteri sancti patres, iura canonica atque simili concorditer reprobant et condempnant in multis locis.	Istas etiam scientias illicitas et eorum fautores ponentes necessitatem in stellarum actionibus et tollentes in quantum in eis est potestatem Dei creatoris, reprobant Augustinus et Gregorius in multis locis, et iura canonica eos condemnant.

Ashenden, it seems, was tailoring Bradwardine's words to his own purposes. As an astrologer, he could not stomach an all-encompassing condemnation of the science to which he had devoted himself. Yet he could use the same form of words to inveigh against the false artists, prevaricators and deceivers, who were the real culprits in his mind. Bradwardine had gone too far. Legitimate predictions on the dispositions of men could be made, and with some success. As a student of theology (as he probably was by 1348) Ashenden found Bradwardine's emphasis on God's omnipotence somewhat extreme. 'Some moderns', he wrote, had posited a single agent without any intermediary (*unum agens omnia etiam sine medio*); this could only be God. But a universal agent would be contrary to free will, as it would negate man's responsibility in choosing good over evil.[19]

[19] 'Et contingit istis ut nullum ens habeat actionem propriam naturaliter et cum entia non habuerint actiones proprias non habebunt essentias proprias. actiones enim non diversificatur nisi per essentias diversas. Et ista opinio est valde extranea naturae hominis et qui recipiunt huiusmodi non habent cerebrum naturaliter habile ad bonum. Haec commentator.' Summa II.12.2, f.216va; citing Averroes, Metaphysica IX.6.

The theological validity of Ashenden's astrology was claimed once at least. A scholastic *questio*, whether superior bodies could influence man's free will, was directed to a certain Thomas Bradeley in Oxford about the year 1400.[20] Bradeley replied positively. God had created the heavens and thus had ultimate control over the stars; but even Duns Scotus, the *doctor subtilis*, admitted that celestial forces directed man's physical existence.[21] The immortal soul remained independent; only the mind, interacting with the material world, was susceptible to changes in natural tendency on which the events of human history hinged. The truth of this, said Bradeley, was aptly demonstrated by Ashenden's predictions of the course of the French war.[22]

Meanwhile, Bradwardine's position on the freedom of the soul from celestial influence drew some criticism. To the question, 'Is it due to fate or the stars that we are good or bad?', William of Woodford (best known as an opponent of Wyclif) cautiously suggested that Bradwardine bordered on heresy, as his opinion was contrary to freedom of will.[23]

20 'Utrum ex influentia corporum superiorum stante voluntatis arbitrio causetur varietas opinionum in inferiori mundo.' Corpus Christi College, Oxford, MS 116, f.1v.

21 I have not found this admission in any of the writings of Scotus. He did, in any case, affirm the universal causality of celestial bodies over all sublunar things. Reportata parisiensia, ed. Vivés, xxiv.509.

22 'Ille nobilis astronomus Aysschyndene per figuras celi equatas predixit...exitum bellorum de Cressy, de Peyties et...prospera regis Anglie et adversorum infortunium sicut in secunda parte sue Summa veraciter est compilatum.' Corpus Christi MS 116, f.1v.

23 J.I.Catto, William of Woodford, O.F.M. (Oxford,

The matter arose again in Woodford's Postilla. On this occasion he examined four doctrines of the nature of predetermined causes or fate: (1) that a *vis communis astrorum* determined human events, (2) that fate was imposed by the alignment of heavenly bodies at one's birth, (3) that fate was the irresistible comnipotence of God, or (4) that 'fate' was a force residing with the stars which disposed rather than compells men to their actions. Woodford stated that the first two propositions were shown to be erroneous by Gregory, Augustine and other Church Fathers. Was he thinking of the same passage with which Bradwardine and Ashenden had concerned themselves? At all events, the third statement, which could be equated with Bradwardine's proposition, many theologians considered dangerous because it too was marred by determinism. Only the fourth statement, Woodford believed, escaped this error.

Robson describes other Oxford scholastic questions, 'a variis doctorum scriptis' and dating to 1345-1370, which similarly criticized Bradwardine for his determinist tendencies.[24] I do not intend to look at the matter further here. It is plain, I think, that the general verdict was more in favour of Buckingham's *medium catholicum* than Bradwardine's paradoxes. Ashenden's beliefs, so it appears, were consistent with the majority view.

unpublished thesis, 1969), 133-5. Woodford's *questio* appears in CUL add. MS 3571, f.90v.

[24] J.A.Robson, Wyclif and the Oxford Schools (Cambridge, 1961), 104-5.

2. The Efficacy of Secondary Causes

Important as it was, the debate over determinism was of less consequence to the position of astrological theories than were matters of natural philosophy. Contingency in human action was, after all, something that even Bradwardine wished to preserve. Admittedly, it was his insistence on the superior jurisdiction of God's causality that upset middle-of-the-road theologians so much. Yet Bradwardine's statements were also seen to deny the relationship between divine activation and the natural structure of the universe. Despite the praise Bradwardine now wins from historians for his application of mathematical functions to natural philosophy, contemporaries were not so sure of his acceptance of the regularity and contancy of nature as a causative force in its own right. Many investigators were seeking natural causes; others, typified by Bradwardine, were concerned more with the unification of all causes within God.[25] Simon Tunstede put a question near the heart of the matter. Were natural forces (*impressiones*) ordered in such a way that one might devise rules for predicting their effects? He was asking this in relation to weather phenomena; but it is difficult to say whether he would have objected if

[25] See J.P.Reilly Jr., 'Thomas of York and the Efficacy of Secondary Causes', Mediaeval Studies 15 (1953), 225-32; A.A.Maurer, 'John of Jandun and the Divine Causality', Mediaeval Studies 17 (1955), 185-207; Keith Hutchinson, 'Supernaturalism and the mechanical philosophy', History of Science 21 (1983), 297-333; W. Courtenay, 'The Dialectic of Divine Omnipotence', in Covenant and Causality in Medieval Thought (London, 1984), art. IV.

his enquiry were generalized to all phenomena.[26] To phrase an anachronistic question, was there such a thing as a natural law?

