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Arabic Medicine: Continuation of Greek Tradition and Innovation

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An 'International Institute of Islamic Thought and Civilization' in Kuala Lumpur, Malaysia, has earned the merit of editing an interesting tract by Abū Bakr Muḥammad ibn Zakarīyā' al-Rāzī, in Latin tradition known as Rhazes (854–925 or 935), with the title 'Doubts on Galen'.[1] This sounds programmatic, but it is confined to minor details, and the author confesses that he feels very uneasy when criticizing a man whom he reveres as his most benevolent master in the medical art, but he is compelled to comply with the principle 'magis amica veritas' as Galen himself has always done in his time. The edition is intended to be the start of a series with the title 'Islamic Thought', and the director of the institute, Syed Muhammad Naquib al-Attas,[2] announces in his foreword its aim 'to formulate an Islamic philosophy of science', which he further specifies with the following words: 'In order to learn from the past and be able to equip ourselves spiritually and intellectually for the future, we must return to the early masters of the religious and intellectual tradition of Islam, which was established upon the sacred foundation of the Holy Qur'an and the Tradition of the Holy Prophet.' (Ref. 1, p. 3). But here we feel obliged to add that Rhazes was not the right man to inaugurate such a series, as he showed himself in his philosophical writings as an outright apostate who deemed all prophets of the revealed religions to be frauds and had even chosen as his spiritual leader, his imam, none else than Socrates.[3]

A booklet under the title 'Islamic Medicine' appeared in London in 1986, with a reprint in 2008. The author Muhammad Salim Khan, a practitioner with a rather shadowy knowledge of medical history, presents Galen's humoral pathology as part of the Sharia and therefore also as 'the medicine of the future'.[4] The author describes the state of health among the first followers of Mohammed as simply 'miraculous' (Ref. 4, p. 10), whereas the unsuspecting reader may think that the medical prescriptions of the prophet were already in agreement with Galen's humoral pathology, and Khan censures Muslim governments, who have, still under the spell of colonial domination and alienated from their cultural roots, deprived the traditional practitioners from the possibility to exercise their profession (Ref. 4, p. 90).

This is the ideology of Islamists who try to regain the state of a period which they regard as their Golden Age and some of them fight by all means against any foreign

influence, which they regard as un-Islamic.[5] But Islamism also comes along in a more sophisticated manner when more enlightened Muslim historians, while paying heed to the role of the Greek heritage in the Islamic civilization, are cultivating nevertheless the phantom of an 'Islamic scientific tradition',[6] which began with the prophet and took up from foreign sources only what was compatible with it. Muzaffar Iqbal, the president of a 'Center for Islam and Science' in Canada expressly declares: 'Translations were done to enrich the traditions not to give birth to it, as some orientalists have claimed.'[7] The activity of the translators in ninth-century Baghdad are also seen in this perspective: 'Ḥunain was a Christian but since he was working within the framework of the Islamic scientific tradition, his works are considered to be part of the Islamic scientific tradition, just as the scientific works of thousands of Muslim scientists who are working in the contemporary West are part of the Western scientific tradition.' (Ref. 7, p. 86, note 37). The author fails to take into account Ḥunayn's cautious, but nevertheless decidedly formulated distance toward Islam.[8]

The Galenism as transmitted by Hunayn's translations was the same as that which was continued in Byzantium and nobody would call it there a kind of Christian or Greek-Orthodox science. In our contemporary debates it is therefore necessary to have a clear idea about the fact that the whole Greek heritage within the Islamic civilization was nothing else than the continuation of a special kind of learning that was living on outside of the official religion,[9] just as had happened under the Christian denominations, with their own dogmas, that existed before the advent of Islam.

