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Fabrizio Speziale

Centre for Indian and South Asian Studies (CEIAS),
School of Advanced Studies in the Social Sciences (EHSS), Paris

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Principal Contact:

Dominik Wujastyk, Editor, University of Alberta
Email: ⟨wujastyk@ualberta.ca⟩

Mailing Address:

History of Science in South Asia,
Department of History and Classics,
2–81 HM Tory Building,
University of Alberta,
Edmonton, AB, T6G 2H4
Canada

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1 INTRODUCTION

Ḥakīm muḥammad qā'im al-gawālyarī was a Muslim scholar who settled and lived in Farrukhabad (Uttar Pradesh) at the time when the nobleman Muḥammad Ḫān Ġazanfar-i Jang founded the city, in 1714, naming it after the Mughal emperor Farruḫ Siyar (r. 1713–1719). Ḥakīm Muḥammad is remembered as an eminent physician of his time: he treated patients according to the rules of Indian medicine (*qawānīn al-ṭibb al-hind*) and with the "specific compound remedies" (*al-murakkabāt al-muḫtaṣṣat*) taken "from the *rasāyana*" (*min al-rasāyin*).[1] This account is related in the *Nuzhat al-ḫawāṭir*, the well-known biographical work on Indian Muslim scholars by 'Abd al-Ḥayy Ḥasanī (d. 1341/1923), a prolific writer belonging to a family of scholars and Sufis. Ḥasanī's father was a physician and Ḥasanī himself also studied some medicine.[2] The *Nuzhat al-ḫawāṭir* includes the biographies of many physicians, and Ḥasanī does not seem at all surprised by the fact that a Muslim practitioner of the early eighteenth century was known for his knowledge of *rasāyana* and Indian drugs made of calcined (*mukallasāt*) metals.

This article studies how elements drawn from *rasaśāstra* (alchemy) and *rasāyana* (rejuvenating therapy) are translated and incorporated into the Persianate medical culture of South Asia. I suggest that looking at the intertwined issues of the creation of a new field of knowledge, and the interaction with Others' learning, allows for a more accurate understanding of how Persian medical studies evolved and adapted to different natural and cultural settings during the late medieval and modern periods. Furthermore, I suggest that the research on such

[1] Ḥasanī, 'Abd al-Ḥayy ibn Faḫr al-Dīn, 1398/1978: 345. Ḥasanī's source on Ḥakīm Muḥammad is the historical work *Tārīḫ-i Farruḫābādī* by Muftī Walī Allāh Farruḫābādī.

[2] See Gaborieau 1992: 5–6, Speziale 2010c: 74.

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phenomena requires shifting from a view centred on the interaction with Greek and Western materials to a perspective that takes into account the broader set of cross-cultural interactions substantiated in the existing literature.[3] This is a key issue for the trends, studies and practices dealt with in this article. The translation of Paracelsus' (d. 1541) ideas into Arabic is often considered the main encounter between early modern Muslim medical thought and non-Muslim knowledge on iatrochemistry. Paracelsus' writings involve a change of paradigm in the history of Western medical thought, as they openly criticise the principles of Galenic and Avicennian medicine. In this article, I assume that this narrative is based on a Eurocentric and Arabic-centric perspective, which led to a number of existing sources being overlooked, such as those produced in South Asia, and this has prevented the emergence of a more precise understanding of new trends of medical studies in the late medieval and early modern Muslim world.

When Ṣāliḥ ibn Naṣr ibn Sallūm (d. 1081/1670), head physician at the Ottoman court, produced the first Arabic adaptation of Paracelsus' thought,[4] Persian-speaking writers in South Asia had already begun incorporating notions and practices drawn from *rasāyana* into their texts three centuries earlier. Looking at the broader Persian-speaking world from a comparative perspective, it is worth observing that Żiyā' Muḥammad's *Majmūʿa-yi Żiyāʾī*, the earliest Persian text dealing with *rasāyana* preserved so far, was written shortly after the *Tanksūq-nāma* was compiled in Iran by the Timurid vizier Rašīd al-Dīn Fażl Allāh Hamadānī (d. 718/1318). The *Tanksūq-nāma*, a Persian treatise based on Chinese medical sources, is another text that illustrates the interest scholars writing in Persian had in the translation of non-Greek materials.[5]

In Sanskrit texts, *rasāyana* and *rasaśāstra* refer to a broad set of notions and practices dealing with the improvement of health, rejuvenation, extending the lifespan and the processing of mercury, metals and minerals for medical treatment. In medical literature, *rasāyana* is one of the eight canonical branches of Āyurveda. *Rasaśāstra* is a field that overlaps with both alchemy and medicine. In Sanskrit alchemical texts, *rasaśāstra* refers to the preparation and usage of mercurial preparations, both for medical and other purposes such as acquiring special powers, while *rasāyana* refers specifically to the culmination of the alchemical process when the alchemist prepares himself for the intake of the mercurial elixir.[6] Persian writers however use only the single term *rasāyana* to refer to both of these fields, although *rasāyana* and *rasaśāstra* are regarded as different branches in the source culture. Moreover, it should be noted that what Persian medical texts de-

[3] On this issue, see Pingree 1992.

[4] See Shefer 2011; Bachour 2015: 857–861.

[5] See Lo and Wang 2013.

[6] On the issue of the definition of *rasāyana*, a term difficult to translate, see Dagmar Wujastyk, Newcombe, and Barois 2017: iii–iv; Dagmar Wujastyk 2017; Maas 2017. On mercury and mercurial drugs in Ayurvedic medicine, see especially Dagmar Wujastyk 2013, 2016. For a detailed overview of Sanskrit texts dealing with *rasaśāstra*, see Meulenbeld 1999–2002: IIa: 581–787.

scribe by the name of *rasāyana* are mainly metallic and mercurial drugs, and their methods of preparation.

This article focuses on the interaction with the Persian medical environment and the role of medical texts in the circulation of materials relating to *rasaśāstra* and *rasāyana* among Persian-speaking readers. Previous studies of the Persian literature on Ayurvedic medicine produced in South Asia,[7] have allowed me to identify a number of sources dealing with Indian medical alchemy and to postulate a set of hypotheses concerning the reception of these materials, which can be summarized as follows: (i) the incorporation of chapters and descriptions on *rasāyana* and *rasaśāstra* becomes a new feature of Persian texts written in South Asia between the fourteenth and nineteenth centuries; (ii) Persian medical texts played a major role in the circulation and transmission of these notions among Muslim and Persian-speaking scholars; (iii) translation into Persian is a selective process, which uses different strategies to incorporate source materials and their lexicon.

In this study I assume that cross-cultural translation implies a cognitive shift in the way different groups of readers understand and classify a certain knowledge. Here I look at the Persian translation of materials drawn from *rasāyana* chiefly from the reader's perspective, which does not focus on the issue of fidelity to the original source, but rather on the hermeneutical and accommodation process through which translated materials are integrated in the target culture. Furthermore, I assume that textual translation was not the only means by which knowledge circulated between groups of Hindu and Muslim physicians. I will look at the creation of this trend of medical studies from different perspectives. The first part of the article examines the features of the corpus of Persian texts dealing with *rasāyana*, and the historical and social environment in which they are produced. I then focus on how the field of *rasāyana* is defined and classified in Persian texts, arranged according to the categories of both the source and the target culture. In the following section, I discuss the methods of translation used by Persian-speaking writers to present *rasāyana* concepts and practices, and their emphasis on the description of the practical aspects of knowledge. Moreover, I examine some critical remarks made by Muslim scholars about the Indian physicians' use of metallic drugs. In the conclusion, I briefly address the issue of the circulation of these materials beyond South Asia.

2 THE CORPUS OF TEXTS AND ITS DEVELOPMENT

The corpus of persian texts dealing with Indian alchemy and medical alchemy includes different types of texts. It may be useful to start by looking

[7] On Persian writings dealing with Ayurvedic medicine, see in particular Speziale 2018, and also Speziale 2006, 2010b,d, 2014b, 2015.

at these sources subject wise, they include: (i) Persian works on alchemy dealing with Indian materials, (ii) chapters in Persian medical texts, (iii) references in other genres of works. Among the third group of texts we find encyclopaedic works such as the *Ā'īn-i Akbarī*, which describes methods for refining gold and silver used in the royal mint during Akbar's time (r. 1556–1605); the *Nujūm al-'ulūm*, an encyclopaedia written at the time of Sultan 'Alī 'Ādil Šāh (r. 1557-1579) of Bijapur, or by the Sultan himself, that probably included a lost chapter on *rasāyana*;[8] the well-known *farmān* (royal order) issued by Awrangzeb (1658–1707), asking master Anand Nāth of Jakhbar (Punjab) to send him quicksilver of better quality;[9] narratives about yogis and their alchemical powers in Persian Sufi texts.[10]

Some Persian works on alchemy written in South Asia include descriptions of Indian materials. The benefits and therapeutic effects of metallic remedies are described in the *Haft aḥbāb* (Seven Friends), an apocryphal treatise ascribed to a group of seven authors who actually lived during different periods.[11] The group includes the Sufi Ḥamīd al-Dīn Nagawrī (d. 643/1246), a master of the Suhrawardiyya order, and Sulaymān Mandawī (d. 944/1537–38), who was initiated by 'Abd al-Quddus Gangohī (d. 944/1537) into the teaching of the *Amṛtakuṇḍa*, a treatise on yoga, which circulated widely in the Muslim world.[12] One of the seven scholars is Gyān Nāth Sa'ādatmand, a Nāth yogi converted to Islam, who presents the alchemical traditions attributed to the masters of the Nāth sect of yogis. We know that the Nāth yogis were one of the Hindu religious groups more open to interactions with the Muslims.[13] The *Haft aḥbāb* becomes a well-known work, it is copied many times in manuscript form, quoted by later sources and translated into Urdu. The *Maqālīd al-kunūz* (Keys of the Treasures) by Aḥmad ibn Arslān is an alchemical treatise of an unknown period, illustrated with drawings of Indian alchemical apparatuses. Some of these appliances, such as the *pātanayantra* (appliance for sublimation), are also used to process drugs and they are often mentioned in Persian medical texts.[14]

Many writers of Persian medical texts in South Asia include materials drawn from Ayurveda. An outcome of this interaction is the incorporation of separate chapters dealing with *rasāyana* and the methods to purify mercury and other

[8] Chapter 23 in the table of contents (A description of recognizing and the making of *rasāyin*), see also chapter 25 (on the description of the origin of the *gutkhā* and alchemy), Flatt 2011: 243. Chapter 23 is missing in the existing manuscript copies of the *Nujūm al-'ulūm*, personal communication by Emma Flatt.

