

universities attempts a synthesis between the two methods by maintaining the original clinical "holistic" approach, completed by the adjunction of laboratory and specialistic methods. Many recent papers, particularly in America (where it seems that a reaction against the mechanistic outlook in medicine is taking place) stimulates the recognition of the primacy of the clinic. Teaching, however, is as yet incomplete from that point of view, and students and young physicians seem to rely too much on laboratory tests. Is it because teaching is too much in the hands of scientific investigators instead of being in the hands of clinicians of wide culture, vision and comprehensive outlook, such as are considered the ideal professors of clinical medicine in Continental universities? Are we running the risk of being deprived of such clinicians as the Sydenhams, Laennecs, Oslers of the past, who received their training at the bedside, were developed in the observational school of medicine, and realized that the study of the whole man is the basis of our Art? The great development of laboratory methods and of specialism shows the importance of team work, but diagnosis remains, in the last resort, a process of clinical reasoning.

The opposition between the approach to the patient through nosology, or direct through physiopathology is again encountered in our days, principally regarding psychiatry and endocrinology. Psychiatrists speak of the rejection of the "Kraepelinean nosology" and of its replacement by a dynamic and individual approach. Endocrinologists have the tendency to press everything into physiopathological conceptions, hyperthyroidism, hypogonadism, hypercorticism, and so on, instead of isolating and well describing clinico-anatomical types—with their laboratory features. They seem to merit the reproach of Naunyn to the middle nineteenth-century German "rationalist", Traube, "The clinical pictures were recognized in so far they reflected physiological laws, and it was attempted to read the separate symptoms in the light of these distorted physiological images. Often one constructed them oneself instead of finding them by faithful and impartial observation". The recent trend, however, consists in recognizing that far from disturbing any individual dynamic approach a good natural history of diseases is indispensable. The pilot must know the rocks and narrows in his course.

The tension regarding the role of pathology—in the sense of physiopathology—is also being resolved. The mid-nineteenth-century French clinicians were right to be sceptical because in those days pathology was too much on speculative lines. To-day, however, thanks to the tremendous development of the experimental method pathology has given us a more precise knowledge of the disturbances of the organism and of their causes, and this helps us in our fight against disease. It has been accepted, however, that all physiopathological conceptions cannot have a direct application but should be controlled through clinical observation.

In fact history shows us that the solution of our contemporary medical problems lies in the primacy of the Clinic. Contemporary philosophy has turned away from the "Systems" and directs itself to the study of the concrete human being, and medicine is bound up with philosophy.

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## Arabic Philosopher-Physicians and Christian Doctors of Medicine

(A contribution to the knowledge of the origin of the Moslem revival of Science and the derivation of the Medical Profession)

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It can be assumed that serious and sound medicine, in the modern sense, began with the Hippocratic school and that the tradition has not been lost during twenty-four centuries, to the present day, notwithstanding the many aberrations due to astrological, alchemical or mystical fancies. Admittedly, Hippocratic medicine possessed a limited therapy, consisting of hydrotherapy, climatic treatment and gymnastics. It is therefore understandable that Galenism was welcome, with its many additional methods of treatment, which were modified according to the views of those practising the Healing Art.

It is, however, easily overlooked, that what we know as Medicine, is what has been recorded in manuscripts and printed books which, during many centuries, were the preserve of the mighty and the wealthy. Large portions of the population, both East and West, relied on home remedies and the ministrations of the "practical" leech, *medicus* or *hatibb*. It is only with the development of the

Hospital for the sick, some time in the fifteenth century, that all and sundry had the advantage of being treated by the learned physician or skilful surgeon, though even then many preferred the aid in disease of the unorthodox practitioner.