But when assessing the important role of the Greeks, as the secular minded intellectuals under Islam always did, we must avoid another distortion of this history, as for instance the medievalist Jacques Le Goff committed in his otherwise well-written book *Les intellectuels au Moyen Age*, where he describes the ultimate Latin reception of this tradition via the Arabs as 'un périple de retour', i.e. from Europe to Europe.[10] The Greek nation had settled around the whole Mediterranean, and they were by no means Europeans in the modern sense of the word,[11] and the ongoing tradition of the Greek legacy in Islam began mainly in Alexandria which is, to my knowledge, located in Egypt. What Dimitri Gutas has said about the philosophical tradition in Islam holds also true for medicine. He states: '… the fact remains that the philosophical activity in Alexandria during the fifth to the seventh centuries, its tendencies and intellectual orientations, as well as the written material it both possessed and produced, were determinative of the amount and nature of Greek philosophy that was transmitted to the Arabs. From this derives the first rule of thumb in Graeco-Arabic studies, which says that whatever was not available, either as an idea or a cited text, or as a discrete written work, in the philosophy of late antiquity is by the same token not to be expected to appear in Arabic.'[12]

The continuation was made possible by some propitious factors, which we may appreciate best when comparing it with what was going on with the Romans, who failed to hand this heritage over to Mediaeval scholars, who were in the end compelled to rely on translations or adaptations taken over from the Arabs. After the ultimate defeat of Carthage in the year 146 BC the victors gave the books of the libraries there to their North African allies and took with them only 28 volumes on agriculture by the Punic author Mago.[13] For the largest part the Romans were unable to adopt the standards of

Greek science. Let me quote a judgement from the historian William H. Stahl: 'Because of their lack of interest in scientific thought the Romans must be held responsible for the deteriorated state of knowledge in Western Europe during the first millennium of the Christian Era. While in the Eastern Empire Byzantine and Alexandrian scholars continued to study the original classics of Greek science, the compilers of the Latin West rummaged no further than the readily digestible compendia of their most recent predecessors.'[14]

This may sound unjust, but it is endorsed now by Galen himself in his recently discovered commentary on Hippocrates' 'Airs, waters, places' in Arabic translation. He tried to explain to some experts in Rome the astronomical principles for calculating the beginning of the summer, but they gazed at him as if he were speaking of 'white ravens', i.e. something unheard of, and this according to Galen 'due to the sluggishness of their intellect and their lack of understanding'.[15] Thus, it is no wonder that Galen himself, with his theoretically demanding medicine, left no lasting impact on the following generations of physicians in Rome. Caelius Aurelianus in the fifth century, being dependent on the Methodist school, quotes many medical authorities, but ignores Galen completely.[16] Macrobius (about AD 400) in his 'Saturnalia' shows his erudition by quoting Hippocrates and other physicians, but Galen is not among them.[17]

Almost all Roman authors were well versed in the Greek language, because it had become the lingua franca in the whole Mediterranean long before Rome rose to power. Hannibal too was able to speak Greek. The decline of the Greek language in the West in Late Antiquity proved to be as fatal for the literary tradition of Greek medicine as a whole as it was for the Corpus Aristotelicum and Ptolemy's Almagest, for the Romans failed to render all the treasures of this knowledge in their mother tongue.

The situation in the East was different. Here higher education was likewise linked with the presence of Greeks and their language. Scientific and philosophical activities remained alive in Alexandria, so that they could make, already before the rise of Islam, their impact on the Syrian Christian and pagan intelligentsia. Ḥunayn ibn Isḥāq was in the ninth century still able to purchase his Greek manuscripts all over the Near East, they did not have to be imported from Byzantium.[18]

A rivalry between Greeks and Syrians in the area, or between the denominations of Melkites and Jacobites, was not confined to Christian dogma. In a letter from the year 662 the bishop Severus Sebokht complains about the arrogant behaviour of some Greeks who pretend that they alone were capable of cultivating the sciences, whereupon he extols the old Babylonians and Egyptians at their expense.[19]

The Syrian elite were nevertheless bilingual. In the course of time, however, this bilingualism gave way to a new combination of Syriac and Persian, and this understandably first in the East, where the Persian influence was preponderant. Yet, this did not diminish the ambition to read the old texts. We know of one addressee to whom Sergius of Rēšʿaynā in the sixth century AD dedicated his translations of Galen into Syriac. He was, not by coincidence, a bishop of al-Karkh on the Tigris in the Eastern part of the region (Ref. 18, pp. 1998–1999, reprint, p. 93).