[9] See Goswamy and Grewal 1967: 120.

[10] On Sufism and yogis, see Digby 1970; Ernst 2005.

[11] On the *Haft aḥbāb*, see Speziale 2006.

[12] See Digby 1970: 36. On the Arabic and Persian versions of the *Amṛtakuṇḍa*, see Ernst 2003b.

[13] On the Nāth yogis' interactions with Muslim society, see Servan-Schreiber 1995, 1999; Bouillier 2010.

[14] Aḥmad ibn Arslān, *Maqālīd al-kunūz*, MS London, British Library, India Office, 2362/3, ff. 59a–90a.

metals. The addition of chapters on this topic emerges as a new trend in Persian medical texts written in South Asia, from the fourteenth century onwards. Both Persian works dealing chiefly with Ayurvedic medicine, and Persian texts dealing chiefly with Greco-Arabic medicine, contribute to creating and developing this trend. Moreover, these materials circulate through the direct translations of some Ayurvedic texts, such as the *Śārṅgadharasaṃhitā* by Śārṅgadhara (fourteenth century).[15] This was not a common feature of earlier Arabic and Persian medical texts. While they may consider the division of drugs into plant, animal and mineral based types and describe mineral drugs, they do not include separate chapters on compound drugs made with processed metals. Moreover, in Arabic medical literature mercury is used chiefly for the treatment of external diseases, and not internally as described in the Persian texts produced in South Asia.[16]

Discussion of Ayurvedic materials in Persian texts took place for many centuries: it began in the period of the Sultanate of Delhi, established in the early thirteenth century, continued to develop under the Mughals, who come to power in 1526, and lasted until the colonial period. The production of these texts is a trans-regional and polycentric phenomenon. It is not bound to the patronage of a specific dynasty, but develops in different regional spaces, under different political powers (see Table 1). The main readership for these texts consists of Muslim scholars who have no access to books written in Sanskrit. However, from the Mughal period onwards, Persian medical texts are also written, copied and read by many Persian-speaking Hindu scholars. In the rest of this article I look more closely at a group of medical works that include chapters on *rasāyana*. I do not aim to be comprehensive, especially in view of the early stage of the research on these texts. I will focus on a group of representative texts and compare their strategies of assimilation of source materials. This group includes treatises dedicated to Muslim kings, works by well-known physicians, texts that had a wide readership, but also lesser known writings, representative in terms of their authorship, such as certain texts composed by Hindu physicians. In this article I focus only on chapters of texts entirely or chiefly devoted to *rasāyana* and iatrochemistry. However, starting with the *Majmūʿa-yi Żiyāʾī* (see below), many Persian-speaking writers (both Muslim and Hindu) also include *rasāyana* prescriptions in other chapters of their works, such as those dealing with virility and sexology.

[15] On the *Śārṅgadharasaṃhitā*, see Meulenbeld 1999–2002: IIa: 196–210. On the Persian adaptations of the *Śārṅgadharasaṃhitā*, see Speziale 2018: 60–61, 176, 190–191.

[16] On mercury in Arabic and Persian texts, see Bachour 2015; Thomann 2015.

THE SULTANATE PERIOD

The trend of including a chapter on *rasāyana* is a creation of the Sultanate period. The earliest Persian medical text written in South Asia to have been preserved at the time, already includes a chapter on mercurial (*rasa*) and metallic drugs. Żiyā' Muḥammad 'Umar Ġaznawī writes the *Majmū'a-yi Żiyā'ī* (Compendium of Żiyā') at Dawlatabad after the city becomes Sultan Muḥammad ibn Tuġluq's second capital (r. 1325–1351) in 727/1327. The *Majmū'a-yi Żiyā'ī* is a general handbook, divided into forty-six chapters (*bāb*), which covers most medical topics. The author deals chiefly with Greco-Arabic medicine, although he also integrates notions, remedies and terms drawn from Indian medicine. Chapter forty-one, "on mercurials" (*dar rasahā* in Persian), is entirely devoted to formulas and procedures for making mercurial and metallic drugs. These procedures are said to be based on the teachings (*guftār*) of Nāgārjuna and other yogis. This chapter may have drawn from the lost Persian translation, titled *Maḫzan al-šifā' wa ma'dan al-ġanā'*, of a text attributed to Nāgārjuna.[17] Żiyā' Muḥammad mentions this Persian translation in his preface, among the texts he used for the compilation of his work.[18]

Table 1: Persian medical texts dealing with materials drawn from *rasaśāstra* and *rasāyana*. This list is not exhaustive and includes only the treatises mentioned in this article.

Period	*Title*	*Author/ Compiler*	*Dedicatee/ Commissioner*	*Place*
After 1327	*Majmū'a-yi Żiyā'ī*	Żiyā' Muḥammad	–	Deccan, Dawlatabad
1388	*Šifā' al-maraż*	Šihāb al-Dīn Nāgawrī	–	Gujarat or Rajasthan
1469–1500?	*Tajribāt al-mujarrabāt-i Ġiyāṯ-šāhī*	Sa'd Allāh Niẓām Zanjānī	Sultan Ġiyāṯ al-Dīn Muḥammad Šāh Ḫaljī (r. 1469–1500)	Malwa
1496–7	[*Kitāb-i*] *Sulaymān-šāhī*	Qāsim ibn Quṭb	Sulaymān Šāh	Delhi Sultanate
1512–3	*Ma'dan al-šifā'-i Sikandar-šāhī*	Miyān Bhuwa	Sultan Sikandar Lodī (r. 1489–1517)	Agra

[17] On the medical and alchemical texts attributed to Nāgārjuna, see Dominik Wujastyk 1984; Meulenbeld 1999–2002: Ia: 363–8; Walser 2005: 69, 75–9.

[18] Żiyā' Muḥammad, *Majmū'a-yi Żiyā'ī*, MS Hyderabad, Andhra Pradesh Oriental Manuscript Library and Research Institute, *ṭibb* 344, ff. 2b–3a.

Period	*Title*	*Author/ Compiler*	*Dedicatee/ Commissioner*	*Place*
1588	*Ḫulāṣa-yi Bīnā*	Bīnā ibn Ḥasan	–	Mughal dominions
late sixteenth–early seventeenth c.	*Dastūr al-aṭibbā'*	Firišta	–	Deccan, Bijapur
first half of seventeenth c.	*Ganj-i bād-āward*	Amān Allāh Ḫān (d. 1046/1637)	–	Mughal dominions
1642–1647	*'Ilājāt-i Dārā Šikōhī*	Nūr al-Dīn Širāzī	Dārā Šikōh (d. 1069/1659)	Mughal dominions
1658–1707	*Ṭibb-i Awrang-šāhī*	Darwīš Muḥammad	Awrangzeb (1658–1707)	Mughal dominions
1670	*Dār al-šifā'-i Awrang-šāhī*	Abū al-Fatḥ	Awrangzeb (1658–1707)	Mughal dominions
1658–1707	*Baḥr al-fawā'id*	Ladhamal ibn Bhairav	–	Mughal dominions
eighteenth century	*Takmila-yi hindī*	Šāh Ahl Allāh (d. 1190/1776)	–	Delhi
eighteenth century	*Ta'līf-i Šarīfī*	Muḥammad Šarīf Ḫān (d. ca 1222/1807)	–	Delhi
eighteenth century?	*Dawā al-'ilal*	Bhagavant Dās	–	–
early nineteenth century	*Mu'ālajāt-i hindī*	Ḥaydar Miṣrī	Sikandar Jāh (r. 1803–1829) of Hyderabad	Hyderabad
early nineteenth century	*Tarjuma-yi Pākāvalī*	Dayā Nāth	Sikandar Jāh (r. 1803–1829) of Hyderabad	Hyderabad
ca. first half of nineteenth c.	*Ṭibb-i bēdik*	Aḥmad 'Alī Ḫān	–	–
nineteenth century?	*Mā' al-ḥayāt*	–	–	–
nineteenth century?	*Nusḫajāt*	Pratāb Rām	–	Hyderabad?

Other writings composed during the Sultanate period include separate chapters on *rasāyana* and methods to purify mercury and metals. In 790/1388, Šihāb al-Dīn Nāgawrī writes the *Šifā' al-maraż* (Healing of Disease) a handbook in verse on pathology and treatment, divided into more than one hundred and sixty chapters. In the first chapter, Nāgawrī proposes a new division of humoral pathology, seeking to combine Indian and Muslim views and incorporate *vāta* (wind, *bād* in Persian) into the Muslim physicians' fourfold division of humour.[19] A group of chapters presents the methods for calcination (*kuštan*) of mica (*ṭalq*), mercury (*sīmāb*), steel (*pūlād*), copper (*naḥās*), gold (*zar*) and silver (*nuqra*), as well as some compound drugs made out of these substances, and their benefits.[20] Nāgawrī uses a few Indic terms in this section. For instance, in the chapter on mercury he describes the procedure known as "sand apparatus" (*bālukā-jantra*) in Sanskrit texts but he does not provide the Indic term.