After his 'conversion' to religious studies in the early 1330s, Bradwardine reacted strongly against to natural philosophy whenever it appeared to threaten the theological tenets which he considered inviolable--the omnipotence of God and the dependence of the soul on divine grace. The heavenly bodies were relegated from the status of active causes to inaminate significators, if that, with no causative powers whatsoever. The rift fell between a natural explanation of terrestrial events and the divine providence that intimately drove the natural system. For Bradwardine, the power of God alone definitively activated every physical and spiritual occurrence. Without direct sanction from Heaven nothing could take place.

Many theologians of the day were not going to swallow any such assertion. Robert Holcot, who was probably targeted as one of the new Pelagians, vehemently opposed the idea of constant divine intervention on philosophical grounds. First he had to put aside the traditional syllogism that ran something like this: God can initiate no imperfect action; so if he governed the world directly, our earthly existence would mirror divine perfection. Imperfection often occurred in the corruptible sphere; hence God could in no way be controlling the world immediately or directly. Holcot felt that this facile argument was unproductive when it was manifest to all that God could not be other than the efficient and final cause of all things. The problem still was that God was perfect and his creation blemished. For the solution Holcot was to posit a set of secondary causes between God and this world. God's delegation of causality itself, issuing

[26] Quaestiones Meterologicae I.3.3, ed. Vivès, 12-13.

downwards from superior bodies to inferior ones, was an expression of his perfect (or entire) causality through his creatures. Because God was the final cause and arbiter of natural order, the order he created, he could rightly be known as the governor of everything. Further, as this influence emanating from Heaven came into contact with the lower parts of the universe, its purity would be diffused and thereby corrupted.[27]

Holcot's arguments were little more than a restatement of the long-lived neoplatonic doctrine which had been a significant force in Oxford thought since the time of Grosseteste, namely that the qualities of any being are dependent on that being's position in the universe.[28] For the power of God, forming and activating every creature, varies in intensity throughout space. An important sourcebook of this tradition was a brief anonymous tract (sometimes attributed to Aristotle), the Liber de

[27] 'Quantum ad primum videtur quod Deus non omnia gubernet: quia si sic, nihil male fieret in universo, cum sit summe bonus et summe potens. Ad oppositum est litera. Et est dicendum, quod Deus gubernet omnia cum sit causa efficiens omnium; et etiam finis...Est tamen sic gubernator omnium, quod gubernat mediantibus causis secundis. Unde corpora grossiora et corruptibilia gubernat per corpora coelestia et incorruptibilia et corpora coelestia per angelos sive per intelligentias. Huius ratio est: quia maioris bonitatis communicatio est, si gubernans et efficiens causalitatem gubernandi et efficiendi aliis sub se ordinate communicet, quam si per seipsum gubernaret: et ideo ostendendo suam perfectionem in causando, et communicando perfectionem suam in creaturis, communicat quibusdam gubernationem aliarum.' Robert Holcot, In Librum Sapientiae Regis Salomonis (Basel, 1586), lectio 105, p.356.

[28] See James McEvoy, The Philosophy of Robert Grosseteste (Oxford, 1982), 260-61.

causis.[29] According to the Liber the first cause, God, existed in all beings, though all beings did not receive equal shares of God's causation. The diversity of reception depended on the varying temperament of recipients. The spatial proximity to the cause, God in Heaven, controlled the extent of reception.[30] The Liber was silent about any cosmological purpose the heavenly spheres might serve. The dissemination of divine influence from above did not necessarily give stars and planets any function in a natural system. But they, being the closest entities to God, were the most perfect in substance and motion.

Nonetheless, it was generally understood that the stars and planets had a profound causal relationship with events in the inferior world. In the De stellis, Holcot briefly outlined how Aristotle's Meteors described the linkage between superior and inferior occurrences. Similarly, when in 1315 the Oxonian William of Wheatley sought the explain the natural causes of poor harvests and famine, he relied heavily on the Aristotelian physical construct (in Wheatley's case taken from Alexander Aphrodisias).[31] Yet for a wider, metaphysical superstructure he turned to the Timaeus of Plato (i.e. as preserved by Chaldicius) and the Liber de causis. God, the *auctor de causis*, moved through intermediate causes,

[29] Rede and Reynham had copies. MBMC 133, 163. And we should not forget the Institutio theologia of Proclus, translated into Latin by William of Moerbeke in 1268. The Elements of Theology, ed. Dodds (Oxford, 1933), xxx-xxxii, xlii-xliii. A copy was at Merton in the early fourteenth century. MBMC 96.

[30] The Book of Causes [Liber de causis], transl. D.J.Brand (Milwaukee, 1984), prop. 176-180, pp.38-9.

