

## The Picture of the World in al-Bīrūnī's *'Pharmacognosy'*

---

GOTTHARD STROHMAIER

Wisbyer Str. 8, 10439 Berlin, Germany. E-mail: strohmaier-wiederanders@t-online.de

In his huge *'Pharmacognosy'* the universal scholar al-Bīrūnī (973–1048) equates, in 1116 paragraphs, about 4500 names of medicinal plants, and also foodstuffs, in 27 languages. Before the introduction of an internationally recognised botanical nomenclature this kind of literature served a practical need. Al-Bīrūnī's work is now a mine of information for the linguist and also for world history. It testifies, for example, to the fact that the spoken Greek vernacular of the time had become already quite different from the classical language. Thus, the Byzantine emperors in their efforts to defend their state helped to conserve a cultivation of the humanities, which would have disappeared under Muslim rule. In the article on 'capers', al-Bīrūnī also offers a rare insight into a seemingly relaxed bit of small talk between Constantinus VII and an Arab ambassador.

At the turn of the first to the second millennium, the Hindus in the Punjab region repeatedly suffered from ruthless military incursions by Maḥmūd of Ghazna in Afghanistan. At the same time al-Manṣūr bi-llāh raided the Christian North of the Iberian peninsula. On the Indian subcontinent this was the beginning of a lasting subjugation, which gave its people, at least partly, a new Muslim identity. In Spain, the incursions helped to raise a spirit of resistance. With regard to the history of the sciences there is another great difference. It cannot be denied that, on the whole, the cultural standard of the aggressor was, in both cases, higher than that of the victims. However, there began in Northern Spain on the Christian side an active reception of the astronomy of the Muslims, first concentrated on the astrolabe, the handy universal instrument, together with the accompanying manuals.<sup>1</sup> In Maḥmūd's entourage figured al-Bīrūnī (973–1048), the most outstanding scientist of his time.<sup>2</sup> He seized the opportunity of trying to learn something new from Hindu astronomers; without success, by the way. He dictated to them something about the construction of the astrolabe in their language,

and he even had the intention to translate Ptolemy's *Almagest* into Sanskrit.<sup>3</sup> Unfortunately, no copy has been found. He laments the stubborn attitude of the Hindu colleagues who were unwilling to learn something new and, because of his sarcastic remarks, called him 'a sea or a water more acid than vinegar'.<sup>4</sup> This is an account of an early 'clash of civilizations', fortunately without European involvement this time.

Being a fervent admirer of Greek science, al-Bīrūnī felt contempt for the astronomical literature of the Hindus, because of the compromises it made between science and popular superstitions, and he recalls in this context the heroic behaviour of Socrates who was willing to die for the sake of truth.<sup>5</sup> Enlightened Muslim intellectuals named the Greek thinkers simply as 'the Ancients', similar to how West Europeans addressed them from the Renaissance onwards, when the ancient Greeks had become the spiritual forebears to Europe in a way they had never been before.<sup>6</sup>

In the 19th century, al-Bīrūnī's homeland Chorasmia south of the Aral Sea came under the dominion of Tsarist Russia, and afterwards of the Soviet Union. The colonial exploitation was, in this case too, accompanied by the introduction of a higher culture, including historical and archaeological research into the past of the region. In 1973, the Oriental Institute of the Academy of Sciences in Tashkent, where Russian and Uzbek scholars worked together, published a Russian translation of al-Bīrūnī's huge *Pharmacognosy*. The main responsibility for this lay with the Uzbek member Ubaydullah I. Karimov.<sup>7</sup> A planned edition of the text itself was not realized. Before this, only parts of the very difficult text had been accessible.<sup>8</sup> How extraordinary Karimov's achievement was may be assessed by a comparison with the edition and English translation of the Arabic text that appeared in the same year in Karachi, under the editorship of the renowned Pakistani scholar Hakim Mohammed Said.<sup>9</sup> Its whole philological standard leaves much to be desired, to say the least.