Thus the treatment of compound fractures or the grafting of amputated noses was performed in India by the potter's caste. In Southern Italy, in the fourteenth century, members of the Viano or Branca, of Catania, families grafted human tissues in a manner that was considered magical, hence the designation *Magia tropænsis*. It was only later that Gaspare Tagliacozzi (1546–99) of Bologna University recorded his method in print in 1597. Even then, grafting of surgical flaps was considered to be akin to magic—Tagliacozzi was buried in unconsecrated ground. Another surgical operation which was in the hands of skilled craftsmen in the West, together with the treatment of hernias, was the extraction of stones from the bladder, a common ailment and one which received the attention of travelling lithotomists. The names of the most renowned have been recorded—such as Pierre Franco (1505–70) or later on, the two Franciscan Friars, Jacques de Beaulieu (1651–1719) and then Jean de Saint-Côme (1803–81): the latter, indeed, had the use of a private hospital.

In due time the orthodox profession took over these operations, together with the eye intervention for cataract; though "lens-couching" was performed in the market place in India and Egypt, within living memory.

In the transfer of the knowledge of ancient Hellas to later ages the libraries of Alexandria played an important part.

It is common knowledge that in buildings of cities, such as Alexandria, Constantinople, Rome, during the first five centuries of our era, the writings of ancient philosophers like Plato, Aristotle or physicians were preserved, even if neglected by the majority of Christian converts—if we except St. Augustine of Hippo (354–430). It must be admitted that the majority of the conversions to Christianity took place among the common people, who considered disease as a frequent retribution of sin and in most instances curable by Divine Intervention. This happened in the world of which we have coherent records and which can roughly be said to comprise the lands around the Mediterranean.

It is usual to accept that the light of Alexandria was dimmed after the death of Queen Cleopatra (69–30 B.C.) followed by the Roman conquest of Upper Egypt. Instead the intellectual importance of this city continued during five or six centuries, for Ptolemy the geographer, Galen the philosopher-physician and Plotinus (203–262) the Neo-platonist, flourished after the reign of Cleopatra. Soon Christians congregated in Alexandria and a Patriarchate was established, so that this seaport rivalled Rome as a fountain-head of Christianity. It is unfortunate to have to record that the Christian monks of Alexandria became notorious through gross intolerance and fanatical zealotry, having murdered Hypathia (370–415) the Neo-platonic woman philosopher. Cyril of Alexandria (d. 444) was Patriarch at the time and it is to be hoped that he had no part in this criminal outburst.

The libraries of Alexandria were famous and though on several occasions they sustained severe losses through fire and pillaging, it seems that they were replenished either by donations or the work of scholars. When the generals of Ibn al-Khattab Omar (assassinated 644) conquered Egypt in 641, it is said that all the MSS. were employed to heat the baths of Alexandria during six months.

It may be mentioned that Max Meyerhof (1945) translated the writing of one of the Jewish physicians of Saladin (1137–93)—Ibn Jami (d. c. 1180) who said that the MSS. of the libraries of Alexandria were not burnt, but were sent to Harran and Antioch for further study. Ibn Jami expressed the opinion that Christian kings were careless of ancient learning, which on the other hand Omar protected. In any case the destruction cannot have been very thorough for many of the works of classical times are known from survivals from the libraries of Alexandria.

For the proper understanding of the subject, it is necessary to recall some dates of general history, for now the so-called "Arabic" writers come into the picture. These wrote in Arabic characters, but only one was a true Arab, Al-Kindi (d. 873); the others were Moslems of different sects, some Jews and others Nestorian Christians.

The life of Mohammed (c. 570–632) is easily found in any Encyclopædia. He himself was not hostile to learning, for he is reputed to have said: "Science is twofold—Theology and Medicine." Even if this is a narrow assertion, it goes further than many of the statements of the Early Fathers of the Church, who opposed all pagan and worldly knowledge. Mohammed believed in the efficacy of drugs and had a Nestorian Christian from Jundi-shapur as physician; an example which later Khalifs followed.