[31] De signis pronosticis future sterilitatis, New College MS 264, ff.253-9. Wheatley flourished ca.1305-16. BRUO iii.2030-31.

the celestial bodies. They in turn affected the composition of the atmosphere, which itself had a direct bearing on the growth of crops and man's well being.

The Neoplatonic hierarchy of causes did not satisfy everyone. Ockham was one of the disturbed parties, and for an important reason. A hierarchical natural system removed God, as a cause, from his effects. A remote cause was no cause at all, because an effect did not stem from its presence. In this way Adam could not be said to be the cause of you and me as his descendents, because a being that no longer exists could no longer be a cause. But God existed eternally. He was the absolute first cause. No secondary cause could act without His immediate concurrence. Therefore God was an efficient cause, with the secondary cause, of every effect. He might activate an event in tandem with the ordained secondary cause, or He might do so through his singular intervention.[32] Bradwardine held this line as vehemently as Ockham had. Divine providence was God's active goverance of creation, and His was an irresistible power. The erroneous opinion that God operated only indirectly in the corruptible world had been condemned in 1277, Bradwardine reminded the reader of the De causa Dei. God was not an impersonal first cause, whose influence filtered through a hierarchy of celestial spheres; He caused things immediately--more immediately than any other cause.

These assertions were troublesome, yet they were difficult to deny. Simon Tunstede also pondered God's intimacy with his creation. Not surprisingly, Tunstede admitted divine omnipotence, and God as creator of all

[32] See Gordon Leff, William of Ockham, The Metamorphosis of Scholastic Discourse (Manchester, 1975), 457.

things. God naturally acted through secondary causes; but the very fact that He moved these causes was proof of his ability to act directly on an object. In opposition to this 'proof' Tunstede recited the old quandary that God's perfection was not perfectly mirrored in his creation. There was also the (specious) logic of following syllogism: Given that God could act directly in the world, it did not follow that He was not omnipotent, because it was meaningless to speak of doing the impossible![33] After this scholastic display, Tunstede concluded that one must subscribe to the belief that God ruled the world immediately, because this was the teaching of the Catholic faith.

To help resolve the difficulties of God's action in the world, thirteenth-century theologians posited two distinct aspects of God's causation, His *potentia ordinata* and *potentia absoluta*.[34] Ockham believed were essential to the description of the one power of God.[35] The *potentia ordinata* falls within the realm of the ordained structure of the universe. Effects followed from the natural properties of the stars and planets in their spheres because God created them in that way. He could have created--and still could create--an entirely different universe in which different causative rules would apply. But it remained that He had chosen the present state of things. The natural universe in itself had causal

[33] 'Ad secundum dico quod Deus mundum immediate regere est impossibile, sed non sequitur quod Deus non sit omnipotens, eo quod non potest impossibile facere.' Questiones Meteorologicae I.3.2; ed. Vivés, 15-16.

[34] W.J. Courtenay, 'The Dialectic of Divine Omnipotence', 4-7.

[35] Quodlibeta Septem VI.1; ed. J.C.Wey, 585-6.

significance, for God willed natural causation to adhere to a regular pattern; and the sensible pattern of existence was generally available to man's understanding through reason and experience. In contrast, the *potentia absoluta*, God's freedom of action so to speak, escaped any human attempt at comprehension. Independent of nature and finding no expression in a natural cause, the *potentia absoluta* could be known only by divine revelation. God could move anything by his own will, the divine process of which was miraculous and beyond our demonstration.

Bradwardine, it seems, favoured the concept of *potentia absoluta* in his arguments. He did not deny the celestial spheres a part in a hierarchy of natural causes in the realized world of *potentia ordinata*, instead he stressed God's absolute and arbitrary power of intervention. The possiblity of divine action in every eventuality was the ultimate source of antinecessitarianism, for miraculous causes could always overrule natural mechanisms. The miraculous nature of *potentia absoluta* causality, as Bradwardine was quick to underline, is attested in the Bible. Moses stretched his hands toward Heaven and a darkness, so thick that it could be felt, blanketed Egypt for three days (Exodus 10.22-3). And once Joshua had spoken with the Lord, the Sun and Moon stood still so the Israelites could have vengeance on their enemies, the Amorites. What astrologer interpreting natural signs could have predicted such miracles? To do so by any divination was in fact impossible because God's arbitary power makes prediction a nonsense. Surely there was only one infallible prognostication: whatever God wills, will be.[36]

[36] 'Verum, karissimi, ecce pronosticatio una certa, que numquam potest fallere, numquam falli: quicquid Deus vult foret seu fieri, illud fiet.' Sermo epinicius,

God was no remote and impersonal cause, nor is the ordained order of nature sufficient within itself. As with every man who must receive divine grace for salvation, every natural effect must receive from God its activation. For Bradwardine the ordained and absolute powers of God acted in tandem, but the absolute force always with the upper hand.

Let us return to Ashenden. In the Summa he states his belief in God's two ways.[37] Divine will operateed by means of natural instruments, *per instrumenta*, or miraculously, *sine medio natural sed miraculose*. It is perhaps significant that Ashenden used the term *instrumenta* instead of *agentes* when speaking of secondary causes. He did not necessarily wish to imply an active intelligence or motivation on nature's part; rather instrumentality connoted an utter dependence of the tool on its user. (But Ashenden said nothing of a mechanical universe.) There was no hesitation in Ashenden's mind that divine will had been the first cause of the Black Death; but the plague's natural causes stemmed from the astronomical events of 1345. The heavenly bodies were part of a natural system apprehensible by human reason. And yet God was not constrained by the functions of a mechanical universe. Ashenden seems as happy as any Catholic scholar to admit leeway for the miraculous. Having obviously read Bradwardine's case for indeterminancy, he recited the same biblical miracles that appeared in De causa Dei. There was no dispute on the existence of the miraculous. Ashenden and others, however, allowed a greater place for natural causes in the world than Bradwardine was willing to do. In the instance of the plague, so far as Ashenden was

eds.cit., 309. See also De causa Dei I.1.12-16; ed. Savile, 8-12.