Al-Bīrūnī's Arabic title *Kitāb al-ṣaydana fī l-ṭibb* (*Book of the Pharmacy in the Medicine*) seems a bit odd. It probably means that medicine itself needs a remedy, namely against the multitude of names applied to a single medicinal herb or a single substance. In the introduction he tells the story of how a nobleman of Choresmia paid too much for liquorice, a most common stuff, because he did not know the name indicated on the recipe that was sent to him from another town.<sup>10</sup> Various attempts were made to equate the various names of herbal plants across the Islamic world. The translators in ninth-century Baghdad were sometimes at a loss when they translated Dioscorides's *Materia medica*, which became the standard work for all subsequent generations of Muslim physicians and pharmacists. Well known is the story, as told by Ibn Juljul, of how a team of experts at the court of 'Abd al-Raḥmān III supplemented some missing Arabic terms in Dioscorides with the help of a Greek codex sent by the Byzantine emperor as a

diplomatic gift (Ref. 1, pp. 105–107). Remarkable in the Muslim West is also an analogous undertaking in an anonymous commentary on Dioscorides, recently edited by Albert Dietrich.<sup>11</sup> Al-Bīrūnī's *Pharmacognosy* is of a philological character. Only accidentally does one meet a description of the appearance of a plant in the style of Dioscorides, or any indications as to its therapeutic use. In coeval Byzantine herbals there was likewise a purely philological tendency to concentrate on lexicography.<sup>12</sup>

Al-Bīrūnī's collection comprises a total of about 4500 names in 27 languages. He quotes testimonies from about 250 authors, not just physicians, but also Arabic poets. Each of the 1116 paragraphs is headed by the Arabic term for what follows. The paragraphs are listed in Arabic alphabetical order. With regard to the non-Arabic material he admits that the Arabic alphabet is not well suited to other languages.<sup>13</sup> Next, in quantity after Arabic comes Persian with its various vernaculars, regardless of the fact that he did not like this language and even went so far as to declare that he preferred to be abused in Arabic rather than be praised in Persian.<sup>14</sup> Choresmian, his now extinct native vernacular, belonged to the family of Iranian languages. He thought it to be wholly unsuited to express scientific thought.<sup>14</sup> In the *Pharmacognosy* it is represented with three words only (Ref. 7, pp. 42–43). Another Indo-European language of Central Asia, of which only few literary remnants exist, is Tocharian, which shares certain features with Italic and Germanic languages. Karimov lists two new words, which were hitherto not recorded in the vocabularies (Ref. 7, p. 45).

When staying on Indian soil, al-Bīrūnī seized also the opportunity to collect names of the *materia medica* there, although in his great monograph on India he must confess that he had difficulties in distinguishing and reproducing the consonants of the spoken language.<sup>4</sup> He also had access to two texts of Indian medicine, one by Susruta (sixth century BC),<sup>15</sup> the other by Charaka (first century AD).<sup>16</sup> These were old Arabic translations made in the beginning of the ninth century AD, at a time when the Indian influence via Persia or directly by the presence of Indian physicians in Baghdad was stronger. Later, when Greek science became dominant, it largely ousted the already not very important Indian elements. This effect, however, was not uniform throughout the Islamic world. It pertained less for Muslim Spain, which caused the late David Pingree to speak of 'the Indianizing tendencies of the Andalusians'.<sup>17</sup> Al-Bīrūnī quotes from Susruta only two words and from Charaka one word.

It seems odd that in spite of the busy activity along the Silk Road and the links by maritime trade the Muslims had no idea of the rich philosophical and scientific tradition of China. They even hesitated to include the Chinese among the civilized nations along with the Arabs, the Persians, the Indians and the Greeks.<sup>18</sup> Al-Bīrūnī too does not know any better when he declares that there is in the East only one nation with an inclination to the sciences, namely the Indian.<sup>19</sup>

He knows some products of Chinese origin, among them tea, which was unknown to classical antiquity. His description of its preparation gives the impression that it is based only on hearsay. In the lengthy article on tea he recounts a legend of how the beneficial effects of the plant were found out.<sup>20</sup>

From black Africa he registers one word in Swahili, for the tamarind. His horizon does not encompass the Far West of the Mediterranean. He knows no Latin words. These only make their appearance in later additions to a Persian translation. From *al-ifranjiyya*, the language of the Franks, he has the name of a bird called *ṣafrāghūn*, this is the sea eagle, in Latin *ossifraga*, now in French *orfraie*.

Al-Bīrūnī's veneration of the old Greeks shines through in his introduction, when he says that 'If Dioscorides were living in our regions and applying his efforts to the inspection of what our mountains and deserts have to offer, all their herbs would become medicines.'<sup>19</sup> The ratio of Greek words is less, though, than one would expect. The reason lies in the fact that the old translators in most cases succeeded in translating the Greek names instead of transliterating them. He had no command of Greek as such, as may be gathered from some false etymologies he gives. He rarely uses the term *yūnānī*. Most often, he uses *rūmī*, which corresponds to 'Ρωμαῖος, as the Byzantines called themselves. In Arabic literature, these terms were interchangeable. In the textual tradition of the Arabic version of Galen's commentary on Hippocrates' *Airs, Waters, Places* the word *rūmī* in the phrases 'what is called in Greek "qausos"' or 'called in Greek "phthisis"' is replaced in a secondary stylistic revision by *yūnānī*,<sup>21</sup> obviously because the second expression was thought to render the notion of ancient Greek more appropriately.<sup>22</sup>