The *Tajribāt al-mujarrabāt-i Ġiyāṯ-šāhī* (Tested Remedies of King Ġiyāṯ), by Sa'd Allāh Niẓāmī Zanjānī, has come down to us as a single manuscript copy that is preserved in Hyderabad. This text is probably dedicated to Sultan Ġiyāṯ al-Dīn Muḥammad Šāh Ḫaljī (r. 1469–1500) of Malwa. In the preface, the author provides an interesting account of the writing of this treatise and the power of longevity ascribed to Hindu sages, and their practices. Niẓāmī Zanjānī explains that, in the Persian text, he has compiled the practices of a certain Malik Lālā, a Hindu physician of the time of Sultan 'Alā' al-Dīn Ḫaljī (r. 1296–1316) of Delhi. Although Malik Lālā was about one hundred years old, his physical condition was better than that of a thirty-year-old man.[21] The text includes a chapter on *rasāyan* where the author describes several formulas which do not include metals. In 902/1496–1497, Qāsim ibn Quṭb ibn Ya'qūb Ḥakīm composes the [*Kitāb-i*] *Sulaymān-šāhī*. This is a composite treatise that includes a group of five short chapters (from 82 to 86) dealing with treating and killing (*kuštan*) mercury and other metals.[22]

The *Ma'dan al-šifā'-i Sikandar-šāhī* (Mines of Healing of King Sikandar) is compiled by Miyān Bhuwa ibn Ḫawāṣṣ Ḫān, who dedicates it to Sultan Sikandar Lodī (r. 1489–1517). The *Ma'dan al-šifā'* is the most influential Persian work on Ayurvedic medicine written in pre-Mughal South Asia. It is copied many times in manuscript form and is translated into Urdu during the colonial period. It is completed in 918/1512–3, probably at Agra, which becomes Sikandar Lodī's new capital in 910/1504. Miyān Bhuwa is one of the Sultan's viziers. He has a

[19] See Speziale 2014b.

[20] These are the chapters from 153 to 157 of the lithograph edition, see Nāgawrī, Šihāb al-Dīn ibn 'Abd al-Karīm, 1295/1878–79: 82–87.

[21] Sa'd Allāh Niẓāmī Zanjānī, *Tajribāt al-mujarrabāt-i Ġiyāṯ-i šāhī*, MS Hyderabad, Salar Jung Library, pers. *ṭibb* 31, f. 2a.

[22] Qāsim ibn Quṭb ibn Ya'qūb Ḥakīm, [*Kitāb-i*] *Sulaymān-šāhī*, MS London, Wellcome Trust Library, pers. 368; on this text see the forthcoming article by Reichmuth and Mahmudian (forthcoming).

group of scholars in his service who translate parts of Ayurvedic texts, which are assembled in the *Ma'dan al-šifā'*. The third section of the *Ma'dan al-šifā'* includes a chapter (seventy-three) presenting the methods for purifying and killing (*ṣāf kardan wa kuštan*) mercury, gold, silver, copper, iron, tin, talc and other substances.[23]

THE MUGHAL PERIOD

Few Persian treatises dealing with Ayurvedic medicine are written during the early Mughal period. Akbar (r. 1556–1605), one of the great patrons of the translation of Sanskrit texts into Persian, does not commission the translation of Ayurvedic books.[24] In 996/1588, Bīnā ibn Ḥasan, a physician at Akbar's court, writes the *Ḫulāṣa-yi Bīnā* (Epitome of Bīnā), a text on pathology and treatment in seventy-eight chapters, based on Indian sources. Chapter seventy-six, on the methods of purifying (*ṣaf kardan*) metals, is entirely based on the corresponding chapter of the *Ma'dan al-šifā'*.[25]

In the Deccan, an important discussion of *rasāyana* is provided in the *Dastūr al-aṭibbā'* (Canon of Physicians). Its author, Muḥammad Qāsim Firišta (born c. 978/1570), is a well-known historian who also wrote the *Gulšan-i Ibrāhīmī*, a chronicle of the South Asian Muslim dynasties which includes a chapter on the Hindu kings of the pre-Muslim period. Firišta worked at the court of Ibrāhīm 'Ādil Šāh II (r. 1580–1627) of Bijapur. The *Dastūr al-aṭibbā'* is a general handbook of Ayurvedic medicine and circulated widely among Persian-speaking scholars.[26]

The first half of the seventeenth century sees the compilation of two major Persian medical encyclopaedias, the *Ganj-i bād-āward* by Amān Allāh Ḫān and the *'Ilājāt-i Dārā Šikōhī* by Nūr al-Dīn Širāzī: both include chapters on *rasa* and processing metals. Amān Allāh Ḫān 'Amānī' (d. 1046/1637) is a physician and a nobleman, and serves as the governor of the Mughal provinces of Bengal and Malwa.[27] He also compiled a Persian adaptation of the *Madanavinoda*, a *nighaṇṭu* (dictionary) of drugs and foods made in 1375 for the Hindu ruler Rāja Madanapāla.[28] The *Ganj-i bād-āward* is a work on pharmacology, it has a section on Indian knowledge that includes chapters on *rasāyana*.

Nūr al-Dīn Šīrāzī's family includes two important scholars involved in the

[23] Bhuwa Ḫān, Miyān ibn Ḥawāṣṣ Ḫān, 1294/1877: 442–7. One of Miyān Bhuwa's sources was the *Rasaratnākara* of the Siddha Nityanātha Pārvatīputra (Meulenbeld 1999–2002: IIa, 660).

[24] See Speziale 2018: 124–5, 184–6.

[25] Bīnā ibn Ḥasan, *Ḫulāṣa-yi Bīnā*, MS London, Wellcome Trust Library, pers. 601, ff. 108b–112b.

[26] On the *Dastūr al-aṭibbā'*, see Speziale 2018: 181–4.

[27] See Speziale 2010a.

[28] On the Sanskrit work see Meulenbeld 1999–2002: IIa: 187–9; Pingree 2001: 702; on the Persian translation see Speziale 2018: 187–8.

translation of Sanskrit sources at Akbar's court: they are the brothers Abū al-Faẓl 'Allāmī (d. 1011/1602) and Fayżī (d. 1004/1595). In the *Ā'īn-i Akbarī*, Abū al-Faẓl provides an important description of the sciences of the Indians, and he writes the introduction to the translation of the *Mahābhārata* made at Akbar's instance. For Akbar, Fayẓī translates Bhāskara's *Līlāvatī*, a Sanskrit text on arithmetic and geometry.[29] The *'Ilājāt-i Dārā Šikōhī* (Remedies of Dārā Šikōh) is dedicated to the Mughal prince, Dārā Šikōh (d. 1069/1659), another emblematic figure of the Mughal enterprise of translation of Hindu sources into Persian. The *'Ilājāt-i Dārā Šikōhī* includes two short chapters on *rasāyana* as well as a chapter on the breathing exercises practiced by the yogis.[30]

From the *farman* sent to Anand Nāth of Jakhbar, we know that Awrangzeb (1658–1707) was interested in mercurial preparations. Three Persian treatises dealing with Ayurveda are dedicated to this emperor, and two of them include chapters on mercury and metals.[31] Darwīš Muḥammad dedicates the *Ṭibb-i Awrang-šāhī* (Medicine of King Awrangzeb), a general manual on Ayurveda, to Awrangzeb. In 1081/1670, Abū al-Fatḥ Čištī writes the *Dār al-šifā'-i Awrang-šāhī* (The House of Healing of King Awrangzeb), based on both Indian and Persian sources (*čand ṭibb az zabān fars wa hind*). The chapter of the *Dār al-šifā'-i Awrang-šāhī* on the purification of metals contains passages in poetry.[32] Two years earlier, in 1079/1668, Abū al-Fatḥ had dedicated to Awrangzeb a Persian adaptation of Mādhava's *Mādhavanidāna*, entitled *Mir'āt al-ḥukamā'-i Awrang-šāhī* (The Mirror of the Physicians of King Awrangzeb).

The earliest known Persian scientific and medical treatises authored by Hindu scholars, date from Awrangzeb's period. In the medical field, Hindu physicians continued to write, read and copy texts in Persian until the nineteenth century.[33] The earliest of these medical texts discovered so far is the *Baḥr al-fawā'id* (Sea of Benefits), written by Ladhamal ibn Bhairav. In the preface to the text, the author provides an account of his studies, where he refers to his having trained under Abū al-Fatḥ Čištī, the author of the medical texts dedicated to Awrangzeb; Ladhamal ibn Bhairav calls his master by the honorific title of 'Galen of his Age' (Jālīnūs al-zamān).[34] Like his master's *Dār al-šifā'-i Awrang-šāhī*, the *Baḥr al-fawā'id* is a composite treatise. Ladhamal ibn Bhairav clearly states in the preface that he has based his work on books by both Indian

[29] The *Šāriq al-ma'rifat*, a treatise on Vedanta, is also attributed to him, see Ernst, 2010.

[30] The chapters on *rasāyana* are the twenty-third and twenty-fourth of the conclusion (*ḫātima*), Nūr al-Dīn Šīrāzī, *'Ilājāt-i Dārā Šikōhī*, MS Paris, Bibliothèque nationale de France, supplément persan 342A, ff. 753a–755b. On the *'Ilājāt-i Dārā Šikōhī*, see Speziale 2010d.

[31] On the medical texts dedicated to Awrangzeb, see Speziale 2018: 42–5, 191–3.

[32] Abū al-Fatḥ, *Dār al-šifā'-i Awrang-šāhī*, MS New Delhi, Jāmi'a Hamdard, pers. 1973.

[33] On Hindu physicians' interactions with Persian culture in South Asia, see Speziale 2018: 133–63.