[37] Summa II.12.2, f.216va.

concerned it was abundantly clear that God's instrument had been the natural system, otherwise he could not have made his 'successful' forecast. After all, as Ashenden might have said it, the astrologer was a scientist, not a prophet.

3. Prophecy and Astrology

One indication of the prophetic urge among medieval scholars is the amount of their astrological dabbling in divine affairs. For instance, speculation on whether a great conjunction had predestined the Christ's nativity was not uncommon.[38] The third book of the pseudo-Ovidian De vetula presents the idea as scholastic thinkers conceived it:[39]

> Una quidem talis felice tempore nuper
> Cesaris Augusti fuit, anno bis duodeno
> A regni novitate sui, que significavit
> Post annum sextum nasci debere prophetam
> Absque maris coitu de virgine, cuius habetur
> Typus, ubi plus Mercurii vis multiplicatur,
> Cuius erit concors complexio primo future
> Secte; nam nusquam de signis sic dominatur
> Mercurius, sicut in signo Virginis...
> Hec autem celi pars ascendebat in hora,
> Qua cum Saturno Jovis est coniunctio facta,
> Nuper significans sectam, qui triplicitatem
> Mutavere suam, nec non etiam prope punctum
> Veris, ubi fieri coniunctio maxima posset.

Bacon and Bradwardine quoted these words, and Ashenden and Holcot are known to have read them. But how did the Oxonians judge the possibility of celestial inference in

[38] North, Horoscopes and History, 163-73.

[39] De vetula III.611-19, 637-40; ed. Robathan, 131-2.

sacred history? The writings of two Oxford friars, John Lathbury and Geoffrey Hardeby, I believe testify to the general state of opinion.

John Lathbury, author of a commentary on the Lamentations, discussed the prophecies of the Virgin Birth in his work. A Franciscan regent in Oxford about the year 1350, Lathbury had access to the copy of Albumasar's Introductorius maior which Robert Grosseteste had bequeathed to the convent. In this book he found a note, presumably in Grosseteste's hand, supporting the assertion that the Nativity had been prefigured in the constellation of Virgo. 'All Christians should know' he wrote, 'that the astronomers do not distort or prevaricate, but that the truth resides in the face of the heavens.'[40] The relation of the stars with the Nativity was also studied in the De vita evangelica of the Austin friar, Geoffrey Hardeby.[41] The authorities he noted, Albumasar, Albertus Magnus, and the De vetula, unanimously stated that Christianity was initiated by a great conjunction signalling the birth of Christ. Hardeby was bound to agree. Events of great moment, he thought, could be foreseen by two means, by divine revelation and by astronomy. Knowledge through revelation was, of course, more certain and vital than that gained by astronomy. In the case of the Nativity the astrological evidence only confirmed what was already known to the prophets. In truth it told less than we

[40] 'Sciant hoc et intelligant omnes catholici quod his non fingunt nec mentiuntur astronomi, sed sic se habet veritas in facie firmamenti.' Exeter College MS 27, f.11. Quoted by Beryl Smalley, English Friars and Antiquity (Oxford, 1960), 365.

[41] Appointed regent in the Oxford convent, 1357. BRUO ii.869; and Aubrey Gwynn, The English Austin Friars in the Time of Wyclif (London, 1940), passim. I have consulted the De vita evangelica in Digby MS 113, ff.1-117.

knew, since by all accounts the stars merely indicated that a virgin would conceive and bear a child. Nothing was said about the universal significance of this; nor could the celestial signs provide astrologers with further information. As an instrument of prophecy, then, astronomical calculations were helpful only in a general sense, because the interpretation of their results was too imprecise.[42] Did the stars direct the fate of the Son of God? Was He governed by the celestial spheres while He lived on Earth? Bradwardine complained about the gross error of those who thought so. Christ's mission had a purely spiritual purpose; and as given before the will of God was free of any physical hindrance. The conjunction of planets was no cause of the Saviour's birth, it was but a sign.[43] The conjunction was a sign; Bradwardine did not dismiss it lightly. He was even willing to accept that conjunctions had influence. False religious sects, those that looked after the worldly pleasures of their adherents rather than their spiritual salvation, followed the dictates of the planets. The planets would lead them to oblivion.

Astrology was also entangled with the long-winded disputes over the timing of the Second Coming and Last Judgement. St. Augustine thought the words of the resurrected Christ should have been straightforward enough to end any millenarian dabbling. For when the apostles asked Jesus whether He had come to restore the kingdom of Israel, He replied, 'It is not for you to know the times

[42] Digby MS 113, f.12r.

[43] 'Nec quia talis constellatio, aut talis coniunctio Christum praecessit, ideo Christus fuit de virgine nasciturus, aut legem daturus, sed potius econtra; enim non erant causa istorum sed signum.' De causa Dei I.1.13; ed.cit., 74.

or dates that the Father has decided by his own authority' (Acts I.6-7). But even in the fifth century, as Augustine observed, the question 'when shall the End be?' had become a matter of great curiosity. Many were prophesying and calculating the final days. The direct admonition, 'it is not for you to know' was simply not sufficient to stem the flow of a millenarian tide.