In such matters, however, the opinions and actions of those who succeeded Mohammed are more important, for they show how his principles were put into practice. On his death, Abu Bekr became Ruler of the Islamic States, but he lived only a couple of years, from 632 to 634 and was followed in the Khalifate by a warrior, Abu Hafsa Ibn-al-Khattab Omar (assassinated 644) who, without leaving Medina, through his general, Abu Obeydah, organized the victories which brought under his rule the whole of Arabia, occupied Jerusalem, Syria, Armenia, Assyria and Mesopotamia. Alexandria and

part of Upper Egypt were conquered in 640. On his death, Omar was succeeded by Othman, son-in-law of Mohammed, who completed the conquest of Egypt and took Islam to Central Asia. Othman was assassinated in 656 so that the Khalifate passed to two claimants: Ali—a cousin of Mohammed, and Moawiya, a cousin of Othman. The adherents of these rivals were known as Shiites and Sunnites.

Moawiya and his Sunnites murdered Ali and removed the Khalifate from Mecca to Damascus, which had been captured by the Moslem, Khalid ibn Walid, and here, Moawiya founded the Ummayad Dynasty. From Damascus an unsuccessful attempt was made to capture Constantinople in 718, when, it is said, the Moslem ships were destroyed by "Greek fire".

Under the Khalif Walid—who reigned from 705 to 715—his troops resumed their conquering expeditions, invading Sicily, the Mediterranean shores of Africa and even entering Spain and crossing the Pyrénées into France, where they were defeated by Charles Martel (689–741) at Tours in 732.

The Ummayyads however remained in parts of the Spanish peninsula and made Granada into one of the most splendid cities of Moorish Spain.

It will be easily seen that the Ummayyads were mainly concerned with conquest and military matters; this is important because it might be easily concluded that the lively Moslem interest in classical learning flourished within five decades of the death of Mohammed. This is not so; it is the purpose of this lecture to suggest when and how the "Arabian revival of science" took place.

The Ummayyads were supplanted by the followers of Abul Abbas, who founded Baghdad in 750 and transferred the Khalifate there. The Abbasids—as they eventually became known—were patrons of learning.

A pause must be made to consider the reasons that have been suggested for the sudden outburst of zeal in the translation of classical MSS. from Greek into Arabic.

It has been thought that this might be due to the inspiration given by Mohammed, whose recognition of learning was definite: indeed it might provide the reason why he tolerated the people of the Book (Christians and Jews) and was so unyielding in his dealings with Unbelievers or Khafirs. Others have mentioned the protection given and interest shown in all branches of learning by enlightened, even if tyrannical, rulers. This cannot be denied, for it is evident; what remains to be ascertained is: who were these patrons of learning? Again, the admiration for the rapid conquests of Islamic armies has been mentioned; but this would only explain the preference for Arabic script.

Partington (1937), p. 27, suggests that on reaching Alexandria, the Moslem conquerors in 641 found manuscripts explaining how to make gold, and to cure all diseases—accordingly they became interested and searched for further information. Against this it may be objected that the troops invading Alexandria were Ummayyads and that the interest in classical learning began about a century later, not in Damascus, but Baghdad. Then the first writings to be translated from Alexandria were those of Aristotle and that the interest in astronomy originated in Persia. None the less, the suggestion is well worth considering, for it may provide a partial explanation of what is a most remarkable incident in the history of civilization. According to Guthrie (1945), p. 87: "Before the birth of Mohammed, however, the roots of Arabian medicine had been planted; planted, moreover, by an unorthodox but liberal-minded Christian." This can be accepted as a correct though restricted interpretation of events. For it must not be forgotten, after the first impetus provided by the Nestorians of Jundi-shapur, many other writers took up authorship, such as Persians like Rhazes, or Jews like Maimonides or Spanish Moors, such as Averroes.

