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**The Occult Sciences of Astrology, Alchemy  
and Magic and their Relation to Other  
Greco-Arabic Sciences**

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# **The Occult Sciences of Astrology, Alchemy and Magic and their Relation to other Greco-Arabic Sciences**

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In twelfth century Western Europe, Christian scholars suddenly developed (for reasons still not entirely clear), a voracious hunger for the advanced scientific learning of the Moslems. For about 200 years (c.1100-1300) these Western scholars located, read, translated and assimilated Arabic texts on Greco-Arabic Science<sup>1</sup>.

This Greco-Arabic Science was essentially an Arabic Neoplatonic synthesis of Aristotle's Natural Science. It had a compellingly attractive feature to it. While its science was intimately wedded to Islam, it was not an entirely closed system prohibiting discussion or elaboration but rather a remarkably unified vision of the relation of God, Man and Nature produced by a curious (to the modern mind perhaps) fusion of theology, philosophy and the sciences. At the time, Christendom, especially Western Christendom, had nothing like it. Every art and science known to man, from metallurgy and mining, to ethics and political science and ultimately to theology had a place in this grand hierarchical overview.

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<sup>1</sup> Called Greco-Arabic Science because it was a continuation of Greek Science cultivated by Arabic speakers under Islam. The translations began c 1126 with Adelard of Bath's translation of the astronomical tables of al-Khwarizmi and continued until 1176 or thereabouts with Gerard of Cremona's translation of Ptolemy's *Almagest*. In the thirteenth century these works and the philosophical and scientific writings of Aristotle and Averroës were assimilated. Nicholas Rescher "By 1300 the processes of active translation had slowed down to a mere trickle." *Studies in Arabic Philosophy*, University of Pittsburgh Press, 1966, p.156.

By the beginning of the twelfth century, Moslem culture, drawing upon Greek philosophy and science, had articulated a pyramidal synthesis of all knowledge which placed Allah and His Koran as the cap-stone of this pyramid and viewed the various other arts and sciences as derivative and therefore as supportive and subordinate to Islam. Through the ramifications of the subdivisions of the sciences and due to the different applications and sub-disciplines pertaining to each of the subordinate arts and sciences the conceptual area covered by this arrangement was broad at the "bottom" of the pyramid, i.e. in their application to human life, and narrow at the "top" as the many practical arts were ruled by or subordinated to a few key sciences, which were in turn regulated by Allah and the Koran.

This all-encompassing model of knowledge (set forth in a number of documents, some of which were translated into Latin in the twelfth century and some of which became known to Western scholars later)<sup>2</sup> was, surely an ordering technique intended to support the Koran and Moslem religion but it also assisted in the regulation of civil affairs since it subordinated jurisprudence, political science, economics and military science to theology. It was therefore an important theocratic tool. But it also functioned as a mnemonic device facilitating the orderly arrangement of complex subjects in the philosopher's mind and promoted the opportune recall of needed information stored in the memory in an appropriately hierarchical fashion.

This conceptual model gave legitimacy to the arts and sciences so arranged. Once its position in the hierarchy of human knowledge was established, the given art or science had a place in the hierarchy nearer to or farther from Allah, the source of all authority. What is most notable about this is that astrology, alchemy and magic were placed immediately beneath the Koran and hence, above all the other arts and sciences.<sup>3</sup>

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<sup>2</sup> E.g. the *Rasa'il* of the *Ikhwan as-Safa*, discussed below, and Alfarabi's *De ortu scienciarum*, translated by Gundisallinus in the 12th century. C.f. also, the *Introductorium maius* of Abu Ma`shar.

<sup>3</sup> Hence when Agrippa (*De Occulta Philosophia*, Bk I, chapter 1) defines Magic as "The most perfect and chief science, that sacred and sublimer kind of philosophy, and lastly the most absolute perfection of all most excellent philosophy," he is merely repeating the vision of magic's priority as conceived in Medieval Islamic Science.

## Origins of the Islamic Order of Science.

Medieval Islamic orthodoxy did not succeed, initially in stifling all heterodoxy. By the eighth century, the intellectual world, the Arabs had taken possession of was rich in philosophy and science and astrology, alchemy and magic played significant roles in societies, which came under Moslem control.<sup>4</sup> Unlike the Germanic barbarian invasions, which transformed the Roman Empire and gave rise to Feudalism, the Arab conquest of the East was swift and left the society mostly intact.

The desert Arabs had been without science and, according to Ibn Khaldun (writing in the fourteenth 14th century), prior to the Prophet, were totally ungovernable and wild. Islam was what was needed to bring to them any semblance of civilization. It did this well for by 762 AD Baghdad had been founded and by 813 the *Bait al Hikma* (House of Wisdom) was established there. It was designed to be a place in which to assimilate the wealth of wisdom that the Arab Empire had inherited. To further the cultural flowering of the Abbassid Dynasty, the Caliph Al-Mansur<sup>5</sup> asked the Byzantines, the Persians and the Indians to send him texts on science and translators to render them into Arabic. They complied with the request. Observatories were constructed near Damascus and Baghdad and translations of Greek, Syriac, Persian and Sanskrit literary, scientific and philosophical works were avidly undertaken.

This flurry of translation brought to the ken of the Arabs the mathematical and astronomical works of the Indians (the Siddhantas, called by the Arabs the Sindhind), the astrological doctrines of the Babylonians, Chaldaeans, Persians and others; and the philosophical works of the Greeks. Of especial importance were

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<sup>4</sup> By 711 the Islamic World spread from India, west through Persia, the Arabian Peninsula, Egypt and the Mideast, excepting large areas of Anatolia controlled by Christian Byzantium, North Africa to the Atlantic Ocean and Spain to the Pyrenees.

<sup>5</sup> abu-Ja`far `Abdullah al-Mansur 712?-775. Second Abbasid caliph (754-775). He moved the seat of government to the new city of Baghdad. He was a patron of learning, encouraging the translation of Greek and Latin classics into Arabic.

the Neoplatonic writings, the Hermetic writings and the scientific writings of Aristotle, which the Latin Christians had been without until the twelfth century. The prejudices of Islam being different than those of Christianity, science, philosophy and medicine flourished under the Arabs.

The ideas introduced into Islamic society by the translation of these literatures gave rise to numerous heterodox interpretations of Islam, which quickly found it necessary to present themselves as esoteric doctrines circulated in small, discreet communities.

Moslem orthodoxy kept a wary eye out for heterodox opinions that had any potential for unseating the religious *status quo* and especially for any resurgence of astrological polytheism. Nevertheless, in the eighth and ninth centuries numerous *Batineeyeh* (esoteric) movements began (such as Isma`ilism) which arose either from exposure to Greek, Persian or Indian ideas or were survivals of pre-Islamic sects (e.g. the Mandaean and Harranian Sabaeans).