Al-Bīrūnī, as well as Karimov, was unable to differentiate between classical Greek and coeval Greek words. Still, sometimes there appear forms that clearly indicate that they are taken from the living language of the time.<sup>23</sup> There are two possibilities as to how al-Bīrūnī got hold of these words. He tells that in his youth he approached in his home town in Choresmia, south of the Aral Sea, a Greek merchant, whom he calls a *rūmī*, and showed him many things of everyday use in order to jot down their Greek names with Arabic letters.<sup>13</sup> But he also often quotes from a book, now unfortunately lost, with the title *Kitāb ma 'ārif bilād al-Rūm* (*Book of the Knowledge of the Country of the Greeks*) by a certain al-Ahwāzī.

I found the following items, but there will be more material that might be interesting for the development of the Greek language in the Middle Ages: 'Eggs' appear first transliterated as 'w', i.e. ωά, but then with reference to al-Ahwāzī as *abgā*, which corresponds to αβγό in modern Greek.<sup>24</sup> 'Bread' is not ἄρτος, but *bsumin* or *bsumīn*, now in modern Greek ψωμί, in Middle Greek it was still ψωμίον,<sup>25</sup> and 'water' is no longer ὕδωρ, but *nīrūn* (e 'NYRWN correxī), in modern Greek νερό, in Middle Greek still νηρόν.<sup>26</sup>

With regard to the many quotations from the classical authors, Karimov was able to verify the Greek terms in Dioscorides with the help of the Arabic version as edited by César Emilio Dubler and Elias Terés,<sup>27</sup> of which I had managed to procure a film for him. But this was not possible in Galen's often quoted pharmacological writings as with all the many other Greek authors, because in Tashkent he had neither access to the Greek editions nor to the collaboration of a classical scholar. Here we see how important it would be for our Oriental colleagues working in the field of the history of Arabic medicine to have these basic texts at their disposal in a translation into a modern European language.

But for Galen's pharmacological writings, Karimov has succeeded in identifying the shortened titles *Mayāmir* and *Qāṭājānas* with Περὶ συνθέσεως φαρμάκων τῶν κατὰ τόπους (*De compositione medicamentorum secundum locos*) and Περὶ συνθέσεως φαρμάκων τῶν κατὰ γένη (*De compositione medicamentorum secundum genera*). Hakim Mohammed Said, in his translation, left *Mayāmir* as is. For *Qāṭājānas* he ventured to suggest this as an author, namely Cato the Censor in Ancient Rome.<sup>28</sup> He should have known that no piece of Latin literature was ever translated into Mediaeval Arabic, except, in Spain, the *Historia adversus paganos* of Orosius.<sup>29</sup>

Sometimes al-Bīrūnī rejects superstitions or legends, except, of course, when they figure in the Koran, as is the case of the story of Salomo in the valley of the ants in sura 27, 17–19, where an ant speaks to his fellow ants, which Salomo is able to understand.<sup>30</sup> As in many of his other works, al-Bīrūnī is fond of strange or amusing stories. In the entry on 'capers' we find something that has some relevance to world history. It throws light on the personality of the Byzantine emperor Constantinus VII called Kopronymus. An emissary of the Abbasid caliph al-Manṣūr took part in the relaxed small talk at the emperor's table. When pickled capers were served he dared to remark that these were a very common food in his country, whereupon the emperor added: 'Oh, these shrubs usually grow in ruins, and therefore they are with us something precious.'

This fragment of the ambassador's report can be supplemented by another piece quoted by the geographer Ibn al-Faqīh, where the Arab diplomat tells how he was lured into a seemingly friendly relationship and became in the end the victim of an alchemical hoax, when the emperor demonstrated before his eyes how he was able to produce gold and silver at will, in order to engage soldiers and horses, whereupon the caliph al-Manṣūr felt the need to begin with alchemical experiments himself.<sup>31</sup> In a newly published history of alchemy, Hans-Werner Schütt has proposed that this ruse possibly deterred the Muslims for a while from greater military excursions.<sup>32</sup>

At any rate we have here an example of the skill and persistence of the Byzantine emperors in defending not only their state but also the totality of the literary heritage of ancient Greece, including Plato's philosophy and what is

called, in a broader sense, the humanities, which might have withered away under Muslim rule. We may consider what happened in Syrian Christendom where the intellectual elite in time forsook the Syriac-Greek bilingualism they had inherited from their ancestors for Syriac-Arabic. And al-Bīrūnī testifies to the fact that Middle Greek and Classical Greek already in his time had developed into two rather different languages, with the ancient literature remaining accessible only through a thorough knowledge of the classical language.

