CONTRIBUTIONS OF CONTEMPORARY SCIENCE TO CHAUCER'S WORK

A Thesis
Submitted to the Faculty of Graduate Studies
in Partial Fulfilment of the Requirements
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Master of Arts
in the Department of English
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by

Beatrice Mary Binder

Saskatoon, Saskatchewan

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The Faculty of Graduate Studies
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We, the undersigned members of the Committee appointed by you to examine the Thesis submitted by Beatrice Mary Binder, B.A. in partial fulfilment of the requirements for the Degree of Master of Arts, beg to report that we consider the thesis satisfactory both in form and content.

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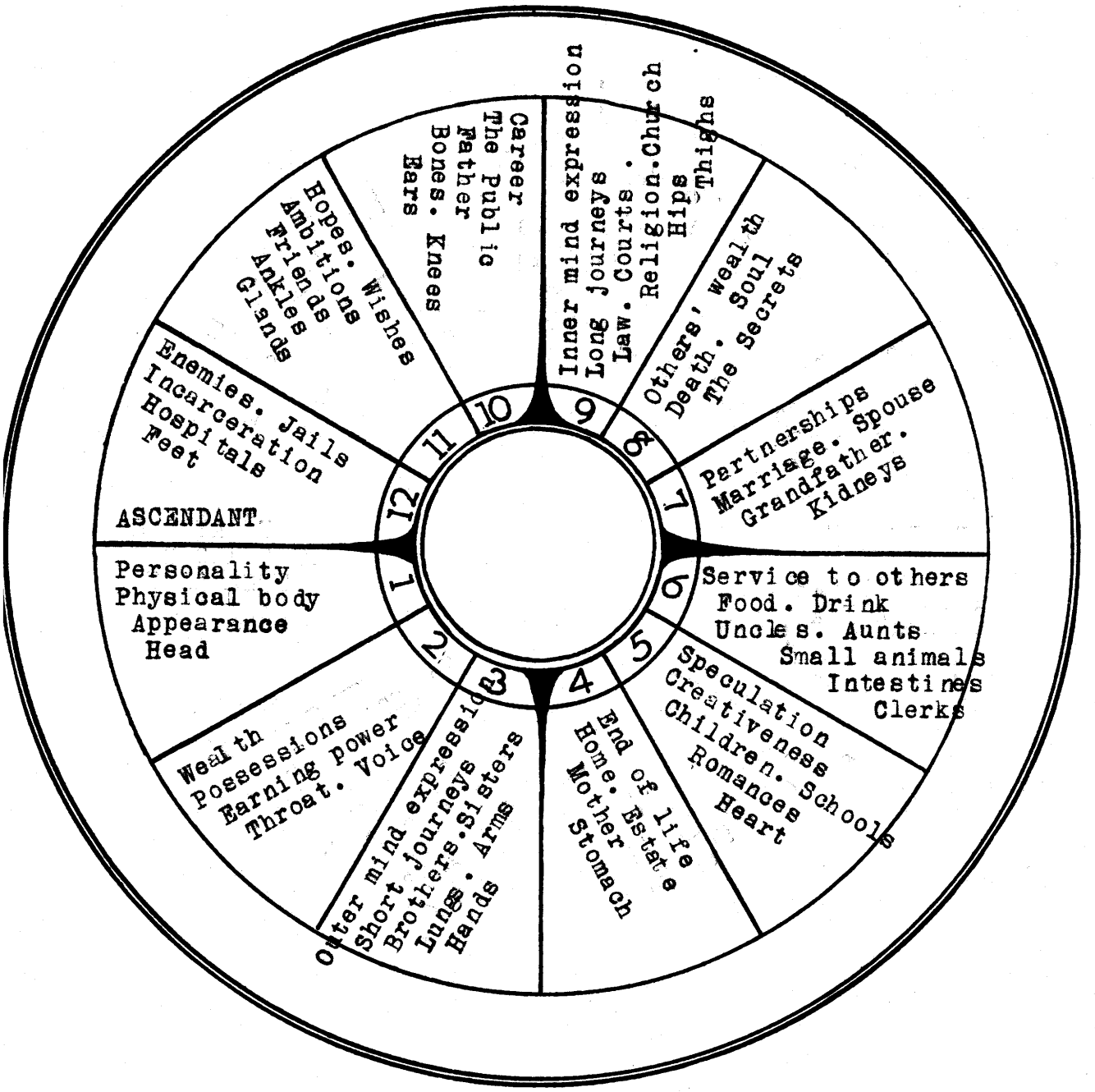

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RULER'S HOUSE

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ANGULAR 1, 4, 7, 10

SUCCEDENT 2, 5, 8, 11

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INTRODUCTION

In this study I have endeavoured to explore the various branches of the mainstream of Medieval Sciences and to present a survey of the currents of scientific thought in the Chaucerian period.

I have attempted to make an assessment of Chaucer's use of the sciences in his poetry and to form an estimate of his own attitude toward them. In these respects, new scholarly investigations of astrology, alchemy, and magic that appeared in this decade, along with the recent publication of an English translation from the Greek of Claudius Ptolemy's Tetrabiblos, have been invaluable, as well as Lynn Thorndike's exhaustive study of A History of Magic and Experimental Science.

The thesis shows that the Medieval Sciences made a significant contribution to Chaucer's mind and art, and that Chaucer shared the attitude of great scholars before and after him: he accepted some of the prevailing ideas of his time and he rejected others that did not appear reasonable or just.

I wish to express my appreciation to the officials of the Regina College library and the University library: Miss Emma Bell, Miss Ruth Cordy, Miss Ruth Murray, and Mr. D. G. Sokulsky, M.L.Sc., for their kind co-operation in securing articles, papers, and books, to Professor John Bentley and Professor Joseph L. O'Donnell for suggestions, to Professor Edward McCourt for his criticism and help, and to Professor Carlyle King for his inspiration, encouragement, and guidance in directing this work.

March, 1959.

I

BACKGROUND OF CONTEMPORARY OPINION

The notion that natural science began in the seventeenth century with Bacon, Galileo, and Descartes, or perhaps in the sixteenth with Copernicus and that the Greeks were mere speculators and the medieval thinkers all sunk in theology and superstition is not merely an established popular error; it has become a basic dogma of modernistic philosophy and is even shared by some professional historians. This error is largely supported by the prevailing type of specialized education, which trains students of nature to look at things exclusively from the point of view of current conceptions and does not sufficiently equip them with philological or historical methods to investigate how the world appeared to men at other times.[1]

In the Middle Ages, there were two basic theories underlying all philosophy and science: the doctrine of the Four Elements and the doctrine of the Macrocosm and Microcosm. These beliefs now seem so fantastic that it is difficult to imagine why educated people accepted them; yet the idea that everything was composed of four elements, earth, water, air, and fire, permeated every branch of science from very early times until the eighteenth century when Lavoisier in 1783 offered indubitable proof that water is a compound and that air consists of at least two gases.[2]

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[1]Morris R. Cohen and I. E. Drabkin, A Source Book in Greek Science, New York: McGraw-Hill Book Co., Inc., 1948, p. vii.

[2]Douglas McKie, "The Birth of Modern Chemistry", History of Science, A Symposium, London: Cohen and West, Ltd., 1951, p. 104.

Such is the strength of tradition, however, that his discoveries were not accepted by orthodox scientists without a considerable struggle over a long period of time. How did these doctrines become so firmly established in men's minds and what was their effect upon scientific thought?

The idea of water as an element seems to have been derived from bardic memories of olden times. The worlds came forth from a primeval chaos of waters through the union of the male and female gods of the chaos. By words of command (the Logos) and by magic spells, the younger natural forces or gods continued forever the work of the universe with the aid of djinns and genii. To primitive tribal communities reclaiming land from the water, it appeared that life came out of water and that procreation was of chief importance.[1]

Beliefs in animism endowed nature with multitudes of hidden powers which must be supplicated or placated according as they appeared to show favor or disfavor to crops, weather, health, or any other department of life. All the Aryan races worshipped natural forces, especially the sun, the giver of heat and light and hence the source of the earth's fertility. In what appeared to be a

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[1]Stephen Mason, Main Currents of Scientific Thought, New York: Henry Schuman, 1953, p. 6.

capricious world, the sun, moon, and planets consistently moved in an orderly and predictable way; "therefore, the sun came to be regarded as divine, and this idea spread to the moon and the stars."[1] These bodies were considered to have influence on human affairs for good or evil; in this way the study of astrology developed. The form of religion shown in the earliest written records of poetry or legend like the Vedas of the Hindus or the Zend-Avestas of the Persians, was the worship of the sun, moon, and planets. The emblem of the sun was fire; thus fire was deified by the Hindus as Agni, as Ra in Egypt, Asshur in Assyria, Mithra in Persia, Helios in Greece, Phoebus Apollo in Rome, and by other peoples like the Incas and Aztecs. This shows the widespread concept of fire as the most powerful agent in nature. In the Vedas, the powers of nature are gods; in the Avesta, they are spirits or servants of the supreme power. The genii are subordinate spirits to carry out commands and assist in the government of the universe.[2]

In some very early stages of society, a medicine-man or witch-doctor combined two offices, the spiritual and the healing, his work being to guide the propitiation of the

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[1]Edwin Pahlow, Man's Achievement to the Age of Steam, New York: Henry Schuman, 1953, p. 45.

[2]John Lord, Beacon Lights of History, New York, James Clarke and Company, 1883, I, p. 69.

gods by dances or other kinds of ceremonies, and to nullify the power of evil spirits and demons, or to frighten them away, or to expel them from the body. As society became more civilized, these two functions were separated when they grew more complex. Physicians adopted the study and care of the body while a priest class conducted the increasingly elaborate ceremonials. Among the Hindus, the priests were called Brahmins. Although the Brahminical caste became very oppressive in exacting a burdensome ritualism, yet it must have developed some enlightened thinkers:

> There is scarcely an hypothesis advanced by philosophers in ancient or modern times, which may not be found in the Brahminical writings. We find in the writings of these Hindus, materialism, atomism, pantheism, Pyrrhonism, idealism. They anticipated Plato, Kant, and Hegel. They could boast of their Spinozas and their Humes long before Alexander dreamed of crossing the Indus. From them the Pythagoreans borrowed a large part of their mystical philosophy, of their doctrine of the transmigration of souls, and the unlawfulness of eating animal food. From them Aristotle learned the syllogism...[1]

The priests of the Zoroastrian cult were the Magi. Along with the worship of Mithra as fire, there crept into it with passing time, the worship of other elements of nature: air, water, and earth.

At first, man offered simple gifts of grain or fruits to the gods or spirits. But blood was more potent:

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[1]Lord, op. cit., p. 69.

> The origin of animal sacrifices was like that of circumcision,--a pouring out of blood (the universal, ancient symbol of life) as a sign of devotion to the deity; and the substitution of animals was a natural and necessary mode of making this act of consecration a frequent and continuing one....Then this became a propitiatory rite to appease anger or gain favor of the Divine. Then in the natural human self-seeking of the sacerdotal class, the sacrifices increased as they tended to exalt the priesthood.[1]

From animal sacrifices, the practice grew of examining entrails for purposes of divination, particularly the liver. A whole science or art, built up upon the appearance of each little section of a liver, was taught in Babylonian temples to initiates. The Etruscans carried the idea to Italy. Such investigations gave an impetus to the study of anatomy and medicine. These early efforts to understand and control nature identified magic with experimental science.[2]

About 5000 B.C. a highly talented and artistic people migrated from central Asia and some of them settled in the valley between the Euphrates and Tigris rivers, mingled with the natives, and produced the gifted Sumerians of Mesopotamia. Others moved on to the valley of the Nile. They brought with them many ideas shared with the Hindu

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[1]Lord, op. cit., p. 92.

[2]Lynn Thorndike, History of Magic and Experimental Science, New York: Columbia University Press, 1934, III, p. 22.

people: philosophical speculations, arts, sciences, probably superstitions, and the Hindu numerals that reached us through the Arabs. By 3500 B.C. both branches of these migrants had brought their original settlements to a high level of civilization and culture, showing great skill in their engineering feats and in the production of beautiful art treasures. The Babylonians attained mathematical skill, using decimal fractions and tables of compound interest in arithmetic, and in geometry through land measurements. They were acquainted with the theorem of Pythagoras which he enunciated hundreds of years later.

Considering that no one knew how to measure small fractions of a day accurately until Galileo invented the pendulum clock in the early seventeenth century and that there were no truly accurate instruments until then, the accomplishments of the Mesopotamians in astronomy alone were remarkable. Many of them became part of our everyday life. Keeping records of observed data is a major step in a science; the Mesopotamians began recording planetary motions, particularly of Venus, before 3000 B.C.; another set, started in 747 B.C., became very valuable for later astronomers. They noted the period of 1461 years named by the Egyptians, the Sothic cycle, in which the stars return

to their places, which Chaucer mentions. The length of the year was found to be 365 1/4 days. A sexigesimal numerical system was employed which has the advantage of combining the multiples of five, as well as two, four, six, and three. It has survived in the division of the globe and circle into angles much used in geometry and astronomy, and also in measurement of time. They gave the names to the signs of the zodiac and called them the celestial houses or mansions of the sun because the sun lives in each one for thirty days; they called the month after the moon because they had noticed that the four phases of the moon coincide fairly well with this period of days.

Finally, in the sixth century B.C. the Babylonians discovered the Saronic cycle of the moon's north nodes, a period nearly equivalent to eighteen years. They were now able to predict solar eclipses and they noted certain effects upon the weather in this cycle. Such knowledge, which enabled men to predict some events with certainty, seemed to indicate that other future happenings could be foretold and gave the Babylonian astronomers astonishing prestige throughout the ancient world.

All the Mesopotamian peoples were addicted to a reliance upon methods of divination by reason of their

geographical and political situation. The floods of the Tigris-Euphrates were unpredictable and were greatly feared. "They were chaos reasserting itself."[1] An unstable, oppressive type of rule was established under city governors. Dynasties rose and fell. By 2000 B.C. the Sumerians were supplanted by the Babylonians. Altogether, life seemed more harsh and cruel in Mesopotamia than in Egypt where the Nile floods appeared with regularity and without any violence and where long established dynasties ruled in peace. The end result of such disturbances was fear and insecurity and foreboding. These led the Mesopotamians to search the future more anxiously and to encourage a variety of methods for divination like liver inspection, augury, dream interpretation, necromancy, astrology, and others for favorable or unfavorable times to take or to avoid actions.

In the formulation of a science of astrology, the Babylonians incorporated the theory of the four elements. All the signs of the Zodiac were divided into four triplicities of three signs each. Beginning with the vernal equinox, the signs followed in rotation the order of fire, earth, air, and water. To simplify and shorten explanation they would appear thus:

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[1]Mason, op. cit., p. 21.

THE FOUR TRIPLICITIES

Fire Hot	Earth Cold	Air Dry	Water Wet
Aries, the Ram	Taurus, the Bull	Gemini, Twins	Cancer, Crab
Leo, the Lion	Virgo, Virgin	Libra, Scales	Scorpio, the Scorpion, or Eagle
Sagittarius, Centaur-archer	Capricorn, Goat	Aquarius, Man the water-bearer	Pisces, the Fishes
Positive Masculine	Negative Feminine	Positive Masculine	Negative Feminine

FOUR HUMOURS OR COMPLEXIONS RELATED TO THE ELEMENTS

according to Hippocrates

Sanguine	Melancholic	Choleric	Phlegmatic

Four Qualities Related to the Four Elements

according to Empedocles

Hot-Dry	Cold-Dry	Hot-Wet	Cold-Wet

Not long after the discovery of the Saronic cycle of the moon's north nodes, the brilliant reputation of the Babylonian scientists attracted the attention of Thales (c. 624-516 B.C.), an Ionian Greek trader from Miletus on the shores of Asia Minor. On his journeys to the East and to Egypt, he picked up many new ideas including geometry and astronomy which he carried back to his homeland. His accurate prediction of a solar eclipse quickly spread his fame as a wise man. He attracted pupils, and the Ionian school of Greek philosophers became the well-spring of all Greek philosophy and science. It was the heir of a past that had a common source with the Hindus and that had gathered volume as it came through the Sumerian, Babylonian, and Egyptian channels. Sir James Jeans says of Thales:

> Most of his 'discoveries' in geometry were so rudimentary that any schoolboy of to-day would dismiss them as obvious. But this is only to say that Thales stood at the very fountain-head of European geometry, where he turned the stream of discovery into truly scientific channels, so that the tracing out of the history of geometry, and thence of mathematics and science in general, is merely tracing the course of this stream.[1]

When the Ionians considered the question which engrossed the attention of philosophers: 'Of what one substance are all things made?' Thales said that water was the

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[1]Sir James Jeans, Growth of Physical Sciences, Cambridge: University Press, 1947, p. 23.

fundamental element because that which exists can take the forms of mist, water, and earth, by which he probably meant that matter exists in three forms, gaseous, liquid, and solid. Fifty years later, his successor, Anaximenes (c. 585-525 B.C.) stated that the basic element was air because it sustains all living things while a general form of air sustains all the life of the universe. But all forms of matter change into one another through a process of rarefaction and condensation. Water rarefied became air. When water was both rarefied and heated, it became fire which was heated air. The earth is condensed water.

After another fifty years passed, Heraclitus of Ephesus declared that fire was the most changing of all substances and hence was the fundamental element. Everything begins as fire. Fire changes into water and water into earth.

Thales had a distinguished pupil, Pythagoras, also of Miletus. His intelligence was so obvious that Thales desired him to study in Egypt with the priests. From the age of twenty-two to forty-four, Pythagoras studied chiefly astronomy with the Egyptians. The following twelve years he spent in captivity in Babylonia where he investigated music, arithmetic, and other branches of knowledge. When

he returned to Greece, he gathered pupils around him and founded a mystic brotherhood which shared everything in common and kept its learning secret. Only Philolaus committed anything to writing and from him, it is said, Plato drew heavily for the Timaeus, his one scientific dialogue.

The Pythagoreans were much interested in geometry and arithmetic. According to their mysticism, to passages in the Old Testament, and to later writers like Augustine, things occurring in the same number have inner, occult relations. The Pythagorean philosophy of the symbolism of numbers had an influence on succeeding generations right down to our own day, and nearly every branch of medieval thought was affected by it: theology, medicine, literature, music, art, and science. Three and seven came to have special meanings because three represented the Trinity while seven was the number of known heavenly bodies. Five came to represent the five wounds of Jesus. In Chaucer, these numbers are used frequently. Almachius, for example, struck three blows on St. Cecilia's neck and she lingered between life and death for three days. Averagus came home on the third night. There are three revellers in the Pardoner's Tale and seven hens in Chaunticleer's harem.

The Canon borrows three marks for three days. Many more instances are found in Chaucer's pages.

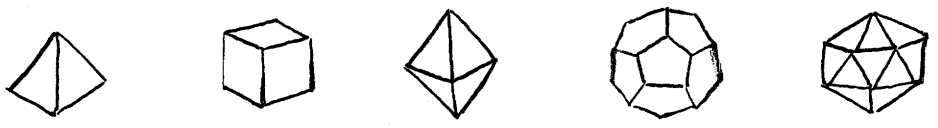
As the Pythagoreans considered the circle the perfect figure, they said that the heavenly bodies were spherical and travelled in a circular path. They themselves did not believe that the earth was the center of the universe but that all the spheres revolved around a central fire. They considered the planets to be at a distance apart which was in ratio to the musical scale, and that as these bodies moved in their concentric spheres, they made a harmonious sound, the music of the spheres, an idea which has had great appeal to the poets. It is expressed exquisitely in the music of Chaucer:

> Thann shewede he hym the lytel erthe;
> And after shewede he hym the nyne speres,
> And after that the melodye herde he
> That cometh of thilke spheres thryes thre,
> That welle is of music and melody
> In this world here, and cause of armonye.
> P F 57-63

While the Ionians had attempted to trace all creation to one element, the Pythagoreans in Italy affirmed the Babylonian theory of the four elements.

The Pythagorean representation of the four elements of the physical world as four regular solids had a far-reaching influence upon thinkers in following ages. Earth,

water, air, and fire were shown by figures having all their sides and angles equal, namely the four-sided pyramid, the six-sided cube, the eight-sided octahedron, and the twenty-sided icosahedron. A fifth regular solid with twelve sides and with the five-sided pentagon was discovered later and taken to represent the universe in the absence of a fifth element. Aristotle afterwards called the fifth element the quintessence or ether, the superior shining substance from which the heavenly bodies were formed. The five possible regular solids became known as the 'Platonic bodies'. In the sixteenth century the first modern unitary theory of the universe came from Kepler's thinking about the Platonic bodies which are shown thus:



1	2	3	5	4
4	6	8	12	20
pyramid	cube	octahedron	with pentagon dodecahedron	icosahedron

A great contemporary philosopher influenced by the Pythagoreans was Empedocles of Sicily (c.500-440 B.C.). Empedocles believed that all things had begun as a chaotic mixture of the four elements. By the play of attraction and repulsion or Love and Strife, air was separated first and fire next. Earth followed and water exuded from earth last. The heavens were formed from air, the sun from fire, and other things around earth from the remainder.[1] In the attraction and repulsion of the four elements to each other, air and fire were considered harmonious in the same way as earth and water, while air was opposed to earth, and water to fire. Then again, each element had a binary combination of the four primary qualities, heat, cold, dryness, and moisture. The qualities were also allied or opposed to each other. Plato adopted all of these notions and discussed them in the Timaeus. With other Platonic and Aristotelian doctrines, they passed through succeeding centuries into the Middle Ages. They were applied particularly in the study of physiognomy and the practice of medicine along with the four humours. Thus Chaucer's physician

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[1]Charles Singer, A Short History of Science, Oxford: Clarendon Press, 1941, pp. 25, 26.

> ... knew the cause of everich maladye,
> Were it of hoot, or coold, or moyste, or drye,
> And where engendred, and of what humour.
> G P 419-421

These elements were the pure essences. Actual substances on earth were supposed to be composed of all four elements, but earth had a preponderance of earth, water of water, fire of fire, and air of air.

The political beliefs of the Pythagoreans that government should be by a true aristocracy of the most intelligent people and their practice of holding things in common aroused resentment and led to their undoing. Their houses were burned and their possessions were scattered while the devotees had to flee. Socrates was one of them. He went to Athens. There his pupil, Plato, founded the 'Academy' which lasted for nearly a thousand years. Justinian disbanded it in 529 A.D. after which Christians dissenting from Justinian's views carried Greek learning to the Arabs in Bagdad and Spain who nourished it for a half century or more and transmitted it to Western Europe.

Plato's influence on succeeding ages was tremendous but for natural science it was deleterious. His master, Socrates, had taught that the chief concern of the philosopher was the ordering of man and society, not the control and understanding of nature. Socrates was mainly interested in

ethical and political problems. He rejected natural philosophy. He thought astronomy was a waste of time and that the mechanical arts carry a social stigma. Plato accepted some of Socrates' ideas and on account of his enormous prestige brought experimental science into disrepute. He discounted the value of practical observations because they relied upon the senses whereas truth must proceed from reason alone. Hence, theory became divorced from practice and both the crafts and science suffered from the split. Scholars had to rely more and more upon tradition and the writings of former thinkers. The literature in scientific subjects became encyclopaedic, catalogued, diversified, and fantastic during later Roman and Medieval times.

Unlike Socrates, Plato thought theoretical astronomy was important because 'any philosophy with a claim to generality must include a theory as to the nature of the universe'.[1] Being preeminently mathematical in mind, he held to the Pythagorean views. Further, he developed their idea that the heavenly bodies were 'divine and noble beings'. He said that the universe was alive, being informed with a soul throughout space and the planets likewise. Being alive, it moved of itself. Regarding the universe as an uncreated chaos

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[1]Mason, op. cit., p. 23.

in the beginning, Plato agreed with his Mesopotamian, Egyptian, and Grecian predecessors, but he thought that creation proceeded not from a word of command or from organic procreation but as a result of an intelligent design made by the Creator. He never mentioned how the design was effected but believed that events occurred because of the plans and purposes of intelligent beings. Henceforth the heavenly spheres were accepted as gods which had the names of the planets whose spheres they moved. This seems to be the basis of the medieval fashion of 'astrologizing the gods' as Chaucer does. For example, in the Knight's Tale it gives credence to the action, and the delightful way in which Chaucer does it makes the planet gods as real and near as 'old-home week!:

> What kan now faire Venus doon Above?
> What seith she now? What dooth this queene of love,
> But wepeth so, for wantynge of hir wille,
> Til that hir teeres in the lystes fille?
> She seyde, "I am ashamed, doutelees,"
> Saturnus seyde, "Doghter, hoold thy pees!
> Mars hath his wille, his knyght hath al his boone,
> And, by myn heed, thow shalt been esed soon."
> K T 2663-2670

Another Platonic idea that had far echoes was the notion of "Necessity", a kind of superhuman will or Fate that caused mundane affairs to go contrary to rational purposes. Plato postulated an evil world spirit somewhat like the

Zoroastrian concept of the Ahriman spirit of darkness and death opposing Mithra, the spirit of light. This is considered to be the origin of the Hebrew Satan. Plato's doctrines were acceptable to the Stoics, Neo-platonists, and St. Augustine, and through them he became a dominant authority in the Middle Ages.

Plato's opinions concerning the universe provided a foundation for the Hermetic credendum, "As above, so below", the belief in the intimate relation between the Macrocosm and Microcosm, or the heavens and man.

> Plato's Timaeus became a breviary for astrologers and magicians; the myth of the Demiurge, creating the world as a living organism, every part of which is intimately related to every other, came to be used as the great justification of ideas of the macrocosm and the microcosm and of the influence of heavenly bodies on the lives of men.[1]

Singer says, "this doctrine permeated Medieval thought".[2] As Hermes or Mercury was the messenger of the gods, the go-between the gods and man, it was appropriate to term this concept "The Hermetic Doctrine". The idea is commonly pictured as a man (the Microcosm) standing in the zodiacal circle with lines running from the signs of the zodiac

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[1]Frederick B. Artz, The Mind of the Middle Ages, New York: Alfred A. Knopp, 1953, p. 241.

[2]Singer, op. cit., p. 123.

(the Macrocosm) to the particular part of the human body which each sign governs. Gunther calls it "The Zodiac Man". He shows how the Zodiac Man was used in medicine at Oxford in such operations as blood-letting and bathing long past Chaucer's time.[1] The same type of picture appears in almanacs in the present day.

While Plato contributed to the basic assumptions of the Stoics whose beliefs passed through the Neoplatonic school and St. Augustine to later Christians, it was Aristotle whose views on the structure of the universe were "the framework on which the whole of the medieval science was built." Aristotle's ideas that the stars were noble living beings formed of a different, purer substance than those of the four elements and that they moved majestically with uniform velocity in their perfect circular motion, contributed, in following times, to the credence in astrology and its power to assess the relations between the predictable Macrocosm and the uncertain Microcosm. "In this hope savoir

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[1]R. T. Gunther, Early Science in Oxford, Oxford: Printed for the subscribers, 1925, III, pp. 15-17. A bath had to be prescribed by the astronomer-physician at favorable times. Gunther points out that astronomy and astrology were almost synonymous until long past Chaucer's time. p. 13.

afin de prevoir the medieval was at one with the modern scientist."[1] Chaucer illustrates it in this way:

> Peraventure in thilke large book,
> Which that men clepe the heven, y-writen was
> With sterres, when that he his birthe took,
> That he for love shulde han his deeth, allas!
> For in the sterres, cleren than is glas,
> Is writen, god wot, who so coude it rede,
> The deeth of every man, without drede.
> . . . . . .
> ... but mennes wittes been so dulle,
> That no wight can wel rede it atte fulle.
> M l T 190-203

Some modern scientists define science as a methodology of predicting the most probable.

In the field of astronomy, Aristotle was responsible for the notion that the spheres which carry the sun, moon, planets, and stars around their courses were not mere geometrical abstractions to aid mathematical speculations and theory, but real physical spheres of transparent crystal arranged concentrically around the earth at the centre of the universe. Each sphere moved its own orb as if it were a glittering gem affixed to the surface of the crystal ball. Around the seventh shell of Saturn was the eighth sphere of the fixed stars. Next to it was the ninth sphere of the Primum Mobile representing the supreme being or the First

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[1]F. J. C. Hearnshaw, Medieval Contributions to Modern Civilization, New York: Barnes and Noble Inc., 1949, p. 129.

Cause from which all beings came and by which all were controlled.

> That thilke Moevere stable is and eterne
> Wel may men knowe, but it be a fool,
> That every part dirryveth from his hool;
> K T 3004-3006

Chaucer speaks of the Prime Mover as 'cruel' because it forced all the spheres below it to turn from east to west against their own natural motion.

> O firste moevyng! cruel firmament,
> With thy diurnal sweigh that crowdest ay
> And hurlest al from est til occident
> That naturelly wolde holde another way,
> M L T 295-298

Each sphere was subject to the influence of those outside it.

The Pythagorean influence is seen in Aristotle's contentions that the celestial globes are a distance apart in the ratio of the musical scale making the music of the spheres in their turning, and that their movements are uniform and their paths circular representing the changeless, eternal order of the heavens. Aristotle's universe is limited in time and space, because everything is contained within the confines of the ninth sphere. The finiteness of the Universe became a requisite credo in all the religions of the Middle Ages, especially the churches of Western Europe.

However, Aristotle to a greater extent than any other

fulfilled the aim of philosophy "as a system of thought purporting to explain the Universe and man's place in it."[1] Owing to his great interest in creation in its many aspects, he had a preference for observing natural phenomena at first hand and from the data gathered, for formulating general principles. Aristotle was the codifier par excellence of ancient thought because of his habit of developing his ideas through criticising the work and ideas of others who evoked thoughts in him of such range and magnitude and depth that he symbolized the highest reaches of human intellect to the admiring ages after him whenever they became acquainted with his achievements. For that reason, ALL that he said had weight. He produced a large number of important books not only on the more usual divisions of philosophy, but also on what would now be termed psychology, government, literature, physics, astronomy, and biology. His efforts in the last field, particularly, approached the modern understanding of scientific method.

Aristotle's studies as a biologist were the foundation for the conception that creation was a 'chain of being'. He was impressed by the interdependence of living things and

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[1]Carl Stephenson, Medieval History of Europe, Third edition, New York: Harper and Brothers, 1951, p. 253.

their dependence upon the minerals of the earth in its soil. He was similarly impressed by the power in a seed of a species, plant or animal, to draw the requisite nutrients from its environment for its needs in order to become an individual fully-formed of its class. He believed that this power is the soul and that it dies with the individual. The immortality is in the species or class, and is the mineral, vegetative, animal, and the rational spirit. Hence, in the Middle Ages, people thought of the veins in rock as carrying nutriment to it. In itself, this classification formed a scale of being, but in the various animal species Aristotle found eleven main grades of perfections, shown by embryological criteria "graded according to the degree to which they are infected with potentiality" as expressed by their maturity at birth. The highest creature of one grade was directly contingent upon the lowest creature of the grade above so that "their continuity renders the boundary between them indistinguishable"[1] and so on up to God upon whom all depended. Chaucer's poetical expression of the idea is:

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[1]Mason, op. cit., p. 30.