Before proceeding further we should distinguish between two major currents in the medieval prophetic stream: prophecies established from *mystical* intrepretations of the scriptures, and astrological judgements rooted in the notion of a Great Year or World Year. These currents travel through a bewildering landscape of personalities and ideas. In places the currents are inextricably mixed together, and elsewhere they are separated by doctrinal islands. One important unifying figure was Joachim of Fiore. The writings of this twelfth-century exegete, concerned with revealing the *mysterium* of the scriptures, inspired many would-be prophets. Below we shall meet just a few spin-offs of what was to be known as Joachimism.[44]

[44] For Joachim and medieval prophecy as a whole, consult the admirable study of Marjorie Reeves, The Influence of Prophecy in the Later Middle Ages (Oxford, 1969).

Apparently, the interest in systematic forms of prophecy spread to Oxford from the schools in Paris. The subject became so popular that Henry of Harclay, chancellor of the University, felt compelled to refute its tenets in a *questio* in 1313.[45] Harclay's *questio* was drafted partly as a refutation of the treatises of Arnald of Villanova and John Quidort prophesizing the Antichrist and Last Judgement.[46] The Book of Daniel was a *locus classicus* of their numerological predictions. The proper manipulation of the symbolic numbers in Daniel, it was believed, could reveal the chronology of the Antichrist's appearance on Earth, which would herald the final conflagration. Specifically, in order to obtain useful dates from the account of Daniel's dream, one would have to interpret the mentioned number of days as years instead. Hence from Daniel 12.11: 'From the moment that the perpetual sacrifice is abolished and the disasterous abomination erected: one thousand two hundred and ninety days', Arnald of Villanova distilled that the Antichrist would rise 1290 years after the destruction of the Temple, in A.D. 66, i.e. in 1356. Having come to such a conclusion Arnald was prudently equivocal, admitting that his conjecture did not necessarily follow what was literally stated in Daniel. Yet three questions could be raised: Were such speculations truly possible? Could they

[45] Franz Pelzer, 'Die quaestio Heinrichs von Harclay ueber die zweite Ankunft Christi und die Erwartung des baldigen Weltendes zu Anfang des xiv Jahrhunderts', Archivio italiano per la storia della pieta I (1951), 27-82.

[46] Harold Lee, 'Scrutamini Scripturas: Joachimist Themes and *Figurae* in the early Religious Writing of Arnold of Villanova', JWCI 37 (1974), 33-56. Quidort's tract was printed as Johannis Parisiensis tractatus de antichristo et fine seculi (Venice, 1516).

be proved according to orthodox methods? And would they inspire men to abandon worldly vanity in favour of salvation?[47]

Harclay found Arnald's imaginings vain in themselves, false, superstitious and contrary to the teachings of the Church. Interestingly, Ashenden forwarded criticisms of similar numerological prophecies in a codicile to his 1365 prognostication.[48] Ashenden went to some length to describe the contents of a tract ascribed to Joachim of Fiore, entitled De seminibus scriptuarum.[49] According to this tract the key of sacred history was based on a one-to-one correspondence between the twenty-three letters of the Latin alphabet (Taking *i* and *j* as one letter, likewise *u* and *v*, and excluding *w*) and the centuries beginning with the foundation of Rome and ending with the Last Judgement. The first century was designated *A*, the second *B*, and so on. With twenty-three letters, history would run the course of the alphabet in 2300 years--and that spelt the end of the world. Though an offshoot of the numerological stream of prophecy, this conjecture gained notoriety after Arnald of Villanova put out a commentary to the De

___[47] 'Quicumque legerit istud opus, tria diligenter attendat. Primo utrum assertiones de ultimis temporibus seculi, que proponuntur in eo, sint possibilis veritatis. Secundo utrum procedentur catholice. Tertio utrum sint efficaces ad inducendum corda mortalium ad contemptum terrenorum et appetitum celestium. Quod est intentium principale et proprium Sponse Christi. Et si predicta tria taliter invenerit se habere, non dubitet opus fore compositum nutu Dei.' De antichristo, quoted by Pelzer, 'Die quaestio', 29.

___[48] IIIb.787-1130.

___[49] IIIb.974-1051. The De seminibus, composed about 1204-5, was authored by a German monk from Bamburg. Lee, 'Scrutamini Scripturas', 42 n.26.

seminibus.[50] It had enough of a following to be singled out for condemnation by Hugh of Newcastle, who in 1319 wrote a treatise on the eventual victory of Christ over the Antichrist. Hugh devoted a chapter in his work to the refutation of number-letter prophecy.[51] Ashenden wholeheartedly adopted Hugh's criticism.

Having learned of other Joachimist prophecies which were related to events in 1357 and 1365, Ashenden made it known that he rejected these and any parallels they might have had with his forecasts.[52] Astrological predictions were bound to be mistaken at times, but they were at least founded on experience and the sayings of the philosophers. These prophecies, on the other hand, seemed to come out of thin air; they had no basis in reason. As for any attempt to foresee the Second Coming, Jerome and Augustine had shown conclusively that no one could compute the time of Christ's return. 'The day of God will come as a thief in the night.'