These movements played a role in spreading the occult sciences to Western Christian lands after 1100 when Islamic religious reaction suppressed all but the most orthodox views in the Mid East. It is also true that early orthodox Moslem theology held ideas about fate that were favourable to the acceptance and development of astrological determinism. For the early orthodox theological Moslem *Ashariyeh*, "nothing in the whole Universe, neither a class nor an individual being...is due to chance; everything is the result of will, intention and rule."<sup>6</sup>

Of great importance to our discussion is the influence of the philosophical movements within Islam and in particular that of Neoplatonism, which had from its inception in Alexandria in the first half of the third century<sup>7</sup> been favourable to theurgy (divine magic). Neoplatonism soon absorbed an interest in astrology from

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<sup>6</sup> Maimonides, *Guide for the Perplexed*, III, 17. trs Friedländer, Dover, NY 1956.

<sup>7</sup> Neoplatonism was founded in Alexandria in the early 3rd century by Ammonius Saccas, teacher of Plotinus, Origen, Longinus and others by fusing the teachings of Plato with those of Aristotle.

the Stoics. It is already discussed in Plotinus's (205-270) *Enneads*<sup>8</sup> and in *The Letter to Abammon*, attributed to Iamblichus (d. c. 333), a belief in astrology is well established in the Syrian school of Neoplatonism. Neugebauer states that the philosophers of the sixth century Academy of Athens, by then Neoplatonists, were engaged in making gold<sup>9</sup>. Alexandria in Egypt was fertile ground for the development of astrological theory, practice and the development of mathematical methods.

The Arabic Neoplatonists carried on the philosophical realism of their Greek antecedents and saw the causes of terrestrial phenomena in the celestial and super celestial (Ideal) worlds. Their threefold division (world of the elements; world of the celestial; and world of the super celestial or the Ideal world) corresponded to the fields in which the sciences of alchemy, astrology and magic operated.

Alchemy was the action of body on body (elemental). The astrological talisman was an action of spirit on body (celestial). Magic was regarded as an action of spirit on spirit (super celestial).

With such a cosmology and physics, astronomy was inevitably favoured as providing the *key* to understanding the processes of natural change – the coming-to-be and of passing away. Astrology explained how God's Will manifested in the world and through the Neoplatonic doctrines of emanation and intermediaries it addressed the questions left by Aristotle. Namely how the *Unmoved Mover* who has no body or shape whatsoever can actually *be* in a place on the circumference of the world, and how the *Unmoved Mover* keeps the universe in motion and how a single *Mover* can give rise to the many things of the natural and celestial worlds.

The Neoplatonists, explaining Plato through Aristotle, presented their solution to these problems. The Mystics and the Sabaeans added their views while the orthodox Moslems debated with both.

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<sup>8</sup> Cf Plotinus *The Enneads*, trs MacKenna, London, Faber and Faber Ltd, 1969, pp80-105; esp. "Are the Stars Causes?" pp 91-105.

<sup>9</sup> Otto Neugebauer, *A History of Mathematical Astronomy*, New York, Springer Verlag, 1975, pp.1035 n. 17; 1045, 1050f.

The result of the competing forces of philosophy, occultism, science, mysticism and theology within Islam meant that the arrangement of the sciences had, in large measure the approval of the orthodox Moslem theologians as well as the esotericists and the philosophers. The Sufi philosopher Alfarabi gave a place to the magical sciences in his brief work translated into Latin as *De ortu scientiarum* and his translator, the twelfth century Christian philosopher Dominicus Gundissalinus, following Alfarabi in his own *De divisione philosophiae* lists *nigromancia secundum physicam* among his list of eight natural sciences. Algazali, regarded as "The Father of the Church in Islam" for his orthodoxy, nevertheless includes the magical sciences of *imagines, incantationes et allecciones* (astrological images, incantations and elections) as a part of natural science.<sup>10</sup>

This subordination of the arts and science to astrology, alchemy and magic may seem strange to the modern westerner raised in a rationalist society, which sees this occult trinity as the paradigm of ignorance. While the subordination of astrology, alchemy and magic to religion may strike many as the rankest superstition.

If we are to understand how the Medieval Moslem intelligentsia could construct such a conceptual model and countenance its practical applications, which flow necessarily and logically from it, a number of matters must be clarified first. In so doing we learn not only about Medieval Islamic Science, Christianity and the Occult Sciences, but about of-course about ourselves as well.

First, we must understand what "science" meant, and still means, in Islam. Seyyed Hosein Nasr tells us: "In the Islamic World, the highest form of knowledge has never been any single science, or *scientia*, which remains at the discursive level, but the 'wisdom of the saints,' or *sapientia*, which ultimately means *gnosis*."<sup>11</sup> All knowledge resides in its fullness in Allah because He is its source.

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<sup>10</sup> *Algazel's Metaphysics*, Latin text edited by Muckle, St Michael's College, Toronto, Canada, 1933, p.4.

<sup>11</sup> *Science and Civilization in Islam*, The Islamic Texts Society, Cambridge, 1987 p. 337.

Medieval Arabic Neoplatonic Philosophy, continuing the Plotinian tradition, sought to explain this Gnostic insight rationally by asserting the existence of an Universal Intelligence, an emanation of the Divine. The transcendental unity of Allah was specified and defined in this Intelligence and made intelligible to the soul. Knowledge or *scientia* (Arabic *'ilm*) is what results from the correct use of the senses and reason. *Sapientia* (Arabic *hikma*) passes beyond the soul's faculty of reason to the realm of the Intelligence and to Divine Origins.

The sense in which modern westerners use the term science today is a narrowing of the term *sciens, scientia* from "knowing" in general to a specific criteria for knowing called Scientific Method developed in the seventeenth century. Modern western science arrives at its conclusions through observation of repeatable experiments under controlled circumstances in which the peculiar powers or skills of the particular scientist conducting the experiment have intentionally been factored out. Moreover, classical western science focuses attention on objective, physical phenomena and disregards the traditional *sapientia (hikma)* aspect of knowing which it regards as subjective and hence unreal. Such science was unknown in the Middle Ages to either Christians or Moslems both of whom shared the *scientia/sapientia* paradigm of knowing.