> The First Moevere of the cause above,
> Whan he first made the faire cheyne of love,
> Greet was th' effect, and heigh was his entente.
> Wel wiste he why, and what therof he mente;
> For with that faire cheyne of love he bond
> The fyr, the eyr, the water, and the lond
> In certain boundes, that they may nat flee.
> K T 2987-2993

This Ladder of Nature "Bound by gold chains about the feet of God" shows a parallel with the conception of the universe as a series of concentric shells of spheres controlled in their motions by the Primum Mobile. Such beautiful clear-cut images were bound to lend themselves to poetic allusions in literature, to fascinate the minds of future generations, and to become a stock thought in the medieval times, as well as later, along with the ideas of the four elements with their four related qualities and humours. These formed the part of Aristotle's teachings to which men clung while his wonderful works in biological science were lost for centuries. Indeed, some scholars in the later Middle Ages claimed that Aristotle had his scientific works buried with him and that he had put a magic spell upon his tomb to prevent men from finding them.[1]

Aristotle's work and his school, the Lyceum, were carried on after his death by his pupils, first Theophrastus

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[1]Thorndike, op. cit., II, p. 201

and then Strabo with whom the institution ended. Strabo is credited with the only part of Aristotle's work on the physical sciences, The Meteorology. The special interest of Theophrastus was botany. His botanical treatises embodied the work of many predecessors because man, from prehistoric times, was interested in food, drink, medicines, and perfumes. He drew upon the findings of the rhizotomists (root-cutters) who gathered roots for medicines, poisons, and perfumes, of the agronomists who wrote on agriculture in geoponics, classically known as georgics, and of the naturalistic philosophers. In his writings Theophrastus refers to naturalists and druggists by name and indicates that they had a shrewd knowledge of herbs, shrubs, and trees and of the effect of climate, soil, and plant diseases.

> In dealing with the theory of nature, the Greek philosophers could not well avoid reference to the character and significance of plant life. The early Ionians seem to have emphasized the importance of fluids in the life of plants as well as animals, and this may have led to the medical doctrine of the four humors. Phythagorean botany emphasized the importance of heat and cold in plant life.[1]

Mason points out that the Pythagoreans (540 B.C.) who regarded medicine as a theoretical science rather than an art or technique, seem to have based their doctrine of the four humours upon the observation that four substances may

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[1]Cohen and Drabkin, op. cit., p. 438.

be obtained from blood: a dark clot, representing the melancholic humour, a red fluid, equivalent to the sanguine humour, a yellow serum or the choleric humour, and fibrin which was connected with phlegm.[1] But the importance of the Theophrastian compilations is that they formed the foundation for the works on materia medica in the first century A.D. of Pliny the Elder and Dioscorides. Dioscorides laid the basis for the classification of plants for pharmacology. These three men whom Chaucer cites, along with Isadore of Seville in the sixth century became the dominant authorities on medicines in the Middle Ages.

Greek science culminated in Aristotle and Theophrastus. The end of the Golden Age of Greece came with the death of Alexander the Great. In the three centuries from the advent of the Ionian philosophers with Thales, great strides had been made in human thought. It appeared as though it was necessary for a period of summarizing and assimilation of that spirit to take place. At any rate, this was largely the result wrought by the museum in Alexandria.

Alexander had hoped to make his capital more beautiful than any other. Ptolemy I, his general, was left to carry on the plans of the emperor but he also wanted to

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[1]Mason, op. cit., p. 23.

make Alexandria the cultural centre of the world; therefore he planned a Temple of the Muses which was completed in 300 B.C. and which lasted for nearly a thousand years. The centre of intellectual activity now shifted from Athens to Alexandria. This establishment became a kind of university with a great library devoted to four main branches of knowledge. Euclid became the first teacher of geometry and he was also the curator of the mathematical section in the library. He made a collection of the ideas of his predecessors and contemporaries and entitled it The Elements of Geometry, a volume which has been in continuous use from its completion in the second century B.C. and which is second only to the Bible in the total number of copies sold. Chaucer shows that:

> As well as Euclide dide or Ptolemee
> S T 2289

squire Jankyn was able to solve a problem in vulgar fractions and thus to propound the division of sick Thomas' bequest to the thirteen friars of the convent in the Summoner's Tale.

The final synthesis of Greek science in geography and astronomy was made by Ptolemy of Alexandria in the second century A.D. This work, embodied in thirteen books, was termed by the Greeks, the Great Composition, megale syntaxis.

Megale later became the superlative magiste, from which the Arabs formed Almagisti, latinized as Almagest. This was one among the 'bookes grete and smale' which was possessed by Chaucer's Nicholas, the poor clerk of Oxenford, along with

> His astrelabie longynge for his art,
> His augrym stones layen faire apart[1]
> On shelves, couched at his beddes head,
> Mill T 3208-3211

Graubard says that Ptolemy was a great astronomer by all standards and that the Almagest is the rich storehouse of all astronomical knowledge of antiquity.

> It was Ptolemy's genius that organized and coordinated this vast knowledge into the Ptolemaic System, a coherent and orderly scheme for integrating the known facts into a theoretical structure that served mankind quite adequately for thirteen centuries and constituted the pinnacle of the mathematical and astronomical learning of the middle ages. The same Ptolemy also wrote the Tetrabibilos or The Quadripartite Mathematical Treatise, a Mathematical Treatise in Four Books, dealing exclusively with what the author considered as social or applied astronomy, hence what we term today astrology.[2]

Graubard observes that astronomy and astrology were practically synonymous and that Ptolemy termed what we mean by astrology, 'prognostication through astronomy'. Until the sixteenth century, astrologers or astronomers were

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[1]Augrym stones were calculating blocks used for computation.

[2]Mark Graubard, Astrology and Alchemy, New York: Philosophical Library, 1953, p. 48.

frequently called mathematici or mathematicians because of the calculation involved in their practice. A concise summary of the Almagest appeared in Latin in the twelfth century from the pen of John of Holywood (Sacrobosco) which became the subject of numerous commentaries from the time of Michael Scot (c. 1250) to that of Lynn Thorndike (1941) and which Chaucer used in his Treatise on the Astrolabe.

Astrology made a great impact upon the Stoic philosophy of Zeno as the 'Fate ordained to men by the stars'. Regarding human relations and conduct, the Stoics believed that Fate was the key and that the inescapable could be judged by the test of astrology. Their cosmology was based upon a rigid conception of the interrelations between the parts of the universe, the Macrocosm and the Microcosm. The four elements were separated from 'primitive being' or pneuma first in the order of fire, air, water, and earth. The 'ether' was the remainder of the pneuma. This world was ruled by immutable laws which individuals must obey, being parts of the same creation. When the cycles of time have been completed and the world decays, everything will separate into the four elements and finally return again to the primitive pneuma. The soul of the individual that was in the vegetative state in the embryo and became successively animal

and rational, eventually and inevitably will be resolved into the universal pneuma. Such great Romans as Seneca, Cicero, and Marcus Aurelius adopted Stoicism and helped to pave the way for the adoption of Christianity. With its emphasis on one deity, right conduct, and the brotherhood of man, some Stoic ideas were consistent with Christian ideals. There is a strong vein of Stoicism in Boethius' Consolation of Philosophy which influenced Chaucer.

However, Neo-Platonism absorbed all the Oriental mystic cults which with a new interest in Babylonian astrology had followed in the wake of the Alexandrian conquests in the East. It absorbed Neo-Pythagoreanism with its stress on the mystical properties of numbers, on magic, miracles, sacrifices, and the oneness of Divinity. The view of Plato revived by the Stoics came to maturity in the Neoplatonic system of Plotinus (204-270 A.D.) and passed to Christianity through St. Augustine who studied it in youth.

Augustine objected to the Stoic insistence on Fate and the determinism of the Macrocosm over the Microcosm because these ideas were opposed to man's free-will and to Divine will; yet, while he relied on Cicero's De Divinatione for many of his ideas, he denounced Cicero's statement which says that divination is impossible because there is no

prescience or foreknowledge. Augustine said that "their opinion is more tolerable that ascribe a fate unto the stars than his that rejects all foreknowledge of things to come. For to acknowledge God yet to deny that is monstrous madness."[1] The lack of clarity in Augustine's views may have led to the many long arguments concerning free-will versus predestination which troubled the medieval ages and which turn up in the work of Boethius and his follower, Chaucer. Some of the early church fathers considered that astrology was allied to magic and that "Learning is wonderful and even awesome, but much to be feared on occasion, since it wields vast power and can be exploited for selfish and evil purposes."[2] However, Christian opposition to astrology reached its peak with Augustine. After scholars developed the doctrine that 'the stars impel but do not compel' and as medicine was almost wholly dependent upon it, astrology became so strongly entrenched in medieval times that

> It was not until the days of Boyle and Voltaire that anyone, however enlightened or skeptical, was capable of disbelieving in both Christianity and astrology simultaneously.[3]

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[1]Graubard, op. cit., p. 77.

[2]Thorndike, op. cit., I, p. 511.

[3]Thorndike, op. cit., V, p. 38.

Elements of Stoicism and of Neoplatonism are evident in the works of Galen of Pergamum in Asia Minor who was the most outstanding medical practitioner and writer before the fall of Rome. Having made a synthesis of all previous medical work and philosophy, he was regarded in later centuries as "the supreme embodiment of Greek and Roman medical knowledge."[1] Galen's belief in pneuma or world spirit was in harmony with the Stoic conception of a world soul in all men making them brothers. He thought that the principle of life was a spirit or pneuma inhaled with the breath from the general world spirit. On meeting the blood charged with natural spirit from the liver, it became vital spirit in the heart, and then the blood flowing to the brain became filled with animal spirit or the breath of the soul, the noblest of all. In the Knight's Tale, Chaucer employs the Galenic idea to describe the cause of the death of Arcite after the tournament. (K T 2750)

The doctrine of the Macrocosm and Microcosm is implicit in Galen's thought. He claims that every work of creation (of which man's body is a type) shows God's intelligent design and every structure in the body is for a

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[1]Cohen and Drabkin, op. cit. p. 467.

perfect purpose. Everything is a reflection of God's perfection. Since man's dwelling is in a finite world bounded by the eighth sphere and since this world is ruled by immutable laws, man is subject to the laws of the heavenly bodies. In short, every part of the body is controlled by the planets and the zodiacal constellations. Hippocrates has said that the medical man cannot be considered a perfect physician if he is ignorant of astronomy. Hippocrates also rejected the demon theory of disease and asserted that it is nature which heals.

> And certeinly, ther Nature wol nat wirche,
> Fare wel phisik! go ber the man to chirche!
> K T 2759-2760

Galen adopted the Pythagorean principles in the Hippocratic collection of medical writings where the body is considered to be composed of four humours. The various bodily constitutions were associated with an excess of any one of them to make the four kinds of temperaments or complexions, the sanguine, phlegmatic, melancholic, and the choleric. Since these four humours were related to the four elements and qualities, it was believed that a good way to drive out an excess of one humour so great that it caused disease, was to use a remedy having the opposite quality. For instance, a sanguineous condition which is hot and dry, could be reduced

by the application of cold water, the water signs being cold and wet. In other words, an inflamed area would require cold compresses and this is undoubtedly what dame Prudence in the Tale of Melibee would recommend, for she says: "this is to seyn, that in maladies that oon contrarie is warisshed by another contrarie;" (T of M 127-129)

From Eristratus came the belief that the chief cause of disease was due to an excess of blood or plethora in any particular part of the body and it should be reduced by starvation. Fasting is not a popular practice at any time; so the contemporaries of Eristratus adopted blood-letting as an easier method of drawing out the plethora. Since it is quite apparent that the moon governs the tides, it was thought that the moon ruled body fluids; hence, blood-letting became an elaborate operation performed in favorable aspects of the moon. R. T. Gunther shows how blood-letting along with purgations and baths was prescribed by the 'learned Phisician' for the various complexions in relation to Digge's Zodiac Man 1555 with a due consideration for the conjunctions, oppositions, and quadrate aspects of the planets, and he concludes:[1]

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[1]Gunther, op. cit., p. 19

.... The practice may not have been less thorough in Oxford than it was in the East, and at the right hour on the right day the High Street by St. Mary's may, like the streets of Bagdad, have been seen running with blood from the barber's shops. And bleedings continued through the centuries: indeed as late as the beginning of the nineteenth century the practice of many Oxford physicians did not differ greatly from that of the celebrated Dr. Lettsom (d. 1815)

When any sick to me apply,
I physicks, bleeds and sweats 'em;
If after that they choose to die,
What's that to me,
I. Lettsom

In the later times of the Museum at Alexandria medical studies had fallen under the classical curse of the stigma upon manual arts. Theory had become divorced from practice and the practical side of the physician's work was left to nurses and barbers; dissection and experiment had almost ceased; but Galen showed the true scientific spirit by actual research. He was forced to use the Barbary ape and other animals in his study so that he was not always able to arrive at correct conclusions, and his errors passed on to later generations. He made long trips in Asia Minor in quest of healing plants and drugs. With his death in 200 A.D. science came to an even more abrupt standstill than philosophy. It was not until about 1550 that Vesalius, a Belgian, was destined to break centuries of veneration for Galen.

A fanatical Christian mob at Alexandria destroyed

the school and the library with its accumulated store of pagan wisdom. In 529 during the reign of the Byzantine emperor, Justinian, the centre of learning passed to Byzantium where the Greek-speaking people had been in continuous but passive contact with the classics. The Nestorian Christians went into exile in Asia Minor to escape Justinian's determination to make one uniform practice of religion. In the seventh century, the Arabian conquests brought the Arabs into contact with Nestorian scholars who had carried Greek learning with them. The Arabs were not impressed with the literature of the past, but they eagerly began the study of the sciences, especially of Aristotle's works. Translation into Arabic went on apace. With a split in the Caliphate, ancient science was carried to Spain and reached western Europe; but in Sicily the emperor, Frederick II, who had oriental contacts also began to encourage the translation of Arabic writings into Latin. The period from the ninth to the thirteenth centuries was one of eager study of ancient knowledge in Europe.

During the long period of intellectual stagnation in the Latin west, the Church was converting the peoples of Europe, but many crude and irrational superstitions survived. Combined with the imperfect and often fantastic learning

from Latin sources such as Pliny and Isadore of Seville, were the folk-lore beliefs handed down among the masses from prehistoric animism with its accompaniment of magic, incantations, and charms which received a Christian embodiment in demonology and witchcraft. Hellenic knowledge had not passed through Arabic channels undefiled and it was tainted with oriental superstitions. The end result was that in Chaucer's time,

> ...sheer magic, incantation and divination, witchcraft, unfounded convictions on the marvellous properties of stones and plants, alchemy and astrology all flourished to the detriment of the advance of a sound knowledge of nature, which nevertheless did take place.[1]

Popular views of the times may be deduced from the denunciations made by the medieval preachers who inveighed against the beliefs of the people in magicians, diviners, and prophets. Their sermons allude to such nefarious practices as uttering prayers to bring death to another, making compacts with the devil or with devils and demons to secure power, riches, learning, or foreknowledge, as exemplified in the Dr. Faustus legend, and using the sacraments, especially the consecrated host and chrismal oil, for magic practices such as healing disease and killing

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[1]The Shorter Cambridge Medieval History, Two Volumes, Cambridge: University Press, Vol. II, p. 1094.

cabbage worms. During the Spanish inquisition, it was decreed that inquiry should be made as to "whether there were any magician, diviner, wizard, soothsayer, or sorcerer; or if anyone made offerings to trees, streams, or stones, or placed there lighted tapers or any gift whatsoever; or if there were present any deity which in the minds of the peasants could bring about good or evil."[1] All these are denounced by Chaucer's Parson thus:

> But let us go now to thilke horrible swerynge of adjuracioun and conjuracioun, as doon thise false enchauntours or nigromanciens in bacyns ful of water, or in a bright swerd, in a cercle, or in a fir, or in a shulderboon of a sheep. I kan nat seye but that they doon cursedly and dampnably agayns Christ and al the feith of hooly chirche.
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> What seye we of hem that bileeven on divynailes, as by flight or noyse of briddes, or of beestes, or by sort, by geomancie, by dremes, by chirkynge of dores, or crakkynge of houses, by gnawynge of rattes, and swiche manere wrecchednesse? Certes, al this thyng is deffended by God and by hooly chirche. For which they been acursed, til they come to amendment, that on swich filthe setten hire bileeve. Charmes for woundes or maladie of men or of beestes, if they taken any effect, it may be peraventure that God suffreth it, for folke sholden yeve the moore feith and reverence to his name.
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> P T 602

As Symonds says, "The confusions of influences, classical and medieval, Christian and Pagan, in that age is not the least extraordinary of its phenomena. Even the new thoughts that illuminated the minds of great discoverers seemed to them like reflections from antiquity.[2]

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[1] Dalhousie Review: Vol. XXI, No. 4, January 1942, "Mediaeval Peasant", Ross Collins, pp. 424-2.

[2] John Addington Symonds, New edition, Renaissance in Italy, London: Smith, Elder and Co., 1912, p. 13.

II

MAGIC

Other writings of the West show that the magic practices censured by Chaucer's Parson were rife and never had been really annihilated even in the early Middle Ages, although attempts to suppress them had continued from Roman times through the Dark Ages by fines, penances, trial-by-ordeal, torture, or death. Many pagan customs survived among the lower classes, but everybody believed in the power of magic from peasant to pope, king, and scholar. While the Church frowned upon so-called magic in general, many of its clerics along with other scholars through the centuries were engaged in studying, practising, and discussing one or more branches of the occult sciences. These writers in toto display towards the sciences an ambivalent attitude which finds expression in Chaucer's work and which probably accounts for contradictory or conflicting statements that may puzzle the reader from time to time.[1]

Most of the medieval scholars do not define clearly

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[1]Kurt Seligmann, The History of Magic, New York: Pantheon Books, Inc., 1948, p. 192

the difference between magic and witchcraft. Some condemn divination but exempt astrological matters from blame. For instance, Boethius (480-524) believes that the stars rule men and all things upon earth. Isadore, a noted church writer who became bishop of Seville in 600, accepts astrology only with strict limitations of its practical applications to such things as medicine or agriculture and not to any forecasting of nativities or events. At the same time he thinks that there are signs of things to come, and he identifies magic with witchcraft. He bases his ideas upon former church writers including Augustine. As Augustine himself had so much influence upon thought in the ages after him, it may be noted that as a philosopher steeped in Neo-Platonism and as a former Manichaean, he tended toward a pronounced dualism in which the power of evil is so strong that it always threatens to limit the power of good. Because he was a practical and energetic clergyman determined and able to build strong church institutions, he established a "system that remains one of the wonders of human thought for its fervid piety, its logical rigor, its exalted spirituality, and its profound inhumanity."[1] The end result of his ethical teaching is that man is depraved and must bear

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[1]Herbert J. Muller, The Uses of the Past, New York: Oxford University Press, 1953, pp. 170-171.

the blame for all the evil in the world. He can only be good if God chooses to give him the grace to will to be good. It can readily be seen how Augustine's ideas could be turned by cruel men to excuse the sadistic excesses performed in the name of religion that blotted the pages of history from the twelfth to the seventeenth centuries, beginning with the extirpation of the Knights Templar and ending with the witchcraft hysteria.

Hugh of St. Victor (1096-1140), who was famous for his classification of sciences, follows the divisions of magic given in Isadore's encyclopedia, the Etymologies, but he organizes them under five heads, the first three comprising the different methods of divination: first, Mantike includes geomancy, hydromancy, aerimancy, pyromancy, and necromancy or divining by means of the four elements, earth, water, air, and fire and the spirits of the dead; second, Mathematics embraces aruspicina or the observation of hours (horae) or entrails (hara), augury or the observation of birds, horoscopia or the observation of nativities; third, Sortilege divines by casting lots;[1] fourth, Maleficia performs 'evil deeds by incantations to demons, or by ligatures

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[1]Thorndike, op. cit., I, p. 630. Isadore notes that "Sortilegi are those who profess the science of divination under the pretended guise of religion... predict by inspection of certain scriptures."

or by any other accursed kind of remedies with the co-operation and instruction of demons"; and fifth, Praestigia makes illusions to fool the human senses.[1] Hugh believes that astrology is partly natural science and partly a superstition because the condition of the human body and other bodies depends upon the constellations, and health, weather, and fertility or sterility can be predicted from the stars, while to claim that they influence contingent events and acts of free will is superstitious.

The voluminous translation of learning from the Arabic into Latin in the twelfth and thirteenth centuries helped to strengthen superstitious beliefs by the contact with those of the East; even after Mohammed had established the new monotheistic faith, the Arabs continued all their old magical practices such as the use of charms, wax figures, talismans, incantations, magic spells, and enchantment by knots. The prophet himself had frequent dealings with demons and had been the victim of a powerful spell, the enchantment by knots and by a needle-punctured wax figure designed to rob him of his virility. When Allah revealed the cause of his ailments in a dream, Mohammed was able to find the wax figure and the cord in a well and to undo the evil by

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[1]Thorndike, op. cit., II, pp. 14, 15.

repeating verses from the Koran.[1]

Belief in the power of the word appears in the very earliest stages of society, and it is worth noting some explanation for it such as that given by Alkindi (ob. it 850), one of the great scholars in Arabic learning whose ideas made a profound impression upon later thinkers. In his doctrine of the radiation of force and his explanation of magic by astrology, he explains how the variety in nature depends upon the diversity of matter from the combination of the four elements and the changing influence exerted by the rays from the stars owing to their constantly varying positions in respect to each other and owing to the fact that each star has its own peculiar force and has particular control over certain things and matters. Everything in the world both in the superlunary and sublunary spheres emits rays of force, for example, fire, color, and sound; but all emanations, in the last analysis, are caused and controlled by the celestial spheres. Alkindi gives the ancient basic argument for belief in the hidden or occult virtue in anything when he says, "The science of physics considers the action of objects upon one another by contact, but the sages know of a more occult interaction of remote objects suggested by the power of the

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[1]Seligmann, op. cit., p. 194.

magnet and the reflection of an image in a mirror."[1] Attracting and reflecting, in other words, are magic properties of a lodestone and a mirror caused by the emission of rays.

Alkindi explains that the power of words in incantations, charms, and words of command arise from rays emitted from the imagination when the mind forms concepts. Muscular movement and speech are two channels or ways by which the mind's conceptions can be transformed into words. Numerous experiments have indubitably proven the power of words spoken with firm faith, strong desire, and intent determination, especially if they are pronounced at an astrologically favorable time. In prayer, the rays emitted by the human mind and voice have more influence upon matter if the speaker has fixed his mind upon God and names him. "Human ignorance of the harmony of nature also often necessitates appeal to a higher power in order to attain good and to avoid evil."[2] He states that faith and attendant circumstances have their bearing upon the success or failure of prayer as well as of other utterances.

Alkindi asserts that figures, characters, or images

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[1]Thorndike, op. cit., I, p. 644.

[2]Thorndike, op. cit., I, p. 645.

formed by the hand of man with due intention, solemnity, and consideration for the correct time and place astrologically also emit rays having the peculiar virtues of the stars or signs impressed upon them. The material and forms used should be suited to the constellation to secure the best results. They can be used to cause or to cure disease. He says more than once that his beliefs have been proven by experiments; this constitutes one more example among previous ones made by scholars of the connection between natural science and magic. His theories about the radiation of force and about the occult virtues of charms, incantations, seals, images, and amulets had great influence in Latin medieval learning. Roger Bacon, for example, repeated the same views in much the same language about four hundred years later.

In his De somno et visione, Alkindi shows his acceptance of clairvoyance and divination by dreams. He asks why we see some things before they happen, some things which need interpretation to know their meaning, and some things that at times are the contrary of what happens. Chaucer asks the same questions in the Proem of Book I in the House of Fame, (1-50). Alkindi, a believer in astrology to the point of magic, felt that alchemy was a fraud.

Some of the great scholars of the thirteenth century who evinced an interest in magic and found it worthy of investigation were clergymen, men such as Vincent of Beauvais, Bartholomew of England, Robert Grossetest, Bacon, Lully, Aquinas and Albertus Magnus. Albertus was typical in outlook of many others. He was an astrologer, an alchemist, a believer in demons, and in occult virtues of herbs, gems, talismans, magical images, medals, and signs to heal or to protect. He does not doubt that magical wonders can be performed. There is jugglery and illusion which deceive people's senses but there is also a natural magic "which is of the good, and a great deal of this good can be found in the writings of the Arabs as well as in hermetic literature."[1] He, too, subscribes to the doctrine of the Macrocosm and Microcosm, for the heavenly bodies govern everything on earth and all virtues come from the stars.

The Biblical stories themselves provided the most authentic of all authorities for belief in prophecies, dreams, miracles, and raising the dead to divine the future, in chiromancy, astrology, and magic, to say nothing of the sorcerers and magicians at Babylonian and Egyptian courts. Thorndike considers that all arts of divination including

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[1]Seligmann, op. cit., p. 205.

astrology come under the heading of magic. At the same time, he thinks that magic and experimental science have been connected in their development.[1]

Anything can be grist in a poet's mill if he chooses. Graubard says:

> To the student of culture one human society is as valuable or as interesting as another. Each one is an experiment set up by nature to bring out new data, nuances and relationships. All enrich his knowledge, raise many problems and answer some questions. They are all different ways of observing Homo sapiens in action; hence all contribute to our knowledge of man.[2]

The same may apply to fields of thought and various times. During the period of about fifteen years from the commencement of the Book of the Duchess to the completion of the Troilus and Knight's Tale, Chaucer's work shows that the poet was acquiring not only skill in narration, characterization, and fluid expression, but also that he was assimilating knowledge of the sciences from many sources. Nowhere did such learning become obtrusive, even in the early poems, but as it became broader with the passing years, he developed such a restraint and nicety in its application to his purposes that he was able to achieve a glorious triumph of erudition and artistry in the Nun's Priest's Tale of

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[1]Thorndike, op. cit., I, pp. 2, 5.

[2]Mark Graubard, Astrology and Alchemy, New York: Philosophical Library, Inc., 1953, p. viii.

Chaunticleer and Pertelote. He used elements of magic and natural magic with its branches, alchemy, astronomy, astrology, astro-meteorology, physiognomy, and medicine with increasing effectiveness to supply time settings, tone and atmosphere, motivation, credibility and characterization.

Manly quotes Machaut's editor, Ernest Hoepffner, thus: 'The aim which Machaut ... pursued was to give to his poetic fictions a greater air of reality. It is the same desire which incited him to enamel his poems with traits borrowed from real life, with petty detail suited to lend to his inventions the character of something true, something experienced.' Manly adds, "In any event, the end aimed at by Machaut was certainly achieved, and achieved on a higher plane and in a higher degree, by his follower and greatest pupil, Geoffrey Chaucer."[1] Although the indications of scientific knowledge are fewand they concern the legitimate sciences chiefly, yet Chaucer shows in his first major work, the Book of the Duchess, his adoption of Machaut's practice of embroidering the verse with the magic connotations of science and the romantic associations of old myths. There may be noted an acquaintance with Pythagoras as a

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[1]John Mathews Manly, Some New Light on Chaucer, New York: Henry Holt and Company, 1926, p. 74.

mathematician and as the founder of the musical scale, with the commentary on dreams of Macrobius, with Galen and Hippocrates as authorities in medicine, and with Ovid's remedies of love. There is an interesting reference to Argus, meaning Al-Khwarizmi, the Arabian mathematician who employed the wonderful ten numerals with which any reckoning can be accomplished by people who understand them.[1] In those times, the number zero and the simple operations of arithmetic were as great marvels as the magnet and the looking glass.

Since astrology is a difficult and detailed subject much reference to it could not be expected in this early work, but Chaucer has borrowed from French sources two figures based upon astronomy which are well suited to the occasion. The first gives expression to the Duke's great sorrow:

> For there nys planete in firmament,
> Ne in ayr ne in erthe noon element,
> That they ne yive me a yifte echone
> Of wepynge whan I am allone.
> B D 693-696

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[1]Gunther, op. cit., I, II. In Chaucer's day even the use of an abacus was not well understood in England and it was not until the sixteenth century that long division was taught in the universities. The lack of instruments and a well-developed science of mathematics was detrimental to the progress of scientific experimentation.

In making a fitting comparison between the beauty and loveliness of Blanche and other women, Chaucer adds a more or less original image to those which he took from De Behaingne, Confort, and De Lorris:

> For I dar swere, withoute doute,
> That as the someres sonne bryght
> Ys fairer, clerer, and hath more lyght
> Than any other planete in heven,
> The moone, or the sterres seven,
> For al the world so hadde she
> Surmounted hem all of beaute,
> Of maner, and of comlynesse.
> B.D 820-827

Chaucer's treatment of the story of Seys and Alcione is not strictly a case of necromancy because by Juno's command, it is Morpheus who animates the king's dead body to give a message to his wife and not the real spirit of Seys.

Shelley remarks that "To the student of Chaucer's poetic development the House of Fame is in some ways the most significant and fascinating of all his works, for it is so clearly experimental ... and transitional."[1] The poem displays the rapidly widening horizons of Chaucer's intellectual interests while it marks a great advance in technique although the verse retains something of the roughness

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[1]Percy Van Dyke Shelley, The Living Chaucer, Philadelphia: University of Pennsylvania Press, 1940, p. 66.

and irregularity in the metre which is seen in the Duchess. It reveals a greater knowledge of the Latin works of men of science, of poets, and of historians, such as Ovid's Metamorphoses and Remedia Armoria, Cicero's Somnium Scipionis, Boethius, and Dante. Coghill states that "... as Rambeau has shown, Dante's Comedy has supplied Chaucer with almost everything in the House of Fame that is vital."[1]

Robinson agrees that Chaucer was clearly under the influence of Dante at the time of writing and says that he has used a number of passages from the Divine Comedy, for instance the second and third invocations.[2] However, the proem in the first book is based upon suggestions from the Romaunt of the Rose while the discussion of dreams is probably based upon the great authority in the Middle Ages, the commentary on the Somnium Scipionis by the obscure Macrobius of the fifth century. The Somnium Scipionis is a part of Cicero's work, De Republica. In this section Chaucer gives a humorous treatment of dreams, one of the favorite medieval speculations which was reduced to a scientific

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[1]Nevill Coghill, The Poet Chaucer, Toronto: Oxford University Press, 1949, p. 170.

[2]Robinson, op. cit., p. 330.

classification[1] and which was sanctioned by the great dream prophecies of the Bible. Chaucer pretends to be confused as to the various causes of dreams and his handling of the subject is not only of interest but it provides a natural introduction to the dream rehearsal of Vergil's Aeneid and then to his own flight of imagination with an eagle.

In Book II his guide through celestial regions is not in the form of a beloved lady like Dante's Beatrice, but is in the shape of a professorial golden eagle. The choice of a bird for this office may have been suggested first by the words of Boethius. A comparison of two passages shows Chaucer's power of compressing thought and of imprinting his own stamp upon borrowed ideas. Boethius says:

> I have, forthi, swifte fetheris that surmounten the heighte of the hevene. Whanne the swift thought had clothid itself in the fetheris, it despiseth the hateful erthes, and surmounteth the rowndeness of the gret ayr; and it seth the clowdes byhynde his bak, and passeth the heighte of the regioun of the fir, that eschaufeth by the swifte moevynge of the firmament, til that he areyseth hym into the houses that beren the sterres, and joyneth his weies with the sonne, Phebus, and felawschipeth the weie of the olde colde Saturnus;
>
> Boece, IV, M I, 1-14

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[1] W. C. Curry, Chaucer and the Mediaeval Sciences, New York: Oxford University Press, 1926, pp. 195-218. Prof. Curry gives a thorough discussion of "Mediaeval Dream Lore".