Ashenden had more difficulty fending off the threat of those who combined prophetic speculation with astrological theory. After all, knowledge of the cyclical nature of planetary alignments had been applied to the study of biblical history; and Ashenden himself had forecast the near future from conjunctions and eclipses. Why could not the distant future, even the end of creation be revealed in the same manner? As it was, an Oxford bachelor of theology recently setting out on his biblical lectures had attempted to prove with philosophical and astrological

[50] Lee, 'Scrutamini Scripturas', 42-8. Among other manuscripts, Canon misc. 370 contains Arnald's Introductio in librum Joachim de semine scripturarum.

[51] Tractatus de victoria Christi contra Antichristum (Nuremberg, 1471), II.26.

[52] IIIb.815-20.

arguments that the period between Noah's flood and the Last Judgement would span exactly 7500 years.[53] In his Summa, Ashenden had sought to fix the time of the Flood with reference to astronomical phenomena. What was to stop the curious from extending this method to the final conflagration? Albertus Magnus set out the astrological criteria for the universal firestorm. The machinery existed to make the predictions. Yet Ashenden was not to be tempted. Instead he followed Aquinas' espousal of the complete divine responsibility for the End. It was possible to conceive of natural causes of a great firestorm that would engulf the whole world. There were hypothetical planetary alignments that might bring it about. And according to St. John, the conflagration would be preceded by natural signs--falling stars, earthquakes and the like. Nonetheless, it could not be admitted that the End would be engendered by natural causes as some had said.[54] The Scriptures expressly ruled out foreknowledge of the last days. Consequently, systems of prediction (valid as they may be under normal circumstances) would have no bearing. The Judgement and destruction of the present world would in no sense depend on the cycles of the planets, but on the will of God alone. It was rash and

[53] IIIb.1052-1124.

[54] 'Et propter hoc alii dicunt quod ignis ille generabit circa locum terre ex congregatione radiorum celestium corporum sicut videmus quod congregantur in speculo comberente tunc autem loco specularoum erunt nubes concave ad quos fiet radiorum reverberatio. Sed istud etiam non videtur conveniens, quia cum effectus celestium corporum sequantur determinatos situs (Summa: actus) et aspectus eorum si ex virtute corporum celestium ignis ille generaretur esset notum tempus illius purgationis considerantibus motus astrorum quod auctoritati scripture repugnat.'Thomas Aquinas, Super quarto libro Sententiarum (Venice, 1481) IV.47; quoted in Summa II.8.2, f.155ra.

presumptuous to try to calculate it.[55] In words Ashenden did not use, God's *potentia absoluta* insured that the time of Judgement, until it was upon us, would remain indeterminate.

If Arnald of Villanova took up prophecy as a religious mission, John Quidort was to treat it more as a problem of rational explanation. After collecting what was known of the Antichrist from biblical passages, Quidort proceeded to contradict the arguments that underlied prophetic calculations. He admired the ingenuity of the calculators, but observed that they certainly were not infallible.[56] However, Quidort was somewhat attracted to the idea of the Great Year, a period of 36,000 solar years. This he related not to Plato, as was common, but to Ptolemy, since his value for precession, 1° in 100 years, over the 360° of the circle would yield a period of 36,000. Again the English critics frowned. Harclay pointed out that the majority of astronomers did not accept Ptolemaic precession, but the theory of trepidation. He did not stop to think that for the calculating prophets the cyclical nature of trepidation likewise provided an indicator of the approaching millenium. Geoffrey Hardeby realized that something like Harclay's statement was insufficient to repudiate the cyclical theories. He looked for a more water-tight device. The Great Year was to be when the stars and planets had returned to their original positions at the Creation. The values for the rotational period of the eighth sphere varied wildly between 36,000 and 49,000 years, the Ptolemaic and Alfonsine figures respectively. Whatever the truth of the estimates, the fact was that

[55] IIIb.1109-1114.

[56] 'Exquisite, ingeniose composite, comparate non prophetico spiritu, sed conjectura mentis humane, que aliquando ad verum pervenit, aliquando fallitur.' Tractatus de Antichristo (Venice, 1516), f.50r.

planetary auges will have shifted as well, preventing the wandering stars from returning to their Creation positions simultaneously. Hardeby went as far to say that all the stars and planets can never align themselves as before, because their motions are in an irrational proportion to one another. Quite simply, no Great Year cycle existed.[57]

Harclay had one more prediction to lay aside. Albumasar had forecast the that Islam would collapse after 693 years of existence. Those who promulgated this idea in the West, notably Roger Bacon, called attention to the correlation of Albumasar's number with 666, the mark of the beast as given the Apocalyse (13.18).[58] Ashenden brought up the matter in the addendum to his 1365 prections. Taking the beginning of Islam to be when Mohammed first preached the new faith in A.D. 622, Ashenden concluded that the sect should have fallen in 1315 (622 + 693) or in 1288 (622 + 666). But Islam continued through both barriers. Albumasar was clearly mistaken.[59]

The protestations of Harclay and Ashenden did little to slacken the thirst of those who would speculate in numerological or astrological prophecy. We find Walter Brit, the Mertonian, before an inquistionary tribunal in 1391, staunchly defending a prophetic interpretation of Daniel, with reference to a conjunction of Saturn and

[57] After inspecting the testimony of the astronomical tables Hardeby decided ,'inferri potest ex predictis quod motus supercelestium se habent ad invicem in proportione irrationali.' De vita evangelica MS Digby 113, f.6r.

[58] Opus Maius IV; ed.cit., i.266, 268-9, citing Albumasar De coniunctionibus magnis II.8.