Thus, the Byzantines deserve praise as the transmitters of a great heritage up to a time when Western Europe was capable enough to receive and digest it. The Muslim intellectuals of the Middle Ages are sometimes also seen as mere transmitters of Greek medicine, philosophy and science. This is true when seen from a strictly Eurocentric standpoint, for Latin scholasticism only absorbed a restricted syllabus of Arabic knowledge, and this was, as a rule, of Greek origin. That opinion is completely false, however, when we consider the intrinsic value of Mediaeval Arabic science as instanced by al-Bīrūnī, an author who exerted no direct influence on the Latin West.<sup>33</sup>

## References

1. J. Vernet (1999) *Lo que Europa debe al Islam de España* (Barcelona: El Acontilado), pp. 155–165.
2. P. G. Bulgakov (1972) *Zhizn' i trudy Beruni* (Tashkent: Izdatel'stvo 'Fan').
3. G. Strohmaier (2007) *Al-Bīrūnī*. In *den Gärten der Wissenschaft*, 3rd edn (Leipzig: Reclam), no. 66.
4. G. Strohmaier (2007) *Al-Bīrūnī*. In *den Gärten der Wissenschaft*, 3rd edn (Leipzig: Reclam), no. 50.
5. G. Strohmaier (2007) *Al-Bīrūnī*. In *den Gärten der Wissenschaft*, 3rd edn (Leipzig: Reclam), nos. 55 and 62.
6. G. Strohmaier (2003) *Hellas im Islam. Interdisziplinäre Studien zur Ikonographie, Wissenschaft und Religionsgeschichte* (Wiesbaden: Harrassowitz), pp. 1–6.
7. Abu Raykhan Beruni (1973) *Farmakognoziya v medicine*, translated and commented upon by U. I. Karimov (Beruni, *Izbrannye proizvedeniya*, vol. iv) (Tashkent: Izdatel'stvo 'Fan').
8. M. Meyerhof (ed. and transl.) (1932) Das Vorwort zur Drogenkunde des Bērūnī. In: *Quellen und Studien zur Geschichte der Naturwissenschaften und der Medizin* 3 (fasc. 3) (Berlin: Julius Springer).
9. H. Mohammed Said (1973) *Al-Biruni's Book on Pharmacy and Materia Medica (Introduction, Commentary and Evaluation by S.K. Hamarneh)*, 2 vols (Karachi: Rashid & Sons).
10. G. Strohmaier (2007) *Al-Bīrūnī*. In *den Gärten der Wissenschaft*, 3rd edn (Leipzig: Reclam), no. 84.
11. A. Dietrich (1988) *Dioscurides triumphans. Ein anonymer arabischer Kommentar (Ende 12. Jahrh. n. Chr.) zur Materia medica*. (1. Teil: Arabischer Text; 2. Teil: Übersetzung und Kommentar) (Abhandlungen der Akademie