Chaucer transmutes this to verse thus:

> ...A thought may flee so hye,
> Wyth fetheres of Philosophye,
> To passen everych element;
> And when he hath so far ywent,
> Then may be seen, behynde hys bak,
> Cloude, -- and al that y of spak
> H F 973-979

There seems to be a parallel also between Chaucer's dialogue with the eagle and the conversation between Boethius and the Goddess, Fortune, in the Consolation of Philosophy. Certainly, in the person of his winged and witty monitor, Chaucer is able to present a bird's-eye view of the little earth from an unusual vantage point at that time, the upper regions with their clouds, mists, rains, hails, and snows, of the ecliptic and its mansions, and of the Galaxy, all being reminiscent of Plato's Timaeus and Aristotle's Meteorology. The amusing repartee with the eagle allows an interesting survey of the zodiacal and other constellations. The instruction on the Aristotelian theory of the inclination of elements to seek their own home sphere

> Thus everything, by this reson,
> Hath his propre mansyon,
> To which it seketh to repaire,
> H F 753-755

leads into the Boethian discussion of sound waves taken from Boethius' de Musica. The two ideas, cleverly combined,

provide a plausible explanation of the reason why every sound

> Thogh hyt were piped of a mous,
> Mot nede come to Fames Hous.
> H F 785-786

The mouse image is an example of the way in which Chaucer chooses a simple, homely detail to make a brilliant and clear visualization of his thought and very frequently to add a touch of delicious salty humor. And just as the poet uses scientific lore to enhance his page, he enhances science with his own kind of artistry. Copying Dante, he places the House of Fame amidst three Dantesque sublunary spheres of —

> Heven, erthe, and eke the see,
> As most conservatyf the soun....
> H F 845-846

so that every sound wave passing upwards with the air in circles similar to those created in water after a stone is thrown into it, must eventually reach Fame's palace. By the time that the eagle sets his pupil down near the portals of the House of Fame, there have been more entertaining allusions to stars in the sky and to the myths of ancient Greece.

The beginning of Book III significantly appeals to Appollo, as the god of science, to enter the poet's breast. Chaucer appears to have acted upon the principle that the god helps those who help themselves because this one book alone gives evidence of an amazing breadth of study. Often only a word or line indicates gleanings from widely varied sources. For instance, a reference to Medea, Circe, and Balenus might show merely a reading in the Romaunt of the Rose, as Prof. Skeat has noted,[1] but the inclusion of Simon Magus, a scholar of the early Christian period, famed as a sorcerer who tried to buy spiritual power from the apostles,[2] shows that Chaucer had knowledge of beliefs in magic current in those times.

Actually, however, Mercury is the god of science and reason, cold calculation, communication, and all forms of intellectual exercise like oratory, teaching, and writing. The eagle who is instructing the poet on this flight of learning is himself in the nature of the winged Mercury, the

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[1]Robinson, op. cit., p. 894.

[2]Acts 8. 9-24. The term simony comes from Simon Magus.

messenger of the gods passing as quickly as thought through space. Mercury gives the gift of wit and repartee such as the eagle has. He also governs physical exercises, especially those requiring swift movement of the limbs and hence he controls porters and carriers of every kind. Thus he may be identified with a great golden eagle sailing through the air with a poet clutched in his talons. This god or planet is also said to rule trickery and deception, thieves, lawyers, and physicians. The physician's symbol is taken from Mercury's Caduceus with the two snakes representing wisdom, coiled around a rod and looking into a round mirror.

Hermes was the Greek name for Mercury and was related by the Egyptians to their god, Thoth, who as Hermes Trismegistus was the supposed author of a body of sacred, occult writings prized and preserved by the Egyptian priests. Accretions to these manuscripts embodied Neo-Platonic, Judaic, and Cabalistic ideas as well as magical, astrological, and alchemical notions. These Hermetic Books became a revered mine of scientific information during the Middle Ages. One of the disciples and teachers of the Hermetic doctrines was Hermes Ballenus whom Chaucer mentions. He is often

identified with Appolonius of Tyana, a famous philosopher and magus of the first century.[1]

Chaucer does not mention Hermes Trismegistus here but a clue to the poet's study of the Hermetic science is seen in more than one matter. The similarity of his own position in the talons of his eyrie friend with that of Elijah who was caught up to heaven causes the poet to remark:

I neyther am Ennok, nor Elye. (Elijah)
H F II, 558

Now Enoch was frequently confused with Elijah; and Enoch was traditionally accounted to be one of the three Hermes who survived the Flood. Noah was the second, and the third was Hermes Triplex, king, prophet, and philosopher, hence triplex or trismegistus. He was supposed to have collected and written all the knowledge of astronomy and of the liberal and mechanical arts that existed before the deluge.[2]

Among the medieval Hermetic manuscripts is a treatise on fifteen stars, herbs, stones, and images to be engraved on stones sometimes ascribed to Hermes and sometimes to Enoch.

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[1]E. M. Butler, Myth of the Magus, Cambridge: Cambridge University Press, 1948, pp. 55-65.

[2]Thorndike, op. cit., II, pp. 216-222.

As Thorndike points out, fifteen is a very unusual number to use in medieval science as it does not apply to planets, signs, or decans of signs; but John Gower in the Confessio Amantis speaks of the stones and herbs appropriate to the fifteen stars,[1] indicating that there was access to the Hermetic Books in London then as there is now in the British Museum. Two other Hermetic manuscripts deal with images of planets, and in each, there follows a work by a Toz Graecus called the Book of Venus or the twelve stones of Venus which discusses the occult virtues of various stones. As mentioned previously, it was a centuries-old belief based apparently on the magic power in a magnet or in lodestone to attract iron, that everything had a hidden power; in some things this occult power could be used for promoting a desired benefit such as healing;[2] in others, the bad effect must be guarded against by the use of incantation, suffumigations (fumigation) with incense or smoke, sorcery, exorcism, or alteratives to offset the evil. The book by Toz is full of magic experiments, conjuration, and the methods of magicians to be

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[1]Thorndike, op. cit., II, p. 221.

[2]Seligmann, op. cit., p. 364-365. "Dancing, singing, making music are the operations of white magic; and similarly the operations of reading and writing are magical activities as we have learned from the Cabala."

used in exorcism. The good powers in gems and gold were considered to be especially potent "...to adorn King's Crowns, grace the fingers, enrich our household stuff, defend us from enchantments, preserve our health, cure diseases, they drive away grief and cares, and exhilarate the mind."[1] Such books on stones were called Lapidaries as Chaucer mentions. (H F 1352)

Chaucer describes the palace of Fame as one of great beauty being fashioned from beryl. Burton says that the beryl "much avails to a good understanding, represseth vain conceits, evil thoughts, causeth mirth, &c". The beryl was also said to mend manners between people in general, to promote amity and good understanding between wives and husbands, and to increase love. The throne of the lady, Fame, is made of carbuncle which drives away childish fears, Devils, overcomes sorrow, and hung about the neck, represses troublesome dreams.[2] Albertus Magnus believes that beryl prevents laziness and this would be a virtue in achieving fame;[3] but merely naming the beryl as the substance forming

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[1]Robert Burton, The Anatomy of Melancholy, eds. Dell and Smith, New York: Farrar and Rinehart, 1927, p. 567.

[2]Burton, op. cit., p. 568.

[3]Seligmann, op. cit., p. 209.

the walls, towers, pinnacles, and halls of the castle calls to the mind a picture of exquisite loveliness in glittering crystals of pink, white, yellow, green, and aquamarine in which this gem occurs thus creating a place attractive to all manner of people seeking the limelight. Possibly the varied colors of the gem have a connection with the different aspects which Fame and glory presents to various persons.

Standing in niches in the pinnacles, are the minstrels and 'gestiours' that tell famous stories, sad or humorous. From this description the poet finds a natural introduction to the recounting of noted musicians of all times from Palestine to Spain and Wales and of all manners of instruments from the harps of ancient Greece to the

> ...pipes made of grene corn
> As han thise litel herd-gromes,
> That kepen bestes in the bromes.
> H F 1224-1226

Music, of course, was one of the scientific subjects of the quadrivium for the Master of Arts degree in medieval universities. Throughout his poetry Chaucer evinces much interest in music.

Amongst the people in this great crowd was a host of practitioners in black magic, a subject of perennial interest. The arts of black magic are primarily associated

with nigromancy from the Latin, niger, for black and with necromancy from the Greek, necro, for dead body and, manteia, for diviner, meaning divination by means of the spirits of the dead. The Christian conception was that these were fallen angels, demons, not spirits of the dead; but either idea was one of fearful fascination. The old witches, Phitonesses, magicians, jugglers, tregetours, charmeresses, and sorceresses whom Chaucer names, evoke the same emotions and command the same attention as ghosts and ghost stories still do for many persons. Wizards and witches or sorcerers and sorceresses could use the various methods of making noises or suffumigations or drawing a magic circle to keep their weird assistants within bounds, while the more scholarly magicians by their knowledge of mathematics could draw magic diagrams such as the pentagram of Solomon's seal to control genii or demons, as the Squire remarks of the maker of the wonderful brass horse:

> He that it wroghte koude ful many a gyn
> . . . . . .
> And knew ful many a seal and many a bond /control/
> S T 128, 131

The tregetours and jugglers are sleight-of-hand artists, who practise Praestigia, the magic art which creates illusions to fool the senses. One of them is the famous English

magician, Colle tregetour, who could make a wind-mill disappear under a walnut shell (an old version of the shell-game).

Regarding the noted Colle, Chaucer must have followed his activities with some attention because no book mentions his name until 1396 when a French manual of conversation was written which tells of Colle having lately practised his art at Orleans. An interesting point is that in the Franklin's Tale, when Aurelius' brother is casting about in his mind for a place where he can secure the services of a magician, he thinks of Orleans where there are young clerks that like to

> Seken in every halke and every herne
> Particular sciences for to lerne.

And he says:

> For I am siker that ther be sciences
> By which men make diverse apparences,
> Such as these subtile tregetoures pleye.
> For ofte at festes have I wel her seye
> That tregetours, withinne a halle large,
> Have maad come in a water and a barge,
> And in that halle rowen up and down.
> Somtyme hath semed come a grym leoun;
> And somtyme floures sprynge as in a mede;
> Somtyme a vyne, and grapes white and rede
> Somtyme a castel, al of lym and stoon;
> And when hym lyked, voyded it anon. /banished/
> Frank T 1139-1150

He finds a man par excellence who is capable of creating illusions which match those that the French report of Colle's

'mervailles par voie de nigromancie'; after Aurelius and his brother go to Orleans, the magician produces in his study, the equal of an hour's television show of a kind calculated to keep medieval gentlemen in one or more kinds of suspense by scenes of hunting with hounds and falcons, jousting, and dancing with fair ladies. He closes the performance with two claps of the hands, the classical method of ending a hypnotic trance or a spell in lieu of the manual operation of turning a switch.[1]

Another kind of black magic was the method of employing natural magic, the legitimate sciences like astrology or medicine for evil and unholy purposes; thus, Chaucer includes with the group of black magicians:

> ...clerkes eke, which konne wel
> Al this magik naturel,
> That craftely doon her ententes
> To make, in certeyn ascendentes,
> Ymages, lo, thrugh which magik
> To make a man ben hool or syk.
> H F 1265-1270

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[1]Butler, op. cit., pp. 112-120. Butler describes some astounding feats performed by Zyto, a magician long kept by King Wenceslaus IV of Bohemia. His daughter, Anne, was the beloved wife of Richard II. Chaucer had likely heard of Zyto at the King's court. Chaucer had a very high regard for Anne.

[2]Orleans was long a centre of occult learning owing to the interest of the nobles.

In his discussion of the Hermetic Books, Thorndike says that:

> Of the books of bad necromantic images for each of the seven planets by Hermes, which the Speculum astronomiae[1] censured, at least one seems to have been preserved for our inspection in the manuscripts, since it has the same Incipit as that cited by Albert...and the same title, Liber lune or Book of the Moon, or, as it is more fully described, of the twenty-eight mansions and twenty-eight images of the moon and the fifty-four angels who served the images....It tells how to engrave images as the moon passes through each of its twenty-eight houses.[1] The names of angels have to be repeated seven times and suffumigations performed seven times in the name of God the merciful and pious....Instructions are given for engraving images which will destroy villa, region, or town; make men dumb;... or twist a man's limbs. Four special recipes are given to injure an enemy or cause him to sicken.[2]

Such an image would be an amulet made when the moon is in an unfavorable aspect to other planets, with incantations or curses, and with a seal designed to procure demoniac powers. The Speculum astronomiae of Albertus Magnus also includes in the list of books on evil images, a work on the images of Venus, a second on the four mirrors of Venus, and a third on the stations for the cult of Venus.

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[1]Robinson, op. cit., p. 829. "The twenty-eight mansions, or stations of the moon correspond to the twenty-eight days of a lunation." Actually, the moon takes two and one-third days to pass through each of the twelve celestial houses or mansions.

[2]Thorndike, op. cit., II, p. 223-224.

In the Franklin's Tale, the subsequent course of the plot really hinges upon the Book of the Moon because it is the remembrance of such a book that causes the brother of Aurelius to seek and secure the services of a magician who can procure the result which will effect the cure of Aurelius' malady:

> He hym remembered that, upon a day,
> In Orliens in studie a book he say
> Of magyk natureel, which his felaw,
> That was that tyme a bachelor of lawe,
> Al were he ther to lerne another craft,
> Hadde prively upon his desk ylaft;
> Which book spak muchel of the operaciouns
> Touchynge the eighte and twenty mansiouns
> That longen to the moone, and swich folye
> As in oure dayes is nat worth a flye,--
> For hooly chirches feith is our bileve
> Ne suffreth noon illusioun us to greve.
> And whan this book was in his remembraunce,
> Anon for joye his herte gan to daunce,
> And to hymself he seyde pryvely:
> "My brother shal be warisshed hastily;" /cured/
> Frank T 1123-1138

This passage has frequently been cited as proof of Chaucer's disbelief in astrology, but from Thorndike's treatment of the Hermetic Books, it seems safer to say that Chaucer was in agreement with Albertus Magnus in condemning works on evil necromantic images and with the Church in censuring necromancers; nevertheless, the artist can employ them to move the action of the story plausibly and to move his audience with delight and wonder.

Albertus Magnus also mentions in his Summa the teachings of Hermetic writers regarding that branch of necromancy which concerns images and rings, mirrors of Venus, and seals of demons.[1] In the story of oriental marvels so eminently suited to a youth of the Squire's years and education, the strange knight brings gifts from the kings of India and Arabia to honor King Cambyuscan on his birthday. For the Princess Canacee there is a ring of gold which enables the wearer to understand the language of all birds and the healing properties of all herbs; and there is a mirror which will reveal any threat of peril in the king's domain or the innermost intention for good or bad of any person. For the king there is a naked sword which will pierce any armor of any thickness, causing a wound which can only be healed by a stroke from the flat of the sword; and the last is a supreme piece of an ingenious imagination, created by a craftsman who knew many a seal, the marvellous

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[1]Thorndike, op. cit., II, p. 226.

> ...steed of bras, that esily and weel
> Kan in the space of o day natureel--
> This to seyn, in foure and twenty houres--
> Wher-so yow lyst, in droghte or elles shoures,
> Beren youre body into every place
> To which youre herte wilneth for to pace,
> Withouten wem of yow, thurgh foul or fair; / harm /
> Or, if yow lyst, to fleen as hye in the air
> As dooth an egle, whan hym list to soore,
> This same steede shal bere yow evere moore,
> Sq. T. 115-123

The poet's soaring fancy turns again to the 'fetheres of Philosophye' or the wings of an eagle. When the king asks the knight how to manage this perfection of a courser, he learns knowledge which became actuality in the twentieth century: the engine, or 'gyn' is controlled by three knobs or 'pyns', one to make it ascend and go forward, one to cause it to descend and stop, and one to make it withdraw. By means of the reins of the magic bridle (the controls), the craft is moved about 'to trippe and daunce'; one might say to wheel and turn.

While somewhat reminiscent of the mythical Pegasus to which Chaucer refers and of the Ebony Horse in the Arabian Nights,[1] Chaucer's description is as remarkable as any piece of prophecy in English literature but the power of his utterance creates the same enchantment as the Magic Carpet

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[1]Robinson, op. cit., p. 822.

or the Kublai Khan of Coleridge. Possibly the unfinished state of the Squire's Tale and of the Kublai Khan adds to the strange spell because much is left to speculation and wonder. However, in the Man of Law's Prologue,[1] Chaucer virtuously prides himself on not writing the incestuous story of Canacee as Ovid and Gower had done; and this seems to be sufficient reason for not allowing the Squire to bring his tale to an end unfitted to his character and opposed to Chaucer's principles. It is said that an early or untimely end is one of the factors contributing to fame and the same could apply to a work in which the aura of mystery and far-off unreality has been developed so strongly and to which the medieval sciences have contributed not a little.

According to ancient belief, Moses and Solomon were great magicians and they were included with others like Simon Magus, Vergil, and Bacon in medieval tradition.[2] Moses was supposed to have a magic ring, the Ring of Oblivion, which would induce forgetfulness while the ring of Solomon was like that of Canacee, a kind often mentioned in Oriental tales, that gave the wearer the power to understand the birds.

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[1] Man of Law's Prologue, II, p. 77-80.

[2] Butler, op. cit., p. 99.

It is difficult to understand why such an ability would be prized; it may be that it was an expression of a common human desire to hear the latest news, especially from distant places, a taste which Chaucer ascribes to himself in the House of Fame and which has had its fulfilment in news-hawks and radio waves. People may have felt that birds in their flight over the earth could see and know things which would be hidden from ordinary eyes. Canacee's ring permits the poet to introduce a bleeding-heart story of a beautiful, well-bred falcon abandoned by her false, tercelet lover for a snippy, low-brow kite, a bird of prey.

> Men loven of propre kynde newefangelnesse,
> . . . . . .
> Ne gentillesse of blood ne may hem bynde.
> Sq T 610-620

Perhaps this is the secret of the sciences' attraction.

In regard to magic mirrors, it is not difficult to see why optics had a fascination for people in earlier and in medieval times when one remembers the illusion said to be created by mirrors, of the upper half of a live person sitting upon a glass shelf suspended in the air. Such a show has been discussed by present-day persons in much the same way as the people at Cambyuscan's court.

> And somme of hem wondred on the mirour,
> That born was up into the maister-tour,
> That men myghte in it swiche thynges se.
> Another answerde, and seyde it myghte wel be
> Naturelly, by composiciouns
> Of anglis and of slye reflexiouns,
> And seyde that in Rome was swich oon.
> They speken of Alocen, and Vitulon,
> And Aristotle, that writen in hir lyves
> Of queynte mirours and of perspectives.
> Sq T 225-234

A mirror at Rome supposedly set up by Vergil did much to foster the impression that he was a magician. Among other famous mirrors were "those of Archimedes, those by which Caesar saw Britain from the shores of Gaul, and that by which Socrates discovered a dragon in the air."[1] Bacon's burning-glass contributed to the conviction that he, also, could perform magic feats and he was regarded by some "with the bated breath of terror and repugnance."[2] He became in popular tradition a conjuror, nigromancer, and magician. He is depicted with a perspective glass, a speaking brass head, and a magic wand, in Robert Greene's play about 1592, the "Honourable History of Friar Bacon and Friar Bungay" and about the same time in prose "Historie of Fryer Bacon".

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[1]Thorndike, op. cit., II, p. 668.

Butler, op. cit., pp. 102-103. Butler gives many of the magic feats accredited to Vergil.

[2]Thorndike, op. cit., II, p. 676.

Thus optics affords an example of the way in which experimental science often became identified with magic and of the way that a poet makes magic with science.[1]

The fact that optics was a subject studied from the earliest times excites curiosity about the reason why it was investigated. The cause seems to have been the splitting of light into the seven colors of the rainbow. The rainbow and the spectrum were as great mysteries as lodestones and mirrors. All had some properties of magic. Jean de Meung (c1270) gives the clue thus in the Romaunt of the Rose:

> Only he who's learned the rule
> Of optics in some famous school
> Can to his fellow men explain
> How 'tis that from the sun they gain
> Their glorious hues;

From optics, burning-glasses, magnifying glasses, and concave, convex, or other types of mirrors a person:

> ... may learn the cause
> Why mirrors, through some subtle laws
> Have power to objects seen therein --
> Atoms minute or letters thin --
> To give appearance of fair size,
> Though naked unassisted eyes
> Can scarce perceive them. Grains of sand
> Seem stones when through these glasses scanned.
> . . . . . .
> But to these matters blind affiance
> No man need give; they're proved by science.[2]

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[1]Thorndike, op. cit., II, p. 680.

[2]Ibid, p. 442.

Robert Grosseteste, Bishop of Lincoln from 1235 to 1253 and teacher of Roger Bacon, is one of the first men to note the new experimental discovery, magnifying glasses. In a work on the rainbow, Grosseteste mentions the view of some natural philosophers that vision is the result of the eye receiving something from without, but he holds to the current contemporary view that sight results from the emission of rays from the eye. He, too, follows Alkindi's doctrine on the radiation of rays from stars and all things in the world of the four elements. "This doctrine of radiation or emanation of force seems to date back at least to Plotinus."[1] The same theory is set forth by Roger Bacon under the title of "Multiplication of the Species", a phrase which he borrowed from his master.

We have noted previously that Bacon follows Alkindi closely in some respects: in the emission of stellar rays, radiation of forces, and power of words, for example. Bacon believes in the doctrine of the Macrocosm and Microcosm and agrees with Rabbi Moses Maimonides (1136-1204) that the Scriptures provide the basic source of astrology and therefore it is a legitimate study. Like Albertus Magnus and other

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[1]Thorndike, op. cit., II, p. 443.

contemporary scholars, he had a firm belief in astrological medicine and in the rulership of the stars over parts of the body. He admits that magic exists and there are two kinds: natural magic aims at good while black magic has evil purposes.[1] Alkindi thinks that alchemy is a fraud. Bacon believes that it is really a kind of natural magic and is related to physics. In speaking of Bacon's real attitude to science Thorndike says:

> As William of Auvergne associated experimentation with magic rather than with science, so Bacon seems to regard natural science as largely speculative, and confirms the impression, which we have already derived from many other sources, that magicians were the first to "experiment", and that "science", originally speculative, has gradually taken over the experimental method from magic.[2]

Bacon's beliefs are of the highest importance because they so well picture the general flood of medieval thought including some of its back eddies and covering its most advanced currents.[3]

Magic is an outstanding feature in the House of Fame, the Franklin's Tale, and the Squire's Tale. It is also an important element in other selections. Calchas' power of divination puts the plot of Troilus and Criseyde in motion.

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[1]Seligman, op. cit., p. 213.

[2]Thorndike, op. cit., II, pp. 651-652.

[3]Ibid, pp. 618.

Then by pretending that a letter from her would act as a medicinal charm to cure Troilus of his love-sickness, Criseyde's uncle, Pandarus, entices her into an acquaintance with the hero. These two factors supply credibility for the ensuing action.

Two instances of the use of a magic spell or enchantment occur in the stories told by the Wife of Bath and the Miller. In the Miller's Tale, one of the best short stories ever written, the complication of the action depends upon the feigned trance of Nicholas, the student of astronomy who boards with John, the carpenter, whereby he pretends to foresee another Noah's flood impending. To restore him to normalcy, John says the night spell in the four corners of the house to drive out the elves and the evil spirits which appear to have entranced Nicholas who is using this ruse to play upon the carpenter's credulity in order to spend a night with John's beautiful wife. The following events are a riot of fun with John hanging from the rafters in a kneading trough, Nicholas being branded on the buttocks with a hot iron, and Alison being kissed in the dark on a most unusual place.

The Wife of Bath's Tale depends in large measure upon enchantment. The foul old hag appearing before the

knight as the fairies' circle dance vanishes, gives in return for marriage, the solution of the problem which will save his life. The knight's reactions to her age and ugliness on their wedding night permits a long discussion of the Stoic philosophy that gentility depends not upon birth or possessions but upon good conduct or character, a favorite theme of Chaucer.

The folk-lore belief that there are elves and that elf-women can marry men is used in the Man of Law's Tale as the reason for the hatred of King Alla's mother, Donegild, for Constance, her daughter-in-law, and for her determination to separate her son from his wife, thus providing a credible excuse for the heroine's second long sea voyage with her little son. Donegild's belief that Constance is a fairy arises from the miraculous appearance of a hand to strike Constance's false accuser dead at her trial for murder before King Alla and from the sound of the supernatural voice that declares the innocence of Constance. Hence, magic is vital to the story; it creates that strange atmosphere of uncluttered clarity of the world when it was new such as we feel in Homer.

Pluto and Proserpine, king and queen of the fairies, supply the deus ex machina by which old January can have his

sight suddenly restored in time to see his young wife, May, in the perilous embrace of his squire, Damyan, in the pear tree, through Pluto's help; Proserpine's championship of women gives them the wit for a ready answer in any circumstance for all time and introduces an amusing commentary upon women's wiles.

Chaucer indicates a humorous regard for the common beliefs of folk-lore and demonology in the introduction to the Wife's Tale. He explains in a facetious ironical vein that friars and other wandering holy men by their frequent blessings upon every spot in the land, have caused the fairies to disappear and not even one demon mate of women, an incubus, is any longer to be seen. His mocking attitude accords well with the ben trovato use of demonology in the Friar's Tale. Here a kindly fiend is in juxtaposition with a fiendly Summoner the better to show off the depravity of the latter. The supernatural character of the gay yeoman is apparent at once by his green clothing and by his dwelling in the north country, the far north being traditionally associated with the Devil. The Summoner's ignorance of the demon's real character is amusing, particularly when he is revealing his own unconscionable character to the devil who awaits the opportune time to snatch the rogue away to hell.

Chaucer's bantering treatment of the whole situation suggests an enlightened skepticism towards the subject although a skeptical view of demonology was not orthodox. While the Church inveighed against practices of black magic, the witch hunts had begun; but Chaucer maintains the outlook of the artist. He selects detail to enhance his work and to achieve his aim of creating pleasure and delight.

III

ALCHEMY

"No science can boast as many martyrs as alchemy whose devotees would rather die than betray their procedures."[1] The impassioned love of research and learning stirred by a desire to know God through an understanding of the wonderful forces that Nature had received from Him led people to sacrifice whole patrimonies, health, home, comforts, and promising careers to follow the siren lure of alchemy which, more often than not, brought poverty, prison, torture, and even death to its lovers. The roster of names includes great scholars, physicians, mathematicians, astronomers and astrologers, theologians, and even popes from the second to the eighteenth centuries.

In the early part of our era, the alchemical masters of Graeco-Egypt sometimes cloaked their identity under pseudonyms like Mary the Jewess, Cleopatra, and Isis. These, along with Democritus, Olympiodorus, and Synesius of the fourth century became the 'old authorities' in later times.

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[1]Graubard, op. cit., p. 315.

The murder of the woman-philosopher, Hypatia, in 415 A.D. marked the end of pagan learning at Alexandria where the science of alchemy evolved. The refugees from religious oppression of the Church carried the Greek learning first to Constantinople and thence to Asia-Minor and Persia. At Constantinople in the seventh century, Stephanus made a conciliation of the science with Christian principles, and alchemy became more acceptable to the Church. His work shows the ardor, poetry, love of allegory to mystify and to conceal meanings, materials, and processes, and a practical knowledge of metallurgy and chemical processes all tinged with a mystic religious fervor, that were the regular features of alchemical writings.

Among the Arabian savants who took over this body of science from the Syriac translations during the eighth, ninth, and tenth centuries and from whom the knowledge was made available to the West by Latin translators in the eleventh, twelfth, and thirteenth centuries, there were four pre-eminent and revered authors: Geber, (c 800), Alfarabi (c 900), and the two physicians, Rhasis (c 900) and Avicenna (c 1000). Their names added the magic, glamor, and romance of the Orient to alchemy but they endured great trials and unhappy ends as a result of their pursuit of the science.

In the thirteenth century in the West when alchemy was being studied in the Latin and was becoming more widely known, but while its full implications or supposed possibilities had not registered themselves upon the minds of rulers, nobility, or charlatans, the alchemists had little trouble. They were generally teachers, physicians, or theologians who followed their professions and practised or wrote upon alchemy on the side. Two great Spanish alchemists, both physicians, were Arnald of Villa Nova who taught at Paris and his famous pupil, Raymond Lull. Lull won an imperishable reputation in the annals of alchemy but died trying to convert Mohammedans. Michael Scot retained an enviable position as translator, astrologer, and astronomer at the Sicilian court of Emperor Frederick II. Thomas Aquinas and Albertus Magnus suffered no tribulations, nor did the famous poet, Jean de Meung, who wrote two notable treatises on alchemy besides the Romaunt of the Rose, namely, The Remonstrance of Nature to the Wandering Alchemist and The Reply of the Alchemyst to Nature. The wise followed the rules set forth by Albertus Magnus for the alchemist, the eight commandments:

1. An alchemist must be discreet and reticent; he must be secretive about his findings and knowledge.

2. He must dwell far from human habitation and his home must contain two or three rooms designated as his workshop.

3. He must carefully choose the seasons and hours for his labors.

4. He must be patient, assiduous, and perseverent.

5. He must perform and master according to the rules of the art the processes of trituration, sublimation, fixation, calcination, solution, distillation, and coagulation.

6. He must avail himself exclusively of glass vessels and glazed pottery.

7. He must be sufficiently affluent to afford all expenses his operations may demand.

8. He must avoid having any relations with princes or sovereigns.[1]

But from the later fourteenth century to the eighteenth century there were many men of wealth and good birth who reduced themselves to a pauper's grave by catching the fever of transmutation like the Italian noble, Bernard of Trevisa (1406) or Zachaire of the French nobility (1510). Among many other alchemists who endured persecution, imprisonment, and torture for maintaining secrecy about their methods of producing a transmutation, real or fancied, were Thomas Dalton (c 1450) an English abbott, and Sethon (c 1620),

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[1]Graubard, op. cit., p. 288.

a Scot widely travelled in Europe who fell into the hands of the German Hermes, Rudolph II, and died as a result of torture. Sendivogius, a Polish noble, made great sacrifices to save Sethon. He himself was imprisoned. Edward Kelly was an assistant and co-worker of the celebrated and learned Dr. Dee, a renowned mathematician of Oxford who was imprisoned during the reign of Queen Mary but who won fame and fortune on the continent as an alchemist during the reign of Queen Elizabeth. He returned to England in good time and became the queen's astrologer and adviser. Kelly, however, was trapped by Rudolph II and died in 1597. In 1575 the Duke of Brunswick and Luxemburg burned the alchemist Marie Ziglerin in an iron cage, and as late as the early eighteenth century, alchemists were hanged in Germany and Poland for refusing to divulge their secrets or to make gold.

Apart from some swindlers who used alchemy as a way of getting a living by guile, there were sincere devotees who lacked wealth to pursue their studies and costly experiments and who resorted to deceit and trickery to get it. Rulers passed edicts against the charlatans from time to time. Pope John XXII, himself an alchemist, issued a Bull in 1317 against pretenders who practised alchemy to seek gain instead of the truth. Henry IV of England passed a law against

cheating practitioners of alchemy in 1408.

In the light of these facts, a study of the Yeoman's description of his master, Chaucer's Canon, shows him to be one of those so genuinely eager to follow the science that he had lost all his servant's possessions as well as his own and because they were never able to reach their goal, as the yeoman says:

> To muchel folk we doon illusioun,
> And borwe gold, be it a pound or two,
> Or ten, or twelve, or manye sommes mo
> And make hem wenen, at the leeste weye, / believe /
> That of a pound we koude make tweye.
> C Y T 673-677

But it is clear from the yeoman's statements that he and his master shared the 'bitter sweete', the dangerous allurement;

> For al my sorwe, labour, and meschief,
> I koude nevere leve it in no wise.
> C Y T 713-714

Strange to say, however, like all alchemists even to the noted astronomers and mathematicians like Kepler, Tycho Brahe, and Newton, they never thought to question the false premises upon which alchemical principles were based but continually sought some flaw in their procedures. Thus the yeoman explains after the Canon departs that he can say boldly that his master has a great reputation for his knowledge in every way, yet the Canon is often blamed for not

succeeding in reaching his goal when actually the fault was that 'the pot tobreketh, and farewel, al is go!' or the metals were so strong that a great explosion resulted. It might have been the wrong kind of wood for the fire, or the wrong degree of heat applied or the heat applied too long.