The Medieval Moslem understanding of science distinguished between a knowing (*sciens*) which treats of manifest or rationally discernible causes and a knowing which apprehends hidden causes (*sapientia*). Hidden because they exceed the capability of the human reason to discern and distinguish them. Astrology, alchemy and magic fall into this second category, hence they are of a different order than the other arts and sciences whose causal rationales are readily comprehended by reason. As a result these three sciences were accorded a different status than the others as being non-disciplinary and as requiring for their successful and proper practice a given spiritual power or potency, i.e. a given *sapientia*, on the part of their practitioner.<sup>12</sup>

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<sup>12</sup> Dominicus Gundissalinus *De divisione philosophiae* ed. Bauer, in *Beiträge zur Geschichte der Philosophie des Mittelalters herausgegeben von Dr Clemens Baeumker, Band IV, Heft 2-3, München 1903*, p. 120: "Unde Alfarabius dicit, quod astronomia (sc. astrologia) est scientia de significacione stellarum, quid scilicet stelle significant de eo, quod futurum est, et de pluribus presentibus et de pluribus preteritis. Nec nominantur inter scientias disciplinales, set inter virtutes et potencias, quibus potest homo iudicare de futuris, sicut est virtus interpretandi visiones et sicut est virtus augurandi in avibus et sterutacionibus et aliis huiusmodi."

It was just such requisite personal contribution of the operator which was rejected as a factor in science by Francis Bacon in his seventeenth century articulation of Scientific Method which led to the divergence of Western and Eastern science and to the split between astrology and astronomy, alchemy and chemistry and Natural Magic and Physics.

Secondly, we need to understand that since astrology, alchemy and magic in perfect state entail a transcendental knowing, and yet are based upon the lower sciences such as mathematics and physics. As such they form a link between the theological or mystical knowledge of God and the arts and sciences pertaining to the terrestrial well being of Man.

Although astrology, alchemy and magic were transcendental sciences, the goal of which was to bring the practitioner to a knowledge of and union with the transcendental One, each of these three Occult Sciences rested upon non-transcendental, rational sciences; especially the seven Liberal Arts (divided into the four mathematical arts: the Quadrivium and the three expository arts: the Trivium).

In what follows I hope to show how astrology, alchemy and magic were seen by the Arabic philosophers to be based upon these Liberal Arts. These Liberal Arts being the foundation of Greco-Arabic Science. Please keep in mind that we are discussing Medieval Science, not Modern Western Science and that we are emphasizing Medieval Scientific theory rather than practice.

## Astrology and Medieval Science

The famous Persian astrologer [Abu Ma'shar](#) (Abu Ma'shar Ja'far ibn Muhammad ibn `Umar al-Balkhi) (787 - 886 AD) is a major representative of [Arabic Astrology](#). He was a student of the great [Al-Kindi](#) (d. 870 AD),<sup>13</sup> "the philosopher of the Arabs," prominent in the *Beit al-Hikma* at Baghdad and a leading astrologer. Under Al-Kindi's influence, Abu Ma'shar linked astrology to both Neoplatonic Aristotelianism and to Hermeticism in his *Introductorium Maius (Kitab al-mudkhal al-kabir ila `ilm ahkam an-nujjum)*.

"For Abu Ma'shar, astrology is not only a valid science, rooted in principles of natural science and proven by experimentation, but it is also the highest science dealing with nature precisely because it transcends the evidence of pure sensible perception."<sup>14</sup> For Abu Ma'shar, astrology is founded upon two disciplinary sciences: astronomy and judgment. The greatest authority on the first of these is Ptolemy's *Almagest*<sup>15</sup>. The source of the second is observation and the teachings of the wise and of philosophers who have reduced such observations to a logical science.

By using Aristotle's natural philosophy, he demonstrates the scientific foundation of two of astrology's principle premises: first, that the motions of the heavenly bodies are the source of all activity in the physical universe, and secondly, that the bodies of the inferior world have an innate disposition to receive such influences which are the causes of their own motions.

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<sup>13</sup> Al-Kindi (Ya`kub ibn Ishâk ibn Sabbâh al-Kindî), who died c. 870, is one of the greatest names in the history of Arabic learning. He is known as "The Philosopher of the Arabs." Al-Kindi worked in the famous House of Wisdom erected by the Caliph Al-Mansur in Baghdad (founded 762) for promoting the Arab world's assimilation of Indian, Greek and Persian science. He translated the works of Aristotle and other Greeks into Arabic and developed his own philosophy (heavily influenced by the Neoplatonism). Many books are attributed to him on such subjects as philosophy, politics, mathematics, medicine, music, astronomy and astrology. Few of his works survive. See [On the Stellar Rays](#).

<sup>14</sup> cf Richard Lemay, *Abu Ma'shar and Latin Aristotelianism in the Twelfth Century*, Beirut, 1962, pp 48-50.

<sup>15</sup> Claudius Ptolemaeus, *The Almagest*, trs R. Catesby Taliaferro, Great Books, Vol 16, Chicago, 1948.

For Abu Ma`shar, astrology is based on the science of nature. He offers an account of the causality of the stars based upon Aristotle's *Physica*, *De Caelo*, *Meteorologica* and *Metaphysica*. He then gives an account of change in the sublunary world again relating all to Aristotle, this time to *Physica* and *De Generatione et Corruptione*. Throughout his work, Abu Ma`shar stresses the scientific nature of astrology.

Yet this scientific astrology has led Abu Ma`shar to a knowledge of God for, by observing apparent things, known to the senses, he perceives that the ultimate source of celestial motion (and hence of terrestrial change) is in God's Will. Thus, astrology assists in raising the contemplation of the philosopher from the observation of the sensible to the rational *sciencia* and finally to the knowledge of the transcendental or *sapientia*.

Astrology was linked to the Quadrivium (the four mathematical sciences of arithmetic, geometry, music and astronomy) in several ways. Firstly, the periods of the planets were based upon counts of days, months and years. Calculation of planetary positions were accomplished through arithmetical operations adjusting current positions to known positions at given epochs. The astrological meanings of the houses, aspects and signs as well as the so-called Arabic Parts relied, ultimately, upon numerological speculations derived from Pythagorean doctrines kept alive by the Neoplatonists.

Music was interpreted, following Plato and Theon of Alexandria, as proportion. A rich doctrine of correspondences linked the planetary spheres and elements of the physical world together in a harmonious symphony. Astrology's physical basis was in astronomy and the mathematical basis of astronomy was to be found in geometry as Ptolemy's *Almagest* makes clear (especially Book I, which provides a spherical basis for astronomy).

As an example of Arabic Astrology's self conscious awareness of its profound dependence upon the Quadrivium we need only consider Al-Biruni's *Tafhim* (English title: *The Book of Instruction in the Elements of the Art of Astrology*<sup>16</sup>) written in 1029 AD. The first 41 pages of which are a primer in mathematics covering such subjects as number theory, geometry, algebra, proportions, ratios, powers, roots, conic sections &etc.

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<sup>16</sup> Translated R. Ramsay Wright, Luzac & Co, London, 1934.