- der Wissenschaften in Göttingen. Philologisch-historische Klasse. Dritte Folge, nos. 172 and 173) (Göttingen: Vandenhoeck & Ruprecht).
12. J. Stannard (1971) Byzantine botanical lexicography. *Episteme*, 5, 168–187 (reprinted in: J. Stannard (1999) *Pristina Medicamenta: Ancient and Medieval Botany*, edited by K. E. Stannard and R. Kay (Aldershot, Variorum Collected Studies Series: CS646) VIII).
  13. G. Strohmaier (2007) *Al-Bīrūnī*. In *den Gärten der Wissenschaft*, 3rd edn (Leipzig: Reclam), no. 3.
  14. G. Strohmaier (2007) *Al-Bīrūnī*. In *den Gärten der Wissenschaft*, 3rd edn (Leipzig: Reclam), no. 2.
  15. M. Ullmann (1970) *Die Medizin im Islam* (Leiden, Cologne: Brill), p. 104.
  16. M. Ullmann (1970) *Die Medizin im Islam* (Leiden, Cologne: Brill), p. 105.
  17. G. Strohmaier (1992) The Indian and the Greek Elements in the Sciences of Muslim Spain. In: G. Strohmaier (1996) *Von Demokrit bis Dante. Die Bewahrung antiken Erbes in der arabischen Kultur* (Hildesheim, Zurich, New York: Olms), pp. 376–381.
  18. G. E. von Grunebaum (1963) *Der Islam im Mittelalter* (Zurich, Stuttgart: Artemis), pp. 51, 56, 461–462.
  19. G. Strohmaier (2007) *Al-Bīrūnī*. In *den Gärten der Wissenschaft*, 3rd edn (Leipzig: Reclam), no. 83.
  20. G. Strohmaier (2007) *Al-Bīrūnī*. In *den Gärten der Wissenschaft*, 3rd edn (Leipzig: Reclam), no. 85.
  21. See the equivalents to pp. 28, 15 and 32, 2 in H. Diller (ed.) (1999) Hippokrates *Über die Umwelt* (Corpus Medicorum Graecorum I 1,2), 2nd edn (Berlin: Akademie Verlag) in my forthcoming edition in the 'Corpus Medicorum Graecorum. Supplementum Orientale'.
  22. Cf. N. Serikoff (1996) *Rūmī and Yūnānī*: towards the understanding of the Greek Language in the Medieval Muslim World. In K. Ciggaar *et al.* (eds) *East and West in the Crusader States: Context – Contacts – Confrontations*. Acta of the congress held at Hernen Castle in May 1993 (Orientalia Lovaniensia Analecta 75) (Leuven: Peeters), pp. 169–194.
  23. Cf. Evangelinus Apostolides Sophocles (1914) *Greek Lexicon of the Roman and Byzantine Periods* (Cambridge, MA, and Leipzig: Charles Scribner's Sons) (reprinted Hildesheim, Zurich, New York: Olms, 1992).
  24. Abu Raykhan Beruni (1973) *Farmakognoziya v medicine*, translated and commented upon by U. I. Karimov (Tashkent: Izdatel'stvo 'Fan'), no. 198.
  25. Abu Raykhan Beruni (1973) *Farmakognoziya v medicine*, translated and commented upon by U. I. Karimov (Tashkent: Izdatel'stvo 'Fan'), no. 368.
  26. Abu Raykhan Beruni (1973) *Farmakognoziya v medicine*, translated and commented upon by U. I. Karimov (Tashkent: Izdatel'stvo 'Fan'), no. 972.
  27. César Emilio Dubler and Elias Terés (1952–1957) *La 'Materia Medica' de Dioscórides. Transmisión medieval y renacentista*, vol. 2: *La versión árabe de la 'Materia Medica' de Dioscórides* (texto, variantes y índices) (Tetuán, Barcelona).
  28. H. Mohammed Said (1973) *Al-Biruni's Book on Pharmacy and Materia Medica* (Karachi: Rashid & Sons), p. 27, 11, translation p. 18, cf. the note 57 on p. 57.

29. G. Levi Della Vida (1954) La traduzione araba delle storie di Orosio. *Al-Andalus*, **19**, 257–293.
30. A. Raykhan Beruni (1973) *Farmakognoziya v medicine*, translated and commented upon by U. I. Karimov (Tashkent: Izdatel'stvo 'Fan'), no. 880.
31. G. Strohmaier (1991) 'Umāra ibn Ḥamza, Constantine V, and the invention of the elixir. In: G. Strohmaier (2003) *Hellas im Islam. Interdisziplinäre Studien zur Ikonographie, Wissenschaft und Religionsgeschichte* (Wiesbaden: Harrassowitz), pp. 147–148.
32. H.-W. Schütt (2000) *Auf der Suche nach dem Stein der Weisen. Die Geschichte der Alchemie* (Munich: Beck), pp. 191–194.
33. J. Samsó (1992) *Las ciencias de los antiguos en al-Andalus* (Madrid: Mapfre), pp. 128–129.

### About the Author

**Gotthard Strohmaier** studied theology and Arabic philology in Leipzig and East Berlin. From 1958 till 1999 he worked on the 'Corpus Medicorum Graecorum' at the Academy of Sciences in Berlin. He gained his Dr. Phil. with an edition of a tract by Galen of Pergamum preserved only in Arabic translation. After the fall of the Berlin wall he began to give lectures at the Freie Universität in former West Berlin, where he was appointed Honorarprofessor in 1995. He has more than 300 publications on the Greek heritage in Islam, on Dante Alighieri, and on the influence of Arabic astrology on the arts in Medieval Europe to his name. Among these are three collections of articles (*Von Demokrit bis Dante*, Hildesheim 1996, *Hellas im Islam*, Wiesbaden 2003 [with bibliography], and *Antike Naturwissenschaft in orientalischem Gewand*, Trier 2007).