> But, be it hoot or coold, I dar seye this
> That we concluden everemoore amys.
> We failleof that which that we wolden have,
> C Y T 956-958

The Canon is a faithful adherent to the eight rules of Albertus Magnus with the exception of the seventh pertaining to the possession of wealth sufficient for experiments. In spite of every setback, he is patient and persevering. He heartens his helpers with the reminder that even a merchant has periods of adversity when 'his good is drowned in the see.' Another time or the next time the fault may be overcome. The reason that he is suspicious of the yeoman's conversation with the Host lies in the first commandment, namely, to be reticent. As he says, he is afraid that his servant will disclose what he should hide.

Nevertheless, the yeoman is determined to set an example of himself to prevent others from making the same mistake as he did and thus becoming blear-eyed, pallid, threadbare, and loaded with the debt of money borrowed, and then enticing others into the same snare.

Lat every man be war by me for evere!
C Y T 735

The warning motive may have been the reason which Chaucer had in mind for the introduction of a highly dramatic tour de force at a point in the pilgrimage when a break in the routine would quicken interest and pleasure. Professor Manly suggests that Chaucer's slender means in old age may have been the result of contributions to alchemical experiments.[1] H. E. Richardson supports Tyrwhitt's contention that Chaucer was possibly the victim of a swindling alchemist and that the Canon's Yeoman's Tale gives vent to his resentment.

In the Transactions of the Royal Historical Society for 1922, Mr. Richardson discusses evidence to be found in the Plea Rolls concerning John de Walden who was imprisoned in the Tower in 1350 because he failed to secure success in his alchemical experiments for which he had received from the king's treasury five hundred crowns and twenty pounds of silver.[2] Such a matter was likely well known at the time and long after. In 1374, another alchemist, William de Brumley was arrested for making counterfeit gold, actually an alloy of gold and silver; nowadays gold alloys such as

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[1]J. M. Manly, Some New Light on Chaucer, New York: Henry Holt and Company, 1926, pp. 243-246.

[2]Robertson, op. cit., p. 866.

ten or twenty-two carat gold are perfectly legitimate. De Brumley claimed that he had learned the art from William Shuchirche who was the canon of the King's Chapel at Windsor. On the basis of these two pieces of evidence, it would appear probable that Chaucer was well aware of some of the tribulations connected with the practice of the science since he was a member of the Royal household and a frequent visitor at Windsor. When he was superintending the repairs of the King's Chapel at Windsor in 1390 he may have been reminded of the case of William Shuchirche or, as Professor Manly suggests, he may have been one of the victims of Shuchirche. However, clergymen were known to have an interest in scientific studies. L. Thorndike says that in the fourteenth and fifteenth centuries, "Alchemical treatises are indeed often ascribed to friars."[1] Professor French thinks that the Shuchirche discovery may lend greater probability to the idea that Chaucer had personal knowledge of alchemy[2] while Professor Manly claims that it suggested the choice of the hero for the Canon's Yeoman's Tale. He believes that the address to the 'chanouns religious' in the story may actually

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[1]Thorndike, op. cit., III, p. 223.

[2]Robert Dudley French, A Chaucer Handbook, New York: F. S. Crofts and Co., 1932, pp. 327-333.

have been given to the canons of the King's Chapel at Windsor.

These speculations are interesting but, as F. N. Robinson points out, they can not be verified and if any conclusion can be drawn from the yeoman's disclosures, it would indicate that Chaucer's attitude to the science was skeptical. The basis of the tale is probably founded upon current reports, stories, and observations as well as from his own wide reading since Chaucer gives evidence of a thorough understanding of the subject.[1] The narrative may be an example of the literature of revolt against the greed and evil of some of the clergy, nobility, and officers of the law.[2] It is entirely probable that he intended to give a good satirical dig at church officials who were not attending to their real business of saving souls and taking care of their flocks in the parishes. For instance, the priest who is gulled by 'a chanoun of religioun', is an 'annueleer', a priest solely engaged in saying annual masses for the dead, thereby depriving the parishes of sorely needed help and guidance.

The consensus of opinion seems to be that Chaucer showed great art by causing a kind of alchemical

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[1]Robinson, op. cit., p. 867.

[2]Hardin Craig, ed., History of English Literature, New York: Oxford University Press, 1950, pp. 96-97.

explosion among the pilgrims quietly ambling along in the morning sunshine, that he builds up the humour of the situation through the ignorance of the yeoman, and that this ignorance is fittingly represented by a jumble and confusion of scientific terms about which he could know little of the real meaning. Raymond Preston goes so far as to say that "... Professor Spargo, in his valuable essay on the sources of the piece, admits that about the fourteenth-century prelude to chemistry very little is known even by the experts. In that they are more fortunate than the teller of the tale, who apparently knew nothing."[1] The trouble was that alchemy is such an exceedingly difficult subject that scholars did not give much time to this piece of Chaucer's work and consequently the real meanings of Chaucer's packed lines and phrases were not understood. When they are comprehended, the role of the yeoman is seen to depict two kinds of alchemists, the one an ardent misguided scientist and the other a complete fraud. The first was Chaucer's Canon, the yeoman's master. The second was the chanoun of religion.

Being the Canon's laboratory assistant, the yeoman would have been simple indeed, if he had spent the magic seven years in helping to perform hundreds of experiments

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[1]Raymond Preston, Chaucer, London: Sheed and Ward, 1953, pp. 282-283.

without learning something about the equipment, materials, and operations that were being used. The yeoman claims that his lord is a skilled master in his science and 'kan do craftily' and he says:

I wol you telle, as was me taught also.

Not only does he give a description of his lord's laboratory and the activities taking place there that makes as fine a piece of genre painting as one can find, but he gives the most vivid impression of the heroic courage and dogged persistence in the face of failures repeated week by week, month after month, year upon year of those led on and on and on by the lure of the Philosopher's Stone and the Elixir which restores health and youth and gives perfection.

More than a hundred years later, Paracelsus (1493-1541) says very much the same thing as the yeoman in his The Receipts of Alchemy and How to Make Gold and Silver (Sol and Luna).[1] A comparison of the yeoman's description with that of Paracelsus makes an interesting revelation of Chaucer's genius in creating humour and atmosphere with what would otherwise be a bare recital of facts that would not have much interest for an uninitiated audience. The yeoman

[1] "Hermetic and Alchemical Writings of Paracelsus" (in Latin), The Autobiography of Science, eds. Forest Ray Moulton, Justus J. Schifferes, Garden City: Doubleday, Doran and Company, Inc., 1945, pp. 52-54.

sets a jocular tone for the first part of his tale by giving a rather clownish picture of himself; then after claiming to be 'a lewed man', an ignoramus, he describes in detail what Paracelsus calls the great 'diversity of its vessels and instruments' and all manner of chemicals and materials which were employed in alchemical experiments. Everything was tried:

> Unsleeked lym, chalk, and gleyre of an ey,
> / egg white /
> Poudres diverse, asshes, donge, pisse, and cley,
> Cered pokkets, sal peter, vitriole,
> / waxed bags /
> And diverse fires maad of wode and cole;
> C Y T 806-811

He shows enough knowledge of the fine points, 'To reyse a feend, al looke he never so rowe.' If he had been an alchemist, however, he would not have been telling these secrets. The 'give-away' is part of the fun. To proceed with his disclosures, it is necessary to remove the master and thus the master is represented as feeling guilty. Chaucer does not say that he is guilty of trickery but only that he fled for 'verray sorwe and shame' when he saw that 'his Yeman wolde telle his pryvetee'.

In repeating the danger of the attraction which alchemy has, the yeoman warns his listeners that if they yield

to it, they will sacrifice practically everything down to their bare backs and wherever they go, they will 'stynken as a goot' from the 'smel of brymstoon'. Then in the second part of his tale, he tells a perfect story of another canon, not his lord, as he makes clear to the host:

> Sire hoost, in feith, and by the hevenes queene,
> It was another chanoun, and not hee
> C Y T 1089-1090

It was the 'chanoun of religioun' that knew 'a hundred foold moore subtilitee' than his own master and consequently was able to perform three sleight-of-hand tricks to effect an illusion of transmutation from mercury to silver and then from copper to silver thus making an 'annueleer priest' gladly pay forty marks to buy the recipe for the Philosopher's Stone with which he anticipates reproducing the marvel himself. The story moves along swiftly and with such interest that it does not require the humorous touches of the first part to hold an audience's attention, but it has an element of satire since both clergymen are actuated by greed and both reveal a callous disregard for the noble principles of their profession and religion.

Finally, this yeoman who is said to be so ignorant, cites two of the greatest names in the history of alchemy, Hermes Trismegistus, and Arnald de Villa Nova, the author of

the alchemical work, Rosarium Philosophorum and he gives the very essence of the essence of their philosophy; he mentions the greatest book on alchemy in the Middle Ages, the Secreta Secretorum attributed to Aristotle; and in conclusion, he refers to the highest pinnacle of the science, its mystical and spiritual side.

Alchemical doctrine held that scientific experiment is without value and cannot reach its goals unless it is accompanied by an ennoblement of the soul. The most important part of alchemy was not in finding the Elixir which would produce youth and longevity or the Philosopher's Stone which would accomplish the transmutation of base metals into gold. No, it was based upon the old theory of magic that like produces like; hence, the seven steps in the process of changing the base to the noble metals, silver and gold, should be accompanied by a similar perfecting of the character. Only as the alchemist attained a high spiritual level would he gain the insight needed to follow the correct procedures in achieving success with his experiments. This success was symbolized by 'Christ's appearance in the retort'. Because this was Christ's gift to the worthy, alchemists cloaked their meaning in allegory:

The philosophres sworn were everychoon
That they sholden discovere it unto noon,
C Y T 1404-1405

Only the wise and initiated, the devotee pure in heart seeking the perfection of his own nature just as he was seeking gold, the most perfect substance, would be able to apprehend the occult meaning of the allegorical language.

These ideas are found in the Hermetic books which alchemists considered to be the embodiment of all the ancient learning in the arts and sciences, collected by Hermes Trismegistus and bequeathed to his spiritual heirs. The gem of the Hermetic collection is a work on alchemy called the Emerald Tablet,[1] supposed to have been found in the hands of Hermes' mummy. Inscribed in it is the substance of the Hermetic doctrine: 'that which is above is like that which is below', or briefly, 'as above, so below'. This is the doctrine of the Macrocosm and Microcosm. The transmutation of the soul accompanies the transmutation of the metals. The composition of matter from the four elements is also described and pictured allegorically. The ambiguities of the tablet's statements provided the material for endless

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[1]Graubard, op. cit., p. 267. Graubard gives The Precepts of Hermes, engraved upon the Emerald Tablet.

Seligman, op. cit., pp. 126, 127, shows some pictured representations of allegorical statements on the Tablet.

theorizing and discussion of a mystical and worthy nature which added to the allurement of the science for its adepts. The need for study and contemplation of the occult mysteries was one of the chief reasons for solitary residences 'in the suburbes of a toun'.

The magical and spiritual elements in chemical processes first came from very early times, being associated with the operations involved in such crafts as metallurgy, dyeing, and the making of ceramics, imitation gems, and glass. Magic rituals were performed to secure the best kind of products. For instance, the Greeks put masks on the kilns to frighten away the demons which cracked the pots. There was the legend connecting the fallen angels or demons with the arts and sciences because it was said that after they had taken on human form to marry women, they taught methods and crafts for making beautiful things to please their wives and their records were called Chema. But besides the mystery associated with rites and demons, there was the 'mystery' of the craft, the secret knowledge and practices learned and developed by following a particular kind of work, which were passed on from father to son and which helped to make a master craftsman.

By 3500 B.C. the Sumerians were producing an art that

showed centuries of work and experience behind it. They were very skilful in metal-work and made implements, helmets, and figurines of animals from silver and gold. They made copper vases, bowls, daggers, lamps, glass, and twelve-stringed harps. But Egyptians outclassed the Mesopotamians in the working of alloys of gold, copper, silver, tin, lead, mercury, and finally iron. Graubard says that without the labors of these craftsmen, no science of alchemy could have arisen whenever it did.[1]

When the city of Alexandria was established on the Nile in 331 B.C. and Greek colonists went to Egypt, they began to apply Greek theory and philosophy to Egyptian craft practices and from the union of the two, the science of alchemy was born. The name may have come from the Greek word signifying molten metal, chyma, or it may have come from the Egyptian word, khem, meaning black earth, but it was the Arabs who added the prefix 'al'. Some stories claim that Hermes Trismegistus is a myth resulting from the Greek identification of Hermes, god of science, with the Egyptian Thoth, god of scribes and writings, as it was noted previously.

At the Museum in Alexandria, some alchemical

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[1]Graubard, op. cit., p. 140.

treatises were written at a time when Stoicism was dominant. Some notions of the alchemists were derived from the Platonic and Aristotelian elements that are found in Stoic philosophy. Aristotle had synthesized the teaching of Empedocles and of Plato. From Empedocles came the view that all matter is formed from the four elements: fire, air, water, and earth. Because of the two qualities which each element has of hot, cold, moist, or dry, and because of the constant change in qualities taking place in nature, it was believed that the elements can change from one to another.[1] It was the Platonic credo that although the body of the world was made "of elementes foure" as the yeoman quotes, yet matter has a basic unity and each element can be transmuted to others.[1]

Plato's belief in the transmigration of souls also gave force to the idea that the soul of base metals could transfer into the soul of the precious metals. From Aristotle's statement that the soul is in the seed and is the power which enables the seed to draw the requisite ingredients from its surroundings to enable it to become an individual

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[1]Graubard, op. cit., p. 244. Graubard quotes the Timaeus, giving Plato's reasoning for the belief in transmutation. "Water by condensation becomes stones and earth..." (Dialogues of Plato, V.2)

of its own kind, some alchemists drew the inference that if they could provide the right environment and the proper nutrients, as it were, together with a seed of gold or silver as the case might be, then a body of the precious metal would grow, or 'multiply'. Others thought that merely the application or 'projection' of the Philosopher's Stone into the liquid metal would produce multiplication if all the factors were right. The soul or form of a metal was supposed to be its spirit or vapor and was often exhibited in its color. Color then became a very important consideration in the process and a surface plating of gold or silver was considered to be a kind of transmutation. The Alexandrian alchemists were largely concerned with plating and alloys, and also the making of dyes and imitation gems.

An Assyrian text of circa 700 B.C. ascribes the production of metals to a birth process. There were alchemists who adopted this primitive notion. They claimed that metals were male or female and were produced from a kind of sexual generation. The sun was identified with one of the four primordial elements, fire, which was believed to be the active male principle in generating all forms. The sun is yellow; so gold and sulphur were associated with the generative principle. Sulphur or brimstone was thought to

have the quality of combustibility, also like the sun. The moon is silvery and rules the tides and things feminine so that silver and mercury were associated with the female principle of generation. Quicksilver was said to have the property of fusibility (possibly because it is normally liquid), the ability to fuse or coagulate with any other metals; it is the "metal fusible" that the yeoman mentions. In another place he calls them "combust materes and coagulat". The Philosopher's Egg[1] resulted from such beliefs in seeds and sexual reproduction of metals. It was the sealed matrix enclosing the materials believed to be involved in the growth of base metals into the noble ones; the 'foure spirites'

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[1]The Philosopher's Egg is a symbol of creation in both Mesopotamian and Egyptian belief. To the Greek alchemist it was a symbol both of art and of the universe which has the four elements enclosed within it. (Encyc. Brit. Vol. I, p. 536). "The conception of man, the microcosm, containing in himself all the parts of the universe or macrocosm, is also Babylonian, as again probably is the famous identification of the planets with the metals."

Even in the third century alchemical papyri in the museum at Leyden, the astrological symbols for the sun and moon are used to mean gold and silver. By the tenth century the present connection of the other metals, (the seven bodies) with the planets are lead and Saturn, iron and Mars, electrum, an alloy of gold and silver which was first accredited to Jupiter but later tin was allied to Jupiter, copper with Venus, mercury and Mercury.

were the trisulphide of arsenic called orpiment, ammonia, sulphur (brimstone), and mercury (quicksilver); they were indispensable to act upon the metals, the 'bodyes seven'. As instruments improved, the Egg later was a hermetically sealed glass tube, but the yeoman's Canon used an earthenware pot covered with glass 'enlutyng', that is, sealed with clay to keep air out. The Egg was then subjected to varying kinds of heat produced with various kinds of fuel or heating devices by which the alchemist hoped to imitate in a vastly accelerated fashion the growth and transmutation of the metals which he believed to be taking place in nature.

Since quicksilver and sulphur were supposed to be present in all metals including silver and gold, part of the refining or purifying process was to remove the sulphur and mercury from the gold and silver, fancifully called Sol and Luna by alchemists, to represent sun and moon. Since sulphur and mercury were always associated in every metal they were often called brothers. In the right proportions, these two would drive each other out of another metal. That is what the yeoman means by saying that brimstone (sulphur) is drawn out of Sol and Luna by his brother.

Also the fact that a seed planted in the earth decays after it begins to sprout and grow, led to the idea that

death, mortification, or putrefaction must take place as a step in the process before the precious metal could begin to grow and eventually to appear.

The conception of mortification was supported by the appearance of a black substance in the crosselet or crucible when the sulphur and mercury were heated together. All these points may be found in the 'Rosarie', the famous book on alchemy written by Arnold of the Newe Toun, otherwise known as Arnald de Villa Nova, as the yeoman tells us. He quotes from it:

> 'There may no man mercurie mortifie
> But it be with his brother knowlechyng.'
> C Y T 1431-1432

The yeoman tells how the same idea was first explained in figurative terms by Hermes, the father of philosophy:

> He / Hermes / seith how that the dragon, douteless,
> Ne dyeth nat, but if that he be slayn / unless /
> With his brother; and that is for to sayn,
> By the dragon, Mercurie, and noon oother
> C Y T 1435-1438

The association of a dragon with mercury developed from the Biblical account of creation. From the story of the Garden of Eden came the belief that the serpent signified man's yearning to investigate the tree of knowledge. Representing the same idea, the caduceus of the god, Mercury, has two serpents entwined about a staff (or tree) looking

into a round mirror. In early times this became the symbol of the healing science; the tree and the serpent became two esteemed emblems also in alchemical science. The snake, named Ouroboros, is shown as half black and half white to denote that perfection and imperfection, the good and the bad, are both bound up in matter. The serpent forms a circle with its tail in its mouth to depict the axiom, 'One is All', because all matter is One. The Gnostics had transformed the snake of Eden into the Ouroboros. The alchemists then, at times, enlarged the serpent into a dragon. The dragon still retained the association with Mercury, the god of wisdom and science; therefore, in the allegorical language of alchemists, the dragon was used to indicate quicksilver. This makes the yeoman's words clear but Lambsprinck's book on the Philosophical Stone showing fine etchings of the Hermetic dragon and the Hermetic Allegory, goes further in clarifying the meaning as well as giving an example of alchemical style of allegory in referring to the killing or mortifying the dragon:

> Most venomous is he, [Mercury] yet lacking nothing,
> When he sees the rays of the Sun and its bright fire,
> He scatters abroad his poison,
> And flies upward so fiercely
> That no living creature can stand before him....
>
> His venom becomes the great medicine.
> He quickly consumes his venom.
> For he devours his poisonous tail.
> And this is performed on his own body,
> From which flows forth glorious balm,
> With all its miraculous virtues.
> Here do all the sages rejoice loudly.[1]

In plain words, the meaning is that the 'mercury is precipitated, dissolved in its own water, and then once more coagulated'. But before the miracle can be performed with this marvelous metal, containing its own 'medicine', the dragon must be killed.[1] In effect, this is saying that mercury changes from its poisonous form like the bichloride to another salt of mercury like the yellow oxide which makes an excellent salve; thus mercury can change from a poison to a balm as Chaucer states.

It is in the first part of the tale that the Canon's Yeoman dwells upon the seven stages in the transmutation of metals into gold, "the goal of all chemical knowledge".[2] Of course, the actual change depended upon the Philosopher's Stone or the red elixir which was the crowning effort of the

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[1]Seligman, op. cit., p. 135.

[2]Graubard, op. cit., p. 234.

great magistery, the magnum opus. Before it could be accomplished, however, the minor magistery or production of the white elixir, which would turn metals into silver, had to be done. The white elixir was also called philosophical mercury or the spirit of mercury to distinguish it from ordinary quicksilver. It was silver salts in reality and the red elixir or powder was gold salts. The use of some of these terms suggest the early connection with crafts.

The seven steps of the magnum opus were supposed to be performed at the proper astrological times and consisted of: Preparation, Coagulation or encorporyng, Mortification or putrefaction, Ablution or enbibyng or albification or ablucions, Rubification, Fixation or cementyng, and Fermentation or fermentacioun. The Preparation involved the formation of the Philosopher's Egg, the sealed earthenware or glass bottle containing the four spirits and some of the seven bodies or metals each of which is under the rulership of a planet: gold, silver, copper, mercury, iron, tin, and lead ruled by the sun, moon, Venus, Mercury, Mars, Jupiter, and Saturn respectively. The yeoman mentions that the herbs, egremoyne, valerian, and lunarie were added. They were believed to be efficacious in keeping demons out. Then the Egg had to be incubated at four different levels

of heat each for a certain period of time to simulate nature's methods. The time had to be based upon the periods of the planets ruling the metals used since the planets move at different speeds.

In Coagulation, the mercury and sulphur united. When the substances in the Egg appeared black, they were believed to be dead or mortified and Putrefaction had set in. Ablution showed the change to a white color and life was thought to be emerging. When the mixture had turned red the stage of Rubification had been reached. The Egg was broken; the red powder was removed; and it was mixed with heated gold to strengthen its powers in the final stages of Fixation and Fermentation. Finally, some base metal was melted in a crucible and the elixir, wrapped in a small waxed bag, the 'cered pokkets', was dropped into it. This was called Projection. If pure gold were found in the 'crosselet' when it was cooled, the alchemist had become an adept.

Far from producing a jumble of terms in describing the 'elvysshe craft' so strange, so secret, so alluring, and so heart-breaking, the yeoman follows an order. For subliming (driving off the vapors), amalgaming (softening or mollificatioun), and calcining (oxidizing) he tells about the vessels and materials used for the Preparation. For the

other stages of transmutation he mentions the various bottles, such as vials, decanters, urinal bottles usually used in uroscopy, curkurbites or cucumber-shaped bottles, and alembics or stills. Then he names the various substances that have been tried to achieve success. The alchemist like the medical man in prescribing compound remedies, did not hesitate to use horse hair, human hair, excreta, metal filings and every kind of strong alkaline substance to be found. Having given the materials for the processes, the containers, the fires and furnaces, and the warnings to have nothing to do with it all, the yeoman is ready to give a humorous account of the way the experimentation proceeded. The attitudes of the experimenters following an explosion which scatters everything everywhere even into the roof, epitomizes the scientific attitude in all times and in all climes. The yeoman's Canon said:

> 'Pluck up your hertes, and beeth glad and blithe.
> Pees! quod my lord, 'the nexte tyme I wol fond
> To bryngen oure craft al in another plite.'
> C Y T 937, 951-952

The yeoman's master has a character different entirely from the 'chanoun of religioun'. The former is reserved and poorly dressed but he has all the equipment in his laboratory to carry on truly scientific experiments which he has done with patience and perseverance and he has taught

his assistants carefully in the seven steps of the process. He has followed the eight commandments of Albert the Great.

The false chanoun has no laboratory out in the 'suburbes of a toun', well-equipped for the whole alchemical series of operations. What is his workshop? He takes a crosselet out of his bosom and shows it to the priest. What are his four kinds of fires with different heating fuels? He tells the servant to bring in some coals, and he even has one inside his shirt, filled before-hand with silver filings, the hole being stopped with wax. He lives down-town, handy to his prey. He has no assistant during his experiment except his victim. He has sent the servant away the better to perform his sleight-of-hand. The powder that he throws into the crucible is some kind of chalk or ground glass; the yeoman does not know which. The coals are poked up around the vessel. The silver filings are introduced, firstly by means of the hollowed piece of charcoal and at the second assay, by a hollow stick. The third trial substitutes a silver rod, which the trickster has hidden up his sleeve, for the copper one which the priest has bought.

The smooth hypocrisy of the swindler in pretending the greatest sincerity and honesty to catch unwary people blinded by their covetousness, taxes the full extent of the

poet's powers of language spoken by the yeoman. That the swindler is a clergyman heightens the depth of his sin. Chaucer pulls out all the organ stops for his clamor. Why? We have no reason to doubt his avowed purpose. The first part of the tale shows people what to expect of a bona fide alchemist with the correct knowledge and materials; nevertheless, people ought to avoid becoming implicated. The second part of the tale reveals how a slick charlatan can deceive others who let their emotions of greed overcome their common-sense and wariness.

The story also warns against the wolf in sheep's clothing. It tells the 'chanouns religious' in particular but other orders in general to look out for the hypocrites and to remove any Judas in the convent; and it applies to others as well:

> But to correcten that is mys I mente.
> This tale was nat oonly toold for yow
> But eek for others mo:
> C Y T 999-1001

Later, when the town chanoun is about to perform his third transmutation, the yeoman feels moved to rehearse:

> It weerieth me to telle of his falsnesse,
> And nathelees yet wol I it expresse,
> To th'entente that men may be war therby,
> And for noon oother cause, trewely.
> C Y T 1304-1307

At the conclusion of the tale, he again repeats his admonition:

> Medleth namoore with that art, I mene,
> For if ye doon, youre thrift is goon ful clene.
> C Y T 1424-1425

To impress the audience with the difficulty of understanding the language and speech of the science and its practitioners, he gives an example of one of the basic principles in allegorical terms. To reveal the intention of alchemists to mystify the unlearned man, he makes Plato answer the simple question, "What is the Philosopher's Stone?" Plato replies that it is 'Magnasia', a water made 'of elementes foure'. When it comes to telling what is actually 'the roote' of Magnasia, Plato leads off into the spiritual side of alchemy and anachronistically explains that only the Christ mind gives the insight to apprehend the truth.

This brief analysis gives some indication of the extent of Chaucer's knowledge of alchemy whether any of it was first hand or not. He had to have a thorough command of its terms and principles to be able to turn them to account with such artistry. Professor Manly says:

> Anyone familiar with the subject will testify that no single treatise or small number of treatises on alchemy would have provided all the technical terms and ideas exploited by Chaucer in this tale and prologue. Such breadth and accuracy of knowledge as he displays could have been the fruit only of a profound and prolonged devotion to the

subject -- at least as long and serious as that which gave him his knowledge of astronomy and astrology.[1]

He thinks that Chaucer's interests in science were fostered not only by his splendid library of sixty books, a truly sizeable one for those times, but by association with men of science like the physician, John of Aderne, who practised from 1370 to 1377 in London, and like the astronomer Nicholas of Lynn, a Carmelite friar who made a calendar for John of Gaunt in 1386.

Chaucer's ardent injunctions and fervent adjurations to audience or readers could not stop the progress of knowledge. Fortunately, the tide of experimentation rose higher, yet it can be said truly of alchemy, the mother of chemistry: "Science begins with naive, often mystic conceptions of its problems. It reaches its goal whenever it can replace its early guessing by verifiable hypotheses and predictable results."[2] The Platonic credo that matter has a basic unity and that elements can be transmuted was finally proved in 1931 by an American physicist at the University of California.

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[1]Manly, op. cit., p. 242.

[2]The Autobiography of Science, eds., Forest Ray Moulton, Justus J. Schifferes, Garden City, New York: Doubleday, Doran and Company, Inc., 1945, p. 587.

Ernest O. Lawrence is representative of the twentieth-century experimental physicists who, profiting by the long and winding course of mathematical and theoretical physics [and chemistry] that made possible their success, finally brought true the alchemist's dream of transmutation of the elements.[1]

F. B. Artz says that the "complexity of astrology was as great as that of alchemy."[2] Alchemy is a very difficult subject and was so adjudged by its devotees. The fact that Chaucer could handle so many details of its involved scientific procedure with such a swift, dexterous touch and could give the pith of its cloudy philosophy with so much verve and elan shows that he not only had acquired a thorough understanding of the subject but that he had mastered his medium of expression to a superlative degree. Coghill says that the story "has the eye-witness quality that we have so often seen in Chaucer." Although the trick with the hollow tube used by the town chanoun is found in Giovanni Sercambi's twenty-first Novelle, "a work that in its construction faintly foreshadows The Canterbury Tales" there is no source for this tale except Chaucer's own "interests in science and roguery".[3] And from his interests

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[1]The Autobiography of Science, op. cit., p. 557.

[2]F. B. Artz, The Mind of the Middle Ages, New York: Alfred A. Knopf, 1953, p. 242.

[3]Neville Coghill, The Poet Chaucer, London: Oxford University Press, 1949, pp. 173, 174.

in science and roguery, Chaucer makes his spiral ending of the tale, rising from the deceits and trickeries of individuals in the mundane world to the level of the universal verities, and bringing us at the last into the presence of God.

> For whoso maketh God his adversarie,
> As for to worken any thyng in contrarie
> Of his will, certes, never shal he thryve,
> Thogh that he multiplie terme of his lyve.
> And there a poynt; for ended is my tale.
> God sende every trewe man boote of his bale! Amen.
> C Y T 1476-1481

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[1]Thorndike, op. cit., VI, pp. 316-317. William Gilbert (1544-1603) "denied the doctrine of the chemists and alchemists that the metals are composed of quicksilver, which he regarded as substances of a different order. He preferred Aristotle's explanation that the metals were composed of an exhalation which hardened into the veins of the earth, where some are found in a pure state, others mixed with ore. Gilbert also held that within the earth were hid germs (primordia) of metals and stones, just as on its periphery were the seeds of herbs and plants. He denied that earth was a simple substance, 'as the Peripatetics dream'." Gilbert was a noted scientist whose great book on the magnet, published in 1599, is an important landmark in the history of experimental science as well as of electricity.

IV

MEDICINE

Among the scientists of both the Muslim world and the Latin West, many of the noted alchemists were physicians. Arnald de Villa Nova whom Chaucer mentions as a great alchemical authority in the Canon's Yeoman's Tale was not only an alchemist who had performed a successful transmutation to gold in the presence of Boniface VIII but was a very famous and skilled medical man in treating such eminent people as Frederick II of Sicily, his brother John II of Portugal, and three popes including Boniface VIII. Except that he spoke Greek, Arabic, and Latin, Arnald was a typical doctor of the period and may well have been a model for the Doctor of Physic as he undoubtedly was for other doctors in actual life.

While Arnald condemned magic and superstitious practices in his Disapprobation of Sorcerers, he used remedies of counter-magic, which were the very same as methods of magic employed by wizards. He translated from the works of

the great Arabian physician, Costa ben Luca, a treatise on ligatures and suspensions[1] and another on stones, herbs, talismans, and charms. He was considered to be especially skilful in making images or amulets and cabalistic signs for treatments. He used incantations, conjurations, and prayers, not always orthodox. He gathered plants for medicine in the best times whether by hour of the day or by the dark of the moon. In other words, he used ceremonial or natural magic all of which had to be done at times correctly chosen by the positions of the stars.

For selecting the auspicious times for treatments or their preparation, any medical man had to be well 'grounded in astronomye'. Arnald was a noted astrologer. Like most of his confreres he based his art upon Hippocrates and Galen. Hippocrates said, "The medical man... cannot be considered a perfect physician if he is ignorant of astronomy; no man ought to commit himself into his hands."[2] It should be noted that astronomy and astrology were interchangeable terms until the seventeenth century. When better tools and better

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[1]A ligature was something tied onto the body and thus was expected to communicate its occult properties to the body. A suspension was hung from the neck to communicate its healing virtues. Amulets, images or holy medals were a type of suspension.