Of astrology's intimate (though esoteric connection) with the Trivium, we can cite Alkindi's *[On the Stellar Rays](#)*<sup>17</sup>. This text gives a rational explanation of astrological magic and in doing so suggests a link between speech and astrological magical influences. The author attempts to correlate various modes of speaking with magical intentions. In articulating this theory of the magic art, the Alkindi refers to the light radiating from the stars as the active agent in both judicial astrology and in astrological magic. His remarks make it apparent that he has in mind the medieval theory of optics and that he is equating light with spiritual influence.

By doing so Alkindi is transmitting ancient and medieval optical theory from within the tradition of the Neoplatonic philosophers who speculated upon the relation between physical light and spiritual light. His ideas of the behaviour of light as linked to astrological influence is repeated by Roger Bacon (*Opus Maius, Opus Tertius*) in the thirteenth century, John Dee (*Propaedeumata Aphoristica*) in the sixteenth century, and Kepler (*De Certioribus Fundamentis Astrologiae*) and Placidus (*Primum Mobile*) both of the seventeenth century.

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<sup>17</sup> translated by Robert Zoller, available electronically from <http://www.new-library.com/zoller>.

## Alchemy and Medieval Science

Alchemists, such as Geber (Jabir ibn Hayyan, 721?-815?), often considered the greatest alchemist of Islam (although Glassé says<sup>18</sup> he was not a Muslim but an Harranian Sabaeen), saw proportion and measure everywhere in Alchemy. Geber's writings were very influential in European Alchemy throughout the Middle Ages<sup>19</sup>, extending through the Renaissance and, via Rosicrucianism, into the eighteenth century. He was sufficiently well known to Medieval and Renaissance Christian Europeans for Dante to place him in his *Inferno*.

Geber<sup>20</sup> is a figure veiled in a good deal of mystery. Some Western scholars towards the beginning of the twentieth century doubted he even existed.<sup>21</sup> Others asserted he was an important figure in the history of Alchemy as well as for the Harranians. Shiite tradition asserts that he studied alchemy under the sixth Imam Ja`far As-Sadiq before the latter's death in 765 and he is said to have served as court alchemist to the caliph Harun al-Rashid (789 – 809 AD). It may well be that it was after he left Alrashid's court that he began

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<sup>18</sup> Cyril Glassé, *The Concise Encyclopedia of Islam*, HarperSanFrancisco, 1991.

<sup>19</sup> Geber (Jabir ibn Hayyan As-Sufi), was an important figure in the history of Alchemy as well as of the Ismaili branch of Islam. According to some accounts, he studied alchemy under the sixth Shiite Imam Ja`far As-Sadiq before the latter's death in 765 and served as court alchemist to calif Harun al-Rashid. Geber died in 815 AD at Tus (in the Khorasan – modern day northern Iran). He is said to have been a Harranian Sabian and is called al-Sufi. Also, Geber is said to have lived for sometime in concealment, fearing for his life when a new Caliphate government actively started suppressing the Barmecides (viziers under the earlier caliph Harun al-Rashid), who had been influential in early Ismailism. These *bamakis* were descended from the priests of the Afgan Buddhist shrines and preserved much of the pre-Islamic teachings of that area. Some Moslems regarded him as a silent Imam.

<sup>20</sup> The following relies on: *Ambix* Oct 1953 "The Antiquity of Alchemy" by H.E. Stapleton.

<sup>21</sup> J. W. Fück, in *Ambix* Vol IV, Nos 3 & 4, February 1951, p.125, states that Holmyard and Stapleton believed Geber to have studied with Ja`far as-Sadiq. J. Ruska asserted that even if a man named Geber existed, it was no proof that he wrote the works attributed to him. While Paul Kraus asserted that the works attributed to Geber could not have been written in the 8th century, but were written by an Ismaili circa 900 AD.

to conceal his whereabouts as his association with the Ismaili sect would have placed his life in danger. It was around this time that the Ismaili were in great dispute with the caliph in Baghdad. A dispute that led to their secession in the ninth century and their successful establishment as a sect that is today headed by the Aga Khan.

Geber frequently cites Hermes and Agathosdæmon, exhibiting a strong Hermetic influence and lending support to the idea that he was connected to the Harranian Sabaeen community whose sacred books were the writings of Hermes Trismegistus. Geber's alchemy is both theoretical and practical. Alchemy for Geber (and apparently for the entire Sabaeen community) was part of a complex inter-related system of Neopythagoreanism, Neoplatonism and Hermeticism. Indeed, Corbin's précis of Geber's *The Books of the Balance* suggests that the Harranians had developed a highly exacting form of alchemy and medicine founded upon numerical theory.<sup>22</sup>

Geber is said to have written a great number of alchemical, astrological, cosmological, talismanic and related works. They represent an Isma'ili synthesis of Harranian Sabaeen teachings.<sup>23</sup> Berthelot translated what is available of the alchemical works into French.<sup>24</sup> The underlying theory in the 28 (of an alleged 2000) books

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<sup>22</sup> "In Islamic gnosis, the metaphysical and mystical basis of the science of correspondences is called, 'the Science of the Balance'. This science was practiced *par excellence* by the alchemists. It provides the basis for an allegorical interpretation of Scripture and science such that a concrete science like alchemy can be viewed as having spiritual import and a spiritual text such as the Koran can be viewed as scientific. *Temple and Contemplation*, Henry Corbin, Kegan Paul International in Association with Islamic Publications, 1986, page 55.

<sup>23</sup> In fact there is some confusion as to whether Geber was a Harranian Sabian, a Sufi, or an Isma'ili. E.J.Holmyard wrote an article entitled: An Essay on Jabir ibn Hayyan, in *Studien zur Geschichte der Chemie. Festgabe für E.O. von Lippmann*, Berlin, 1927. On p. 28 he suggests that Geber was murdered while working for the Isma'ili (whose members included the notorious sect of the Assassins).

<sup>24</sup> Some were edited by O. Houdas in Berthelot *La Chimie au Moyen Age*, iii, 91-205 (text) and 126-224 (translation). Eleven tracts were published in 1891 in lithograph at Bombay. In 1928 Holmyard reprinted this work at Paris as *The Arabic Works of Jabir ibn Hayyan*.

which have survived is the Reduction of "Bodies" to the four elements (fire, earth, air and water) and of these elements to the four natures (hot, cold, wet, dry). Also the alchemist must bring about the requisite combination in their proper proportion of Body, Soul and Spirit and know how to conduct the two operations (Outer and Inner).

### **The Books of the Balances.**

Geber's alchemical teachings are found in his *The Books of the Balances*. Its *Theory of the Balance* teaches that the numbers 1,3,5,8 (=17) as well as the number 28 express the basal structure of matter and of every science as well as the language by which men attempt to express their ideas and dreams.