[59] IIIb.531-46, and as previously noted.

Jupiter.[60] Others used biblical numerology to different ends. For instance, the author of a short manuscript notice looked forward to the destruction of the Lollards in the year 1410. Once again, the mystical number 1290, extracted from the Book of Daniel was the root of the calculation. The sum of this, 33 (the age of Christ at his passion) and 42 (the number of years between the passion and the destruction of the second temple) was 1365, the year of the great conjunction signalling the rise of a new sect. Clearly, the rise of the Lollards fulfilled the signification of the conjunction and the numbers. The Lollards were destined to cause great injury to the physical and spiritual fabric of the Church. Fortunately, the end of the heretical movement was in sight, as other mystical numbers marked the duration of the unpleasantness. 1335 and 75 make 1410, the year from which peace will reign again.[61]

[60] Registrum Johannis Trefnant, Episcopi Herefordensis, ed. W.W. Capes (London, 1916), 292-3.

[61] This occurs at the end of a copy of Ashenden's Summa, of all places. Digby MS 225, f.243vb: Usquequo finis horum mirabilium et infra cum abhominatio in desolationem dies mille CCXC et posita fuerit ablatum fuerit iuge sacrificium a tempore nativitatis Christi usque ad passionem fluxerant anni 33. Et a passione Christi usque ad destructionem civitatis Jerusalem et pro quo usque ad ablationem sacrificii iugis et positionem abhominationis scilicet ydolatrie et ymaginis Cesaris adorande in templo Jerusalem in desolationem omnium fidelium iudeorum qui ex lege deo sacrificabant non ydolis aut creature fluxerunt anni 42 quibus in unum collectis scilicet 33 annis et 42 annis fuerunt 75 anni quibus addantur dies mille CCXC dies inquam iuxta modum loquendi Ezechielis diem pro anno dabo tibi addantur ergo 75 annis anni 1290 et fient annum 1365 in quo anno fuit coniunctio significavit sectam Lollardorum et sibi adherentium intentium pro posse suo destruere ecclesiam et auferre temporalia etc. libertates ecclesie ab ecclesia sacrosancta. Et durabit hoc secundum maius et minus 45 annis iuxta dictum Danielis usque finem libri secundum dicentis, beatus qui expectat et perveniet usque ad dies,

Select Lollards and opponents might have invoked celestial powers and applied letter-prophecy to bolster their causes, but Wyclif, the great heresiarch himself, wholly rejected prophecies inspired by abbot Joachim and regarded as fanciful the notion of the Great Year.[62] He considered it unwise to attempt calculations of the End; rather one was directed to look forward to it as an article faith. Wyclif wrote voluminously on 'Antichrist'. Antichrist held an important place in his thought, though to him the word stood for something utterly divorced from the popular visions of Christ's arch enemy and harbinger of the Final Days. Antichrist was anyone who opposed the true teachings of the Son of God.

Wyclif would probably have labelled as Antichrists those who aspired to systematic prophecy. Condemned or not, medieval soothsayers and astronomers at least were looking for a kind of truth. The number of out-and-out charlatans and attention seekers increased with the passage of time. That historical development, fortunately, is outside the bounds of this study.

dies inquam scilicet usque ad annos a die desolationis templi continue usque annos 1335. Quibus 1335 si addamus annos 75 a nativitate Christi usque ad desolationem et destructionem templi veteris erunt in universo 1410 anni post quos erit pax et beautitudo talis qualis haberi poterit in via in ecclesia nulitante comperando illam pacem sequentem illos annos ad persecutiones qucis(?) ecclesia prius paciebitur.'

[62] Some of Wyclif's judgements on prophecy are found in his De ente predicamentali II; ed. R.Beer, 18. De dominio divino, ed. R.L. Poole, 108. And Sermones I.12; ed. Johann Loserth, i.85. All published by the Wyclif Society.

EPILOGUE

Ashenden's Readership 1350 - 1750

It is a truism to say that a man is a product of his times. I trust my study has shown that Ashenden was very much a fourteenth-century scholar, and that his scholarship was one (though not the largest) of the intellectual facets in the Merton jewel. If, however, he had planned to establish an agenda and methodology for astrology as a natural science (i.e.independent of prophetic uses of astrology), his desire, which at most was a tentative one, came to nothing. His astrology did not grow and thrive in the way Bradwardine's dynamics grew and thrived, partly because natural astrology was nearing a dead-end, and partly because Ashenden lacked the force and clarity of mind to express a programme of which others could take hold. Evidently, readers of his Summa valued it mainly as a repository of astrological doctrines. The feeble messages of Ashenden's curiosity, understanding, experience and, yes, even scepticism, went by largely unnoticed. And yet, his works attracted readers through four centuries.

We have no evidence of the initial reception of his *pronosticationes* or the Summa. I imagine that the reception in Oxford was positve. (The 1379 complaints of Jean de Ponte have been noted above.) In all likelihood the Summa was swiftly transmitted to Paris, from where

copies were distributed across Europe.[1] It must have moved quickly, since the earliest indication of the Summa in use on the Continent is a tract on the comet of 1368, presumably written by Hermann de Przeworsko, a doctor of medicine in Cracow.[2]

It would be only a slight exaggeration to claim that every astronomer and astrologer of the fifteenth century knew of Ashenden's works, but specially the Summa. In England the Summa was commonly found in College libraries. In Oxford, copies were kept at Merton, Oriel, and All Souls', and one was included in Duke Humphrey's donation to the University in November 1439. At Cambridge, the Summa was to be found in Clare College and Peterhouse. (As already noted, the mathematician and Master of Peterhouse, John Holbroke, had bequeathed that copy to the College.) Men ranging from the composer John Dunstaple, to Johannes Baptista, physician to Henry VII, acquired manuscripts of Ashenden's *pronosticationes*.