[2]W. C. Curry, Chaucer and the Medieval Sciences, Toronto: Oxford University Press, 1926, p. 7.

practical dissection by students led to improved methods upon which physicians could rely for treatment, astronomy was dropped from medical studies.

These facts fit the Doctor of Physic and besides, he was not strongly religious. Neither was Arnald an orthodox Christian. It was only his achievements and skill as a doctor that protected him from the Inquisition.[1] This seemed to apply to the medical profession as a whole in all periods. The skepticism of the practitioners was a heritage from Galen (125-200) and from the Arabic works on medicine. Galen was a Greek born at Pergamum in Asia Minor; he seems to have shared the opinion of Juvenal and other classical writers that the Jews and Syrians were a race of charlatans especially given to superstition and sorcery. For example, "Celsus regarded Moses equally with Jesus as a wizard."[2] Galen made little distinction between Jews and Christians and speaks of Moses and Christ contemptuously.[3] He criticizes both sects for their fanatical obstinacy.

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[1]Seligman, op. cit., p. 203.

[2]Thorndike, op. cit., I, p. 437.

[3]Thorndike, op. cit., I, p. 137.

Galen's voluminous medical writings along with those of Hippocrates, Dioscorides, Aristotle, Archimedes, Appolonius, Euclid, Ptolemy, Hermes Trismegistus and other classical scientists and philosophers had been turned into Arabic by some of the great scholars like Geber (fl. 850), Alkindi (d. 873), Albumasar (d. 886), Rases (d. 924) and Avicenna (d. 1037) with whose works the Doctor of Physic was acquainted, as Chaucer says. The Galenic bias coupled with the Islamic influence would be felt by physicians as a class and therefore, their "studie was but litel on the Bible."[1] (G P 438)

Galen, however, believed in a Supreme Being who works through natural law alone, not through any supernatural means. Every part of every single entity, including man's body, is designed for some planned and determined purpose. The basic principle of life is a spirit or pneuma drawn in the act of breathing from the general World Spirit.

Galen thought that the pneuma passes through the trachea or windpipe to the lung through the pulmonary vein (arteria venalis) to the left ventricle of the heart and upon meeting the blood, charges it with the Vital Spirit, a second kind of pneuma. The arteries carry the arterial blood

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[1]Robinson, op. cit., p. 24.

to the organs in an ebbing to and fro but the blood passing through the arteries to the brain becomes charged with the Animal Spirit, the animus or breath of the soul. The Animal Spirit passes through the hollow nerves to the muscles and organs and there initiates the higher functions, motions, and feelings.

The blood comes from the liver in the first place where it has been produced from the chyle, the liquefied food substances brought through the portal vessel from the intestines. In the liver this first lower type of blood (venous blood) charged with the Natural Spirit in the liver flows up to the right ventricle of the heart; part of it flows through the pulmonary artery (vena arterialis) into the lung giving off impurities which are exhaled; and a small part of this venous blood trickles through tiny channels in the Septum to become mixed with the arterial blood in the left ventricle.[1]

Thus can be seen the nature of Arcite's mortal wound which burst his chest. The injury had caused the blood to

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[1]C. Singer, Short History of Medicine, Oxford: Clarendon Press, 1928, pp. 86-90. Vesalius in 1542 proved by dissection that there were no channels in the septum. The discovery of the circulation of the blood was delayed for centuries because of Aristotle's contention that circular motion, which he believed was perfect motion, was reserved for the heavenly spheres.

clot around his heart. The swelling increased because attempts to draw off the venous blood failed and thus the pulmonary artery, "The pipes of his longes," began to swell and could not carry away the impurities brought up from the liver with the Natural Spirit. Neither cupping or leeching, nor emetics, laxatives, or herbal medicines helped to remove the congestion. Since the arterial blood could not carry the Vital Spirit up to the brain there was no Animal Spirit to initiate any expulsive motor responses in the muscles to move the blood. Every muscle in his chest was injured with the poison of accumulated wastes in the tissues. According to the Hippocratic belief, when Nature fails, there is no hope.

> Fare wel phisik! go ber the man to chirche!
> Kn T 2760

His dying hours add much pathos to the story. Strange to say, the same kind of a tragic accident occurred to the

young Earl of Pembroke in 1389.[1]

The saddest thing in the case of Arcite was that for Emily he previously had suffered the lover's malady of Hereos during the two years or so that he spent at Thebes after his escape from the prison of Duke Theseus. He could not eat, drink, or sleep. As the medical authorities explained it, his moisture dried up from the heat of his passion and he grew as thin and dry as a shaft. His eyes sank in his head and his skin turned yellow and as pale as dead ashes. Always alone, he spent the night wailing or moaning. Music made him burst into tears. His voice became so weak and his appearance changed to such an extent that

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[1]E. Rickert, Chaucer's World, London: Oxford University Press, p. 216.

A Fatal Passage at Arms. 1389. Continuation of Higden, Polychronican, LX, 219-220.

The King kept Christmas at Woodstock. There, on the last day of December, the Earl of Pembroke, a young man not quite seventeen years old, insisted upon trying out his horse with another knight, Sir John Saint John, in preparation for the next tournament. When the two met, the knight, at the earl's bidding, flung his lance from one side. The part which he gripped hit the ground and stuck, while the other end flew up in the air. At this the earl's horse took fright and flung him with great force, so that the spear entered his body near the groin and inflicted a mortal wound. His helmet being knocked off at the same time, he was knocked senseless and died about noon.

Thereupon laughter was turned into tears, and there was universal mourning. The KNIGHT WAS OVERCOME WITH GRIEF, and the Queen and her women shut themselves in her chamber and gave themselves up to their sorrow.

when he happened to see himself in a mirror, it occurred to him that he could return to Athens in disguise to seek work which would at least bring him into contact with Emily. In this way it was the disease of Heroic love which moved the action forward to the tournament in which he was the victor in arms by the favor of his patron god, Mars, but in which he was the loser in love because his cousin Palamon had the protection of Venus and through her, the intercession of Saturn who caused a fiendly fury to start from the earth to scare Arcite's horse, tossing him to the ground and causing him to fall on the pommel of his saddle.

In fact, Arcite's case of Hereos was so serious that it was rather more like the mania which springs from an excess of imagination in the forward cell of the brain. The brain has three cells,[1] according to the medieval physicians whom Chaucer follows. The third cell has the memory. The second cell has the reason. The first cell is the cell fantastic where imagination or fantasy takes place. If the play of fancy is not kept under control

> Men may dyen of imagynacioun
> So depe may impression be take.
> Mill T 3612-3613

as the poet remarks anent the old carpenter, John, who

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[1]Thorndike, op. cit., I, p. 660.

brought upon himself a serious fall from the roof in a tub and a broken arm because of his fancy running riot. On the other hand, if imagination is controlled and the fantasy for instance, turns towards learning astrology, a young man like Nicholas, "the poure scoler" boarding with carpenter, John, may use his knowledge to play tricks upon his host and wife and to make a very comical story as well.

Ailing Thomas appeared to have some abnormal condition of the brain. His wife tells the Friar:

> His sike head is full of vanytee
> I hold him in a manere frenesye.
> Summ T 2208-2209

Nevertheless it did not prevent Thomas from posing a peculiar mathematical problem for the Friar to solve which is exceedingly clever and humorous even if it is somewhat unrefined.

Chaucer does not indicate that there is anything out of the ordinary in the sufferings of Troilus from Hereos but all the symptoms of the disease are manifested by him. Troilus lets his thoughts play upon Criseyde constantly night and day and the more he thinks of her, the more fiercely his passion burns and the more mighty his exploits in battle become to win renown. Then he loses all desire for sleep and food. In the tradition of courtly love, he dies a thousand

deaths for fear his love would become known to others and for fear that it would not become known to Criseyde. Like Arcite, he weeps "Til neigh that he in salt teres dreynte." He moans and wails alone in his chamber. At last the nature of his sufferings begins to show physically. The upshot of the disease in this instance is that Pandarus learns of it and uses the threat of Troilus' death from love-sickness to weaken Criseyde's resistance by working on her sympathies and to lead her into the love affair that follows. He says:

> Now understonde, for I yow nought requere
> To bynde yow to hym thorugh no byheste,
> But only that ye make hym bettre chiere
> Than ye han doon er this, and moore feste,
> So that his lif be saved atte leeste:
> T C 358-362

Hereos, the 'lovere's malady', supplies the motivation for the ensuing action of the plot; therefore it was considered to be a serious condition.

Love-sickness was first definitely recognized by the Greek physicians as a malady and later by succeeding authorities through the centuries, including the great names in the list of doctors mentioned by Chaucer. They gave considerable attention to this form of mental aberration. J. L. Lowes shows how the term, Hereos, seems to have been derived from the Greek 'eros'. Then in translation from the Greek to the Arabic, the condition became associated with

al-isq meaning ardent and excessive love

> ...which is excessive love beyond bounds to such an extent that the imagination of the ardent lover is never free from the object of his ardent love,... When ardent love becomes strong, it becomes love-madness... in which state there is no room left in the mind of the lover for anything but the picture of the object of his ardent love...[1]

and also with coturub, a species of melancholy which makes the face drawn, the skin pale and ashy, the eyes sunken, and the body thin. Avicenna says that the 'passionate lover is called asic because he withers away' like the plant asaqah. First the plant is green, turns yellow, and shrivels up in the same manner as the unrequited lover. An association with the Latin herus and also heros crept in with passing time.

Robert Burton in his Anatomy of Melancholy has based his treatment of love-melancholy directly upon Avicenna, Bernard Gordon, and Arnald de Villa Nova as well as their contemporaries and followers. Burton calls it a mad, burning lust which affects the liver, the source of black bile and hence of the melancholic humour. The physicians call it Heroical love because 'commonly Gallants, Noblemen, and the

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[1]John L. Lowes, "The Loveres Malady of Hereos", Modern Philology, Vol. II 1913-1914, pp. 491-527, p. 510.

most generous spirits are possessed with it[1].... most evident among such as are young and lusty, in the flower of their years, nobly descended, high fed, such as live idly, and at ease; .... They that are in love are likewise sick;[2] Avicenna and others declare that the best cures are the same as those for black choler or plain melancholy: syrup of Hellebore to clear the liver, or other good purges and laxatives as well as blood-letting.[3] Galen held that bleeding and cold drink were the two chief remedies for fever and probably that includes the fever of love.[4] Constantinus Africanus (d. 1087), the restorer of medical literature in the west by translations of the Arabic medical works and the writer of a treatise on melancholy, De Melancholia,[5] says that a suspension of the plant agnus castus over a sleeper will mortify lust and cool the passions.

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[1]Robert Burton, Anatomy of Melancholy, eds. Floyd Dell and P. Jordan-Smith, New York: Farrar and Rhinehart, 1935, p. 643.

[2]Burton, op. cit., p. 657.

[3]Ibid, p. 769.

[4]Thorndike, op. cit., I, p. 141.

[5]Ibid, p. 752.

[6]History of English Literature, ed. Hardin Craig, New York: Oxford University Press, 1950, p. 131. The thesis of nearly all of the poems in the thirteenth-century collection, Carmina Burana, containing most of the best Goliardic verse, is unrequited love leading to a wasting love-sickness attended by the usual insomnia and falling spirits.

The Parson calls a spade a spade. He states that the sin appertaining to lechery generally among young, unwed, or corrupt persons comes from four things:

> Sometyme of langwissynge of body, for the humours been to ranke and habundaunt in the body of man; somtyme of infermetee, for the fieblesse of the vertu retentif, / animal spirit or soul / as phisik maketh mencion; somtyme for surfeet of mete and drynke; and somtyme of vileyns thoghtes that been enclosed in mannes mynde whan he gooth to slepe, which may nat been withoute synne; for which men moste kepen hem wisely, or elles may men synnen ful grevously.
> P T 921-932

The remedy against it, he would say, is chastity or marriage.

Purgations and bleedings to reduce an excess of plethora of a humour, as it will be recalled, were necessary to restore its balance with the other three. The sources of the four body liquids or humours of black bile or melancholy, phlegm or pituita, yellow bile or choler, and blood had their sources respectively in the liver, head, spleen, and heart and produced their respective complexions: melancholic with an olive skin, phlegmatic with a pale or creamy skin, choleric with a tanned or sallow skin, and sanguine with a ruddy skin. The qualities related to each of the humours in the same order were the cold and dry melancholy, the cold and moist phlegm or pituita,[1] the hot

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[1]Singer, op. cit., p. 30. "Aristotle considered that phlegm or pituita was the secretion with which the brain cooled the heart and prevented it from being overheated."

and dry choler, and the hot and moist blood. The Doctor understood all these factors well:

> He knew the cause of everich maladye,
> Were it of hoot, or coold, or moyste, or drye,
> And where they engendred, and of what humour.
> He was a verray, parfit praktisour.
> G P 419-422

However, to reduce any one of these fluids it was not customary to bleed, cup, or leech the part producing the humour. The experienced practitioner would refer, mentally at least, to the Zodiac Man showing the part of the body under the signs of the zodiac and the rulership of the planets. Then he would refer to his tables for blood-letting. He would consider the age and the complexion of the patient, the time of year, and the signs dangerous for blood-letting: Taurus, Gemini, Leo, Virgo, and Capricorne, with the last half of Libra and Scorpius. For instance, from the new moon to the first quarter, was the time to bleed young men, second quarter for middle-aged, third quarter for the aged, and the last quarter for old men.

The signs in which it was suitable for the complexions to be bled were: for the melancholic, Libra and Aquarius, for the phlegmatic, Aries and Sagittarius, for the choleric, the three water signs: Cancer, Scorpio, and Pisces. The sanguine person could be bled in any of the signs mentioned.

In the spring, the bleeding was done on the right side and in the harvest time, it was performed on the left side. Tables were also made up for purges and baths.

> The learned Phisician will consider, beside all that is sayde, the Conjunctions, Oppositions, and quadrate aspectes of the Planetes: with many other things Astronomical, most necessarie, both in bludletting, purging, bathings, ...[1]

R. T. Gunther says that the old Greek doctrine of the influence of particular planets on particular organs became the physician's guide, and helped him to shelve many of his responsibilities onto the stars. An interesting survival of the ancient bond between astronomy and medicine is the sign of Jupiter, ♃, with which every modern prescription begins.

Another adopted sign of the physician was the flask of a certain shape called a urinal which was used for the inspection of the urine of the patient and by which the nature of a malady could be determined. The science of this method of diagnosis was called uroscopy. Likely the Doctor had a good knowledge of this branch of the medical art. The physician referred to a circular diagram, known as the Urine-Ring, in which all imagined colors were related to the complexion of the patient and the maladjustment of his humours. R. T. Gunther says:

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[1]Gunther, op. cit., III, p. 16.

It not infrequently came to pass that a whole course of treatment was based on this one symptom alone, which opened a very wide door to the fraudulent practitioner. Arnold de Villanova, who taught medicine at Montpellier about 1300, gave his students the following advice. 'If on examining the urine you cannot find anything wrong, say there is an "Obstruction" of the liver. If the patient complains of headache, tell him that they come from the liver. But take care to use the word "obstruction" because people don't understand it, and a great deal depends on their not being able to understand what one says.'[1]

But Chaucer's physician was a perfect practitioner who would not have to resort to such subterfuges in diagnosis, for:

> The cause yknowe, and of his harm the roote, /cause/
> Anon he yaf the sike man his boote. /remedy/
> G P 423-424

To expedite the preparation of his prescriptions, for the patient's benefit the doctor had a long-standing arrangement with the druggists which was profitable to both sides if not to the sufferer. As well as accepting a 'commission' for each prescription, the physician was not averse to gilding the pills or adding a speck of gold dust or powdered gems in order to raise the price of the medicine to a very high sum because the common belief in magic was that the occult virtues in anything could communicate themselves to adjacent bodies. The greed of doctors was proverbial and was the target of satire:

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[1]Gunther, op. cit., III, p. 32.

For gold in phisik is a cordial,
Therefore he lovede gold in special
G P 443-444

E. Rickert found that "Costly fees also helped to satisfy the physicians' well-known love of money." John Aderne, the famous doctor who came to practise in London in 1370 gave this advice to beginners. A doctor should 'Never ask too little; for this is bad for both the market and the patient.' John Aderne was particularly noted for his cure of fistula and he charged anywhere from a minimum fee of $750 to $10,000.[1]

As a perfect practitioner, the Doctor of Physic would inquire into the nature of his patient's dreams. Galen in common with a long line of doctors right down to present times considered that dreams were often an important clue to a successful diagnosis. Galen said, "A dream indicates to us the condition of the body."[2] H. Ellis says that sensory influences can give rise to premonitions of disease in dreams. "A physical disturbance may reach sleeping consciousness many hours, or even days, before it is perceived by the waking consciousness and become translated into a more or less fantastic dream." This fact was noted by Aristotle

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[1]Rickert, op. cit., p. 175.

[2]Curry, op. cit., p. 205.

who declared that "dreams were thus useful to the physician in diagnosing symptoms not yet perceptible in the waking state".[1]

Vincent of Beauvais expresses the same idea but includes with the visceral stimuli such mental impressions that reach the brain and possibly disturb the imagination as outward sensory stimuli, worry, influences of planetary intelligences, or good and evil spirits.[2] The last type cause "fantom and illusioun" (H of F 493) from which Chaucer begs to be preserved. Vincent along with Arnald de Villa Nova thinks that dreams are influenced by the environment and by the seasons of the year. The spring and fall equinoxes seem to make dreams more confused and disorganized. This is what Pandarus tells Troilus that "Men say after tyme of the yeer by kynde, men dreme," (T C, V, 376) Such dreams are without meaning and "th'effect goth by the moone."

Arnald de Villa Nova places all ordinary dreams that arise from mental distractions or from body disturbances such as an imbalance of the humours under the heading of Natural dreams.[3] They have no significance. When Troilus

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[1]Havelock Ellis, The World of Dreams, Boston: Houghton Mifflin Company, 1911, pp. 91-92.

[2]Curry, op. cit., p. 206.

[3]Ibid, p. 211.

tells Pandarus that he feels the approach of death because of his dream of shrieking owls on two successive nights. Pandarus attempts to laugh his fears away by ascribing the dreams to the excess of melancholic humour which is upsetting Troilus. (T C, V, 315-385). Similarly, when Chaunticleer dreams that a beast with a color between yellow and red is going to bring about his death, his fair wife, Pertelote, laughs him to scorn and blames the color and the dream upon the excess of Chaunticleer's choleric complexion.

From the exactitude of Chaunticleer's description of a fox, one might have thought that Pertelote would at least advise him to be on guard, but, of course, part of the delightful humor is that both she and her husband seem oblivious of what his description implies. A statement of H. Ellis is quite applicable to Pertelote's attitude:

> We see that the subconscious element of dream life treats the conscious part much as a good-natured teacher treats a child whose lesson is only half learned, giving repeated clues and hints which the stupid child understands only at the last moment, or not at all. It is, indeed, a universal method, the method of Nature with man, throughout the whole of human evolution.[1]

Pertelote would represent the conscious element or child. It is true, though, that Pertelote's inferences are supported by the best medieval medical opinion. One example must

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[1]Ellis, op. cit., p. 93.

suffice. Peter of Abano thinks that red choler is responsible for dreams of 'red, fiery things, flights, disputes, madness....'[1] In spite of the fact that Chaunticleer refers to the greatest authority of the Middle Ages on dreams, Macrobius, and tells of two interesting incidents which illustrate what Macrobius calls a visio, the type of dream in which the dreamer sees events exactly as they come to pass, Pertelote refuses to pay attention to her husband's anxiety, and advises him about the proper remedies to eat to purge away the choler.

Troilus' last dream is what Macrobius calls a somnium 'which conceals with figures and veils with ambiguity the significance of a thing not capable of being understood except by interpretation.'[2] Troilus instinctively knew at once that his dream of Criseyde enfolded in the arms of a boar with great tusks meant her loss to him forever no matter how Pandarus tried to twist its meaning otherwise. His sister, Cassandra, the famed sybil, merely confirmed his dark suspicion and showed how the boar really did signify Diomede. The interpretation of the dream thus spoken by Cassandra permits the introduction of the summary of the

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[1]Curry, op. cit., p. 206.

[2]Ibid, p. 199.

Thebiad of Statius, amplifies the tale in this way, and ornaments the verse with many of the names of antiquity.

> Hippocrates said, "I frame my judgments on the common nature of all and the particular nature of the patient, the custom and manner of his life, practice and age of the patient, the weather, the nature and time of dreams, pluckings, scratchings, hiccoughs, breathings, etcetera."[1]

In prescribing the best simples for Chaunticleer, Madame Pertelote follows Hippocrates and reveals a sound knowledge of drugs based upon the best authorities with whom she is in agreement both as the cause and the cure. The digestyves suggested by Dioscorides, the great authority on medicines, are peculiarly appropriate "to make the remedy fit the fowl". It is a preparation of ground up earthworms mixed either with the food which would suit Chaunticleer best, or mixed with goose-grease, or drunk with wine. As Professor Lowes remarks, "... I can only observe that 'wormes' is a symbol of all the wealth of Chaucer's learning characteristically flowering in a single word."[2] Following the worms, the little wife prescribes a number of herbs to purge him both above and below of choler and melancholy. She advises him to stay out of the hot sun so that he will

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[1]Cohen, Drabkin, op. cit., p. 500 (From the Hippocratic collection)

[2]J. L. Lowes, Geoffrey Chaucer, London: Humphrey Milford, Oxford University Press, 1934, p. 27.

not have an excess of hot humours to increase his very choleric complexion lest it bring on a tertian fever.

A tertian fever had a recurrence every other day and was most likely to proceed from an excess of black bile (melancholy) or of yellow bile (choler) such as Pertelote supposes that her husband has. Fevers as a whole were divided into semitertians, tertians, quartans, quintans, septans, and nonans. As if this were not sufficiently complicated, the medieval doctors considered that fevers in general were continuous, diurnal, or nocturnal for each of the above divisions. The semitertians of acute diseases were the most fatal. The quartans were the longest but the least difficult to cure. According to the Hippocratic injunctions, it really required skill to keep track of the crises and the exacerbations, the highest point of the fever, for each of the named fevers.[1]

While Pertelote thinks the remedy should suit the disease, Prudence agrees with Galen: "... maladies been cured by hir contraries....". Galen believed in contrary remedies, moist for dry complexions, warm for cold humours, or compound medicines varying in degrees of coldness of the ingredients which would produce any degree of coldness

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[1]Cohen, Drabkin, op. cit., p. 501

desired to offset any degree of a hot humour and the same for each of the other three complexions and qualities. For instance, Galen thought that epilepsy during a waxing moon is a very moist disease but during a waning moon, it is a very cold disease. Nevertheless his remedy for epilepsy was simply a suspension of peony. Constantine's recipe for epilepsy and fantasy was to administer the brains of a goat drawn through a gold ring!

Other suspensions for epilepsy are hairs from a white dog or the small red stones taken from swallows' gizzards at midday. Whatever was the basis of reasoning in such a case, Constantine usually followed Galen's principle of the four humours and avoided occult virtues whereas Galen disclaimed magic but many of his recipes border on it. Constantine went further than Galen, however, and developed the idea of the varying degrees of the qualities in medicinal simples. He determined four gradations in strength for each quality. It is interesting to note that this was the beginning of scientific thermometry. He said, for example, that a food or medicine is hot in the first degree if its heating power is below that of the normal human body; if it is of the same temperature as the body, it ranks as of the second degree; if its heat is somewhat greater than that of the body, it is

of the third degree; if its heat is extreme and unbearable, it is of the fourth degree. The rose is cold in the first degree and is dry towards the end of the second degree while the violet is cold towards the end of the first degree and moist in the beginning of the second degree. This idea was the basis of the complicated formulae for 'compound medicines' which contained as many as thirty or more ingredients which might include any kind of filth of the secretions or excretions of human beings or animals or parts of animals, plants, stones, or minerals to supply the different amounts that might be needed of heat, cold, moisture, or dryness. Constantine translated and wrote most of his works after he became a monk at Monte Cassino and for this reason, Chaucer refers to him as the cursed monk 'daun Constantyn' who wrote the book De Coitu.[1]

Since Galen and Constantine were the models for their successors, the effect of their cures for epilepsy can be imagined. Epilepsy, falling-sickness, or various nervous excitations going by that name or by St. Vitus Dance, was one of the three horrible afflictions of the thirteenth, fourteenth, and fifteenth centuries. The second was the periodical visitations of the plague. The third was skin

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[1]Thorndike, op. cit., I, pp. 743-759.

diseases and ulcerations. Leprosy and syphilis were included in the last type. Leprosy was supposed to have been introduced from the East by the Crusaders and syphilis from the West Indies by the Spaniards. The general state of religious and feudal repression would help to lead to psychopathic disorders manifesting themselves in the weird epileptic dances and dreadful, fiery itching allergic conditions of the skin which can cause a burning from the scalp to the toes. The general state of uncleanliness during the whole medieval age, the 'thousand years without a bath', the bad or insufficient diet, and the pernicious use of purges and bleedings could not help leading to the predominant hunger, anemia, and the impotence so feared. Michelet says:

> ...the blood was thin as water, and scrofulous complaints were bound to be all but universal.... On Sundays, after Mass, the sick came in scores, crying for help,--and words were all they got; 'You have sinned, and God is afflicting you.' Only the rich could hire Arab or Jewish physicians at great cost.[1]

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[1]Jules Michelet, Satanism and Witchcraft, trans. A. R. Allinson, New York: The Citadel Press, 1930, p. 77.

[2]The feudal lords of the nobility and Church feared the impotence that would lessen the supply of villeins and serfs. The blame was often imputed to wise old women who had knowledge of herbs and simples and was one of the basic reasons or excuses for the terrible witch massacres.

The great Arab physician, Avicenna, believed that the widespread outbreak of skin diseases which became particularly notable in the thirteenth century, was the result of using "those excitants whereby men at that period sought to awake, or to revive, the flagging energies of love."[1] The alchemists had newly discovered the art of distilling liquors and fermenting various wines and these, along with the hot, inflammatory spices from the East probably had such an effect.[1] These are the very things which old January had on his wedding night:

> He drynketh hypocras, clarras, and vernage
> Of spices hoote, t'encreessen his corage;
> And many a letuarie hath he ful fyn,
> Swiche as the cursed monk, daun Constantyn,
> Hath writen in his book De Coitu;
> To eten hem alle he nas no thyng eschu..
> Merch T 1807-1812

When ulcerations and skin diseases were so prevalent, a group of pilgrims could hardly escape having one or two persons showing evidence of the afflictions. The Cook, appropriately named Roger Hogge, had a mormal on his shin and the Summoner had a skin condition which Chaucer calls 'saucefleem'. J. M. Manley calls a mormal a cancerous sore[2] but F. N. Robinson seems to agree with W. C. Curry that the

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[1]Michelet, op. cit., p. 78.

[2]J. M. Manly, Canterbury Tales, New York: Henry Holt and Company, 1928, p. 523.

mormal is a dry-scabbed ulcer[1] produced by a corruption in the blood from natural melancholia or sometimes melancholia combined with salsum phlegma, otherwise salt phlegm.[2] The Cook may have had an ulcerating varicose vein but whatever was the nature of the sore, "greet harm was it", for he knew all the methods of cookery well and could perform them with the best of the experts in food preparation although the Host's words give a clue to the fly-blown, tainted victuals which he sells to patrons.

In a discussion of the Summoner's malady, Professor Curry quotes from the Dietary of Andrew Boorde and from Bartholemew:

> 'Gutta rosacea be the latin wordes. In Engliyshe it is named a sauce fleume face, which is a redness about the nose and the chekes, with small pymples; it is a pruye sign of leperousness....This impedyment doth come of evyl dyet, and a hote lyver, or disorderynge of a mans complexion in his youth, late drynkynge, and great surfetynge.' Then Bartholemew divides Lepra /leperousness/ into four types, the third kind being Alopicia or Vulpina because 'The foxe had a propertie, that his haire falleth in Summer for heat of blood in the liver; so ofte his haire that hath this evill falleth from the browse, and from other places.'[3]

Arnald de Villa Nova has much the same description:

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[1]Robinson, op. cit., p. 762.

[2]Curry, op. cit., p. 47-48.

[3]W. C. Curry, "The Malady of Chaucer's Summoner", Modern Philology, Vol. 19, 1921-22, pp. 395-403, p. 397.

'Allopicia est species lepra, que sit ex sanguine adjusto et in ista specie toto depillantur supercilia et barba. Et propter hoc dicitur alopicia ab alopibus, id est, vulpibus depillantur enim in modum vulpium.... et odor eorum et sudor et anhelitus fetet et difficulter odorant; ...'[1]

Professor Curry also states what is said by other eminent medical authorities about the conditions which may produce the Summoner's 'fyr-reed cherubynnes face', the narrow eyes and the depillation of the hair and his beard as well as his scabby black eyebrows. Chaucer says that the Summoner was 'saucefleem', termed Gutta rosacea in Latin, a form of Acne Rosacea so-called from the red tinge imparted to the skin, and caused by bad diet and corrupt blood. Because of the falling hair, Professor Curry is inclined to follow the doctors who note this symptom in a form of leprosy called alopicia after the fox which sheds its hair, and F. N. Robinson agrees.[2] Chaucer suggests that none of the well-known ointments such as mercury ointment, sulphur ointment, or ointments of lead protoxide, borax, or cream of tartar were of any avail in clearing up the white accretions under the skin; and this observation was perfect because none of these good salves are effective today for

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[1]Curry, op. cit., p. 399.

[2]Robinson, op. cit., p. 768.

Acne Rosacea. Professor Curry concludes from his study that "it appears that Chaucer's knowledge of medicine was more thorough and accurate than was once supposed."[1]

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[1]Curry, op. cit., p. 403.

V

PHYSIOGNOMY AND ASTROLOGY

Astrology is fundamental in medieval science; physiognomy is frequently a basic factor in astrology. Physiognomy is a science of judging character and health by physical characteristics and appearance. It was used by astrologers from early times to help in rectifying the ascendant when the time of birth was not exactly known or in trying to find the ascendant when the hour of birth was not known at all. It was employed by physicians to aid in diagnosis and to prepare treatments for a patient suitable to his birth. Aristotle wrote one of the earliest treatises upon the subject, but most of the Arabian doctors and their translators like Constantine and Michael Scot had something to say about physiognomical matters.

Since the zodiacal sign which is coming up over the horizon at the time of birth is considered to have the chief influence upon the physical constitution and the personality, modified by such planets as happen to be situated in the sign or related to it, "the science or art of physiognomy is bound up with and is firmly grounded upon

the principles of astrology."[1] Each sign of the zodiac and each planet may confer characteristics of body, mind, or action which are peculiar to it upon the native; every sign is related to one of the four qualities: hot, cold, wet, and dry, to one of the four complexions: sanguine, melancholic, choleric, and phlegmatic, and to one of the four triplicities of the signs, namely: fire, earth, air, and water as mentioned previously. In the course of centuries observers noticed that certain little signs like birthmarks or moles or scars on the face or lines on the forehead, were often associated with the signs or the planets. The branch of physiognomy which analyses character from the lines on the forehead is called Metoposcopy while the study of the lines of the hands is called Chiromancy.

All the various data collected from observations in medicine, astrology, and physiognomy were gathered together in manuals. The manuals provided a large stock of details from which a writer could draw in composing a character sketch of any type of person in any type of calling such as the stylized portraiture called the effictio, one of the 'colours' of rhetoric.