[34] Ladhmal ibn Bhairav, *Baḥr al-fawā'id*, MS London, Wellcome Trust Library, pers. 88, f. 2b.

and Muslim scholars (*kutub ahl-i hind wa yūnān*).[35]

LATE MUGHAL PERIOD AND PRINCELY STATES

The eighteenth and the nineteenth centuries see the production of new Persian texts dealing with Indian medicine and drugs. Among them are the works of Šāh Ahl Allāh and Muḥammad Šarīf Ḫān, two scholars active in Delhi, the capital of the last Mughal rulers. Šāh Ahl Allāh (d. 1190/1776) is a member of an eminent family of Muslim theologians and Sufis. He writes the *Takmila-yi hindī* (Indian Perfection) a compact handbook of Ayurvedic medicine, which includes a chapter on the purification of metals.[36] Muḥammad Šarīf Ḫān (d. c. 1222/1807) is the eponymous scholar of the Šarīfī family, an influential family of physicians of the colonial period.[37] He writes the *Ta'līf-i Šarīfī* (Compilation of Šarīf), also known as *Mufradāt-i hindī* (Indian Simple Drugs), a dictionary of Indian remedies based on the model of Muslim pharmacopoeias. The *Ta'līf-i Šarīfī* is an innovative text: Indian remedies are presented in the form of a Persian dictionary (*farhang*) and the text consists of over one thousand entries, including several on metals and minerals. It enjoys a wide readership and is also translated into English and read by British physicians during the colonial period.[38]

Persian texts on Ayurvedic medicine are also composed in the Princely States, which emerge with the decline of Mughal power. The *Mu'ālajāt-i hindī* (Indian Healings), also called the *Qarābādīn-i hindī* (Indian Pharmacopeia), is compiled in early nineteenth-century Hyderabad. It is a short medical text entirely devoted to Indian iatrochemistry. The text is written at the behest of Sikandar Jāh (r. 1803–1829), the third Niẓām of Hyderabad, who is an expert in medicine and has a particular interest in Indian medicine.[39] Sikandar Jāh demands that the Ayurvedic formulas he has personally tested, and which are preserved in the royal store (*tūša-ḫāna*), be gathered in a text. It is compiled by Šayḫ Ḥaydar Miṣrī; *miṣrī*, the one who lives in the "city" (*miṣr*), is a term used by Muslims to refer to an Ayurvedic physician.[40] The *Mu'ālajāt-i hindī* is divided into three parts, the first deals with the production of metal oxides (*risāla-yi kuštajāt*), the second describes the preparation and benefits of a group of compound drugs made of metals and minerals, while the third presents the actions, properties and dosages of the same compound drugs in the form of a table.[41] Many formulas presented

[35] Ladhamal ibn Bhairav, *Baḥr al-fawā'id*, MS London, Wellcome Trust Library, pers. 88, f. 3a.

[36] On the *Takmila-yi hindī* and its author, see Speziale 2018: 196–8.

[37] On Muḥammad Šarīf Ḫān, see Speziale 2009.

[38] Šarīf Ḫān 1280/1863; on the *Ta'līf-i Šarīfī* see also Speziale 2018: 199–200.

[39] Fārūqī, Mu'īn al-Dīn Rahbar, 1420/1999: 158–9.

[40] See also Speziale 2018: 139.

[41] Ḥaydar Miṣrī, *Mu'ālajāt-i hindī*, MS Hyderabad, Andhra Pradesh Oriental Manuscript Library and Research Institute, *ṭibb* 339.

in the *Tarjuma-yi Pākāvalī* (Translation of Pākāvalī)[42] include oxides of metals. The *Tarjuma-yi Pākāvalī* is the Persian translation of a text on *pākaśāstra* made by the Hindu scholar Dayā Nāth at the request of the same Niẓām of Hyderabad.[43] Processed metals and minerals, beginning from the ashes (*ḫākistar*) of mercury, are the main topic of the *Nusḫajāt* (Recipes) by Pratāb Rām, a physician who may also have been active in Hyderabad where the only known copy of his text is preserved.[44]

This incomplete overview illustrates more clearly certain salient features of the production of the Persian medical studies dealing with *rasaśāstra* and *rasāyana* mentioned above. Chapters dealing with processed mercury and metals become a standard subject of Persian medical works written in South Asia. In a diachronic perspective, the features of this corpus of texts show the existence of a continuous trend of studies in the target culture beginning from the late thirteenth or the early fourteenth century, and ending only in the nineteenth century, when the scientific and political role of the Persian language progressively declines in South Asia. The fact that a large part of the existent manuscript copies, including those of earlier sources, date from the eighteenth and nineteenth centuries, confirms the existence of a significant readership for these texts up to the colonial period. In what concerns the space of production and reception of these studies, it involves writers, translators and patrons active in various cultural centres and cities. The overall trend is a widespread and trans-regional phenomenon, which reflects the broader political and intellectual dynamics of the provincial diffusion of the Persian language and scientific culture in South Asia. The writing of Persian medical accounts of *rasaśāstra* and *rasāyana* develops in the centres of the Sultanate powers, such as Dawlatabad, Agra, and Bijapur, while the later production involves the regional cities of the Princely States, such as Hyderabad.

3 POLITICAL AND SOCIAL ENVIRONMENT

A closer analysis of the political and social context helps clarify additional features underlying the production of these texts. The courts of Muslim sultans in South Asia are important sites for the production of scientific-technological knowledge, and for the exchange of knowledge between scholars belonging to different groups.[45] Muslim rulers also patronised the writing of

[42] *Pākāvalī* is the title of several Sanskrit texts dealing with *pākaśāstra*, see Meulenbeld 1999–2002: IIa: 419.

[43] Dayā Nāth, *Tarjuma-yi Pākāvalī*, MS Hyderabad, Andhra Pradesh Oriental Manuscript Library and Research Institute, *ṭibb* 449.

[44] Pratāb Rām, *Nusḫajāt*, MS Hyderabad, Andhra Pradesh Oriental Manuscript Library and Research Institute, *ṭibb* 470.

[45] On Hindu physicians working at Muslim courts and Muslim physicians working at Hindu courts in South Asia, see Speziale 2018: 140–44.

works in Sanskrit and in other Indic languages.[46] We find a treatise on alchemy, the *Nasirsahi kankaligranth* (sic.), written in Hindavi, with quotations from Sanskrit texts: it deals with the processing of mercury and other metals and is composed at the court of Sultan Naṣīr Šāh (r. 1500–1510) of Malwa.[47] An important question therefore is, to what extent can we consider these Persian texts the product of royal patronage? The courtly environment certainly plays a role in this. Several of these texts – as we have seen – are compiled by scholars connected to the court and are dedicated to, or commissioned by, Muslim sultans and noblemen (see Table 1). The use of *rasaśāstra* materials in the courtly context is particularly important in the *Muʿālajāt-i hindī*, commissioned by the third Niẓām of Hyderabad. In this case the compilation of the text may also be interpreted as a means of celebrating the Muslim king's knowledge and his appropriation of the Indian source.

However, certain texts written in the courtly context are not commissioned by Muslim kings, and are only dedicated to them, such as those dedicated to Sikandar Lodī and Awrangzeb. Scholars and physicians, for example Darwīš Muḥammad, often dedicated theirs texts to kings and noblemen in the hope of obtaining a position at court, or other benefits. While royal patronage and the search for royal patronage are important factors, the production of these texts also develops as a phenomenon independent of political support. Among the authors of these texts are physicians working outside the courtly environment, such as Żiyāʾ Muḥammad and Šāh Ahl Allāh. Moreover, certain authors, like Firišta or Amān Allāh Ḫān, do not dedicate their texts to Muslim kings despite their connections to the court.

The Persian-speaking medical milieu of South Asia was a composite environment made up of different groups of scholars, including foreign and Indian Muslims, and Hindu as well as some Christian physicians.[48] Most writers of Persian texts dealing with *rasāyana* are Indian born physicians, both Muslim and Hindu. The influential group of foreign Muslim physicians, which migrated from Iran and Central Asia and attained posts at the courts of Indian Muslim rulers, such as Akbar's court (r. 1556–1605), do not seem to offer any noticeable contribution to the writing of Persian texts on *rasāyana*. These scholars, who often migrated to India after having completed their studies in Iran, focus more on the translation into Persian of Arabic texts, such as the *Qanūn* of Ibn Sīnā (d. 428/1037).[49] An exception could be considered Firišta, however he migrated from Astarabad (Iran) when he was a child and grew up in India.

Certain parallels between the social and intellectual environments of authors

[46] On Sanskrit at the Mughal court, see Truschke 2016.

[47] Day 1965: 369–70.

[48] Such as those belonging to the family of José De Silva (d. 1826). José De Silva writes a Persian treatise on Indian simple drugs, the *Mufradāt-i hindī*, see Speziale 2018: 155, 204.

[49] On these issues, see Speziale 2018: 124–6, 179–80.

in the source and target cultures should be taken into account, also in view of the fact that the development of Sanskrit writing on *rasaśāstra*, and the adaptation of these materials into Persian, were contemporary phenomena. The groups of scholars involved in the composition of texts on *rasaśāstra* in Hindu and Muslim society present certain analogous features. David White explains that, in Hindu society, many authors of major texts on alchemy were court physicians or members of *śakta-śaiva* and tantric religious orders.[50] Nāth yogis, who had close contacts with the Muslim environment, are often noted for their knowledge and practice of alchemy,[51] for example Nityanātha Pārvatīputra, the author of the *Rasaratnākara*, which is mentioned among the texts translated for the compilation of the *Ma'dan al-šifā'-i Sikandar-šāhī*. Muslim writers and readers were also aware of this issue. The *Haft aḥbāb* clearly shows that Muslims regarded the Nāth yogis as authorities in the field of Indian alchemy.

The interaction between medicine and ascetic circles is also a feature of the assimilation of these materials into the Persianate and Muslim culture of South Asia. Physicians are the group of Muslim rational scholars the most involved in the writing of Persian texts on *rasaśāstra*. On the other hand, in South Asia the Sufis are the Islamic religious scholars the most open to an interaction with yoga and Hinduism.[52] The authors of important Persian texts dealing with Ayurvedic medicine and medical alchemy are members of Sufi orders, or have interactions with Sufi circles, especially with leading transregional orders such as the Čištiyya and the Naqšbandiyya. Miyān Bhuwa has close connections with the Čištī master 'Abd al-Quddus Gangohī (d. 944/1537), one of the most representative figures of the interactions between Sufism and Hinduism in the sixteenth century.[53] Nūr al-Dīn Šīrāzī writes a treatise on Sufi cosmology and dedicates his medical work to a Sufi prince, Dārā Šikōh.[54] Darwīš Muḥammad and Abū al-Fatḥ Čištī are both members of the Čištiyya order. Šāh Ahl Allāh is also a practicing Sufi and the brother of Šāh Walī Allāh (d. 1176/1762) a leading Naqšbandī master of Delhi. Muḥammad Šarīf Ḫān's family also belongs to a Naqšbandī line of Sufis that migrated from Central Asia to India.[55]

Moreover, the *Haft aḥbāb* shows how the creation of an Islamized mythology, and the attribution of knowledge to eminent Sufis, could be used as a means to incorporate and appropriate the other's knowledge. A similar process takes place in the dissemination of the Arabic translation of the *Amṛtakuṇḍa* in the Middle East, where it is known as a work by the famous Andalusian Sufi Ibn 'Arabī (d. 638/1240, Damascus).[56] In the *Haft aḥbāb*, beside the conversion of Gyān Nāth

[50] See White 2001: 873; see also White 1996.
[51] See Mallinson 2011; for some contemporary accounts, see Bouillier 2008: 62, 109, 174.
[52] See Gaborieau 2002; Ernst 2005.
[53] On 'Abd al-Quddus Gangohī, see Digby 1975; on Miyān Bhuwa, see Speziale 2010c: 43–4.
[54] Speziale 2010c: 53–4.
[55] See Speziale 2010c: 48, 58–61.
[56] Ernst 2003b: 205.