The wanderings and vicissitudes of Nestorius (d. 451), Patriarch of Constantinople, condemned as a heretic by Council of Ephesus in 431—can be read elsewhere. What concerns us is that Nestorians, led by the Bishops of Edessa and Nisibis propagated their doctrines in Iraq, Persia, Malabar and China and in South-Western Persia, where in Jundi-shapur a school of medicine and dispensary or hospital were established, probably grafted on a Sassanian place of instruction. In this they taught the doctrines of Galen, on the basis of translations into Syrian.

It can be assumed that this hospital and school were functioning about five decades after the death of Nestorius, so that pupils could be taught. The renowned physician George Bachtishua of Jundi-shapur was the first of six generations of eminent physicians. It has been seen that a pupil of this school was physician to Mohammed.

The most renowned of the family was Gabriel Bachtishua, (d. 828-9) physician first to a Barmecide—a famous and wealthy family of Baghdad, who were massacred in 802 by order of Haroun al Raschid (763–809), with whom Gabriel became Court physician. He was one of the wealthiest physicians recorded in history, receiving fabulous sums for the cure of his masters and their favourites. In the end he fell out of grace with the Khalif, being imprisoned, and even condemned to death; however, he regained his former position with his successors, Al-Amin and Mamun.

His medical triumphs—as related by near contemporary authors—appear somewhat theatrical to modern eyes; consisting as they did in curing the, apparently hysterical, posture of a raised arm in a favourite of the Khalif by lifting her skirt, or bringing a dead man to life again by making him

sneeze. The splendour of his position at Court, the enormous fees Gabriel was paid, the fame obtained by his knowledge, all this would make him a worth-while example for ambitious youth.

Gabriel did not leave any writings; not so Hunayn ibn-Ishaq (809-73) known to the Latins as Johannitus, a gifted philosopher-physician, who translated nearly all Galen. He wrote medical treatises which, it is said, were bought for their weight in gold. Such reports would also impress young people and inspire them to follow in the path traced by these physicians. He lived under the protection of the Khalif Mamun (813-33) of Baghdad.

In the *Arabian Nights*, Vol. V, pp. 218-27, the story of the spendthrift Abu al-Husn and the clever slave-girl Tawaddud explains that the physician should not only be acquainted with Galenical medicine, but with theology, law, philosophy, astronomy, astrology, music and chess. The last is especially significant for it must mean that he could play with his patients; in other words was on a level with the mighty. Though the *Arabian Nights* often mention Haroun al Raschid, more probably, they were compiled in the twelfth to thirteenth centuries.

In any case they show that the philosopher-physician was a highly respected and learned person, very different from his Western prototype who, in the eighth century, was *nulla litteris cognitus* or sat among the menials.

That concurrently with such sound philosopher-physicians, also quacks and charlatans existed is shown by Rhazes (841-926), who related how they cut the back of the head for epilepsy or extracted stones, lizards, worms by sleight-of-hand from their head, throat or elsewhere, (*On Impostors*, page 80, W. A. Greenhill's translation, 1848).

It is obvious that pupils from Jundi-shapur could claim superior medical knowledge obtained from Hippocratic or Galenical writings, but in the beginning of the Arabic interest in classical knowledge, astronomy was also included. This can be explained by the use of reckoning by the stars in making calendars; a knowledge which must have been obtained from the Persians. It is understandable that the wonderment aroused by the discoveries obtained in observing the firmament, the sureness with which certain celestial phenomena could be foretold or the results of seemingly miraculous cures, suggested that it might be possible to extend such triumphs to other spheres. This must also be remembered—Science was not as clearly defined as at present; in reading or examining some book on astronomy, chapters on optics or astrology might be encountered and an interest awakened in other matters.

The linking of astronomy and medicine by means of astrology was a process that began with Galen, but which the Arabic writers continued and extended, till by its neglect of anatomy and the symptoms of disease, it was a source of error and confusion.