*The Books of the Balances* consist of 144 texts in which the *Theory of the Balances* is discussed. Briefly stated this theory holds that astrology, alchemy, medicine, physics, music, astronomy, grammar and prosody are all based on the numbers 1,3,5,8, (and their total 17) which indicate the balance of relationship between the four natures (hot, cold, wet, dry) that must be maintained in the case of every phenomenon that presents itself to the human intellect. This particular portion of the theory being attributed to Apollonius of Tyana.

Stapleton relates the numbers used in Geber's alchemical doctrines to the magic square of Saturn (Saturn = Lead, being the father of all other metals):

4	9	2
3	5	7
8	1	6

Taking the gnomon, say 4+9+2+7+6, we get 28 and 1,3,5,8 are left untouched. This illustrates why Geber took 28 as the Perfect Number and attributed the numbers 1,3,5,8 to the four elements as follows: 1=Fire, 3=Earth, 5=Water, 8= Air.<sup>25</sup>

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<sup>25</sup> Also see Corbin, *Temple and Contemplation*, chapter 2: The Science of the Balance and the Correspondences between the Worlds in Islamic Gnosis according to the work of Haydar Amuli 8th/14th century.

Geber's work exhibits the dual level of esoteric (spiritual) and exoteric (chemical) interpretations of alchemy. This is nowhere more evident than on the subject of the *Elixir*, the alchemically produced substance used in the manufacture of the Philosopher's Stone.<sup>26</sup> The Philosopher's Stone is said to first show up in seventh century alchemical literature.<sup>27</sup> For Geber, the *Elixir* is both a chemical and a spiritual ferment. It is a material substance, which transmutes base metals to gold, and it is the Word (*Logos*), which transforms the world. However that may be, the question of just what the *Elixir* is central to any practical alchemy. Trying to find out the answer, though, is often a thorny affair. The term is not part of the Greek alchemical Corpus and Geber himself gives us little help.

The *Muqaddimah*, a historical work, written in Arabic c. 1377<sup>28</sup> by ibn Khaldun (1332-1406) also addresses the subject of alchemy.<sup>29</sup> After a detailed discussion in which an alchemical text by Ibn Bishrun is given in full, ibn Khaldun concludes that alchemy is a form of sorcery because, among other things, it makes gold from something other than gold (which he regards as impossible for the ordinary person) thus is the preserve of the sorcerer.

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<sup>26</sup> It is possible that Geber invented this word (*elixir*) although Stapleton thinks the whole subject is quite a bit older (perhaps 400BC and maybe 1200BC!).

<sup>27</sup> The philosopher's stone first appears about the 7th century but may be earlier. Stillman, *The Story of Early Chemistry*, D. Appleton & Co., NY 1924, p170.

<sup>28</sup> Ibn Khaldun, *The Muqaddimah*, trs Franz Rosenthal, 3 vols., 1958 by Bollingen Foundation by Pantheon Books, NYC.

<sup>29</sup> op cit. pp227-246

## Magic and Medieval Science

Officially, Islam does not countenance magic. Its practice is presently illegal in a number of Islamic countries and this situation is not new. *Muqaddimah*, (*Ibid* p. 170) tells us that then religious law bans sorcery, talismans and prestidigitation (three kinds of magic we will discuss below). However the subject of magic in Islam is not as simple as it may at first seem. Whereas we modern Westerners have but one word for that which "magic" denotes, Medieval Islam, a society steeped in age old traditions of such practices recognized numerous varieties of what we lump together and dismiss as magic and had different names for each. Thus we read about letter magic (*simiya*, *shimiya*), talismans, prayers (*qiyamat*, *subuhát*), While some of these practices were condemned in Islam, others were permitted under certain conditions.

### The *Muqaddimah* on Magic<sup>30</sup>

Medieval Islamic attitudes regarding magic are recorded for us in the fourteenth century *Muqaddimah*. It's author ibn Khaldun's opinions are rather conservative and orthodox. They reflect with fair accuracy those of his coreligionists of 300 years earlier *vis-a-vis* the seriousness with which the subject of magic was taken. From the amount of space and the detailed accounts ibn Khaldun gives to magic, astrology and alchemy, the reader gets the impression of the great role these sciences played in fourteenth century Islam.

We are told<sup>31</sup> that "all (magic) activity in the world of nature comes from the human soul and the human mind, because the human soul essentially encompasses and governs nature." "The activity of people working with talismans consists in bringing down the

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<sup>30</sup> In the section on magic, I am relying upon Ibn Khaldun, *The Muqaddimah*, trs Franz Rosenthal, 3 vols., 1958 by Bollingen Foundation, Pantheon Books, NYC. Ibn Khaldun deals with magic in pp 156-246. Page 156 has his section 27 titled, "The sciences of sorcery and talismans. Pages 171-177 deal with letter magic and talismans. 170-182 deal with legal and illegal sorcery. 182-214 deal with *Zairajah*, a branch of letter magic for finding out the answers of questions by means of connections existing between the letters of the expression in which the question is phrased. Various forms of letter magic are given in pp 214-227.

<sup>31</sup> *Ibid* page 175 *Muqaddimah*

spirituality of the spheres and tying it down with the help of pictures or numerical proportions.<sup>32</sup> People who work with talismans require little spiritual exercise to be able to be effective magicians. People who work with words must exert themselves strenuously because it is the light of the Lord God, which effects whatever is affected. Word Magic is of a higher order than astrological magic.<sup>33</sup> Also you should note the connection between magic and "numerical proportions" as well as words.

Ibn Khaldun distinguishes the miracles of the saints from the works of magicians. The former acquire the power from faith and detachment. They do not will it. The power comes to them spontaneously. The miracles the saints do are licit while the works of the sorcerers are not, though they are real.

He tells us that human souls are one in species but differ in qualities. The souls of prophets are prepared to have divine knowledge and to be addressed by angels in the name of God and to exercise the influence which goes with all that upon created things. The souls of certain sorcerers are able to exercise influence upon created beings and to attract the spirituality of the stars so that they can use it and can exercise an influence through either psychic or satanic powers.

Keeping in mind that astrology, alchemy and magic were regarded by the Medieval Moslems as requiring special powers on the part of the operator in order to be fully effective, ibn Khaldun tells us that the souls that have magical ability are of three degrees.

The first kind exercises its influence merely through mental power without any instrument of aid. This, philosophers call sorcery.

The second kind exercises its influence through the aid and temper of the spheres and elements or with the aid of the properties of numbers. This is called talismans. It is weaker than the first kind.

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<sup>32</sup> *ibid* page 175 *Muqaddimah*

<sup>33</sup> *ibid* page 175 *Muqaddimah*

The third kind exercises its influence upon the powers of imagination. That is, the magician influences the imagination of others. The magician plants different sorts of phantasms in the imagination: images, pictures, whichever s/he intends to use. Then s/he brings them down to the level of sense perception so that others may see them by the power of his or her (i.e. the magician's) own soul. As a result, the phantasms appear to the observers as things existing in the external or physical world (while in fact, there is nothing of the sort there). For instance a person may see gardens, rivers or castles where none exist. The philosophers call this prestidigitation. We recognize it as hypnosis, without the distinction of the need to be present to perform this.