Sa'ādatmand, the motif of the Nāth yogi's conversion as a device for the transmission of knowledge from one tradition to the other, resurfaces in chapter four. It describes the methods for the production of acids that Dayā Nāth, a three hundred years old yogi, allegedly passed on to Šayḫ Ẓahīr al-Dīn Rūmī after the latter had converted 84 yogis, including the same Dayā Nāth, to Islam. The *Nusḫa-yi ghōḍācōḷī* (Recipe of Ghōḍācōḷī),[57] attributed to Muḥammad Ḥusayn Gīsūdirāz (d. 825/1422, Gulbarga), the leading Čištī master of the Deccan, offers another example of how the creation of Sufi authorship is used to assimilate these materials. This short text describes a drug made with mercury, sulphur, the three myrobalans and other ingredients, which is a panacea for different diseases.[58]

4 DEFINING AND INCORPORATING THE OTHER'S KNOWLEDGE

The next sections of this article look more closely at how the authors of these texts present the field of *rasāyana* and translate the other's knowledge for Persian-speaking readers. First of all, it is evident that the target culture considers this domain a branch of the medical field, to be dealt with in medical texts. At the same time, it is also evident that Persian-speaking writers regard and classify this domain as a specific branch of knowledge that should be presented in a separate chapter. This view is probably shaped by the interaction with Indian culture: Ayurvedic texts often deal with *rasāyana* and mercurial drugs in separate chapters. Moreover, the description of these materials overlaps with other branches and sections of Persian medical knowledge and texts, such as the sections on the treatment of diseases and the chapters on '*ilm-i bāh* (lit. 'knowledge of coitus'). Many Persian medical texts, starting with the *Majmū'a-yi Żiyā'ī*, include metallic formulas in the chapters dealing with *quwwat-i bāh* (lit. 'power of coitus'). This interaction is also important in Ayurvedic medicine: in Sanskrit medical texts, chapters on *vājīkaraṇa* (virility therapy) and *rasāyana* are often placed close to each other.[59]

In what concerns the interaction with Arabic and Persian terms and categories, it is worth remembering that earlier Muslim medical culture did not have a specific term to refer to iatrochemistry. Persian medical texts written in South Asia do not use the Arabic term *kīmiyā'* ('alchemy,' derived from the Greek) to refer to material on metallic drugs translated from Indic sources. The inclusion of a section on *kīmiyā'* was not a common feature of earlier Arabic and Persian med-

[57] According to White (1996: 83, 129, 418), Ghoḍā Coḷī (or also Ghoḍacoḷi, Ghoḍācoḷī) is the name of a *mahāsiddha*; he is the author of a short Sanskrit alchemical work entitled *Ghoḍā Cōḷī* or *Ghoḍācoḷī Vākya*. The term *ghōḍācōḷī* is used in Marathi to define a "pill composed of sulphur, mercury, orpiment, etc." (Molesworth and Candy 1857: 154).

[58] See Speziale 2010c: 234–36.

[59] See Dagmar Wujastyk 2015: 109–110.

ical texts, and Persian-speaking scholars in South Asia do not consider *kīmiyā'* to be a suitable and comparable category to translate the domain of *rasāyana*. Šihāb al-Dīn Nāgawrī's division of chapters in the *Šifā' al-maraż* provides a particularly useful illustration of this point. Nāgawrī includes a chapter on *kīmiyā'*, placed towards the very end of the book, in which he expresses a critical opinion on this science.[60] This chapter does not deal with *rasāyana* techniques, which are presented earlier in the text. In Persian medical literature the use of the term *kīmiyā'* to refer to iatrochemical materials seems to appear especially after Ibn Sallum's Arabic work on Paracelsus' thought is translated into Persian.[61]

In the absence of a specific term in the target language, Persian-speaking medical writers use different strategies to define the field, and to name the chapters on this domain. Many authors borrow Indic terms such as *rasa* and *rasāyan*, which also exist in Urdu. Writers of Persian medical texts actually do not seem to make a clear distinction between *rasāyan* and *rasaśāstra*. They use the term *rasāyan* as a broad overlapping category that deals with both *rasaśāstra* and *rasāyana* procedures. The texts analysed here do not use the term *rasaśāstra*, although they deal extensively with *rasaśāstra* and alchemical materials, such as processed mercury and metals. Most authors do not seem to refer to *rasāyan* in the way it is used in earlier Ayurvedic works, where it deals with vitalisation tonics and not with processed metals (at least until about the eleventh century). They consider *rasāyan* a field closely connected with processed metals, i.e. the way it is intended in Sanskrit alchemical texts and in the Ayurvedic texts of their own period.[62]

Moreover, titles of chapters often use compound expressions in Persian, which refer to the main procedures involved in processing substances, such as the purification (*ṣāf kardan*) and killing (*kuštan*) of mercury and metals, which must be carried out before these can be used as drugs for internal use. This also seems to be a borrowing from Sanskrit texts, such as the *Śārṅgadharasaṃhita*, where the titles of the corresponding chapters make direct reference to the procedures for purifying (*śodhana*) and killing (*māraṇa*) metals and mercury.[63] *Kuštan* is also the key notion of Abū al-Faż l 'Allāmī's definition. The classification of the Hindus' sciences given in the *Ā'īn-i Akbarī* includes *rasavidyā*. Abū al-Faż l writes that "*Rasavidyā* [*ras bidyā* in Persian script] is the science of the killing (*'ilm dar kuštan*) of mercury, gold, silver, copper and the like. The elixir (*iksīr*) is made from it."[64]

In the fourteenth century, Żiyā' Muḥammad entitles the relevant chapter of his work "On the *rasa* according to the teachings of Nāgārjuna and other yogis on

[60] It is the second to last chapter (164) in the lithograph edition, Nāgawrī, Šihāb al-Dīn ibn 'Abd al-Karīm, 1295/1878–79: 96–7.

[61] On the Persian translations of Ibn Sallum's work, see Storey 1971: 253, 259–60; the earliest Persian translation recorded by Storey dates from the eighteenth century.

[62] See Dagmar Wujastyk 2013, 2015, 2016; Maas 2017.

[63] See Śārṅgadhara, 2003: 145, 157.

[64] Abū al-Faż l 'Allāmī, 1877: 129.

the killing of mercury, gold, silver, copper and the like [...]" but does not offer any further explanation of *rasa*.[65] The titles of related chapters (*kuštan-i ṭalq*, *kuštan-i sīmāb*, etc.) in Nāgawrī's *Šifā' al-maraż* also focus on the concept of killing (*kuštan*) a substance.[66] For his chapter, Sa'd Allāh Zanjānī uses a title that refers both to the Indian term and the major benefit ascribed to *rasāyan*: "On the compound [drugs] which extend lifespan and [which are] called *rasāyan* in Hindawi" (*dar biyān tarākīb ki 'umr afzāyad wa hindawī rasāyan guyand*). Again, the author does not offer a more precise definition of the field, although in the preface he clearly refers to the question of rejuvenation. Several *rasāyan* formulas provided in the chapter contain only plant based drugs.[67] Qāsim ibn Quṭb ibn Ya'qūb Ḥakīm uses the same expression in the titles of all his chapters on metal oxides: *dar ma'rifat-i kuštan*, which means "On the knowledge of killing" a certain metal.[68] The title of the chapter in the *Ma'dan al-šifā'* (*dar ṣāf kardan wa kuštan-i dhātu-hā wa upadhātu-hā wa jawāhir wa manand-i ān*, "on the purification and killing of *dhātu*, *upadhātu*, gems and the like") is an adaptation of the title of the corresponding chapter of the *Śārṅgadharasaṃhita* (*dhātuśodhanamāraṇa*, "purification and killing of metals").[69]

In the second section on the *Dastūr al-aṭibbā'*, Firišta provides a more detailed explanation of *rasāyan* and its uses in the Indian environment. The way he divides his chapters also shows the attempt to apply a conceptual framework drawn from Persian culture. Firišta classifies *rasāyan* materials by dividing them into simples (*mufrada*) and compounds (*murakkab*), which is a typical classification of drugs in Persian and Arabic texts: *rasāyan-i mufrada* (chapter 14) and *rasāyan-i murakkab* (chapter 15). In the introductory part of chapter fourteen, Firišta makes several remarks about the Indians physicians' use of these drugs. First of all, he explains that although Indian physicians (*ḥukamā'-i hind*) also use plant and animal based drugs, they use mineral (*ma'daniyāt*) drugs and oxides (*kušta*) for rapid healing and for diseases that cannot be treated by other drugs. Furthermore, Firišta gives an environmental explanation for the Indian physicians' use of these remedies. He writes that in some regions of India where the climate is very moist, such as Karnataka and Vijanagar (Bijapur in one manuscript), and in certain regions of Tilang, Gaur, Bengal and thesuch like, plants are not very effective in removing the disease, so they usually employ *rasāyan*.

[65] The title given in the table of contents is slightly different from the one that appears at the beginning of the chapter, see Żiyā' Muḥammad, *Majmū'a-yi Żiyā'ī*, MS Hyderabad, Andhra Pradesh Oriental Manuscript Library and Research Institute, *ṭibb* 344, pp. 14, 643; MS New Delhi, Jāmi'a Hamdard, 11963, ff. 8b, 219a.

[66] Nāgawrī, Šihāb al-Dīn ibn 'Abd al-Karīm, 1295/1878–79: 82–7.

[67] Sa'd Allāh Niẓām Zanjānī, *Tajribāt al-mujarrabāt-i Ġiyāṯ-i šāhī*, MS Hyderabad, Salar Jung Library, pers. *ṭibb* 31, pp. 24–8.

[68] Qāsim ibn Quṭb ibn Ya'qūb Ḥakīm, [*Kitāb-i*] *Sulaymān-šāhī*, MS London, Wellcome Trust Library, pers. 368, ff. 95a–100a.