From the four triplicities and complexions, the

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[1]Curry, op. cit., p. 56.

conclusion is that all people can roughly be classified as sanguine, melancholic, choleric, or phlegmatic. Among the Canterbury pilgrims one might expect to find individuals who would correspond in some ways to these four general types. Chaucer states that the Franklin is of sanguine complexion and that the Reve is choleric. Certain clues show that the Miller comes under the earth sign of Taurus, the Bull and therefore is melancholic. The Summoner may belong to the water sign, Scorpio, and therefore may be of a phlegmatic disposition.

The Franklin with his ruddy skin and white beard makes a pleasing picture. Because he is sanguine in temperament, he belongs to one of the fire signs. Sagittarius is the fire sign ruled by Jupiter and Jupiter gives that love of bounty, good food, and delightful hospitality which the Franklin exhibits like a true Epicurean. In his own district he is like the patron saint of hospitality, St. Julian.

> It snewed in his hous of mete and drynke
> Of all deyntees that men koude thynke
> G P 345-346

In the offices which he has held in presiding over the sessions of the Justices of the Peace, as a member of Parliament for his county (knight of the shire), as the King's administrative officer in his court ranking next to the Lord

Lieutenant (sheriff), and as a pleader in the courts, he shows other qualities of his ruling planet because Jupiter controls governmental matters, the law, and religion. Nothing would be more natural than that he should be riding along with a Sergeant of the Law. In a few lines the poet has given the substance of a sanguine man of the fire sign, Sagittarius, ruled by Jupiter, the beneficent.

The choleric complexion belongs to the air signs: Gemini, Libra, and Aquarius which all show an element of irritability. Because thoughts are as intangible as air, because speech or sound travels through air, and because all people breathe air, these signs accent the intellectual and sociable side of life and associations with others in business, pleasure, or learning. Their sociability makes the natives agreeable to others and well-liked as a rule. Thus the choleric Reve, Oswald the Carpenter:

> His lord wel koude he plesen subtilly,
> To yeve and lene hym of his owene good,
> And have a thank, and yet a cote and hood.
> G P 609-612

Mercury as the ruler of the sign Gemini and of learning, trading back and forth, keeping accounts, writings, speeches, messengers, deceit and trickery, gives the nature interests in other things like mental pursuits and occupations but also it gives the changeability and vacillation or

versatility that often cause the native to be a butterfly in love, flitting from flower to flower. Consequently, the long, slender limbs characteristic of the sign is associated by the physiognomists with desiring 'the companye of women more than him nedeth'. According to the Reeve's statement, this is applicable to many old men whatever their complexion:

> For in our wyl ther stiketh ever a nayl,
> To have a hoor heed and a green tayl
> As hath a leek;
> R P 3877-3878

In his treatment of the choleric air signs, all of which are double-bodied consisting of two parts, Ptolemy says:

> Bicorporeal signs render the mind variable, versatile, not easy to be understood, volatile, and unsteady; inclined to duplicity, amorous, wily, fond of music, careless, full of expedients, and gretful.[1] / irritable /

Another astrological delineation notes these points which are pertinent to the Reeve's description:

> The children of Gemini are wonderfully quick-witted and bright; they also have the ability to express themselves clearly and to the point; therefore they are always good company....They acquire learning very rapidly and are very well informed on most subjects. They have a good memory so that what they have won is not lost....They are able to adapt themselves to other people and to circumstances.... They are of a roving disposition and love to travel about from one place to another. They excel in scientific or clerical activities, as agents or representatives of others

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[1]Claudius Ptolemy, Tetrabiblos, New Edition, trans. J. M. Ashmand, Chicago: The Aries Press, 1936, p. 108.

where their Mercurial talents find an avenue for expression... From the moral point of view it is not good to have a flexible nature.... because they are apt to be "led unconsciously into paths of wrong doing."

The children of Gemini are very high-strung and nervous and therefore they are easily worried and irritated, which is reflected in their actions and bodily health. They have "flashes of temper for they are very quick-spoken under wrath;"[1]

With this nature, it is easy to see why the Reve could so well estimate the yield of crops whether the seasons had been good or bad, and why the auditors, bailiffs, herdsmen, or hinds could never cheat or cover up any trickery. Because he could see through deceit and because of his quick temper and sharp tongue, "They were adrad of him as of the deeth." He could purchase better than his lord and was able to put something away in his own store of goods. His lord had so much confidence in his ability as his agent that the Reve had full management of granaries, bins, and all the flocks and herds of the estates.

He had become a master craftsman in the carpentering trade but he did not follow it. All the trades employing iron or steel are more suited to people who are ruled by Mars. Even in this small instance, Chaucer is true to scientific factors. It is frequently in such little touches

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[1]Max and Augusta Heindel, Message of the Stars, Oceanside: The Rosicrucian Fellowship, 1927, p. 123-124.

that he reveals his real knowledge; a little deviation from type lends versimilitude but it must be in accord with scientific factors. The Reeve was a carpenter by trade but he made his living in pursuits under the control of his ruler, Mercury.

The application of the astrological delineations to the description of the Reeve makes it clear that Chaucer knew the astrological types of the signs well, but it is interesting to see how a work on physiognomy compares with astrology. The physiognomical part of the Secreta Secretorum which Chaucer knew says:

> The colerike [man] by kynde he sholde be lene of body, his body is lyght and drye, and he shal be sumwhat rogh; and light to wrethe and lyght to Peyse; of sharpe witt, wyse and of good memorie, a greete entremytter [enterpriser] ...; he louyth hasty wengeaunce; Desyrous of company of women moore than hym nedeth.[1]

John Metham agrees that thin legs without much calf denotes a lecherous, unclean, and deceitful temperament.[2]

Aside from the scientific factors, Chaucer seems to have drawn upon a stock of information about these officials and their duties even if he did not have any particular person in mind. In the latter part of the fourteenth century,

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[1]Curry, op. cit., p. 188.

[2]The Works of John Metham [fl.1448] from the unique manuscript in the Garrett collection in the library of Princeton University, ed., by Hardin Craig, Ph.D., London: Humphrey Milford, Oxford University Press, 1916, p. 138.

the office of reeve had frequently been combined with that of sheriff. Some local knowledge and public experience were needed in order to compile the compoti or manor rolls which were elaborate because the land holdings were usually very large and scattered. These documents had to be accurate. This explains the lines:

> Wel koude he kepe a garner and bynne
> No auditor koude on him wynne.

Originally the rolls were in charge of the stewards who turned them over to the bailiff. The reeve acted as the go-between between the tenants and the bailiff. Chaucer gives such personal details about the Reeve as to suggest that he may have had an original in mind.

A type of the melancholic complexion is the Miller. He is a stocky, thick-set man with big bones and muscles, a wide mouth and a short thick neck, all traits typical of natives of the sign, Taurus, the Bull. The face is inclined to be wide and square. He has the sociability given by the rulership of Venus over Taurus, and the inclination to conviviality and music. The character is usually stubborn in the extreme and while slow to anger, is like a bull in a china shop when roused. The hair often has an auburn shade. John Metham says that a 'Fulle nekkys, grete

and fatte and schort, thei be hasty and hard to be taught.... A nek the swych ys rowgh off schap /rough of shape/ sygnyfyith an ontawght parsone, and a wyllde chargyng off ryght nowght:[1] Chaucer says:

> There was no dore that he nolde have of harre,
> Or breke it at a rennyng with his head.
> His berd as any sowe or fox was reed,
> And thereto broad, as though it were a spade.
> G P 550-553

Indagine notes that 'bearded fellows.... are brutal, vengeful, have poor memories, are unfortunate and covetous.'[2] The Miller's beard is as broad as a spade, indicating that he has a full measure of these qualities.

W. C. Curry has consulted all the great authorities on physiognomy like Aristotle, Polemon, Razis, Cardan, Richard Saunders, not omitting the pseudo-Aristotelian Secreta Secretorum of the Middle Ages. They all seem to show that their observations are 'grounded in astronomye a ful grete deel' but with much bias toward noticing the worst and most sensational qualities in human beings. The wide mouth and big lips of the Miller show a glutton, with cupidity and belligerence, a swaggerer, and the amorous sensualist fond of singing coarse songs or telling risque

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[1]Metham, op. cit., p. 135.

[2]Seligman, op. cit., p. 378.

stories. He is shameless and a chatter-box. The Miller does indeed like music, thus showing the effect of Venus, his ruler, because he plays the bagpipes. He is stubborn; he insists upon telling his story although he is drunk.

According to physiognomy, hairs on the end of the nose mean a simple person while a wart or mole on the nose means the same as the mark on the face mentioned by the Wife of Bath. All authorities agree on that point:[1]

> Yet have I Martes mark upon my face,
> And also in another privee place,
> W of B P 619-620

A person with such a peculiarity is an enemy to his own peace. If the mole or wart is honey-coloured, "contentious brawling shall most perplex him; if red, he is most afflicted with envious hostility; if it is like a wart or lentil, he is a principal artificer in his calling."[2] The Miller evidently

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[1]W. C. Curry, "Chaucer's Reeve and Miller", P.M.L.A. 35, 1920, 187-209, p. 207. Haly Abenragel, an Arabian physician of the eleventh century, agrees with Melampus who flourished at the time of Julius Caesar, "that if a Mole appear on the Nose or near the eye that person is beyond measure Venereal...; A Mole on the Nostrils gives another on the Stones, between which and the nostrils there is great sympathy." and Melampus: "If the wart is on the nose of the right hand, and it is blonde in color, he will be insatiable in love. And at the same time he has a wart in a hidden place."

[2]Ibid, p. 208.

knew his business well: he had "a thombe of gold, pardee" in his milling. The plain astrological interpretation suits him better than the physiognomists', for his relations with his wife are amicable and he seems to be content with his home life:

> A housbonde shal nat been inquisityf
> Of Goddes Pryvetee, nor of his wyf,
> Mill P 3163-3164

It is a Taurian characteristic to like the opposite sex, to find its members agreeable, and to love one's home. Robin displays the bull's stubbornness in his refusal to heed the Host. He insists upon telling his story immediately even though he knows that he can hardly sit on his horse because of his drunkenness. On the whole the astrological factors do more to bring out the Miller's character than physiognomy. Even his vocation is suited to him, dealing as it does with business and the products of the earth, Taurus being one of the melancholic, earth signs.

The Summoner might qualify as a phlegmatic man since his character displays some of the qualities associated with the water sign, Scorpio, which governs the secrets of both the mind and body. Onions, leeks, and garlic are said to be plants associated with Scorpio, the Scorpion, possibly because of the sting or because of the hot influence of the

ruler, Mars. "Wel loved he garleek, oynons, and eek lekes." Traditionally, Scorpio people are repositories of others' confidences which are usually as closely guarded as personal matters. Detectives, research scientists, surgeons, or investigators of all kinds such as the Summoner for the Archdeacon's court, come under the influence of Scorpio. The old astrological works paint the natives of Scorpio as being very sensual and fond of the opposite sex.

> In daunger hadde he at his owene gise / power, control /
> The yonge girles of the diocise,
> And knew hir conseil, and was all hir reed, / secrets, adviser /

Metham says that black brows show great wit, hard heart, hardiness, and lecherousness. Small eyes indicate a deceivable nature and subtle wit like a fox.[1] The Summoner is depicted as being "lecherous as a sparwe", and he is clever enough to parade the few terms of Latin that he had learned from hearing them so often in the Archdeacon's court so that he will appear wise; but he is not intelligent enough to acquire any depth of knowledge. If anyone sounds him out on any subject, he cries, "Questio quid Juris" meaning What of the Law? He is not hard-hearted; for a quart of wine he will let a fellow have a concubine or he will

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[1]Metham, op. cit., p. 120.

accept a bribe for other infractions. He has a sense of fun and of the dramatic; he sticks a huge wreath of leaves on his head and carries a shield before him that he has made out of a large cake. It appears, then, that Chaucer has not relied entirely upon medicine, physiognomy, or astrology to describe the Summoner. He has added his own observations to deliver a cutting commentary upon a court system which had become too oppressive.

The portrait of the Pardoner is another criticism of an unscrupulous person in clerical garb. His character is shown by his physical features and actions. A lack of hardy virility is apparent at once because of his fine, thin, soft, and long fair hair. The yellow hair indicates pride, according to Metham[1] but it should be crisp and curling to portray manly courage. His small voice and lack of beard make it clear that he is an effeminate man, possibly a eunuch by birth. The Pardoner has eyes glaring like a hare's. This trait would seem to show an inclination to madness. This is what Metham says: "Shyning starting eyes yff thei be pasyng grete, thei acord to the dysposycioun off ryhtffulness and wodenes...."[2] W. C. Curry quotes Polemon

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[1]Metham, op. cit., p. 120.

[2]Ibid, p. 130.

as saying of glaring eyes prominently set that they indicate a 'man given to folly, a glutton, a libertine, and a drunkard'. It is difficult to see how a eunuch could be a libertine, but Professor Curry thinks that the Pardoner shows "he is a glutton and a typical tavern reveler" because "he calls for cakes and ale before he begins his story". The Secreta Secretorum agrees that a glaring open eye betokens a shameless man and a small voice shows a lack of virility. The long thin neck, according to Goclenius, is a 'sign of garrulity, haughtiness of spirit, and of evil habits' and a beardless man is endowed by nature 'with a fondness for women and for crafty dealing.... yet repeatedly he exhibits a rare and singular intellectual cleverness.'[1]

The Pardoner claims that when he goes into the pulpit, he makes his voice ring out in haughty tones. He is an exceedingly clever man who has built up a role and plays it superbly for a church audience. He displays a gift for psychological discernment in order to satisfy his own greed when he delivers his master-stroke:

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[1]Curry, op. cit., pp. 57, 58.

> If any wight be in this chirche now
> That hath doon synne horrible, that he
> Der nat,for shame, of it yshryven be,
> Or any womman, be she yong or old,
> That hath ymaad hir housbonde cokewold,
> Swich folk shal have no power ne no grace
> To offren to my relikes in this place.
> And whoso fyndeth hym out of swich blame,
> He wol come up and offren in Goddes name,
> P P 378-386

Who could resist? With that goad he extracts a hundred marks a year from rich and poor. After he has made them smart for their sins, he tickles them with stories of long ago because ignorant people 'loven tales olde'.

When he describes his own actions in the pulpit, he reveals his nature to a further extent. Metham's remarks are appropriate:

> The throte qwan yt ys lene and stondyth muche owte, that ys to sey, gretly apperyth, yt sygnyfyth dysposcion to be a gret spekere and fulle of wordys; yff yt be so that the throte be pleyn, that ys to sey, that no bone be apperyng but lytyl, yt sygnyffyeth dysposycion to myrth and to gret sparyng; but such a persone ys noght dysposyd to be hardy....
>
> Qwan the eyn renne fast in the hed, and the hed meue and the breath comyth owt off hys mowth with gret vyolens, that the vyolens off the spyryte may be herd afferre, yt sygnyffyth a passygn bold man and an envyus and a man dysposyd to manslaut, and a froward man, ioying off oder mennys tribulacion.[1]

Whatever the Pardoner lacks physically, he makes up for it by his mental prowess, his ability to joke and to tell stories; he is equal to almost any occasion. To relieve

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[1]Metham, op. cit., pp. 130, 141.

himself of a threat of a cardynacle (a heart attack) proceeding from his deep sympathy for the sweet Virginia of the Physician's Tale, who was beheaded by her father to prevent her dishonor, the Host calls upon the cleric for a story. Although he acknowledges himself to be 'a ful vicious man' he accedes to the request of the 'gentils' for 'som moral thyng, that we may leere', and he proceeds to tell the wonderful story of the three revellers. After the tale, however, he causes one of the funniest episodes in the whole of Chaucer's work. He shows his utter shamelessness when he invites the Host as being most enveloped in sin, to come up and kiss the relics and contribute. The Host in a fury replies that the Pardoner would make people kiss his old dirty pants because he swears that they were a 'relyk of a saint' but for his part he would rather have in his hand just what the physiognomical factors show that the Pardoner lacks:

> I wolde I hadde thy coillons in myn hond / testicles /
> In stide of relikes or of seintuarie.
> Lat kutte hem of, I wol thee helpe hem carie;
> They shul be shryned in an hogges toord! / turd /
> P T 952-955

These were cutting words and left the Pardoner speechless with wrath, but the Knight made the two pilgrims kiss and make up and ride merrily on.

The portrait of the Wife of Bath has been the subject of more analysis than all the other pilgrims combined. Only a few astrological details are given to build up a complex character of surpassing interest. Three outstanding physiognomical characteristics are mentioned; her gat-teeth and the print of Venus (a mole on her hip) give her a passionate nature, while a scar (the mark of Mars) on her face, implies that she likes to have the mastery over others. Her character is chiefly based upon the three astrological factors. She never tells her actual birth month; she only mentions that her Ascendant, the sign rising on the eastern horizon at birth, was the sign Taurus the ruler of which is Venus. Mars being posited in Taurus is co-ruler with Venus.

Since the Ascendant with its ruler largely determines the physical body and the outward personality, Alison shows the large, full face and rosy complexion of the Taurian woman. She has large hips and probably a stocky build characteristic of the sign. The influence of Venus as ruler of the sign is seen in her handsome appearance, her love of fine clothes, her pleasure in the company of others, chatting and joking, and her interest in the 'remedies of love'. Mars as co-ruler, gives her 'sturdy hardiness', a roving nature, a dominating personality and the determination to rule. He

gives additional strength to the strong body of the Taurus individual and the desire to venture forth on journeys, for example. She gets her skill as a weaver from both of the planets. Her Taurian nature makes her very stubborn and persistent and Mars on the Ascendant contributes to a war-like or quarrelsome make-up.

Actually, however, it is the opposition of Mercury, the ruler of things of the intellect, to Venus, the ruler of pleasures, sociability, and things delightful to the senses which causes her much resentment and sorrow. Mercury in opposition to Venus means that Mercury is probably ruling her seventh house representing the marriage partner and that was the reason that her one true love was a man so fond of reading and books. The Taurian part of her nature enables her to see through love problems and she recognizes the basic antagonism between the planets' natures which affected her married life and which affords her the raison d'etre for a very long and humorous commentary upon clerks' and Biblical and classical mysogynies about woman's wickedness. Alison is not drawn merely from books. Chaucer has added touches which give an air of realism. Her actions and speeches do much to develop her character.

C. Camden Jr. in his study of the physiognomical factors in Sir Thopas finds that "Chaucer conceived of his knight as a very effeminate creature who conformed to the physiognomical conception of the timid and cowardly man and that thus he burlesqued the typical knightly hero."[1] Such terms as 'fair and gent', sydes smal or slender or flat, white skin, red lippes, semely nose or streyt and smal, are all used by the noted physiognomists to depict a timid, cowardly, effeminate man. The name Thopas means topaz, the gem worn by young girls to protect their chastity. To further accentuate his purity, this knight drinks water instead of good strong, blood-building wine as heroes do, and sticks a lily in his helm. Like the dainty elf-queen, he mounts a dapple-grey palfrey and when the giant offers combat, Sir Thopas says

> Tomorwe wol I mete thee
> Whan I have myn armour
> Sir T 2007-2009

Then he went pricking away on his little horse as fast as its little mincing steps would take him, the very antithesis of a big, brawny hero on a sturdy war-horse well able to carry a large rider in heavy armour.

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[1]C. Camden, Jr., "The Physiognomy of Thopas", Review of English Studies, Vol. XI, 1934, 326-330, p. 326.

Such a description of a knight, who was all that a true knight would abhor, would afford great amusement to a medieval audience that would understand the implication of the phrases.

Louis Haselmayer, Jr. says that "This portrait then is conventional in design and content, and the details are of such a nature that satire is achieved which may have more than one object of ridicule as its purpose. It is almost identical with many other portraits of an effeminate knight."[1] He shows that most medieval portraits were written in a rather rigid style and diction called an effictio. The effictio was one of the 'colours' of rhetoric used by medieval poets to amplify their verse and to give it an impression of brilliant decoration. The effictio is a formal portrait produced by a catalogue of the physical features of a person from head to foot, arranged in set order. From one portrait to another, there may be more or less detail and more or less variability in length, but the pattern is always the same. There is repetition from one poem to another, from one poet to another, and from one language to another for it is found in the medieval Latin, Old French,

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[1]Louis A Haselmayer, Jr., Chaucer and Medieval Verse Portraiture, Ph.D. Dissertation, Yale University Library, 1937, p. 261.

and Middle English lyric poetry. Chaucer's mentor, Guillaume de Machaut, wrote very long detailed portraits of this kind. Benoit de Sainte-Maure and Deschamps employed them widely but Chaucer has used them throughout his entire work to a greater extent than any other author. The diction is as conventional as the details. The appearance of the portrait by itself and the enumerative method of presenting details are two factors essential to the type.

The effictio was rarely used for characterization or satire. Its stylized form and conventional vocabulary made it highly artificial. It was intended simply to adorn and to extend the content of the verse. Consequently, catalogues of beautiful women and handsome men were most frequently employed although the rhetoricians allowed occasional portraits of ugly women or men for a vituperative or satirical effect and not for any realism. The women usually had yellow hair like Emily's, preferably in a long yellow braid hanging down the back, a white skin, red cheeks and lips, starry eyes or eyes gray as glass, snowy neck and breast, and slender or flat sides sometimes likened to those of a weasel. Some illustrations are Criseyde, Alisoun in the Miller's Tale, Blanche in the Duchess, and the lady Fame in the House of Fame.

The men have tightly curled, crisp hair, flashing eyes, huge arms and legs, big muscles and bones, and square shoulders. Some illustrations of the type are Troilus and Diomedes in Book V of Troilus and Criseyde, Nicholas and Absolon in the Miller's Tale, Lycurgus and Emetrius in the Knight's Tale, the god of love in the Prologue to the Legend of Good Women, and Chaunticleer in the Nun's Priest's Tale.

Two outstanding examples of the conventional hero are presented by the portrait of Emetrius, King of Inde and that of Lygurge, King of Thrace, two gorgeous panels painted by Chaucer to balance each other in the Knight's Tale. Emetrius is Chaucer's own glittering creation. He is not even named in the Teseide of Boccaccio whereas Lygurge is named but not described to any extent. In the Knight's Tale they receive the full treatment. W. C. Curry thinks that Chaucer has added details from astrology to suit Emetrius as a Mars type since he is the champion of Arcite who is under the protection of Mars while Lygurge supports Palamon who is under the protection of Venus and Saturn and is said to be Saturnalian in appearance. By reason of his long black hair and his capelet of an old, coal-black bearskin, Curry's contention seems to be true since Saturn is old Father Time and black is his color. Lygurge is driving four white bulls,

emblematic of Venus because her color is white and she rules Taurus, the Bull.

Emetrius with his yellow hair as crisp as iron rings, his trappings of gold stuck with rubies, his glancing like a lion, and his sanguine complexion, seems more suited to the sanguine fire sign of Leo, the Lion, ruled by the Sun. Nevertheless, it seems quite clear that Curry and Haselmayer are correct in their belief that Chaucer definitely had recourse to the sciences for suggestions for his portraits but these are strictly learned portraits having the suitable details taken from manuals.

Chaucer progressed from the conventional type of portrait and succeeded in creating characters that have more truth to life by adding personal observations from his own experience or from his knowledge of the sciences. There is the same formality in listing traits but he abandoned the stock physical characteristics and formal diction. He makes the language suit the characters. He has chosen types from the whole panorama of life and not merely from the upper classes. His is a new departure in introducing the formal portrait into the fabliaux, in using it for a group as in the gallery of the General Prologue, in applying it to the description of an animal like Chaunticleer and thereby adding

to the humor of the mock heroic piece, and in the use of the scientific factors in physiognomy, astrology, and medicine to lend an air of versimilitude and realism as well as to supply memorable touches and flashes of beautiful color and brilliance.

VI

STAR SCIENCE

"The oldest work written in English upon an elaborate scientific instrument" is Chaucer's only strictly scientific composition, A Treatise on the Astrolabe.[1] The derivation of the word 'astrolabe' from the Greek 'astron' for 'star' and 'labein' for 'to take', shows that its purpose was to find the positions of stars and to ascertain the places of the sun and planets with regard to the ecliptic. It was also used to solve other problems of astronomy and astrology which Chaucer intended to teach to his little ten-year old son, Lewis, by a discussion divided into five sections. The death of 'lyte Lowys' in October of 1391 was the probable reason that the work was discontinued after the completion of the first two parts. Chaucer calls Lewis 'my sone'.

The astrolabe which Chaucer gave to Lewis was similar to the chief types: A portable armilla or arrangement of rings, all circles of one sphere, was intended to show the relative positions of the principal circles of the heavens;

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[1]R. T. Gunther, Early Science in Oxford, Part II - Mathematics, London: Oxford University Press, 1922, p. 9.

a planisphere with movable sights represented the circles of the heavens in the plane of the equinoctial; and a graduated brass ring with a movable label or index turning upon the centre was used simply to take altitudes. "Its most complex form, as described by Tycho Brahe, passed into the modern Equatorial."[1] The present day Star globe used in air and sea navigation is a model of beauty and precision for any latitude or longitude in the world. With its ivory sphere and delicate measuring parts enclosed in a polished hardwood box for protection, it is a far cry from the small iron netted globe "compowned after the latitude of Oxenford" made to hang from the thumb and justifiably called by Chaucer "so noble an instrument".[2]

Although Chaucer only finished the first two sections, the plan given in his introductory remarks for the whole treatise needs careful consideration in forming an estimate of the range of his knowledge of star science and perhaps of the extent to which he accepted it. An impartial examination

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[1]James A. Murray, A New English Dictionary on Historical Principles, Oxford: Clarendon Press, 1888, I, p. 525.

[2]Large brass models are to be seen at the Adler Planetarium, Chicago.

shows that a large part of the proposed work would concern astrology as well as astronomy and, furthermore, that the complete treatise would entail a tremendous amount of effort.

In Part I, Chaucer describes the astrolabe. Some points in his description apply to a horoscope.[1] He explains how the east side of the globe is at the left side of the person who is suspending the instrument from his right thumb by means of the ring attached to the axis. The west side is on the right side of the person so that the horizon line divides the ball into two halves. The top part with the thumb ring is the south half. The 90 degree point from the horizon is the zenith. It corresponds to the point in a horoscope at which the sun stands in the mid-heaven (medio coeli) every day at noon. The bottom part of the globe is the north half and the 90 degree point from the horizon is the nadir (imo coeli). It corresponds to the place in a horoscope at which the sun stands at midnight.[2]

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[1]A horoscope and a star map are the reverse of an earth map. Chaucer has been careful to make particular note of this confusing point at the very beginning. When a star map is held overhead, the left-hand side is toward the east, the place of the ascending sun and planets. The Big Dipper will be in the north.

[2]W. C. Curry, Chaucer and the Medieval Sciences, New York: Oxford University Press, 1926, p. 15, shows a horoscope.

The line from the zenith to the nadir is the meridian. It includes the 'lyne meridional' of the south half and the north line, 'the lyne of midnight'.

The meridian divides the horizon line into the east (oriente) and the west (occidente). The meridian and the horizon cross at right-angles and cut the globe (as well as the horoscope) into four parts at four very important places called the cardinal points. These represent the four times of the year when the sun changes direction with respect to the earth. The thirty-degree arc of each of the four strong angular houses called the Cardinal houses begins at these points, marking off the first, fourth, seventh, and tenth mundane houses of the horoscope, Chaucer tells us.

The astrolabe has an outside metal Border passing around the iron circles of the horizon and the meridian. On this Border is drawn a line graduated in degrees each of which equals four minutes of time. Longer strokes on the line mark every five degrees of arc so that fifteen degrees make an hour of time. Below this circle on the Border is another circle, a line on which are written the names of the twelve signs or constellations of the zodiac. They are the celestial mansions or houses of the sun because he stays in each one for thirty degrees or for about thirty days.

Chaucer bids us to take careful note of the fact that every degree of every sign contains 60 minutes and every minute contains 60 seconds, while every degree of arc is equal to four minutes of time, as he said before. The third circle on the Border is graduated for the days of the year and there is another circle marked with the months of the year. All four of these circles are concentric and drawn on the metal Border.

A little cross is seen on the end of the front horizon line next to the Border. This cross is important, for it designates the zero hour, the degree of dawn when the sun peeps over the horizon. This is the Ascendant. It also represents the first degree of Aries when the sun is crossing the Equator on his northward journey, (March 12 in the time of Chaucer). From Aries the other signs of the constellations are marked anti-clockwise on the line around the Border.

From early times, Chaucer explains, it was found that certain groups of stars were associated with the sun's movements and that these groups of stars formed a belt across the heavens. This path or belt of constellations is called the ecliptic and it is about 12 degrees / sic / wide.[1]

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[1]J. M. Manly, Canterbury Tales, p. 135. The zodiac is about sixteen degrees wide.

The sun, moon, and planets always move through this band of the sky. The path of the sun running along its centre is the celestial equator of the ecliptic. The whole circle of the ecliptic is divided into twelve divisions that form the twelve mansions of the constellations which to the ancients seemed to resemble beasts (animals); hence from the Greek word 'zodia' meaning 'beasts', this band of the ecliptic was named zodiac. When the sun enters any of these signs, he takes on the qualities of those animals or when the planets are under these signs, "thei causen us by her / their / influence to take on the operaciouns and effectes like to the operaciouns of / those / bestes". (Part I, 69,70)

Furthermore, says Chaucer, when a hot planet (Mars, Venus, Sun, or Jupiter) comes into a hot sign, then the heat of the planet is increased, or if the planet is cold (Saturn or Mercury), then it ameliorates the heat of the hot sign. Thus all the signs whether moist or dry, cardinal, movable, or fixed, influence the quality of the planet. Each of these twelve signs corresponds to a certain part of a man's body: Aries rules the head, Taurus the neck, Gemini the arms, and so on, as he intends to show more plainly in the fifth part. Finally, Chaucer states that the ecliptic

slants across the heavens so that half of it is southward of the equator and half of it is northward of the equator.

It will be noted that the Border of the astrolabe supplies the data for changing globe time to clock time. The reason for the emphasis on time is that clock time must be equated with celestial time to solve astronomical problems, the year being 365 1/4 days in length and the celestial globe being 360 degrees. Also, the birth of a person (a nativity), the choice of a suitable time for undertaking anything important (election) or for asking a question (interrogation) is noted by clock time, but clock time must be translated to celestial time so that the Ascendant can be calculated. Every four minutes of time will bring a new degree up to the Ascendant with a corresponding change in the degree of each zodiacal sign on the cusp of each of the twelve houses of the zodiac. The lines marking the division of the houses in a horoscope are called the cusps of the houses. Chaucer very frequently notes the time of events by astronomical figures which give charm and beauty to his verse.[1]

Since the sign on the Ascendant governs the personality and physical body, the complexion, of a person, and

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[1]Robinson, op. cit., p. 829. (Fr T 1018) The astronomical mode of defining times and persons, was very characteristic of Chaucer and his time.

since the planet ruling the rising sign is the ruler or lord of the nativity or is the significator of the interrogation in horary astrology, it is very important in making a correct analysis to find the actual degree rising. A change of one degree can bring a new sign on the Ascendant. Then again, the degree on the Ascendant determines whether or not the Ascendant may be fortunate or unfortunate because of the angles made between it and the planets. Certain angles or aspects are considered to cause a harmonious or fortunate influence, namely: the trine of 120 degrees, the sextile of 60 degrees, the semi-sextile of 30 degrees and the conjunction in the same degree.[1] The chief unfavorable or inharmonious aspects are the opposition of 180 degrees, the square of 90 degrees, semi-square of 45 degrees, and the sesqui-quadrate of 135 degrees. The way in which the aspect manifests itself will depend upon the qualities of the planets involved, the things they govern, and the department of life according to the house of the horoscope where the influence of the aspect falls. For instance, in the Knight's Tale, Palamon says of his imprisonment:

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[1]Robinson, op. cit., p.829. (Fr T 1055). The highest tides occur when the sun and moon are in conjunction or opposition.