Ibn Khaldun makes his belief plain that the sorcerer possesses this power potentially but transforms it and makes it active by exercise. He also makes plain his belief that all magical exercise consists of directing oneself to the spheres, the stars, the higher worlds, or to the devils by means of various kinds of veneration, worship, submissions and humiliation. From this it was concluded that magical exercise is veneration, etc of beings other than God and for this reason magicians ought to be killed. The first two kinds of sorcery are real but the last is not. In asserting the reality of sorcery the Koran states that the devils Harut and Marut taught it to man.

From what ibn Khaldun tells us and from other authorities on the subject we see that mathematics makes magic possible. This is especially so in astrological magic where the erection of a chart for the times auspicious for the manufacture of talismans presupposes competency in astronomical mathematics. In addition to this the astrological magician has to use the magic square of the planet and know how to construct the appropriate modification of the said square. In the *Muqaddimah* various sorts of talismans are described which use numbers. This sort of talisman seems to have been considered superior, probably because the Arabs thought the Greek Pythagoreans had used it.

We are told that the philosophers distinguish between talismans and sorcery. First, they affirm that both derive their effectiveness from the influences of the human soul. Ibn Khaldun cites their reasoning as being that the soul rules the body: a man walking a tight rope will not fall unless he conceives the idea of falling. Thus, the idea in the soul rules the body.

In sorcery the sorcerer does not need any aid. Those who work with talismans do. For they seek the aid of the spiritualities of the stars, the secrets of numbers, the particular qualities of existing things<sup>34</sup> and from the positions of the stars as they act on the elements. The philosophers say that sorcery is a union of spirit with spirit while the talisman is a union of spirit with body. As they understand this, it means that the high celestial natures are tied together with the low terrestrial nature. The high celestial natures being the spirits of the stars. Those who work with talismans, therefore, usually seek the aid of astrology.

The philosophers think that a sorcerer does not acquire his magical ability but has by nature the particular disposition needed for exercising that type of influence. Miracles are done by good people for good purposes and by souls that are entirely devoted to good deeds. But the power comes from God. Sorcerers, on the other hand are said to act from their own psychic power, and occasionally by the aid of demons. Thus only evil people who are devoted to evil deeds practice Sorcery. They cause, for example, discord between husband and wife, destruction of enemies, and similar things. Here I am closely paraphrasing ibn Khaldun

Ibn Khaldun tells us<sup>35</sup>, "It is definite that sorcery is true, although it is forbidden. But we are satisfied with the knowledge God taught us." Yet, on the same page he says: "Letter magic (*shimiya*) clearly is a kind of sorcery and, as such, attainable through various exercises which are legal according to the religious law." An innate ability for sorcery requires exercises in order to change it from a potential to an actual ability. Usually these exercises involve behaviours contrary to the Koran (e.g. veneration of the planets). However, some of those seeking such powers substitute legal activities for illegal by replacing the non-Koranic veneration with *dhikr* exercises and prayers from the Koran and Prophetic traditions. To this they add the astrological election of days and hours. This is legal. Ibn Khaldun cites al-Buni's *Kitab al-Anmat* as an example of this kind of "Letter Magic." Finally, the miracles of the saints are licit because God ordered them. The saints did not initiate the miracle on their own.

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<sup>34</sup> We are reminded of the whole of Agrippa's 1st Book (On Natural Magic) of his 16th century *Occult Philosophy*. Indeed Agrippa's three-fold cosmos (Natural, Celestial and Spiritual) closely parallels ibn Khaldun's three kinds of magic.

<sup>35</sup> pages 178-182 of the *Muqaddimah*

It is clear therefore that under certain conditions, sorcery and magic, although forbidden when they utilize non-Koranic practices, may be legally acceptable under Islamic Law. We note that, in addition to ibn Khaldun's opinions, just cited, the *Hadith*<sup>36</sup> permits the use of amulets (*tawwiz*) with Koranic verses<sup>37</sup> and, as mentioned above, even al-Ghazzali, the archly orthodox, accepted incantations, images and elections as part of natural science.

Further, it is clear that, at least during the first five centuries of Islam, magic was actively practiced among the Moslem intelligentsia. This is also apparent from the *Rasa'il*, the encyclopedia of the *Ikhwan al-Safa*, or from the Brotherhood of Purity<sup>38</sup>, an esoteric fraternity centred at Basra in the tenth or eleventh centuries. Nasr tells us: "The *Ikhwan* treat magic, talismans, and similar studies in a separate chapter at the end of the treatise where they state that they are due to the action of spiritual (here meaning psychic) beings (*af'al al-ruhaniyin*) in various domains of the cosmos."

Thus it is clear that, for the esoteric *Ikhwan al-Safa* the orthodox Al-Ghazzali and the conservative ibn Khaldun that astrology, alchemy and magic were parts of human knowledge and, given the lack of any separation between church and state in Islam, all sciences, including magic, found their expression in the exercise of governance. Certain aspects of magic might be condemned, but it had its place in the Islamic *Scientia-Sapientia* (*hikma*).

The *Kitab al-Ghayah* (known to the West as the *Picatrix*<sup>39</sup>) often attributed (wrongly) to Maslamah ben Ahmad Majriti is cited by Ibn Khaldun as a systematic treatment of the craft of magic. The *Picatrix* as with other occult arts, presents two aspects to the reader: rational *scientia* and supra-rational *sapientia*.

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<sup>36</sup> Thanks to Christopher Warnock for this citation. Book 50, nr 50.2.3 section "Guarding from the Evil Eye." Malik's *Muwatta*.

<sup>37</sup> Indeed this practice is still widespread today. Practitioners of this craft even have websites. Ref. [www.quranidowa.com](http://www.quranidowa.com).

<sup>38</sup> See Netton, Ian Richard, *Muslim Neoplatonists: an introduction to the Thought of the Brotherhood of Purity*, London, George Allen & Unwin, 1982, pp. 1, 50, 52. See also Seyyed Hosein Nasr, *An Introduction to Islamic Cosmological Doctrines*, Shamballa, Boulder, 1978, p. 90., n. 51.

<sup>39</sup> In what follows I rely on David Pingree's edition of the Latin Text of *Picatrix* published in 1986 in London, The Warburg Institute. Translation mine.