[69] See Bhuwa Ḫān, Miyān ibn Ḫawāṣṣ Ḫān, 1294/1877: 442; Śārṅgadhara, 2003: 145, 157.

Firišta seems to be aware of the fact that *rasāyan* may refer to different kinds of drugs. He explains that all items made of minerals, which are rendered properly so they can be consumed, are called *rasāyan*. Then he adds that, according to the book *Cikitsāmṛtasāgara*, the term *rasāyan* is used for everything that involves the processing of mercury (*sīmāb rā mudabbir sāzand*).[70] He also notices that in popular language people call it *rasāyin* and make a kind of fermented drink (*muḫammar*) with it. He further explains the meaning of the term. He says that *rasa* in the Indian language means the essence of a thing (*lubb-i šay*), because what remains of minerals after burning them is their essence (*ḫulāṣa*, the 'purest part'). Firišta defines mercury as the chief (*sar-gurūh*) of the *rasāyan* and provides a few classifications of this substance. He writes that there are two kinds of mercury (*rasa-sindūr* and *rasa-kapūr*) and he goes on to add that books by Indian physicians identify four types of mercury depending on its origin, i.e. depending on whether the mine is located in the East, West, South or North. Firišta also explains that mercury in Hindi is called *pāra* which means *sāḥil* (shore, coast) in Persian, because the sick person lost in the ocean of illness reaches salvation (*najat*) on the shore.[71] Firišta's discussion of *rasāyan* also includes accounts from previous Persian texts, such as Nāgawrī's *Šifā' al-maraż*.[72]

In *Ganj-i bād-āward*, Amān Allāh Ḫān also divides the materials into two chapters, but adopts a different classification. The second part (*naqd*) of the second section (*ganjūr*) deals with Indian drugs and includes two final chapters (*'aqd* four and five) on processed metals. Chapter four, "On the compounds known as *rasa* according to the Indian physicians", deals with mercurial drugs, while chapter five, "On the compounds which are called *rasāyan*", deals with the other metals. He further clarifies that the science of *rasāyan* (*'ilm-i rasāyan*) deals with gold, silver, copper, steel, lead and iron, and the way of eating them (*tariq-i khurdan*). This division may have been suggested by Sanskrit texts, such as the *Śārṅgadharasaṃhita*, which also deal with mercury and metals in two different chapters. Indian procedures are also described in the third *naqd* of the second section of Amān Allāh's text, which deals with the killing and eating of mercury (*qatl wa akl-i sīmāb*) and includes a few recipes used by European physicians (*ḥukamā'-i farang*).[73]

The authors of the texts dedicated to Awrangzeb focus on the concept of processing metals and minerals. Darwīš Muḥammad titles the relevant chapter (*bāb*

[70] The *Cikitsāmṛta*(*sāgara*) was composed in New Delhi in 1224 CE by Milhaṇa. The pandit Kavīndrācārya Sarasvatī had a copy of the work in his library (Raghavan et al. 1949–2015: 7: 28b).

[71] It is likely that here Firišta is referring to *pār* (पार, 'bank', 'shore'), which however is a different word from *pārā* (पारा, 'mercury').

[72] Firišta, *Dastūr al-aṭibbā'*, MS Edinburgh, Edinburgh University Library, 249, unnumbered folios; MS Copenhagen, Det Kongelige Bibliotek, pers. XXII, ff. 87a–100a.

[73] Amān Allāh Ḫān, *Ganj-i bād-āward*, MS New Delhi, Jāmi'a Hamdard, pers. 1883, unnumbered folios.

four) of the *Ṭibb-i Awrang-šāhī*, "on killing metals (*dhātu*) and purifying minerals (*upadhātu*)" (*dar bayān kuštan-i dhātu-hā wa ṣāf sāḫtan-i upadhātu-hā*); it is divided into eleven short sections (*faṣl*) each dealing with a specific metal, while the last deals with minerals.[74] Abū al-Fatḥ Čištī uses a similar expression in the title of his chapter (*pāk kardan wa kuštan*, Chapter 150) and he also deals with related topics in the following two chapters, the second of which is on miscellaneous benefits (*fawā'id-i mutafarriqāt*).[75] His student, Ladhamal ibn Bhairav, seems to adopt a similar method of presentation. He includes a miscellaneous chapter (*mutafarriqāt*, chapter 35) on certain *rasa* (*ba'żī-i rasa-hā*), which are useful for all diseases, followed by a chapter on the processing of substances (*dar biyān ṣāf kardan wa kuštan-i sīmāb, šangarf, zar, nuqra wa haft dhātu*, chapter 37). [76]

The authorship of the *Baḥr al-fawā'id* raises the question of whether and how the description of source materials changes when the account is written by a Hindu. The method of translation does not actually seem to change significantly. Ladhamal ibn Bhairav does not provide a more elaborate definition of the field, and the relevant chapters begin directly with the first formulas, as was typical of most earlier Persian medical texts. Moreover, when he introduces Indian terms in the text, he uses the third person plural, "they call it" (*gūyand*, *mīgūyand*), i.e. just as the Muslim authors do. The writer does not seem to identify with the source culture but rather with the perspective of the Persian readers of the text.[77]

The Brahmin, Bhagavant Dās, shows a similar approach to translation in his *Dawā al-'ilal* (Remedy of Diseases). It is not clear when this author lived, but the text is preserved as a single manuscript, copied in the eighteenth century. Like Ladhamal ibn Bhairav, Bhagavant Dās does not define the field, nor does he refer to any of the doctrinal aspects related to these materials or directly quote Indic texts in the chapter. Moreover, Bhagavant Dās's lexicon is more Persianized and he uses very few Indian terms. He also refers to Muslim physicians in different chapters of his book. Differing from other authors, Bhagavant Dās deals with metals in the same chapter as oils (chapter 3, *puḫtan-i ruġan wa tarkīb-i kuštan mis wa zirnīḫ wa ġayr*).[78] The *Mā' al-ḥayāt-i ṭibb-i bēdik* (Water of life of Vedic Medicine), an anonymous text, which may have been composed by, or in collaboration with, a Hindu scholar, discusses *rasa* in the same section as pills (*dar biyān guṭka-hā, ḥubb-hā wa rasa-hā*, second *faṣl* of chapter 31) and includes a short section on mercurial pills (*gutka-hā-yi sīmāb*, *faṣl* 13).[79]

[74] Darwīš Muḥammad, *Ṭibb-i Awrang-šāhī*, MS Rampur, Kitābḫāna-yi Rażā, pers. 1338.

[75] Abū al-Fatḥ, *Dār al-šifā'-i Awrang-šāhī*, MS New Delhi, Jāmi'a Hamdard, pers. 1973, pp. 182–192.

[76] "On the purification and killing of mercury, cinnabar, gold, silver and the seven *dhātu*".

[77] Ladhamal ibn Bhairav, *Baḥr al-fawā'id*, MS London, Wellcome Trust Library, pers. 88, ff. 73a–80b, 82a–88a.

[78] Bhagavant Dās Brahman, *Dawā al-'ilal*, MS Paris, Bibliothèque nationale de France, supplément persan 1167, ff. 68a–74a.

[79] *Mā' al-ḥayāt*, MS Hyderabad, Andhra Pra-

A closer look at how these materials are incorporated into the structure of Persian texts helps to further clarify certain aspects of the hermeneutical strategies of the target culture. In both the source and the target cultures, medicine is a broad field made up of various branches, some of which deal with non-homogenous entities such as knowledge of the body and knowledge of plants. However, *rasāyana* is a field of knowledge for which there is no precise equivalent domain in the target culture. How does translation deal with and negotiate this asymmetry? I suggest that the way a writer places a certain knowledge in the order of the text provides important clues to understanding how he conceptualizes and classifies a branch within a field, and the affinities and overlaps between branches.

In the oldest example, the *Majuma'-i Ziya*, the chapter on *rasa* is placed towards the end of the book, before a chapter on magic based on Arabic sources dealing with pre-Islamic materials. This may suggest that the author considers and classifies the *rasāyana* of the yogis as a field close to occult and magical remedies. During the fourteenth century, Šihāb al-Dīn Nāgawrī also places the description of oxides towards the end of the book, after a few chapters on syrups (*šarbat*) and oils (*rūġan*), and before a chapter on remedies for husbands and wives and a group of chapters on the treatment of the horse. On the other hand, in the *Tajribāt al-mujarrabāt-i Ġiyāṯ-šāhī*, divided into ten chapters, the fifth chapter on *rasāyana* is placed before the chapter on the drugs for coitus (*quwwat-i bāh*).[80]

Persian texts often present *rasāyana* formulas after the section dealing with pathology and the treatment of diseases. This suggests that authors consider it a domain related to the broader field of therapy and treatment, a feature consistent with the selective interest authors show in the practical and therapeutic aspects of this kind of remedies. The *Ma'dan al-šifā'* deals with metal oxides in the last part of the third section on symptoms and the treatment of diseases. The chapters of this section are arranged following the model of the *Mādhavanidāna* by Mādhava, a well-known Sanskrit work on pathology.[81] The *Mādhavanidāna* does not deal with therapy of diseases and does not include a section on *rasāyana*. The Persian text most likely follows the style of other Sanskrit texts, which are based on Mādhava's model, and like in the *Siddhayoga* (tenth century), add chapters on *rasāyana* in the last part of the book. Among these texts are the *Cakradatta* (or *Cikitsāsaṃgraha*) by Cakrapāṇidatta (eleventh century)[82] and the *Cikitsāsārasaṃgraha* by Vaṅgasena (eleventh or twelfth century),[83] which are both mentioned in the preface of the *Ma'dan al-šifā'*, among the texts used in the compilation. Other

desh Oriental Manuscript Library and Research Institute, *ṭibb* 340, ff. 125a–135a, 175b–176a.

[80] Sa'd Allāh Niẓāmī Zanjānī, *Tajribāt al-mujarrabāt-i Ġiyāṯ-i šāhī*, MS Hyderabad, Salar Jung Library, pers. *ṭibb* 31, ff. 12b–14b.

[81] On the *Mādhavanidāna*, see Meulenbeld 1974, 1999–2002: IIa: 61–67. On Persian translations of *Mādhavanidāna*, see Speziale 2018: 60, 64, 191–3.