> Some wikke aspect or disposicioun
> Of Saturn, by some constellacioun,
> Hathe yiven us this, although we hadde it sworn;
> So stood the hevene when that we were born.
> Kn T 1087-1090

Saturn rules incarceration, adversity, and poverty, such as Palamon and Arcite suffer in their exile.

To be able to find the degree of the Ascendant, then, and to get the correct positions of the heavenly bodies at any time for judgments of nativities, elections, and interrogations is a necessary attainment but the Ascendant is not used for navigation, surveying, or weather prediction. The words of the noted astronomer, Tycho Brahe in 1574 indicate the opinions held by many learned men up to and beyond his time:

> Astronomy is of value to man in that it helps him tell time and exalts his spirit by freeing it from consideration of earthly matters. Its greatest merit lies in the power to interpret the meaning of celestial movements to human fates. To deny the influence of the stars means to disbelieve in God's wisdom. What are the planets for if not to influence the weather, just as the sun determines the seasons, and the moon, the tides and the rise and fall of humors? Besides, past observations have established the nature of planetary action just as they have the effects of the sun and moon. The conjunction of Mars and Venus in certain parts of the sky means rain and thunder, of Jupiter and Mercury storms, and so forth. Some conjunctions in certain positions cause plague, others diverse misfortune. Some people grant the effect of the planets on physical conditions but deny their effect on man. But what is man if not composed of elements and nurtured by the elements? His heart is equivalent to the sun, the brain to the moon, and like the sun and moon they act upon each other reciprocally,

and are dependent on each other. The liver corresponds to Jupiter, the kidneys to Venus, the milt to Saturn, the gall to Mars, and the lungs to Mercury. As to horoscopes they are merely the dictates of experience. Those born under Saturn are inclined to sublime studies, while those born under the influence of Jupiter take to politics. The solar influence makes people desire honor, dignities and power; that Venus makes them devote themselves to love, pleasure, and music; while Mercury encourages people to mercantile pursuits, and the moon to travelling.[1]

In whole or in part, many noted churchmen, scholars, and physicians up to a century or more beyond his time held the same views as Brahe regarding the Macrocosm and Microcosm, the four elements with their accompanying qualities, and astrology. The bull of Sixtus V in 1586 against the possession, reading, or use of books on judicial astrology or other forms of divination was a passing reaction of the Counter-Reformation to the favorable attitudes towards astrology of former popes like Pius IV, Paul III, and Gregory XIII; but a work in six books on Astrology by Gallucius was dedicated to Sixtus V and first published two years after the bull in 1588 and again in 1606, 1612, and 1617.[2] At the University of Salamanica, professors held

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[1]Mark Graubard, Astrology and Alchemy, New York: Philosophical Library, 1953, p. 181.

[2]Thorndike, op. cit., VI, pp. 158, 159.

the chair in astrology until 1770.[1] In 1620, a university professor of Nassau, John Alsted, published an encyclopedia in twenty-seven volumes on the physical sciences. To Alsted the physical sciences largely meant alchemy, astrology, physiognomy, and experimental science.[2] Indeed, faith in astrology, natural magic, and occult virtues and relationships continued to be as widespread until the seventeenth century as they had ever been in any former age but magical rites and incantations had been dropped in the passage of time.[3]

Chaucer remains 'modern' to the present day. In Section 4 of Part II of the treatise, Chaucer explains his divergence of opinion from that of old astrologers in a very important discussion. Here he makes his "special declaracioun of the ascendant" since it is "a thing which that these astrologiens gretly observen." Chaucer says that the Ascendant truly is, in the widest sense, the degree ascending on the eastern horizon at any one time; and if a planet happens to be ascending in the same degree, it has no latitude from the ecliptic line (the celestial equator of the sun's

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[1]Thorndike, op. cit., VI, p. 166.

[2]Ibid, pp. 433, 434.

[3]Ibid, p. 591.

path) but it takes its degree in the ecliptic from its degree of longitude. It is said that this planet is in horoscope, that is, in the Ascendant.

Now Chaucer says that the "statutes of astrologiens" declare truly that the Ascendant takes in an arc extending from five degrees above the degree rising to the 25 degrees below the rising degree and that any planet within that range is co-ruler of the heavenly body ruling the ascending sign. But if the planet has passed only one degree outside those bounds, then "these astrologiens" say that the planet is falling from the Ascendant and is no longer a co-ruler with the lord of the Ascendant; any aspects formed with it by other bodies, no longer have any effect upon making the Ascendant fortunate or unfortunate. Yet say "these old astrologiens" that the Ascendant or the lord of the Ascendant is fortunate or unfortunate thus: the Ascendant is fortunate when the wicked planets,[1] Saturn or Mars or else the Tail of the Dragon (the moon's south node) are not in the first house (the house of the Ascendant) or if the wicked planets do not make a bad aspect to the degree

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[1]Mars and Saturn were believed to have an unfortunate influence. Mercury could have either a fortunate or an unfortunate effect according to his aspects with other planets and to the Ascendant.

on the Ascendant. It is fortunate when a benign body (Venus, Jupiter, Sun, or Moon) is posited in the first house and is well dignified because it is the ruler of the sign on the first house, the Ascendant, or when it is in its exaltation sign,[1] or when it receives favorable aspects from heavenly bodies in other houses.

The lord of the Ascendant, say they, is fortunate when he is situated in a good place; that is in an angular or succedent house, the cadent house being weak.[2] He exerts a good effect if he is in his dignity, comforted by friendly aspects from planets, and well received by aspect with the moon. Furthermore, he must not be in conjunction with "no shrewe" (Saturn, Mars, or Mercury) nor in conjunction with a planet in its "descencioun", its weakest position called Detriment.[3] He must not be in his own "descencioun" or receive any unfortunate aspect. He must not be retrograde, nor combust with the sun.

Chaucer shows the weakness of any claim that a planet's effect extends only within the bounds of an exact orb (in this case, the Ascendant) especially since so many other factors operate to make the horoscope favorable or

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[1]Seligman, op. cit., Table of Dignities of Planets, p. 371.

[2]Curry, op. cit., p. 16.

[3]Seligman, op. cit., p. 371.

unfavorable. In effect, he asks why the influence of the ruler or co-ruler of the Ascendant should suddenly stop by passing merely one degree beyond the arc which the old astrologians claimed to be the Ascendant. When the planet passes to the sixth degree above the horizon and is then in the twelfth house, "they seyn that the planete is 'fallyng from the ascendent'".

An explanation of some of Chaucer's technical terms may throw some light on his meaning. The twelve mundane houses of a horoscope represent twelve different departments of life; they correspond to the twelve mansions of the zodiac; and the ruler of the zodiacal sign will influence the affairs of life where the sign is placed. For example, the first house, the Ascendant, has dominion over the physical body and personality; the second house represents the money affairs, the third brothers and sisters, short journeys and outer mental expression, the fourth, the home and end of life, and so on.[1] The mundane houses are angular, succedent, and cadent in succession in each of the four quarters of the horoscope and have a strong, medium, or weak effect in that same order. A planet in an angular house has a much stronger influence than if it is placed in

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[1]Curry, op. cit., p. 16.

a cadent house. The twelfth house is the darkest of all the houses as it covers the two hours before dawn; it is considered the weakest of the cadent houses. In the Man of Law's Tale, Chaucer speaks of it thus:

> Infortunate ascendant tortuous,
> Of which the lord is helpless falle, allas,
> Out of his angle into the derkeste house!
> M L T 302-304

A retrograde planet is one which appears to be moving in the opposite direction to the normal path with respect to the earth. It was not known then that such apparent backward motion was caused by the differing orbits of the planets moving around the sun. Any heavenly body combust is in conjunction with the sun and therefore its influence is burnt up or entirely nullified by the sun's rays. When a planet is well received by the moon there are good aspects from the moon to the planet. Good reception from the moon is necessary to make an aspect actually come to pass successfully. If the moon makes a bad aspect, the matter may happen but the results will be unpleasing. The moon or any planet void of course, as Chaucer mentions in the Complaint of Mars (114-117), means that it makes no aspect with other planets during its course through the sign where it is posited; consequently 'she hath but litil myght'.

A planet in its Fall or "decencioun" is weak and is in the sign opposite to the sign which it rules where it is in its second strongest position. It has its best effect in its Exaltation, a particular degree of a certain sign. By a complicated line of reasoning the exaltation positions of the planets were chosen in times past.[1]

A masterly handling of an Exaltation in poetry is seen in the Merchant's Tale in the choice of time for bringing young May and old January into their garden at the same time as Pluto and Proserpine, king and queen of the fairies. The latter represent Jove's empyrean powers in acting the part of the deus ex machina that brings about the denouement of the plot when Pluto restores January's sight in time to see in the pear tree above his head, May and squire Damian in a very ardent embrace; and Proserpine immediately supplies the wife, May, with a ready explanation: It was a piece of magic to help January to regain his sight. Chaucer's choice of time in the air sign of Gemini with the sun near his declination in Cancer, the Exaltation of Jupiter, seems peculiarly appropriate to the airy fairies and to the duplicity and quick wit which Gemini also represents. The beneficent Jupiter in his strongest

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[1]Ptolemy, Tetrabiblos, trans. J. M. Ashmand, new edition, Chicago: Aries Press, 1936, p. 31.

position and in the sign Cancer governing the home, indicates the restoration of peace in the family. A similarly fitting application of the Exaltation is to the birthday feast and festivities of the great King Cambyuskan in the Squire's Tale. The sun was near his Exaltation in the first Face of martial Aries, ruled by Mars (47-51). The first Face of Aries is also ruled by Mars and this position accentuates the strength of a heavenly body found there. Venus, the ruler of music, dancing, and entertainment in general is in her Exaltation in Pisces. In the Parson's Prologue (10, 11) mention of Libra as the Exaltation of the moon is an error that has caused much speculation. Actually, the moon's Exaltation is in Taurus. Both signs are under the rulership of Venus and by some quirk of the mind, the same rulership may have caused a transposition of the signs.[1] Certain it is that Chaucer had access to all the Exaltations if he had access to any and his work proves that he did know several.

In concluding his special declaration of the Ascendant, Chaucer makes a statement which has been taken from its context by numerous writers to prove that he did not believe in astrology:

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[1]Ptolemy, op. cit., p. 31. Chapter XXII of the Tetrabiblos gives all the Exaltations in the same section.

Natheles these ben observaunces of judicial maters and rytes of payans, in which my spirit hath no faith, ne knowing of her / their / horoscopum. For they seyn that every signe is departid in thre evene parties by 10 degrees, and thilke porcioun they clepe a face. And although that a planete have a latitude fro the ecliptic yit sey somme folk, so that the planete arise in that same signe with any degree of the forseide face in which his longitude is rekened, that yit is the planete in horoscopo, be it in nativyte or in eleccion, etc.

Astro. II, 4, 63-77

Chaucer's allusion to judicial matters refers to the practical application of astronomical data to human affairs which was called judgments. The delineation of character by means of astronomical data comes under this heading. For instance, in the 'Legend of Hypermnestra' in the Legend of Good Women, Chaucer says that when the heroine was born, her nativity showed Venus giving her beauty, while Jupiter, so strong in his position that her character is of sterling goodness, makes her incapable of performing an evil deed. The strength given usually by Mars who also governs all things made of iron, is modified by aspect with Venus and weakened by house position in her nativity; for this reason, Hypermnestra lacks the will and the malice to be able to wield a knife even in self-defense. Unfortunately, as time passed, the progression of planets brings Saturn into unfavorable aspects in her horoscope which inflict adversity and incarceration upon

her. Such a judgment of character and the general trend of the life based upon astronomical factors was acceptable to the Church; but if an astrolger had foretold that Hypermnestra would endure a life of cruel imprisonment at the hands of her father because she would be incapable of obeying his command to take his knife and slay her husband, the prophecy would be a judgment in certitudinem and could not be allowed.

According to Thomas Aquinas who supported Albertus Magnus in establishing the orthodox view towards astrology, such judgments of future human actions with certainty or even those that happen by chance must be shunned; such foretelling of events can only be accomplished with the help of demons. It would tend to abrogate the expression of free-will and the endeavor to do good works. Magic of any kind cannot be tolerated; hence, the use of astrology for choosing times to make images or amulets is wrong since such charms have inscriptions upon them and such inscriptions require the supernatural agency of fallen spirits.

"Astrology itself is inveighed against only when it teaches that the actions of the human intellect and will are under the necessary governance of the stars."[1] The same

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[1]T. O. Wedel, Mediaeval Attitude toward Astrology, London: Oxford University Press, 1920, p. 71. Summa 1.1. 115. Ad Secundem (5,544).

opinion was held by Thomas Bradwardine, Archbishop of Canterbury, whom Chaucer mentions as the proponent of free-will in the Nun's Priest's Tale. (4430-4440) At the end of a discussion about astrology in his De Causa Dei, Bradwardine states that astrology, 'inasmuch as it is the science of celestial things, is nearest to the science of God'.[1] He gives Biblical proof that it is the will of God to observe heavenly signs and he cites the Church Fathers and Aristotle's Secreta Secretorum to show that there is no question of the value of astrology.[2] He would agree with Aquinas that astrology for medicine, weather prediction, and agriculture is useful and permissible.[3]

Chaucer takes the same stand as Aquinas in condemning astrological magic for evil purposes like selecting a

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[1]Wedel, op. cit., p. 127.

[2]Ibid, p. 127, De Causa Dei, pp. 468, 469.

[3]Ibid, p. 67.
De Judiciis Astrorum (Opuscula Omnia, Paris, 1634)
'Et ideo si aliquis indiciis astrorum utatur ad praenoscendum corporales effectus, puta tempestatem, et serenitatem aeris, sanitatem vel infirmitatem corporis, vel ubertatem et sterilitatem frugum, et similia, quae ex corporalibus et naturalibus causis dependent, nullum videtur esse peccatum. Nam omnes homines circa tales effectus aliqua observatione utuntur corporum coelestium, sicut agricolae seminant et metunt certo tempore.... Medici circa segritudines criticos dies observant, qui determinantur secundum cursum solis et lunae;' cf. Summa 2. 2. 95. 5 (1.319).

propitious time to accomplish wrong aims. Aquinas would not tolerate it even for worthy ones such as finding an opportune time to carry out an undertaking like a voyage or the best time to make curative images like the Physician's. (G P 414) Images, the very cream or acme of astrology according to Aristotle and Ptolemy[1] were anathema to Aquinas although Chaucer's Parson has a more moderate view. He says that God may suffer charms if they heal wounds or maladies; but he sternly berates false enchanters and necromancers and he strongly censures all forms of divination which they employ: "I kan nat seye but that they doon cursedly and dampnably agayns Crist and al the feith of hooly chirche." (Pars T 600-601) His statements echo the sentiments of the Franklin respecting the magic involved in operations connected with twenty-eight mansions

> That longen to the moone, and swich folye
> As in oure dayes is nat worth a flye,--
> For hooly chirches feith in oure bileve
> Ne suffreth noon illusioun us to greve.
> Fr T 1131-1134

Chaucer's attitude appears to be a mingling of fear of magic as something real but very wrong and of the more modern approach to magic as nothing but false illusion.[2]

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[1]Thorndike, op. cit., p. 666.

[2]Wedel, op. cit., p. 155.

In the Franklin's Tale, the clerk by his astronomical knowledge chooses a time when the sun is in Capricorn and the moon is full in Cancer in the fourth Term and in its own Face, a period of extraordinary potency to accomplish the trick 'of swich a superstitious cursednesse' by which the rocks on the Brettany coast will appear to vanish. For this he also uses other magical observances

> For swiche illusiouns and swiche meschaunces
> As hethen folke useden in thilke dayes.
> Fr T 1292-1293

The poet elsewhere does not show a departure from this position with regard to magic or the use of astrology for performing magic. However, Chaucer is apparently not strictly orthodox respecting elections, images, the Church's belief in the hereafter, or in free-will.

Examples of Chaucer's use of elections in his frequent choice of suitable times have been discussed in regard to the Exaltations of the planets; and his attitude toward the making of charms for medicine has been noted. His belief in immortality is not one of unalloyed faith or unwavering certitude. At the death of Arcite in the Knight's Tale he says:

His spirit chaunged hous and wente there,
As I cam nevere, I kan nat tellen where.
Therefore I stynte; I nam no divinistre;
Of soules fynde I nat in this registre.
Kn T 2809-2812

Chaucer again makes a similar expression at the opening of the Prologue to the Legend of Good Women:

That there ne is non that dwelleth in this contre,
That eyther hath in helle or hevene ybe,
Ne may of it non other weyes witen,
Prol L G W 6-8

Chaucer's leaning toward the astrological determinism of the Stoics expressed in the doctrine of the Macrocosm and Microcosm can be seen in Troilus and Criseyde when Pandarus, the uncle of the heroine, has made use of his excellent knowledge of astrology and weather prediction in choosing a time for the onset of a violent cloud-burst with the moon, Saturn, and Jupiter coming to a conjunction in the watery sign of Cancer. Foreseeing the storm, he inveigles his niece into dining at his house, into staying all night when the rain began to pour, and later into the arms of Troilus. Criseyde had intended firmly to return to her home but Chaucer implies that she is to become a pawn of destiny:

But O Fortune, executrice of wyrdes, / Fate /
O influences of thise hevenes hye!
Soth is, that under God ye ben our hierdes, / herdsmen /
Though to us bestes ben the causes wrie. / hidden /
T C III 617-620

In this passage alone the harshness of Fate is modified by the omnipotence of God, but it is not so in other references to destiny. Chaucer in telling of squire Damian's success in winning May's love speaks in such words as:

> Were it by destynee or aventure,
> Were it by influence or by nature,
> Or constellation, that in swich estaat
> The hevene stood, that tyme fortunaat
> Was for to putte a bille of Venus-werkes--
> . . . . . .
> I kan nat seye;
> Merch T 1967-1970

In the Knight's Tale, he shows how a passing whim can lead to fatal consequences; the chance decision of Duke Theseus to go hunting starts a train of circumstances that ends in Arcite's death.

> The destinee, ministre general,
> . . . . . .
> Be it of werre, or peace, or hate, or love,
> Al is this reuled by the sighte above.
> Kn T 1653-1672

Previously, his cousin had pointed out to Arcite that they must bear their imprisonment patiently for it could not be otherwise:

> Fortune hath yeven us this adversitee.
> Some wikke aspect or disposicioun
> Of Saturne, by som constellacioun,
> Hath yeven us this, although we hadd it sworn;
> So stood the hevene whan that we were born.
> Kn T 1086-1090

Numerous echoes of this Stoic determinism are noticeable in many places in Chaucer's work either by word or line or passage.

T. O. Wedel says that "Chaucer was a bolder sceptic when he espoused astrological fatalism than when he denounced the science of judgments as rites of pagans...."[1], after he mentioned the observances of judicial matters (which apply only to elections and judgments) in his special declaration of the Ascendant. (Astro II, 4, 63-77) The single fact that he was concerned with the right or wrong practice of astrology shows that "Chaucer, in his personal attitude toward astrology, was still a man of the Middle Ages" and not one of the "forerunners of modern enlightenment".[2] He shared the same moderate opinion with other intelligent men of his time in accepting the general utility of astrology but not expecting it to be perfectly efficatious or correct in all instances. The urbanity of the courtier which is marked in Chaucer, usually keeps him to an even tenor.

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[1]Wedel, op. cit., p.153. Wedel, like other scholars after him, applies 'the rites of pagans' to judgments and not to the following explanatory statement concerning the arbitrary pagan divisions of each sign into Faces and Terms, p. 151. He does not cite Ptolemy in his discussion of Astrology in Gower and Chaucer. His biographical reference to Claudius Ptolemaeus is in a Latin edition, Basle, 1551.

[2]Ibid, pp. 152, 153.

The "payen rites" to which Chaucer registers his opposition are certain practices initiated by the Chaldeans and Egyptians in earliest times and these have an influence upon the Ascendant. The fact is that Chaucer is repeating the objections which the great Ptolemy stated in the Tetrabiblos regarding divisions of the mansions into parts smaller than the thirty degrees allotted to them. Chaucer is averse to dividing the ecliptic into thirty-six decans or Faces of ten degrees each and assigning a ruler to each of these Faces.[1] This division puts three Faces in every house each with its own ruler while at the same time the house itself is ruled by the lord of the constellation which corresponds to the mansion because the constellation is astronomically in the mansion. Therefore, to place three other rulers in that same house seems incongruous, for there is no actual astronomical relation between the Face and the ruler assigned to it.

Ptolemy also discusses smaller divisions of the ecliptic called Terms of the Planets amounting to about five

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[1]Ptolemy, op. cit., Chapter XXXII, pp. 32-37.

degrees each[1] since there are six Terms in each sign. Both systems agree in their designation of rulers for the decans but for the disposition of the Terms, the Egyptian method differs from the Chaldean. Ptolemy says that the "Egyptian method preserves no regular distribution" in disposing the Terms of the planets in reference to the dominion of the triplicities. "In point of order it is defective, since it, in some instances, allots the first degrees of a sign to the lord of the house, in others to the lord of the triplicity, and others again to the lord of the exaltation."[2] Ptolemy shows the weakness of the Chaldeans in allocating rulers and a varying number of degrees to the Terms.[3]

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[1]Ptolemy, op. cit., Chapter XXXII, p. 32. "In reference to the terms of the planets, Placidus has these words ...: 'The dignity of the planets in the signs and their parts, which are called the bounds and terminations' (quasi, terms), 'have a real and natural foundation; to wit, the powerful aspect or proportional influxes to the movable points in which the stars begin to reproduce the primary qualities. So that, according to those things we have explained in the philosophy of the heavens, these are found to agree so well with the Aegyptian boundaries' (terms), 'that they are highly deserving of admiration.'"

[2]Ibid, p. 32.

[3]Ibid, p. 34.

It is interesting to note that scholars have taken Chaucer's reference to 'termes' in the Franklin's Tale to mean the nomenclature of astrology. Properly understood as one of the usages of astrology derived from the pagans, his statement that he does not understand the terms of astrology,

> I ne kan no termes of astrologye
> Kn T 1266

comes as a peculiarly fitting interpolation between remarks about the illusions of jugglery and the tricks and wretchedness of 'supersticious cursedness'; the Church's opposition to magical ceremonies and prediction was largely based upon their origin in the rites of pagans.

Chaucer further states that besides not understanding how some astrologians draw up a horoscope by using the smaller divisions of the ecliptic called Faces and Terms or by applying a rigid rule to the limitation of a planet's influence upon the Ascendant, he does not see how they say that a planet can be on the Ascendant when it has latitude from the ecliptic simply because it is rising in the same degree as the Face in which the longitude of the planet is reckoned. Chaucer says in Section 19 following, that the latitude of planets is commonly calculated from the ecliptic because none of them declines much out of the width of the

Zodiac; and that on account of the obliquity of the ecliptic, no heavenly body arises with the same degree of longitude as its latitude except in ONE case when the planet has NO latitude from the ecliptic line. Because of all these things, Chaucer's "spirit hath no feith, ne knowing of her / their / horoscopum" in these judicial matters and rites of pagans.

The "Infortunat ascendent tortuous" for which the Man of Law blames the unhappy journey of Constance is explained by Chaucer in Section 28. The signs from the beginning of Capricorn to the end of Gemini each take less than two hours to rise because they ascend at a more acute angle to the ecliptic than the signs that rise in the autumn. They are the signs of short ascension; hence, they are called the tortuous or crooked signs. The signs from the beginning of Cancer to the end of Sagittarius are called the sovereign signs. They take more than two hours each to rise and are the signs of right ascension. The signs of short ascension obey the signs of right ascension in the order of Gemini to Cancer, Taurus to Leo, Aries to Virgo, Pisces to Libra, Aquarius to Scorpio, and Capricorn to Sagittarius.[1]

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[1]Seligman, op. cit., p. 370.

Another matter concerning astrology is discussed in this part of the treatise which explains the difference between the twenty-four hours of the natural day and the planetary hours. Any natural hour can be quickly found by reference to the Border of the astrolabe, because every fifteen degrees equal one hour and each hour of the natural day is equal to any other. But the planetary hours are under the rulership of the planets and are 'inequal' because from equinox to equinox they are divisions of the day between sunrise and sunset and between sunset and sunrise. In the summer season, the time from sunrise to sunset is longer than in the winter. Consequently, the six day hours will be longer than the six night hours, but "Understand wel evermo generally the houre inequal of the day with the houre inequal of the night contenen 30 degrees of the bordure... answering to the degree of the equinoxiall." However, the chief factor about the planetary hours for which Chaucer makes a second special declaration in Section 12 of Part II, is that the sunrise hour of each day is ruled by the planet for which the day is named. The rulership of the succeeding hours follow the same order of planets over and over. Chaucer's explanation is as clear as any:

> The firste houre inequal of every Saturday is to Saturne, and the seconde to Jupiter, the thirde to Mars, the fourthe to the sonne, the fifte to Venus, the sixte to Mercurious, the seventhe to the mone. And then ageyn the 8 hour is to Saturn, the 9 to Jupiter, the 10 to Mars, the 11 to the sonne, the 12 to Venus. And now is my sonne gon to reste as for that Saturday. Then shewith the verrey degre of the sonne the houre of Mercurie entring under my west orisonte / horizon / at eve; and next him succedith the mone, and so furth by ordir, planete after planete in houre after houre, all the nyght longe til the sonne arise.
> Astro II, 12

On Saturday the first hour after sunrise, then, is ruled by Saturn and this would be a good time to prosecute affairs coming under his sway, or it might be the hour for the physician to make an amulet for a patient or to gather herbs for medicine, or to begin a certain kind of medical treatment. Matters ruled by Jupiter would be initiated in the second hour after sunrise on Saturday and the same would apply to other planetary hours.

The most outstanding example of the hours inequal in Chaucer's work is found in the Knight's Tale where one of the heroes, Palamon, goes to the temple of Venus to pray for success in love in the twenty-third hour on Sunday because that is an hour ruled by Venus. On Monday in the first hour after sunrise, an hour belonging to the moon, the heroine, Emily, goes to the temple of chaste Diana (moon) to pray to remain unwed. Four hours later in the hour ruled by Mars, the second hero, Arcite, in the temple of the

war-god, asks Mars for help in the coming tournament. In each case, the chosen hour was considered to be the propitious time for approaching the divinity.

Altogether Chaucer has given forty-six sections in the second part of his treatise to methods of finding astronomical data which are used in astronomy as well as in astrology and which in most cases require an instrument equivalent to the astrolabe. Even though a large part of the work is translation,[1] yet it must have been laborious; and to undertake it, the incentive must have been strong. Dr. C. A. Young, a former professor of astronomy at Princeton, in saying that astronomy has always been employed in navigation, surveying, and the observance of time concludes thus:

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[1]Robert Dudley French, A Chaucer Handbook, New York: F. S. Crofts and Co., 1932, p. 134. "His own Part I is founded very closely upon Messahala, though he has expanded his original frequently for the sake of greater clarity. In Part I, he has drawn about two-thirds of his material from Messahala, sometimes translating almost word for word."

> In ancient times the science was supposed to have a still higher utility. It was believed that human affairs of every kind, the welfare of nations, and the life history of individuals alike, were controlled, or at least prefigured, by the motions of the stars and planets; so that from the study of the heavens it ought to be possible to predict futurity. The pseudo-science of Astrology based upon this belief really supplied the motives that led to most of the astronomical observations of the ancients. Just as modern Chemistry had its origin in Alchemy, so Astrology was the progenitor of Astronomy.[1]

The introduction to the treatise indicates that much of the material in the last three parts was to apply chiefly to astrology. In Part III, however, tables for determining place and time on land or sea were to be given, and also tables to set a clock correctly and to afford other conclusions for calendars. A Table of Longitudes for Cities and Towns was to be included. In the absence of maps, such a table would be useful in drawing up horoscopes for which it is necessary to have the year, month, day, hour, and minute of birth along with the latitude and longitude of the place of birth of a person or of the time of a question.

In the former case, the horoscope is called the birth chart, radix, or root of the nativity. For a question, the horoscope is named a horary chart which must be analyzed by a different set of considerations that are applicable to

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[1]Charles A. Young, Elements of Astronomy, Boston: Ginn and Company, 1890, p. 3.

events, affairs, or things, as well as to person.

Another way in which an election (a horary chart) can be used, is to elect an auspicious time for commencing any project whatsoever. For example, the Man of Law asks in regard to the unfortunate voyage of Constance.

> Imprudent emperour of Rome, allas!
> Was ther no philosophre in al the toun? / astrologer /
> Is no tyme bet than other in swich cas?
> Of viage is there noon electioun,
> Namely to folk of heigh condicioun?
> Noght when a roote is of a burthe yknowe? / birth-time /
> M L T 309-314

The answer implied is that nothing should be started until the planets have moved into aspects with each other and the Ascendant which would favour the undertaking. When the querent's natal horoscope is known (as is usual with those of noble birth) the choice of time can be even better by referring to the natal Ascendant, to the natal house governing the matter, and to the ruler of that house. For a proposed long journey the ninth house conditions are studied. The third house is related to short journeys.

The same thing may be noted for the making of the wonderful brass horse when the Squire says:

> He that it wroght koud ful many a gyn; / knew /
> He wayted many a constellacion
> Er he had doon this operacion.
> S T 127-130

In the fourth part of the treatise Chaucer intended to explain the theory of the planetary motions and their causes. Chaucer probably meant the Aristotelian theory of the universe, summed up by Ptolemy: The earth is fixed at the centre; it is surrounded by the spheres of the pure essences of water, air, and fire, occupying the space below the moon's sphere and hence, called sublunary to distinguish them from the regions above the moon which were made of Aristotle's quintessence, the substance out of which the heavenly bodies were formed in the order of Moon, Mercury, Venus, Mars, Jupiter, Saturn, and Fixed Stars, all of which were enclosed by the sphere of the Primum Mobile. Around the Primum Mobile is the sphere of a kind of sublimated fire, the empyrean paradise and seat of God.

The motion of the heavenly spheres was supposed to be circular because Aristotle, following the Pythagorean idea, considered the circle perfect, even though circular motion did not fit the facts observed. In order 'to save the phenomena', epicycles had been introduced to account for the retrograde motion of the planets. The epicycles were smaller orbits on which a planet was said to turn while at the same time it was being carried around the earth on its own transparent sphere. It is worth noting that Aristotle rejected

the Pythagorean belief enunciated by Philolaus, that the sun, moon, and all the planets including the earth revolved around a great central fire, because Aristotle said that if the earth moved, the positions of the fixed stars would change.

> Thus the fundamental concept that none but circular paths suited the motions of heavenly bodies acted as a belief trap from which the brilliant genius of Greek thought sought in vain to escape.[1]

To explain gravity, motion in the imperfect sublunary spheres was believed to be rectilinear. The preponderance of one element in anything caused that thing to seek its own sphere. Hence, things belonging to earth, fell straight to earth while fire and air rose to their own spheres.

Chaucer planned to include a Moon Table in Part IV and a Table of Latitudes needed in erecting a horoscope. The Table of Latitudes gives the positions of the planets for particular latitudes while the Moon Table shows the movements of the moon day by day through every sign of the zodiac. It is useful in finding the best times for performing many things such as farm operations, medical treatments, or magic. For example, the Franklin says that it was the remembrance of a Moon Table book which made the brother of

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[1]Graubard, op. cit., p. 46.