Of the transcendent Unity, called "the One Thing," we are told in Book I chapter 1 that the magician must know "where he<sup>40</sup> exists, who is the root and principle<sup>41</sup> of all the things of this world, and through whom all things are dissolved; through this same thing are all things new and old known. This very thing is truly the first thing, and there is nothing lacking in it, nor does it want with respect to some other since it itself of itself is the cause of other things, nor does it receive qualities from another. But it<sup>42</sup> is not a body, nor is it composed from some body, nor is it mixed with some other outside itself, but it is whole in itself. And therefore it can only be called The One. And strictly speaking it is the one truth and one single unity, and through its unity each thing has unity. And it itself is the first truth and it is not lacking with respect of the truth of another; each thing receives truth from it. Indeed, without it, all things are imperfect; for it alone is perfect."

The would-be magician is told:

"Daily you ought to study in God—to wit in his laws and his goodness— because science, understanding (*sensus*) and goodness proceed from him. And his spirit is a noble and high light. And he who intends to study in it should despise the things of this world since they have an end and there is no stability in them .... For which reason know you that this secret which we intend to disclose in this our book cannot be acquired except that knowing (*scientia*) is first acquired. And he who intends to know should study to acquire {knowledge} in the sciences and to thoroughly investigate them in order because this secret cannot be had except by wisdom and studying one thing after the other in science."

Book III, Chapter 6 tells us:

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<sup>40</sup> *ille*. Picatrix consistently refers to this principle as masculine.

<sup>41</sup> *principium*

<sup>42</sup> *Ipse*

"No one is able to be perfect in this science unless his own proper nature inclined him to it by the virtue and disposition of the planets and this is what Aristotle says in the book *Aztimehec*<sup>43</sup> in which he says: *natura completa* fortifies the one philosophising and strengthens his intellect and wisdom so that he may succeed in all his works. Each of the wise men of this science wanted to hide this science among themselves according to their degree as far as they could and they did not want to publish it except to philosophers. *Natura completa* showed them every science and philosophical subtlety beyond the work of spirits to their disciples. Indeed they called the spirits of this *natura completa* with these four names: *Meegius, Betzahuech, Vacdez, Nufenguediz*,.... and when they needed this *natura completa* they called these four names, which names signify the potency of *natura completa*."

Later a vision dream is described in which is given a ritual for acquiring this *natura completa*.

But the magician must also know the more exoteric arts, indeed ten of them. Book IV chapter 5:

"The ancient wise men who invented this science, did so only by investigating with continuous labour and proving all things both while awake and while sleeping (dreaming) until they arrived at that which they desired to attain. By following this path they knew and understood two conclusions: first, they considered it necessary to know ten arts (the second conclusion seems to be that love is the root of this science)".

"The first of these is agriculture, seafaring (fishing? maritime trade?) and governing the people, because this is the first of the arts in the governing of cities and kingdoms. And this can only be done through the ancient sciences concerning which very many books can be found".

"And after this is the art of leading soldiers, of governing armies, of making contests and battles, of making the sounds of animals and birds and of deceiving them. Many books are also to be found on these things".

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<sup>43</sup> No such book of Aristotle is known.

"After these are the arts of cities by which men are aided and under this heading are grammar, the division of idioms (phrases of speech or dialects - possibly rhetoric?), to reason judgements (logic), to make reasons and understand laws and those things which follow from them such as chanceries (*scribania*) with the things pertaining to them, buying and selling etc. But in these things very many books may be found".

"Next follows arithmetic and all books through which numbers and things similar to them are known. After this follows geometry, in which theory and practice consist; from this {comes} the art of measuring the land (surveying), the art of raising a weight (mechanics), making inventions, channelling waters, instruments in brass, constructing burning mirrors and apparitions (*aspectus*). After this follows astronomy through which are known the transits (*gressus*) of the planets and the judgements of the stars. After this music is found. Under this heading is comprehended singing, drumming (*pulsare*) and making notes (musical notation)".

"After this comes dialectic, which is divided into eight books, in which Aristotle the Wiseman taught us how to enter (or penetrate this subject).<sup>44</sup>

"After this is physics, which is divided into two parts: theory and practice".

"After this follows the art of nature which Aristotle and other wise philosophers posited. There are very many books on this subject, which require many glosses and expositions. The first of these is called *Oyodus naturalis*. The second, *Liber celi et mundi*; the third, *Liber generationis et corruptionis*; the fourth, *Liber signorum que apparent in celo*; the fifth, *Liber minerarum*; the sixth *Liber vegetabilium*; the seventh *Liber animalium motuum*, i.e. from one place to another. (Note that mystical works seem to be mixed together with what we would call scientific subjects).

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<sup>44</sup> Note that dialectic is not mere logic. Amongst the Moslems at least and among some esoteric Platonic Christians, dialectic came to mean more than mere logic as it was understood by Aristotle and his followers. For the Platonic mystics, Dialectic meant the means by which one created the "aha" moment through the exploitation of the Law of Three. That is, Higher Knowledge could arise under certain circumstances: when, in discussion there was a sincere desire for truth and real attention to the dialogue, such knowledge occasionally arose and all were edified.

"Next follows Metaphysics, which Aristotle composed in thirteen books. For he who understands them well and shall know them perfectly will be a complete wise man and will achieve the perfection of his beloved goal."

## Conclusion to Magic

Magic in Medieval Islam was more than what is commonly ascribed to witchcraft. The Medieval magician was not a rustic. He was a highly educated scientist, competent in both *scientia* (*`ilm*) and *sapientia* (*hikma*).

I have focussed upon the three occult sciences of magic, astrology, and alchemy. I have done so because it is necessary to emphasize the role of the occult sciences in Medieval Greco-Arabic Science for a several of reasons.

Firstly, histories of philosophy and histories of science frequently suppress the fact that the occult sciences had a central role in Medieval Islamic Science. Modern Western scholarship has, until recently, emphasized the advance of the rational, materialistic, mechanistic science that began to blossom in the seventeenth century and which led to the technological superiority that the West now enjoys. While acknowledging that Western Science's roots are to be found in Medieval Arabic Science, the general tendency has been to regard the Medieval Origins of Modern Science as superstitious embarrassments best left behind and forgotten. This attitude claims that Western Science owed little to the Greco-Arabic Science, which preceded it. This point of view precludes any attempt to objectively and scientifically consider any beneficial contribution the Occult Sciences may have conferred on those who cultivated them and any role they may have had as sociological or spiritual forces in history.

More recently another attitude has begun to be heard. Some historians have begun to admit that Greco-Arabic Science provided the impetus for the rise of modern science.

Edward Grant, in his *The Foundations of Modern Science in the Middle Ages*, Cambridge University Press 1996, writes in his preface, "My attitude changed dramatically, however, when, some years ago, I asked myself whether a Scientific Revolution could have occurred in the seventeenth century if the level of science in Western Europe had remained what it was in the first half of the twelfth century. That is, could a scientific revolution have occurred in the seventeenth century if the massive translations of Greco-Arabic science and natural philosophy into Latin had never taken place? The response seemed obvious: no, it could not. Without the translations, many centuries would have been required before Western Europe could have reached the level of Greco-Arabic Science, thus delaying any possibility of a transformation of science."