[82] Cakrapāṇidatta, 2014; see also Meulenbeld 1999–2002: IIa: 86–90.

[83] Vaṅgasena, 2014; Meulenbeld 1999–2002: IIa: 223–8.

Persian texts arranged according to Mādhava's model, such as those by Bīnā ibn Ḥasan and Ladhamal ibn Bhairav, place chapters on mercury and metals in the same order. In the *Ṭibb-i Awrang-šāhī*, in seven chapters, Darwīš Muḥammad also places the chapter on metal oxides (chap. four) after the chapter on pathology and treatment (based on Mādhava's model, chapter two), and a separate chapter on women's diseases (chap. three).

Persian texts dealing with Ayurvedic medicine are also arranged in the *az sar tā qadam* (from head to heel) order, borrowed from Arabic and Persian texts. This arrangement is often used in works, and sections of works, dealing with pathology and treatment. Works organized in this manner may include chapters on heterogeneous topics, placed after the main section, dealing with the treatment of the different parts of the body. In this type of text, chapters on *rasāyana* are also placed towards the end of the book, after the main section. Among these we can cite the *Dār al-šifā'-i Awrang-šāhī* by Abū al-Fatḥ, the *Takmila-yi hindī* by Šāh Ahl Allāh, the anonymous *Mā' al-ḥayāt* as well as the *Ṭibb-i bēdik* by Aḥmad 'Alī Ḫān (first half of nineteenth century).[84] Šihāb al-Dīn Nāgawrī's *Šifā' al-maraż* roughly follows this arrangement beginning with the diseases of the head. In the *Dawā al-'ilal*, divided into five chapters, Bhagawant Dās places the chapter on oxides (chapter three) after the main chapter of the book (chapter one), which deals with pathology and treatment and is loosely organized *az sar tā qadam*. Qāsim ibn Quṭb's [*Kitāb-i*] *Sulaymān-šāhī* is loosely arranged in the same order and chapters on mercury and metals are placed after the main section, among a group of chapters dealing chiefly with pharmaceutic preparations such as electuaries (*ma'jūn*) and perfumes (*'iṭr*).

Firišta's arrangement in the *Dastūr al-*aṭibbā' places greater emphasis on the link between *rasāyana* and pharmacology. This choice may have been influenced by earlier Arabic texts, which deal with minerals and metals in the sections on pharmacology. For instance, Ibn Sīnā deals with these in the volume of the *Qanūn fī al-ṭibb* on simple drugs. Firišta discusses *rasāyana* at the end of the chapter on compound drugs (chapter two), before the chapter on the treatment of diseases (chapter three). Other texts, as we have already seen, include mercurial and metallic drugs within composite chapters dealing also with other types of compound drugs like oils and pills, for example in the work by Bhagavant Dās and the *Mā' al-ḥayāt-i ṭibb-i bēdik*, or close to chapters dealing with pharmaceutic products, as in the works by Šihāb al-Dīn Nāgawrī and Qāsim ibn Quṭb. In the *'Ilājāt-i Dārā Šikōhī*, Nūr al-Dīn Šīrāzī discusses *rasāyana* preparations in the concluding section (*ḫātima*) of the work, which deals chiefly with pharmacologic and pharmaceutic issues. Moreover, this link is developed in monographs on pharmacology such as Amān Allāh Ḫān's *Ganj-i bād-āward* and the Persian dictionaries (*farhang*) of Indian drugs, like Muḥammad Šarīf Ḫān's *Ta'līf-i Šarīfī*.

[84] Aḥmad 'Alī Ḫān, *Ṭibb-i bēdik*, MS Aligarh, Mawlānā Āzād Library, Subḥ. 616/21.

To sum up, authors of Persian medical texts produced in South Asia use different criteria to define and classify *rasāyana* as a new branch of medical knowledge. Some authors borrow models from the translated sources, some integrate the new branch into a framework drawn from Muslim writer's and readers' models of presentation of medical knowledge. Methods of classification also seem to have evolved over time. Some authors of Persian medical writings composed during the Sultanate period deal with *rasāyana* in chapters close to magic, other non-Islamic materials, sexology and veterinary medicine. Many other writers, chiefly from the end of fifteenth century onwards, choose to include *rasāyana* in the field of therapy and treatment of diseases, in texts arranged according to both Indian and Persian nosographic models. On the other hand, certain physicians, like Firišta and the writers of Persian pharmacopoeias, present processed metals as a section of pharmacology, or contiguous to it.

5 FORMS OF KNOWLEDGE AND FORMS OF TRANSLATION

What forms and sources of knowledge – textual, oral, theoretical, practical, etc. – are translated and how are they translated? An issue to be taken into account is that writers of Persian medical works provide scanty information about the sources they used to write chapters on *rasāyana*. Authors rarely explain whether they have translated a textual source on *rasāyana* from an Indic language or if they used accounts provided in earlier Persian texts. Even scholars such as Miyān Bhuwa and Amān Allāh Ḫān who mention in the preface the books they used for the compilation of their works, remain ambiguous on the sources used to write the chapters on *rasāyana*. Nityanātha Pārvatīputra's *Rasaratnākara*, a well-known Sanskrit treatise on *rasaśāstra*, is mentioned in the preface among the translated texts used for writing the *Maʿdan al-šifāʾ*. However, the chapter on metals of the *Maʿdan al-šifāʾ* seems to be based on an adaptation of the chapters on purifying metals and mercury (11 and 12) of the second section of the *Śārṅgadharasaṃhitā*.[85]

Moreover, the direct references to Indic texts and authors provided in Persian texts may not always permit a precise identification of the source. This may be due to different and concomitant reasons such as: the vagueness of the reference, certain Indic titles and names of scholars are hardly recognizable when written in Persian script, a Persian title is used instead of the Indic title to mention an Indic text, the quoted text or translation is unknown or has not been found, as in the case of the Persian translation of the book ascribed to Nāgārjuna cited by Żiyāʾ Muḥammad. For instance, medical writers may often refer to an Indic book using the expression "a book by" followed by the name of the author, such as the

[85]Compare, for example, Bhuwa Ḫān, Miyān ibn Ḫawāṣṣ Ḫān, 1294/1877: 442–7 and Śārṅgadhara, 2003: 145–84.

"book of Nāgārjuna the physician" (*kitāb-i Nāgārjuna ṭabīb*) mentioned by Nūr al-Dīn Šīrāzī in the chapter on *rasāyan* in the *'Ilājāt-i Dārā Šikōhī*.[86]

The lack of more precise references to Indic textual sources in Persian writings on *rasāyana* could also be read as an epiphenomenon of the prevailing forms of interaction underlying the cross-cultural transfer of medical knowledge between Hindu and Muslim scholars. It is likely than many materials did not circulate through the reading and translation of Indic texts, but through interpersonal exchanges between scholars belonging to different groups, as suggested by the many narratives of pedagogical interactions between Hindu and Muslim physicians referred to in Persian and Urdu texts. For instance, Šihāb al-Dīn Nāgawrī mentions having studied with the yogis, Firišta studied with the teacher Caturbhuj al-Hind and at the court of the Sultan of Bijapur he is in contact with Bīmā Jī, the head physician (*ra'is al-aṭibbā'*) at the court, while Ladhamal ibn Bhairav is a student of Abū al-Fatḥ Čištī.[87]

A relevant issue in cross-cultural scientific translation is how the technical terms of the translated sources are rendered for the new readership, and how this affects and transforms the disciplinary vocabulary of the target culture, at both the lexical and semantic levels.[88] Persian-speaking writers combine different strategies to translate the Indian technical lexicon, such as names of substances, drugs, procedures, apparatuses, etc. The translation involves the addition of Indic terms to the lexicon of the target culture. *Rasāyan* is often regarded as an untranslatable term due to the lack of a corresponding category in the target language. Technical terms referring to apparatuses, such as *yantra* and *dolāyantra*, are also assimilated into Persian texts. Moreover, the names of many local plants used in the formulas are provided in the local language, as this is indispensable to identifying and finding them in the market. Indian names of compound formulas are also referred to in Persian texts. Several of these terms, such as *rasa*, *bhasma*, *jantra* (for *yantra*), *dhāt* (for *dhātu*) and names of plants, exist in Urdu and are often borrowed in their Urdu variant.

At the same time, authors present many terms, notions and procedures by using and adapting the existing lexicon of the target culture, rather than adding new terms. Names of metals, minerals and drugs, for which established Persian equivalents exist, are usually translated into Persian, although sometimes the Indian term is provided. Authors of Persian medical texts often focus on two important procedures for processing mercury and metals: *śodhana* (purifying) and *māraṇa* (killing, calcination). The term *śodhana* is usually translated by synonymous compound verbs such as *ṣāf kardan* and *pāk kardan*, both meaning "to purify". Synonymous terms are also employed to translate *māraṇa*. The Persian

[86] *'Ilājāt-i Dārā Šikōhī*, MS Paris, Bibliothèque nationale de France, supplément persan 342A, f. 755a.

[87] On the pedagogical interactions between Hindu and Muslim physicians, see Speziale 2018: 128–33.

[88] On these issues, see Speziale 2014a.

verb *kuštan*, which means to "to kill" is frequently used to translate *māraṇa*. Firišta and some other writers uses the Arabic term *qatl*, which also means 'killing'.

Another important term of the Indic technical lexicon is *bhasman* (ashes, oxide) which is both assimilated and translated in Persian medical texts. Certain texts, such as Firišta's *Dastūr al-aṭibbā'* and the *Mā' al-ḥayāt* borrow the Urdu form *bhasma*. As in the case of *śodhana* and *māraṇa*, synonymous terms of the target culture are used to translate *bhasma*. Most Persian texts use the Persian term *kušta* (pl. *kuštajāt*) to translate *bhasman*. *Kušta* is the past participle of *kuštan* and is used to refer to a "killed" or "calcined" metal or mineral. Several texts like the *Dastūr al-aṭibbā*, the *Ganj-i bād-āward* by Amān Allāh Ḫān, the *'Ilājāt-i Dārā Šikōhī* by Nūr al-Dīn Šīrāzī and the *Nusḫajāt* by Pratāb Rām also use the Persian term *ḫākistar* (ashes) to refer to the *bhasman* of metals and minerals.