Aurelius recall the clerk-philosopher of Orleans who would be able to bring about the disappearance of the rocks on Brettany shore:

> Now thanne conclude I thus, that if I myghte
> At Orliens som oold felawe yfynde
> That had thise moones mansions in mynde,
> Or other magyc natureel above,
> He sholde wel make my brother han his love.
> For with an apparence a clerk may make,
> To all mannes sighte, that all the rokkes blake
> Of Bretaigne were yvoyden everichon.
> Frank T 1151-1159

The fifth part was supposed to deal only with astrology "after the statues of oure doctours". A Table of Houses for the latitude of Oxford and a Table of the Dignities of Planets were to accompany the "general rewles of theorik in astrologie." The Table of Houses shows the degree of the sign coming up with the sun on the eastern horizon for every four minutes of the day as well as the signs and the degrees on the cusps of the six mundane houses on the left-hand east side of the astrolabe or horoscope. In sections 36 and 37 of Part II, Chaucer shows how to draw the horoscope and arrange the houses with the tenth house at the zenith and the fourth house at the nadir. The seventh house is opposite the Ascendant or first house. Each quarter of the globe or horoscope is then divided into three equal parts, this division giving three houses in each

quarter. The problem to solve is to find the signs in each of the houses. It is done with the Table of Houses since the signs for the houses on the west side are the opposite signs of the zodiac from those given for the east side.

An American astrologer of repute in the early twentieth century, E. Adams, gives a clear picture of the confusing matter of the houses. Adams has visualized the dome of the heavens as a great glass bowl with twelve segments, each of a different hue.[1] When an orb with its own peculiar glow or influence moves over the bowl, its effect will be colored by the segment through which it shines. Thus Saturn, in Scorpio, for instance, will give a different shade from Saturn in Aries; this will affect the affairs in the house of the horoscope where Saturn is posited. The horoscope, as it were, is a still-picture of the heavens at some particular time.

Chaucer indicates that his Table of Houses will be for the latitude of Oxford. What is the significance? The significance is that at the latitudes farther and farther north of the ecliptic belt, the degrees of the houses vary so much that a Table for one latitude or even for every five

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[1]E. Adams, The Bowl of Heaven, New York: Dodd, Mead and Company, 1930, p. 239-240.

degrees of latitude is a great convenience. As one complete revolution of the earth on its axis every twenty-four hours causes the globe to pass under the ecliptic, all places on earth will feel the influence of the whole zodiac in one day while the pattern of the planets is constantly changing; but any one spot will be at a different angle to the ecliptic from another and this may make a difference in degree of the sign on the Ascendant and on the cusp of every house. Such change may involve a new set of 'conclusiouns' from the point of view of the ruler of the Ascendant, the rulers of the houses, the dignities, and interactions of the heavenly bodies according to the various aspects between them and with the Ascendant. There must be a regard for the positions of the fortunate Dragon's Head (moon's north node) and the unfortunate Dragon's Tail (moon's south node). The effect of the angular, succedent, and cadent houses must be considered as well as the nature of the signs whether cardinal, movable, or fixed. A difference in longitude will affect the time of birth and a difference in latitude may change the arrangement of the signs in the mundane houses of the horoscope. The sign in which the nativity takes place is, of course, the sun sign, and is the basis upon which the whole horoscope is delineated. The Ascendant is only a part of it

and the total character could not be assessed upon it alone; but it reveals an important part of it, namely the surface personality. The importance of the Ascendant can be judged from the Wife of Bath whose delineation is largely based upon her Ascendant in Taurus and Mars as co-ruler with Venus.

Chaucer's reasons for wishing to teach these difficult sciences to little Lewis may be found in the words of R. T. Gunther:

> Our Academic Astronomy was founded on Ptolemy, but to the ecclesiastically minded a living interest was imparted by rules for finding the movable festivals of the Church. To the greater number of students there was incentive and fascination in the prospect of mastering the lucrative art of the Astrologer. The general experience of early medical men was that it paid to know mathematics; and even among the Arabian physicians the numbers who are known to have been eminent as mathematicians is remarkable. The close relationship between mathematical and medical sciences in quite early times was due to various causes, partly due to a general belief in the influence of the stars on human health, which required skill in the use of mathematical instruments as part of the equipment of a qualified medical man; to faith in the potency of certain numbers, particularly 3 and 7, and in geometric squares and figures such as mystic trigrams, pentacles, &c; to the belief of many physicians that drugs had to be compounded so as to bring out their dynamidiae (this no doubt led a physician like Arnaldo de Villa Nova (1235-c.1313) to the study of mathematics); and finally to the study of optics, especially by occulists, first among the Arabs and later among the thirteenth-century Western scholars.[1]

This interest of students was exhibited at least until the

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[1]Gunther, op. cit., II, pp. 9, 13.

time of Robert Recorde (1510-1558) "of commanding genius and educational foresight", Fellow of All Souls College, 1531, and Doctor of Medicine of Cambridge, 1548, who taught Astrology along with Arithmetic, Cosmography, Geometry, and Music.

This outline of Chaucer's Treatise on the Astrolabe with some brief indications of the extent of the work which it was planned to cover, may serve to show that the poet had a considerable understanding of astronomy and of astrology and that he might well say of these studies as he did of Love:

> The lyf so short, the craft so long to lerne,
> Th'assay so hard, so sharp the conquerynge,
> P F 1-2

It seems quite clear from the study of his conclusions and declarations that he did not accept all the rules of 'these old astrologiens' but that his interest and belief were sufficient to cause him to undertake an arduous task; for as he says:

Of usage--what for lust and what for lore--
On bokes rede I ofte, as I yow tolde.
But wherfore that I speke al this? Nat yoore
Agon, it happede me for to beholde
Upon a bok, was write with lettres olde,
And thereupon, a certeyn thing to lerne,
The longe day ful faste I redde and yerne.

For out of olde feldes, as men seyth,
Cometh al this newe corn from yer to yere,
And out of olde bokes, in good feyth,
Cometh al this newe science that men lere. / learn /
P F 14-25

CONCLUSION

The origins of medieval conceptions in science are in the very beginning of human thought. The Mesopotamians four millenia before Christ recorded beliefs in water, fire, earth, and air as the basic elements of matter. The Greek philosophers developed those ideas into the doctrine of the Four Elements with their related qualities and complexions. Along with the doctrine of the Macrocosm and Microcosm, it passed from Plato and Aristotle through the Stoics and Neo-platonists to Christians and Arabs and thence to the people of the Middle Ages in the West. Astronomy, astrology, medicine, surgery, and magic followed the same path from Mesopotamia and Egypt to Europe. Alchemy was the latest science to develop; its origins were in the union of Greek philosophy with the technological processes of the metal and dyeing crafts of Egypt and the Orient.

The conquests of Alexander in the fourth century B.C. did much to bring the Mesopotamian practices and ideas to the attention of the Greek philosophers and to stimulate

their thought. In the fifth century A.D. exiles from religious oppression carried learning from Greek Alexandria first to Constantinople and then back to the Middle East. In the eleventh century A.D. the body of accumulated knowledge passed from Asia Minor to Spain and Italy by way of the Crusaders and the Moors, whence it was received by the Latin scholars. Learning seems to have passed between East and West by ever-widening waves or oscillations.

The early Church Fathers were inclined to reject science in general because it was not important to Christianity's goals and because the doctrine of the Macrocosm and Microcosm implied that man was not a free-will agent. Besides the Church disapproved of all arts of divination as part of paganism; astrology was scarcely differentiated from necromancy, soothsaying, oracles, and magic. Augustine along with Tertullian and Lactantius vigorously opposed astrology and caused its eclipse for eight centuries. They believed that successful divination by astrology could not be achieved except by the aid of evil spirits. Such successes as astrologers had, were the result of demons whispering in their ear. "Augustine crystallized the doctrine of the early Church regarding the powers of demons, and laid the foundation for those mediaeval

superstitions which bore malignant fruit in the magic and witchcraft of the fifteenth century."[1]

Isadore of Seville in the seventh century, while sharing the Church's condemnation of astrology, especially judgments of character, makes allowance for the use of astronomy in medicine, admits the influence of the moon over fruit, brains, and oysters, and accepts comets as signs of war and plague. His voluminous encyclopedia spread his ideas everywhere.

During the early Middle Ages, Europe and England had only a rudimentary body of science but it was the basis for later development. In the early twelfth century, Aristotle's works on science were translated from Arabic to Latin. From Ptolemy's adoption of Aristotle's conception of the Universe which fitted Christian beliefs well, astrology had become wedded to astronomy. In accepting

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[1]Wedel, op. cit., p. 23. T. O. Wedel points out, however, that the Crusades brought western Europe into fresh contact with Arabian beliefs in magic, djinns and demons, and stories of fabulous wonders; these ideas became linked with the folk-lore magic of Europe like fairies, elves, and dwarfs.

The Metamorphoses or Golden Ass written by Apuleius, a very popular book during the Middle Ages and full of stories of magic, demons, wizards, and witches probably contributed greatly to the witchcraft delusion in my opinion.

Aristotle's views on cosmology, the structure of the universe, the four elements, and astronomy, they felt impelled to receive astrology.

To make these new ideas acceptable to the Church posed a problem. St. Thomas Aquinas and Albertus Magnus solved it. A passage in the City of God was found in which Augustine admitted that the stars had some control over human bodies; he demanded merely that human free-will should be supported. This declaration gave a sanction for the approval of medical astrology and the Ptolemaic astrology which denies determinism and asserts man's ability to control his stars. It also distinguishes between particular prediction and general prognostication. By this time, too, the astrological work of Albumasar based on scientific astronomical factors that placed it above a mere method of divination, permitted the Church to accept astrology as a science. However, some features were frowned upon: particular judgments, determinism, and magic. At this time, the theologians were having a serious struggle against the fatalism of the Arabian philosophy and they became more willing to compromise on the stars.

St. Thomas asserted that to predict the future with certainty, that is to make particular judgments by the aid

of astrological configurations, could only be successful with the aid of demons and therefore could not be tolerated, and astrological images and charms also fell under censure for the same reason. He firmly believed that necromancy and magic were possible.

When condemnations of judicial astrology appeared in the pages of writers in the later Middle Ages, they were based upon the old works of Augustine and Isadore. By the fourteenth century "a sane science no longer had anything to fear at the hands of the Church."[1] But the Church's view remained that divination in any form was impiety. It allowed no leniency with regard to such forms of magic as geomancy.

The contemporary of Thomas Aquinas, Roger Bacon, is enthusiastic in praise of astrology as a useful science for agriculture, weather prediction, chemistry, and medicine like his master Robert Grosseteste, the Bishop of Lincoln. Dante condemns diviners and astrologers in the Inferno but restores astrology to its place in Christian cosmology when he comes to the Purgatory and Paradise. Chaucer was well acquainted with Dante's poem, The Divine Comedy.

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[1]Wedel, op. cit., p. 70.

During the fourteenth century there was an increasing interest in astrology among literary men. In the Romaunt of the Rose, Jean de Meung writes a long explanation of the stars and their influence which echoes Thomas Aquinas. He upholds the doctrine ascribed to Ptolemy: A wise man can triumph over his native passions. Deschamps, too, adheres firmly to astrology and upholds free-will.

Gower and Chaucer saw the artistic possibilities in the new science. Gower included a discussion of astrological matters in a long section on natural science in the Confessio Amantis.[1] Along with other passages in the Vox Clamantis and Mirour de l'Omme it is easy to determine his attitude to astrology. He completely accepts Albumasar's science of the stars and in a preamble to his astrological discussion, he affirms the orthodox attitude to free-will. But Gower slightly steps over the border drawn by the Church around the magic circle when he accepts magic employed for a good cause.

Chaucer used the sciences more than any other writer of his time. He imitated his mentor, Machaut, but employed the materials much more extensively and more brilliantly to

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[1]Conf. Am. 7. 670-684. (Wedel, op. cit., p. 134)

increase the interest, beauty, and content of his verse. He has no didactic purpose and seldom betrays his own personal beliefs. At least he was guarded enough to voice any unorthodox views through the mouths of his characters.

Through his use of borrowings from France, Chaucer has given to English readers many of the magic wonders, delights, illusions, and marvels that the French romances had received from Arabic sources and had incorporated with the folk-lore magic and fairies of their own land. Chaucer created some remarkable scenes and incidents of great beauty or interest with magic in the House of Fame, the Franklin's Tale, and the Squire's Tale, for example, and with the 'faerye' element in the Wife of Bath's Tale of the Loathly Lady and the Merchant's Tale of January and May. Space prevents further discussion of a valuable and fascinating part of Chaucer's work. The Parson's view seems to express Chaucer's attitude toward practices of magic and which agrees with that of Gower. He may think that amulets or images can be tolerated if they are used for a good purpose, namely to heal the sick; otherwise, magic is wrong or merely entertaining illusion of tregetours.

The science of alchemy provided the subject and material for a humorous interlude in the pilgrimage and a

satirical commentary upon the life of the times, especially the laziness and hypocrisy of some types of clergymen and their abuses of the garb that they wore. The Canon's Yeoman gives the reader an insight into the philosophy and practices of the science and of those who have been caught by its fascination. Chaucer, himself, claims that his true purpose in presenting the Canon's Yeoman's Prologue and Tale is to warn people away from falling prey to alchemy in any shape or form. Chaucer appears to think that it is too difficult and too costly. He does not give a clue to his own disbelief or belief in its claims. Just as alchemy pursues a life apart from society, the Canon and his Yeoman were not actually a part of the pilgrimage. It was a clever touch of genius to suit their entrance into the pilgrimage to their calling.

The references to medicine are many but they are scattered throughout the body of Chaucer's work, often in a line or two. Frequent mention is made of the four elements: fire, earth, air, and water, their qualities and complexions. The outstanding example is in the case of Chaunticleer. The Cook's mormal and the Summoner's skin disease sharpens the outlines of their sketches. The doctrine of the Macrocosm and Microcosm as pictured in the

Zodiac man was implicit in the practice of medicine.

The disease, Hereos, was of such interest that it is described in numberless French poems. Chaucer has made good use of it also. It moves the action of the plot in the Knight's Tale because both Arcite and Palamon have caught the disease. Absalon is brought to a most ludicrous and undignified position under the carpenter's window because of his 'love-longynge'. There are more cases which makes Chaucer's treatment of the subject worthy of further comment. The same applies to the effect of 'phantasy'.

For making healing images and treatments in fortunate aspects of the planets, Chaucer declares that the Physician has the requisite knowledge of astronomy. The Physician's portrait gets a whole battery of medical authorities to increase the feeling that he is very learned.

Dreams as a prognostication of disease or of other things to come receive much attention from Chaucer. They seem to be one of his favorite topics and they are of perennial interest. Dreams have provided a great amount of entertaining material for Chaucer's verse.

Chaucer's highest achievement is his gallery of portraits. His power to select the most appropriate and vivid details from the medieval manuals for formal

portraiture or from the physiognomists' manuals as well as pertinent astrological factors, enables him to create characters of surpassing charm or interest. He has imitated the French and Italians in using a learned effictio in the accustomed fashion solely to decorate and to amplify the verse. Later he gave originality to his portraits by using varied types of all classes and by developing the character through suitable speech and action. As L. Haselmayer and W. C. Curry say, Chaucer has employed astrology, medicine, and physiognomy in depicting his characters.

The Treatise on the Astrolabe proves that Chaucer had a good knowledge of astronomy and astrology. An actual comparison of his treatise with the original Tetrabiblos of Ptolemy reveals an amazing fidelity to the original, especially considering the hands through which passed the astrological work of the great Greek astronomer. In fairness to Chaucer, excerpts cannot be taken from the context; Chaucer was at one with most of the learned men of his time. He believed in the science as it was taught by Ptolemy although he may accept the belief in elections. He was so familiar with the observations of sky time rather than the more mundane clock hours, that

> Like the daring young man on the flying trapeze
> He could fly through the rhymes with the greatest
> of ease.

In the same way he introduced the effect of the planets upon character or arranged the astrological data to move the action of the plot of a story. Gower and other poets used elements drawn from astronomy as well as alchemy, medicine, and magic but never produced the same effect of ease or the same clarity and brilliance as Chaucer because they did not master the subjects to the same degree that Chaucer achieved.

From the beginnings of his work to the last, Chaucer evinces an interest in the works of old authors and refers often to 'myn aucter'. He drew from many sources but four are pre-eminent: Boethius, Ovid, Jean de Meung, and Boccaccio. Most passages concerning philosophy, especially predestination, or morality, or Stoic determinism and free-will as well as his Platonic belief that nobility comes from character not birth were inspired by Boethius. To Jean de Meung, Chaucer owes the satirical attitude and mocking skepticism to be found in the General Prologue and in the prologues of the Wife of Bath and of the Pardoner, the attitude of looking at life as a comedy with critical sarcasm and skepticism. Ovid remained Chaucer's favorite

author throughout his writings and continuously gave the later poet ideas about ways of achieving color, vivid description, ease of expression, grace, and form, and ideas of classical myth and legend. From the Italians, Chaucer derived great intellectual stimulus; he gained new concepts of the individual worth, of a better artistic form, not to mention material for the House of Fame and the substance of two major works, the Knight's Tale and Troilus and Criseyde.

For himself, Chaucer never became a deep thinker and therefore he never became emotionally involved in any burning issues. He never felt a need to preach or teach. But he had an eagerness and receptivity of mind that led him to investigate the sciences of his day and to employ them constantly and to the greatest advantage.

BIBLIOGRAPHY

Books

Adams, Evangeline: The Bowl of Heaven, New York: Dodd, Mead and Company, 1926.

Adams, Evangeline: Your Place in the Sun, New York: Dodd, Mead and Company, 1933.

Artz, Frederick B.: The Mind of the Middle Ages, A.D. 200-1500, (An Historical Survey), New York: Alfred A. Knopf, 1953.

Aristotle; Works of Aristotle, trans., R. P. Hardie and R. K. Gaye, Oxford: Clarendon Press, 1930.

Barrett, Gloria: Astrological Physiognomy, Chicago: Aries Press, 1941.

Bateson, Mary: Medieval England 1066-1350, London: T. Fisher Unwin, 1905.

Berdan, John M.: Early Tudor Poetry, New York: Macmillan, 1920.

Binder, Pearl: Illus. Chaucer's Wyfe of Bath, London: Mandrake Press, 1929.

Boas, Guy: Chaucer and Spenser, London: Thomas Nelson and Sons, 1926.

Bowden, Muriel: A Commentary on the General Prologue to the Canterbury Tales, New York: Macmillan, 1949.

Burton, Robert: The Anatomy of Melancholy, eds., Floyd Dell and Paul J. Smith, New York: Farrar and Rinehart.

Burtt, E. A.: The Metaphysical Foundations of Modern Science, London: G. Bell and Sons, Ltd., 1924.

Butler, E. M.: The Myth of the Magus, Cambridge: University Press, 1948.

Butterfield, Herbert: Origins of Modern Science 1300-1800, London: G. Bell and Sons, Ltd., 1950

Butterfield, Herbert: "Dante's View of the Universe", Origins and Results of the Scientific Revolution, A Symposium, London: Cohen and West, Ltd., 1951.

Chayter, H. J.: The Troubadors and England, Cambridge: University Press, 1923.

Chute, Marcette: Geoffrey Chaucer of England, New York: E. P. Dutton and Company, Incorporated, 1947.

Clow, A. and N.: The Chemical Revolution: 'A Contribution to Social Technology', London: G. Bell and Sons, Ltd., 1952.

Coghill, Neville: The Poet Chaucer, (Home Univ. Library), Toronto: Oxford University Press, 1949.

Cohen, Maurice R. and Drabkin, I. E.: A Source Book in Greek Science, First Edition, McGraw-Hill Book Company, Inc., Toronto, 1948.

Coulton, G.G.: Medieval Panorama, The English Scene from Conquest to Reformation, Cambridge: University Press, 1939.

Coulton, G. G.: Chaucer and His England, Third Edition, London: Methuen and Co., Ltd., 1921.

Cowling, G. H.: Chaucer, London: Methuen and Co. Ltd., 1927.

Craig, Hardin: ed., A History of English Literature, New York: Oxford University Press, 1950.

Crump, C. G. and Jacob, E. F.: The Legacy of the Middle Ages, Oxford: Clarendon Press, 1932. (Toronto)

Curry, Walter C.: Chaucer and the Mediaeval Sciences, New York: Oxford University Press, 1926.

Davies, R. Trevor: A Sketch of the History of Civilization in Medieval England, 1066-1500, London: Macmillan Company, Ltd., 1924.

Ellis, Havelock: The World of Dreams, Boston: Houghten Mifflin Company, 1911.

Forster, J. C.: Philosophies of Plato and Hegel, Oxford: Clarendon Press, 1935.

French, Robert D.: A Chaucer Handbook, New York: F. S. Crofts and Co., Inc., 1927.

Freud, Sigmund: The Interpretation of Dreams, trans., James Strachey, First Edition, New York: Basic Books, Inc., 1955.

Godwin, W.: Lives of the Necromancers, The Golden Library, London: Chatto and Windus, Piccadilly, 1876.

Graubard, Mark: Astrology and Alchemy, Two Fossil Sciences, New York: Philosophical Library, Inc., 1953.

Gunther, R. T.: Early Sciences in Oxford, London and Toronto: Oxford University Press, 1922.
Part I, The Biological Sciences,
Part II, The Biological Collections,
Part III, Medicine and Astrology, Printed for the Subscribers.

Hadow, Grace E.: Chaucer and his Times, Toronto: William Briggs, 1914.

Hammond, Eleanor P.: Chaucer: a Bibliographical Manual, New York: Peter Smith, 1933.

Haselmayer, Louis A., Jr.: Chaucer and Medieval Verse Portraiture, Ph.D. dissertation, Yale University Library, 1937.

Haskins, Charles Homer: Studies in the History of Mediaeval Sciences, Cambridge: Harvard University Press, 1924.

Hawks, Captain Ellison: Astronomy, Edinburgh and London: T. C. and E. C. Jack, Ltd., 1922.

Heindel, Max and Augusta: The Message of the Stars, Eighth Edition, Oceanside: The Rosicrucian Fellowship, 1928.

Hearnshaw, F. J. C.: Medieval Contributions to Modern Civilization, New York: Barnes and Noble, Inc., 1949.

Hill, Clara: The Unique and Complete Contribution of Chaucer to English Literature, Master's thesis, Univ. of Sask. Library, 1929.

Hill, Frank, E.: Canterbury Tales in Modern Verse, Toronto: Longmans, Green and Co., Ltd., 1930

Hole, Christina: Witchcraft in England, London: B. T. Batsford, Ltd., 1945.

Jeans, Sir James: The Growth of Physical Science, Cambridge: Cambridge University Press, 1947. / Jeans revised the proofs of this book shortly before his death. /

Jowett, B.: trans., Dialogues of Plato, Third Edition, Five Volumes, Oxford: Clarendon Press, 1892.
Republic, pp. 1-307
Timaeus, pp. 307-339
Critias, pp. 339-517

Jusserand, J. J.: English Wayfaring Life, the Middle Ages, trans., Lucy Toulmin Smith, New Edition, London: Fisher Unwin Ltd., 1921.

Ker, WP: Essays on Medieval Literature, New York: Henry Holt and Company, 1912.

Kittredge, George L.: Chaucer and His Poetry, Cambridge: Harvard University Press, 1927.

Kramer, Edna E.: Main Stream of Mathematics, New York: Oxford University Press, 1951.

Legouis, Emile: Geoffrey Chaucer, trans., L. Lalavoix, Dent, Dutton, 1913. U. Lib.

Lord, John: Beacon Lights of History, Volumes 20, Vol. I, 'Old Pagan Civilizations', New York: James Clarke and Company, 1883.

Lovejoy, A.: The Great Chain of Being, Cambridge: University Press, 1936.

Lowes, John L.: Geoffrey Chaucer, Toronto: Oxford University Press, 1934.

Magoffin, R. V. D. and Duncalf, F.: Ancient and Medieval History, New York: Silver Burdett Company, 1947.

Manly, John M.: Canterbury Tales by Geoffrey Chaucer, New York: Henry Holt and Company, 1929.

Manly, John M.: Some New Light on Chaucer, New York: Henry Holt and Company, 1926.

Masefield, John: Chaucer, Cambridge: University Press, 1931.

Mason, Stephen, F.: Main Currents of Scientific Thought, New York: Henry Schuman, 1953. Vol. 32 in The Life of Science Library. (Printed in Great Britain by Butler and Tanner Ltd.)

McKie, D.: 'The Birth of Modern Chemistry', History of Science, A Symposium, London: Cohen and West, Ltd., 1951.

Metham, John: The Works of John Metham, from the unique manuscript in the Garrett collection in the library of Princeton University, ed., Hardin Craig, Ph.D., London: Pub. for Eng. Text Society, Humphrey Milford, Oxford University Press, 1916.

Moulton, Forest Ray and Schifferes, J.: eds., The Autobiography of Science, First Edition, Garden City, New York: Doubleday, Doran and Company, Inc., 1945.

Muller, Herbert J.: Uses of the Past (Profiles of Former Societies), New York: Oxford University Press, 1953.

Murray, John A.: A New English Dictionary (on Historical Principles), Oxford: Clarendon Press, Volumes 20, Vol. 1.

Newcomb, Simon: Astronomy for Everyone, rev., and ed., Prof. R. H. Baker, New York: Doubleday, Doran and Co., Inc., 1942.

Pahlow, Edwin W.: Man's Achievement to the Age of Steam, New York: Ginn and Company, 1934.

Painter, Sidney: (John Hopkins University) A History of the Middle Ages, 284-1500, New York: Alfred A. Knopf, 1953.

Pollard, A. W.: Chaucer's Works, Toronto: Macmillan, 1923.

Preston, Raymond: Chaucer, New York and London: Sheed and Ward, 1952.

Previte-Orton, C. W.: Twelfth Century to Renaissance, The Shorter Camb. Med. Hist. Vol. II, Cambridge University Press.

Price, Mary R.: Portrait of Britain in the Middle Ages 1066-1485, Oxford: Clarendon Press, 1951.

Ptolemy, Claudius: Tetrabiblos, translated from Greek, J. M. Ashmand, Chicago: Aries Press, 1944.

Quiller-Couch, A. T.: Age of Chaucer, London: J. M. Dent and Sons Ltd., 1939.

Rickert, Edith: Chaucer's World, London: Oxford University Press, 1948; New York: Columbia University Press, 1948.

Robinson, F. N.: Ed. The Complete Works of Geoffrey Chaucer, Students' Cambridge Edition, Chicago: Houghton Mifflin Company, 1933.

Root, Robert K.: Poetry of Chaucer, rev. ed., Chicago: Houghton Mifflin Co., 1922.

Ross, W. E.: Ed. The Works of Aristotle (Volumes XX), Vol. II, trans., 'Physics' by R. P. Hardie and R. K. Gaye, 'De Caelo' by J. L. Stocks, 'De Generatione et Corruptione' by H. H. Joachim, Oxford: Clarendon Press, 1930.

Saintsbury, George: 'Chaucer', Cambridge Hist. of Eng. Lit., Vol. 2, 1923-1941, 172-224, Putnam, 1908.

Salzman, L. F.: English Life in the Middle Ages, First Edition, London: Oxford University Press, 1926.

Schofield, W. Henry: Chivalry in English Literature, English Literature, London: Macmillan Co., 1906. (Holy Grail, Merlin, Arthur)

Seligman, Kurt: History of Magic, New York: Pantheon Books, Inc., 1948.

Shelley, Percy: The Living Chaucer, Philadelphia: University of Pennsylvania Press, 1940.

Singer, Charles, M.D., Ph.D.: Oxford: Clarendon Press.
The Evolution of Anatomy, Oxford, 1925.
A Short History of Medicine, Oxford, 1928.
A Short History of Biology, Oxford, 1931.
Greek Biology and Medicine, Oxford, 1922
From Magic to Science, London, 1928.
A Short History of Science, Oxford, 1941.

Skeat, Walter W.: The Complete Works of Chaucer, Oxford: Clarendon Press, 1915.

Slesser, Sir Henry: The Middle Ages in the West, London and New York: Hutchinson and Co., Ltd., 1950.

Snell, F. J.: Age of Chaucer, London: Geo. Bell, Ltd., 1901.

Somervell, D. C.: A History of English Thought in the Nineteenth Century

Stephenson, Carl: Medieval History of Europe, Third Edition, New York: Harper and Brothers, 1951.

Symonds, John Addington: Renaissance in Italy, New Edition, London: Smith, Elder and Company, Ltd., 1912.

Tatlock, J. P. and MacKaye, Percy: Complete Poetical Works of Chaucer, New York: Macmillan Co., 1950.

Thompson, C. J. S.: Quacks of Old London, Philadelphia: J. B. Lippincott Co., 1929. (Printed in Great Britain)

Thorndike, Lynn: A History of Magic and Experimental Science, VolumesVI, New York: Columbia University Press, 1923-1941.

Trevelyan, G. M.: England in the Age of Wycliff, New Edition, London: Longmans, Green and Co., 1909.

Ward, A. W.: Chaucer, English Men of Letters Series, New York: Macmillan, 1909. Reissue.

Wedel, T. O.: The Mediaeval Attitude toward Astrology (Particularly in England) Yale Studies in English, ed., Albert S. Cook, LX., New Haven: Yale University Press and London: Oxford University Press, 1920. (A Ph.D. dissertation).

Willey, B.: The Eighteenth-Century Background, London: Oxford University Press, 1946.

Young, Charles A.: Elements of Astronomy, Boston: Ginn and Co., 1890.

Articles

Camden, Jr., Carroll: "Chaucer and Elizabethan Astrology", Modern Language Notes, XLX (May 1930), 298-299.

Camden, Jr., Carroll: "The Physiognomy of Thopas", Review of English Studies, XI (1935), 326-330.

Collins, Ross: "Medieval Peasant", Dalhousie Review, XXI, No. 4, January 1942, 421-422. (Magic)

Cowling, Geo. H.: "Chaucer's 'Complaintes of Mars and Venus'," Review of English Studies," 11 (Oct. 1926), 405-410

Curry, Walter Clyde: "The Malady of Chaucer's Summoner", Modern Philology, XIX, (1921-1922), 395-403.

Curry, W. C.: "Chaucer's Reeve and Miller", Publications of the Modern Language Association of America, XXXV, (1920), 187-209.

Curry, W. C.: "Destiny in Chaucer's Troilus", Publications of the Modern Language Association of America, XLV (Mar. 1930), 129-168.

Haselmayer, Louis A.: "The Portraits in Chaucer's Fabliaux," Review of English Studies, XIV, (1938), 300-314.

Landrum, Grace W.: "Chaucer's Use of the Vulgate", Publications of the Modern Language Association of America, XXXIX, 75-100.

Lowes, Hon. L.: "The Loveres Maladye of Hereos","Vol.II (1913-1914), Modern Philology, II, (1913-1914), 491-527.

Manly, J. M.:"Three Recent Chaucer Studies,"Review of English Studies, X, (1934).

Maxfield, Ezra Kempton: "Chaucer and Religious Reform", Publications of the Modern Language Association of America, XXXIX, (1924), 64-74.

Price, Derek: "The Equatorie of the Planets"-II, The Times Literary Supplement, March 7, 1952. ...."It must be sadly admitted that the brilliant son, godson, or literary invention, 'litel Lowis' of the work on the astrolabe does not appear in the Peterhouse manuscript [of the "Equatorie of the Planetis"]. Perhaps the author may have intended to write him into a finished version; for our text of the "Equatorie" though it stands complete, is not a finished script."

This article was kindly lent by Dr. D. D. Cameron, University of Saskatchewan.

Root, Robert Kilburn, and Henry Norris Russell: "Troilus and Criseyde", Publications of the Modern Language Association of America, XXXIX, (1924), 48-63. Prof. Russell, head of the department of Astronomy at Princeton is responsible for the purely astronomical elements of this article. Prof. Root is sponsor for the astrology and for the literary history. This article deals with the actual date of the great rain in Troilus and Criseyde.