Not so the compounding of drugs, which soon appropriated some of the methods of alchemy. Many of the manipulations of alchemy must seem a waste of time, effort and intelligence, yet it cannot be denied that the connexion with pharmacology and chemistry appears to have been continuous. The jargon of alchemy is not completely senseless; it can be interpreted in modern terms. Whether Arabic authors obtained their alchemy from India or from China cannot be discussed here. Though some medico-historians point out that no Arabic works of Geber are extant, yet it can be assumed that he lived in Baghdad in the eighth century and even if his original writings have not survived, the Latin translations with his name inspired many to follow his methods.

Summarizing, therefore, it might be said that the Moslem interest in the translation of classical manuscripts was mainly restricted to the Abbasid Dynasty and to the Ummayyads when they were transplanted to Spain. It can be ascertained that, beginning with medicine and astronomy for practical purposes, attention was then extended to many other subjects of intellectual import, to which additions were made. Neither the mode of life nor the outlook of Hellas was adopted, for it was not a nation-wide concern, as art and literature were in Tuscany in the Medicean age or the fourteenth to seventeenth centuries.

It was previously suggested that the high esteem enjoyed by the philosopher-physician in Moslem lands may have inspired the authors of the Salernitan writings to style themselves "Masters of medicine". This designation, however, marked the distinction between the "*medicus*" or ordinary leech and those who not only could practise the Healing Art, but wrote treatises compiled from translations from the Arabic or, possibly, sometimes in the original Greek. At the time, "Master", "Doctor", "Professor" signified much the same—capable of teaching the subjects of the Trivium—Grammar, Logic, Rhetoric.

It can be asserted that it was from Salerno that the present-day medical profession arose, which by proving its worth, has become universal and can hold its own in practice and debate with any other system of Healing.

How the Salernitan writings were copied, recopied, modified, added to and eventually printed, need not be recalled. By means of its medical treatises, the fame of Salerno lasted longer than the actuality. In the time of Francesco Petrarca (1304-74) eminent teachers were no more.

Further developments can be clearly, or relatively accurately, documented—the gradual taking over

of medical education by the Universities or *Studium generale* as they were then called, the granting of the "Doctor's" degree, the acceptance of Arabic commentaries and translations of classical writings. Later on, direct and more accurate versions from the Greek were obtained following the scattering of scholars after the fall of Constantinople to the Ottomans in 1453. The eventual substitution of book-learning by direct observation, beginning with Andreas Vesalius (1514-64), then the dawn of experimental medicine in the seventeenth century with William Harvey (1578-1657)—all this is common knowledge.

While orthodox medicine was being transformed, popular or family remedies remained unaltered, though with the increasing effectiveness of academical medicine, home treatment has lost a great deal of its popularity. Even so, every busy medical practitioner will know of instances where rheumatism has been "cured" by carrying a potato in the pocket.

It may be asked: What remains of the Arabic revival? Apart from the numerals and numerous verbal survivals like alcohol, algebra, etc., it can be noted that several useful pharmaceutical technical manipulations, such as the extraction of vegetable agents, have an Arabic origin.

If it is required to know why the active interest in classics ceased nearly as suddenly as it originated, then it may be suggested that this coincided with the time when Latin translations of Greek classics became available through Niccoló Leonicensino (1428-1524) and Thomas Linacre (1460-1524). Printing hastened the declension which had already begun, when it became easier to learn what actually had been taught by physicians of the Hippocratic and Galenical Schools. This relates to the West; in the East, Avicenna is still consulted today.

In this essay, the fruit of reading during many years, it is far from easy to mention the authorities consulted. Exception must be made for: "Introduction to the History of Science" (Baltimore, 1927-1948) by George Sarton—which has proved invaluable, together with the "Encyclopædia of Islam" (Leyden and London, 1913-38), which afforded reliable information on political historical matters.

Dr. Douglas M. Dunlop, Reader in Islamic History, University of Cambridge, helped me greatly in providing information in relation to subjects about which I was in doubt.

The Wellcome Historical Medical Museum (Dr. E. A. Underwood) demonstrated important and rare Persian and Arabic MSS at the lecture, for which thanks are due.

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