The advent of Islam did not endanger the cultivation of the secular sciences of the Greeks including their medicine. On the contrary, it created the preconditions of their dissemination over a vast area from Bukhara in the East to North Africa and Spain

in the West. In the Christian countries the victorious Arabs did not create a cultural vacuum as they did for instance in Choresmia near the Aral Sea. The universal scholar al-Bīrūnī (973–1048) describes the advent of Islam in his country in the year 712 with the following words: 'For after Quṭayba ibn Muslim al-Bāhilī had killed their learned men and priests, and had burned their books and writings, they became illiterate and relied for the knowledge which they required upon memory.'[20]

The Christians were, according to the Koran, not heathens doomed for the sword, but 'People of the Book', i.e. of a divine revelation prior to the Koran. As such, not only their hierarchy, but also their educational institutions and the hospitals, which were also sites of medical training, were left intact. In ninth-century Baghdad, the Syrian physicians were still monopolizing the medical profession and they did not want to read their literature other than in Syriac, and the great translator Ḥunayn had to comply with this, although he was an Arab by birth. Some of his clients understood Greek more or less, so they were able to judge the quality of his translations. Over the course of time the Syriac language lost ground, but there was no danger that the medical texts would disappear as had happened in the West in Late Antiquity, for there was a strong demand among educated Muslims to possess them also.

In one single case we hear from an individual Muslim who had learned Greek. Al-Jawharī, an astronomer and collaborator of the caliph al-Ma'mūn, was able to recite the books of logic, i.e. the Organon of the Aristotelian corpus, by heart in the original (Ref. 8, pp. 596–597). But this was not practicable, of course, for the majority. Thus, those interested in medicine knocked at Ḥunayn's door to commission Arabic versions, usually after the Syrian physicians, as they were only laymen in this field. But Ḥunayn was so busy with the work for his medical colleagues that he often left the task to his pupils who had to rely on his Syriac versions. He could not foresee that these second-hand versions would serve as the main basis for the further development of theoretical medicine in Islam, when Syriac very soon lost its meaning as medium of the sciences.[21]

There has been much speculation about the reasons for the eagerness on the part of Muslim court officials, mainly of Persian extraction, to acquire for themselves all that was available from the Greek scientific heritage. Dimitri Gutas has put forward the thesis that behind it all there lay an old program of the Sassanid dynasty to regain all the spiritual treasures that the mischievous Alexander of Macedonia had robbed from them in order to transfer them to Greece.[22] But more plausible appears to me the existence of the so-called *majlis* ('session') that came in two types. The first type consisted of lessons given in private houses, but open to everybody, where one could study philosophy or medicine. We may assume that the language of the professor was still Syriac, and that Muslims may sometimes have had difficulties following what was going on.

The other type of *majlis* were assemblies where people of various convictions met in order to debate on matters of common interest. Al-Bīrūnī reports a conflict that had erupted in Baghdad 100 years before his time between the Nestorian Christian philosopher Abū Bishr Mattā ibn Yūnus and the Muʿtazilī theologian al-Jubbā'ī. The latter, in this respect still in accordance with the Koranic concept of the cosmos, did not believe that the Earth is shaped like a sphere and confessed to the audience that he had indignantly ripped out pages on this subject from a tract by Aristotle, at which point the

philosopher ridiculed him before the entire assembly.[23] It is understandable that the audience would have been interested in consulting the tracts of Aristotle themselves. But one reason for the translation movement does not preclude the other.

In contrast to the Syrians, the speakers of Arabic were proud of the purity of their language, and Ḥunayn ibn Isḥāq, himself an Arab by birth, was able to comply with the spirit of the so-called ʿ*arabiyya*, so far as this was possible in a medical translation. Instead of transcribing the terms that were not to be found in Arabic he and his pupils created neologisms with the means available in the target language. This contributed to the successful distribution of the texts over the vast area from Bukhara in the East to Spain in the far West, with Latin Christians able to profit from this in some regions of contact.