[1] For the distribution of other scholarly works of the Merton School, see W.J. Courtenay, 'The Early Stages in the Introduction of Oxford Logic into Italy', in English Logic in Italy in the 14th and 15th Centuries, ed. Alfonso Maieru (Naples, 1982), 13-32; and G. Beaujouan, 'La Science anglaise dans les Bibliothèques de Salamanque au XVe siècle', Medieval and Renaissance Studies 5 (1961), 249-69.

[2] Edited by Pruckner, op.cit., 212-14.

Ashenden was also read by a variety of scholars on the Continent. A letter of Regiomontanus recommending Ashenden (among other writers) to the court astrologer at Urbino indicates that even the most competent mathematical astronomer of his day perused the Summa's contents.[3] Cardinal Pierre d'Ailly rated the chronological section of the Summa so highly that he composed a virtual paraphrase, which he called the Elucidarium.[4] A deluxe rendition of the Summa was prepared for Charles V of France.[5] Other copies made their way to the Low Countries, Germany, Austria and Poland.

Nor was the Summa unfamiliar to Renaissance Italy. Francisco Cicereo of Milan, a notable collector of books, added a copy of the tome to his library.[6] Summa extracts are also to be found in the notes of Ermolao Barbaro, the castigator of Pliny.[7] When an opinion was expressed, the Renaissance men were full of praise for the author of the Summa. Pico della Mirandola, as noted above, cited him for his healthy scepticism; and the Summa's editor, Johannes

[3] Maximilian Curtze, 'Der Briefwechsel Regiomontanus mit Giovanni Biachini, Jacob von Speier, und Christian Roder', Abhandlungen zur Geschichte der mathematischen Wissenschaften 12 (1902), 305-6.

[4] An examination reveals that Elucidarium chapters 5-8, 16, 19-22 paraphrase Summa I.1. D'Ailly's text was published as the third part of the trilogy, Concordantia astronomie cum theologia (Venice, 1490).

[5] Léopold Delisle, Recherches sur la Libraire de Charles V (Paris, 1907), ii.110.

[6] Milan, Bibl. Ambrosiana, MS A.201 inf.

[7] Thorndike, 'Some Unpublished Minor Works Bordering on Science Written in the Fifteenth Century', Speculum 39 (1964), 86-8.

Santritter, dubbed Ashenden the foremost of recent astrologers.[8]

Although the influence of the Summa declined in the 1500s, interest in the book continued right through the seventeenth century. John, Lord Lumley, was perhaps the most illustrious owner of a copy of the 1489 edition.[9] Yet it was another copy, now known as Ashmole 576, that became most celebrated. The first recorded possessor of this book was the Oxford educated Dr Christopher Carey, who made a gift of it to Richard Forster in 1573. Forster, sometime president of the Royal College of Physicians, had his secretary, John Woodhouse, correct his Summa against a manuscript in the Merton College library (now MS Bodley 714). The text of the printed edition was found to be unreliable. Upon Forster's death, Nicholas Fiske obtained the corrected book. He later sold it to Elias Ashmole. The renowned astrologer William Lilly borrowed the volume in 1642 with the intention of emending his own Summa. Lilly noted that a long passage (at Summa II.10.2) had been omitted in the edition. In his almanac for 1674, he put this section into print for the first time.[10]

In a letter dated 3 April 1677, Francis Bernard wrote to Lilly thanking him for printing the Summa fragment. It

[8] 'Johannis Eschuid astrologi peritissimi exemplaria interirent. Nam cum caetera ferme omnia quorundam hominum inscitia aut negligentia ad quos ea pervenere aevo absumpta sint...Et autor recentior sed qui inter recentiores astrologos obtineat principatum. Scribit enim eruditius et copiosius, quoque quisque alius faciat ut ex eius lectione cognosci licet.' Summa *ad lectorem*.

[9] See, S.Jayne and F.R.Johnson, eds., The Library of John, Lord Lumley. The Catalogue of 1609 (London, 1956).

[10] Merlini Anglici Ephemeris or Astrological Judgements for the Year 1674 (London, 1674).

seems that the publication gave some impetus to a movement to have a second edition prepared. Lilly had reported that the *editio princeps* had 'a multitude of faults on every page'. John Aubrey (renowned for, among other things, identifying the Aubrey holes around Stonehenge) likewise observed that the Summa was miserably printed. Aubrey suggested to Anthony Wood, the Merton historian, that perhaps the College could underwrite the cost of a new edition.[11] We do not have Wood's reply, but, to be sure, nothing ever came of the idea.

The failure of the Ashmolean circle to do anything further with their manuscript resources spelt the end of Ashenden's currency with English scholars. The manuscripts joined thousands of others of the great seventeenth-century collections in the Bodleian Library. Few people cared ever to take a look at them; fewer still actually studied their contents. In the eighteenth century, Thomas Tanner fiddled a bit with the name 'Eschuid'; yet by the Age of Enlightenment, that name, the man for whom it stood, and his approach to the study of the heavens had become altogether incomprehensible.

[11] Elias Ashmole (1612-1692), ed. C.H.Josten (Oxford, 1966), iv.1376-7.