He goes on to discuss the contributions to science made by the Arabs, the Medieval University, and even the Christian Church! Clearly a reappraisal of the historical record has taken place for Doctor Grant as it has for other scholars.

As early as 1962, Dr Richard Lemay, in his *Abu Ma`shar and Latin Aristotelianism in the 12th Century*<sup>45</sup>, argued that the Occult Sciences, and especially astrology, were the vehicle by which the Western European scholars were introduced to the Natural Aristotle which had been lost to the West since the fall of the Roman Empire in the sixth century but preserved and revised in the Middle East under Islam.

Lemay's point of view, certainly correct, is that Medieval Science, i.e. Greco-Arabic Science, was based upon Aristotle's Natural Science which, in the hands of the Arabic philosophers, was made to serve as a vehicle for synthesizing and collating the many arts

and sciences (occult and otherwise), philosophies and mysticisms cultivated in the Medieval Islamic World. The introduction of this science into Europe in the twelfth century led to the European study of Aristotle and this contributed greatly to the growth of science in the West.

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<sup>45</sup> American University of Beirut, 1962.

Thus far Lemay's thesis is not novel. No historian of science would contest this. He goes on to prove, however, that what initially attracted the western Europeans to the New Science was astrology; especially the writings of Abu Ma`shar, whose *Greater Introduction to Astrology* utilizes Aristotle's Natural Science and metaphysics to justify its claim to being the highest science.

Both these positions fall short of a consideration of the Occult Sciences of astrology, alchemy and magic in their own right. Both Lemay and Grant see Arabic Science's contribution to the twelfth century Latin West as the transmission of the Natural Aristotle which laid the foundation for what later developed into Modern Western Science. But that is changing. There has been a spate of books recently focussing upon magic historically and sociologically. The Occult and the Esoteric are now fields worthy of institutionalised academic investigation.

Secondly, I have emphasized the role of the occult arts in Medieval Greco-Arabic Science because their inclusion in the hierarchy of the sciences especially their prestigious and lofty rank therein is testimony to the fact that Medieval Islamic Science recognized the tremendous importance of a scientific link between rational and quantitative science, i.e. *scientia-ilm* and the absolutely transcendental supra-rational and unitive, the knowledge of which was *sapientia-hikma*. The unique nature of the occult arts of astrology, alchemy and magic is that they provided scientific links between the Divine and the Natural. This link was not merely theoretical or doctrinal. It was operative. The Medieval authors we have examined had no doubt about the efficacy of astrology to predict events, of alchemy to transmute or of magic to bind, loosen, command spirits and effect miracles.

But if astrology, alchemy and magic were efficacious operative sciences, the perfection of their efficacy was due to the practitioner's possession of the requisite spiritual virtues and powers (*virtutes et potencias*), which are the fruit of *sapientia-hikma*. In the final analysis, it was the astrologer, the alchemist and the magician himself who was the link between the Divine and Nature.

## **Conclusion**

In setting the stage for the discussion of the transmission of astrology, into twelfth century Europe, as part of the New Science, focus has been placed on the Arabic side of the story so as to provide a balance to those who elaborate on the Latin European side. For the proper understanding of this important stage of European development it is imperative that both sides are explored.

More than this I have tried to draw attention to the importance of being aware that Greco-Arabic Science was neither similar to nor inferior to modern-day Western Science. Equally, it was not the abject and ignorant superstition that some has tried to portray it as.

In this it is essential to recognize that, in the twelfth century, Western European scholars thronged to Spain, Sicily and Constantinople to learn from Moslem sources. The Medieval Christian world had nothing like the highly sophisticated science of the Arabs. A science that included and valued the occult sciences as a means by which the transcendental could be scientifically linked to the natural.

One inescapable conclusion from all of this is that the Greco-Arabic Science, which the Arabs transmitted to the West in the twelfth and thirteenth centuries, was inextricably bound up with magic, alchemy and astrology. These and the Arabic Neoplatonic Aristotle were the essence of the New Science.

The Western scholars at first eagerly received the New Science. But soon there was resistance to its hidden implications and a separation was made. The first, between Aristotle and the Occult Sciences and then between Aristotle, and the Arabic interpretation of Aristotle.

Aquinas effected this latter feat as a preliminary to his *Summa Theologiae* which eventually became the criteria for Catholic orthodoxy and an obstacle to the overt spread of Arabic Neoplatonic doctrines in Medieval Western Christendom. However Rescher, in *Studies in Arabic Philosophy*, University of Pittsburgh Press, 1966, p.151 tells us that the study of Aristotle from an unchristianized point of view went on in several Italian Universities. Eventually the concrete, rationalistic, materialism of the West overcame the philosophical Realism of the Neoplatonists and the occult sciences were relegated to the dustbin until the so-called "Occult Revival" of the nineteenth century.

It is this key understanding - that the Greco-Arabic Science transmitted to the West was inextricably bound up with magic, alchemy and astrology - which is so important in shedding light upon the origins of the so-called "Western Occult Tradition." Unfortunately, it is beyond the scope of this paper to further explore this subject. That would take us into a discussion of the reception of the New Science by the Western Latin Christian scholars of the twelfth century and its adumbration in subsequent centuries. Nevertheless, this paper does provide background material necessary to that wider investigation.

A second inescapable conclusion is that astrology, alchemy and magic, though transcendental sciences are properly part of the scientific tradition. They are ways of knowing. It should also be remembered that while they were repudiated by the Western rationalist materialists (of the seventeenth through twentieth centuries) who expropriated the name of science for their own schismatic branch of the tradition, the occult sciences are still regarded as sciences by traditional Islam, Buddhism and Hinduism where cultivation of the transcendental is still valued.

Finally, it must be seen that Medieval Science included the transcendental as well as the rational. The *hikma* as well as *'ilm*. The *sapientia* as well as *scientia*.

Since the eighteenth century organized religion and modern Western science have agreed to disagree, to live separate lives. Religion doesn't address scientific matters; science leaves the spiritual to the mystic and the religionist. The result for many people is a spiritual hunger and a technology, which seems increasingly soulless. The occult sciences may well offer a bridge between these two aspects of human existence, *scientia* and *sapientia*.

It may well be that there is benefit to human society by a rapprochement with the transcendental such as it is implied in the *Sciencia-Sapientia* relationship which characterized the Medieval view of Science both for the Moslem and for the Christian. Both for those of the East and those of the West.

***SPECIAL NOTE: digital copies of many of the original texts referred to in the main body of this Study may be obtained by application to the New Library archivist:***

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