Another reason for the success of Galen's medicine was a certain compatibility with Islam. Galen, as an adversary of Epicurus and the Epicureans, in his time had been a champion of what is now called 'intelligent design', which he tried to demonstrate by his anatomy of the animal body.[24] This was, of course, in accordance with creationism as preached in the Koran. Another coincidence occurred with the problem of infection, the transmissibility of a disease from one individual to another, well known to camel-breeding Bedouins but strictly denied by the prophet. Galen's humoral pathology offered no arguments in favour of the clinical evidence, as in his scheme an epidemic disease could occur only by an unhealthy air.[25]

Just like the fanatical Galenists of our Renaissance so too the physicians in Islam disliked innovations (Ref. 1, pp. 266–267), and their description can therefore be a minor chapter in contrast to the phenomenon of the continuation of Galenic medicine.[26] The great Rhazes was only one of the few who had a clear concept of scientific progress (Ref. 1, pp. 267–268). The majority of physicians saw in Galen the 'seal of the physicians',[27] just as Mohammed was the 'seal of the prophets', with whom the series of divine revelations was closed.

Nevertheless some practical progress was achieved in surgery. Abū l-Qāsim az-Zahrāwī, who lived about the year 1000 in Córdoba, has in his *Kitāb al-taṣrīf* ('The book of dedication') an impressive series of illustrations of surgical instruments.[28] Due to the frequency of eye diseases in the Orient, the discipline of ophthalmology had many really creative representatives. Abū l-Qāsim ʿAmmār ibn ʿAlī al-Mauṣilī, who practised about the same time in Egypt, invented a new method of cataract treatment by sucking the lens with the aid of a hollow needle (Ref. 28, p. 209). Criticism of Galen arose mainly among philosophers, when he dared to contradict Aristotle; for instance when it came to the question in which part of the body the soul is located.[29]

Avicenna, the great theoretician in metaphysical matters, extended his speculations also into the field of anatomy, physiology, embryology, the location of the inner senses, etc. They mean mainly a step backward when compared to Galen.[30] The latter had, for example, assumed a transition of the blood from the right to the left ventricle of the heart via the lungs and also by a direct passage between the ventricles. Avicenna decreed that only the last possibility was valid. Ibn al-Nafīs (1210–1288), a theologian and at the same time a medical commentator of his own right has nowadays won great fame, because he postulated against Avicenna, although not against Galen, that only the passage via the lungs is possible.[31]

ʿAbd al-Laṭīf al-Baġdādī (1162–1231) discovered that Galen's description of the bones of the jaw and the sacrum was incorrect, because Galen had to rely on the

dissection of animals whereas ʿAbd al-Laṭīf merely by chance had the opportunity to examine, near Cairo, a large heap of human skeletons, victims of a famine. He did not write a special essay on this subject, as we would expect, but he jotted his discovery down in a description of Egypt.[32] Ibn abī Uṣaybiʿa, the medical historian, has read this book, but remains silent as to a discovery that we would have appreciated as epoch-making (Ref. 27, vol. 2, pp. 208, 11–14 and 211, 25–28).

Really epoch-making was the work of the physicist Ibn al-Haytham, who was concerned with the function of the eye and the physiology of the visual process. He gave the final proof that the eye does not emit rays or transform the air before the eye into some kind of sense organ, as Galen had held. His experiments with glass lenses were continued in Europe and there led to the invention of spectacles, telescopes and microscopes.[33]

The greatest achievement of medieval medicine in Islam was that it produced systematic and well-organized handbooks of the rational medicine of antiquity. In the field of astronomy, the Greek 'Almagest' was ready to be translated into Arabic and further into Latin by Gerhard of Cremona, but in medicine this had to be done by Muslims, namely ʿAlī ibn al-ʿAbbās al-Majūsī and Avicenna.

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Gotthard Strohmaier was, from 1958 to 1999, assistant at the Corpus Medicorum Graecorum of the Academy of Sciences in East Berlin. After the fall of the Berlin Wall he became a 'Honorarprofessor' at the Freie Universität Berlin in former West Berlin. Some of his nearly 350 publications are collected in the volumes *Von Demokrit bis Dante* (Hildesheim: Olms, 1996), *Hellas im Islam* (Wiesbaden: Harrassowitz, 2003) and *Antike Naturwissenschaft in orientalischem Gewand* (Trier: WVT Wissenschaftlicher Verlag Trier, 2007). At present he is preparing the edition of Galen's commentary on Hippocrates' 'Airs, waters, places', preserved only in Arabic translation. He is a Member of the Academia Europaea and 'Korrespondierendes Mitglied' of the Bavarian Academy of Sciences.