Translation is a selective practice that, for various reasons, often related to the issue of how to adapt the content for the new readership, may minimize certain notions in the translated sources and allow others to circulate more extensively in the target culture. The texts analysed in this article seem to show that Persian-speaking physicians make limited efforts to incorporate Indic philosophical and religious notions related to alchemy in their texts, such as the association between mercury and Śiva.[89] This approach may have also been shaped by the Ayurvedic texts Muslim scholars interact with. For instance, the chapters on metals and mercury in the *Śārṅgadharasaṃhita*, which are translated several times into Persian, make no reference to religious and philosophical notions in the introduction; they list metals and synonyms of mercury and then focus on formulas and procedures to process them.[90] On the other hand, Persian texts indicate that yogis are reputed to master and transmit alchemical procedures, and certain texts, such as the *Haft aḥbāb* and Żiyā' Muḥammad's *Majmū'a-yi Żiyā'ī*, directly associate alchemical and iatrochemical procedures with the yogis. In the *Ganj-i bād-āward*, Amān Allāh Ḫān describes a prescription mentioned by Nūr al-Dīn Šīrāzī, which deals with the preparation of a compound drug made with mercurial ashes: this includes the recitation of a *mantra* (glossed by the Persian term *afsūn*, "charm") the text of which is provided in Persian script.[91]

Persian writings focus on the practical aspects and procedures of *rasāyana*, especially those needed to appropriate the other's technical skills and to master the complex methods used to process poisonous drugs such as mercury. As pointed out by Claudia Preckel, Ajmal Ḫān (d. 1925) an eminent physician of the colonial period, states that making the *kušta* of mercury is difficult and that by his time

[89] See White 2012.

[90] Śārṅgadhara, 2003: 145–6, 157–8.

[91] Amān Allāh Ḫān, *Ganj-i bād-āward*, MS New Delhi, Jāmi'a Hamdard, pers. 1883, unnumbered folios. Nūr al-Dīn Šīrāzī is most likely the author of the *'Ilājāt-i Dārā Šikōhī*. However, the prescription and the *mantra* mentioned by Amān Allāh Ḫān are not present in the chapter on *rasāyana* in the manuscript of the *'Ilājāt-i Dārā Šikōhī* preserved in Paris.

only a few physicians were able to prepare it correctly.[92] Firišta's introduction to the chapter on *rasāyana* aims to provide a more detailed presentation of this field. On the other hand, most authors begin directly with the description of a specific formula or procedure. Persian medical texts focus on the description of a group of key notions relating to the production and administration of metals and minerals: ingredients, weights, formulas, procedures, apparatuses, and the benefits and dosages of drugs. In particular, methods to purify and calcine mercury and metals are described in detail, as all metals have to be processed before being used.

Early Persian texts dealing with *rasāyana* already crystallise this approach. The fourteenth-century *Majmūʿa-yi Żiyāʾī* is emblematic in this regard. In the preface Żiyāʾ Muḥammad states that he has based the chapter on *rasa* on the teachings (*guftār*) of Nāgārjuna and other yogis, however he does not provide any additional explanation of the relationship between yoga and alchemy. The chapter has no introduction or conclusion and begins directly with the first compound formula. It includes paragraphs on mercury, gold, silver, copper, tin, lead, iron, mica, arsenic, sulphur and diamonds. A short paragraph on the harmful properties of mercury (*ʿillathā-yi sīmāb*), placed toward the end of the chapter, is the only one that does not focus on a formula or a practical procedure. The chapter is divided into two parts, the first dealing with the production of various metallic compound drugs. Most paragraphs are organized according to a similar pattern, first describing the ingredients used in the formula, then the method of preparation, and finally the uses and dosages. The second part deals with procedures to purify (*ṣāf kardan*) minerals and metals, or to reduce them to ashes (*kuštan*), and their properties (*ṣifāt*).[93]

Indian methods of processing mercury and metals involve specific apparatuses, which are described in Persian texts on alchemy and medicine. The chapter on *rasa* in the *Majmūʿa-yi Żiyāʾī* describes alchemical apparatuses used to purify mercury. The method for preparing the *vālukāyantra* (*bālukā-jantra* in Persian script), the "sand apparatus", is explained in a formula ascribed to Nāgārjuna. Equal weights of mercury and processed sulphur are ground and then placed in a glass bottle, around which a cloth is wrapped several times; then a paste is applied to the cloth. The bottle is dried and buried in a pot of sand. The pot is then closed and heated over a fire for six hours. The *vālukāyantra* is also used in other prescriptions described in the same chapter.[94] Another paragraph of Żiyāʾ Muḥammad's text explains a method to purify mercury, which involves the use of a *dolāyantra* (*dolikā-jantra* in Persian script), the "cradle-apparatus" for

[92] See Preckel 2015: 919.

[93] Żiyāʾ Muḥammad, *Majmūʿa-yi Żiyāʾī*, MS Hyderabad, Andhra Pradesh Oriental Manuscript Library and Research Institute, *ṭibb* 344, pp. 643–682.

[94] Żiyāʾ Muḥammad, *Majmūʿa-yi Żiyāʾī*, MS Hyderabad, Andhra Pradesh Oriental Manuscript Library and Research Institute, *ṭibb* 344, pp. 644–5.

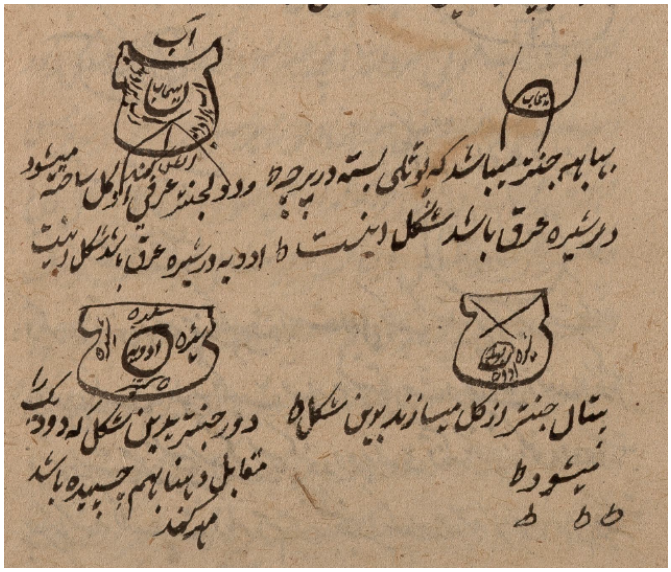

Figure 1: The *pātanayantra* (bottom right, *patāljantra* in Persian script) and other Indian alchemical apparatuses, *Haft aḥbāb*, MS London, Wellcome Trust Library, pers. 611, f. 51a.

steaming drugs. Mercury is mixed and ground with other substances, then this mixture is made into a ball. This is then tied up in a cloth, which is suspended over a pot containing Indian vinegar (*sirka-yi hindawī*). The piece of cloth should not touch the liquid. The pot and the cloth are then covered and placed over a low fire for three days.

Manuscript copies of these texts are also illustrated with drawings of apparatuses, particularly certain copies of the *Majmūʿa-yi Żiyāʾī*, *Haft ahbab* and *Maqālīd al-kunūz*. The manuscript of the *Majmūʿa-yi Żiyāʾī*, preserved in Hyderabad, includes a rough drawing of the *dolāyantra* in the margin of the page.[95] Several copies of the *Haft aḥbāb*, preserved in Europe and India, are illustrated with drawings of the *pātanayantra* (an appliance for distillation) and other apparatuses (see Figure 1).[96] The most interesting of the Persian illustrated manuscripts I have been able to access to date is the *Maqālīd al-kunūz* by Aḥmad ibn Arslān, which includes a chapter on apparatuses. The only existing copy of this text is preserved in London; both the text and the manuscript are undated. The London manuscript is illustrated with twelve drawings of different alchemical apparatuses.[97]

[95] Żiyāʾ Muḥammad, *Majmūʿa-yi Żiyāʾī*, MS Hyderabad, Andhra Pradesh Oriental Manuscript Library and Research Institute, *ṭibb* 344, p. 680.

[96] For the drawing of the *pātanayantra* from the Leiden manuscript (Universiteitsbibliotheek, Or. 22.768), see Speziale 2006: 28.

[97] Aḥmad ibn Arslān, *Maqālīd al-kunūz*, MS London, British Library, India Office, 2362/3, ff. 81b, 82a, 82b, 83a (two drawings of *dolikā-jantra*), 83b, 84a, 84b, 85a, 85b, 86a, 87a.

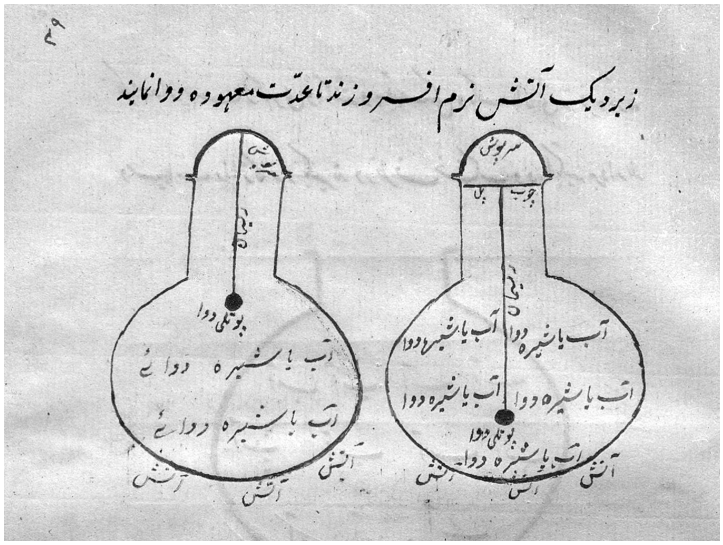

Figure 2: Two variants of the *dolāyantra*, Aḥmad ibn Arslān, *Maqālīd al-kunūz*, MS London, British Library, India Office, 2362/3 f. 83a. © British Library Board.

Figure 3: The *dolāyantra* as represented in Sanskrit manuscripts of the *Rasendramaṅgala* of Nāgārjuna Siddha. Left: MS Ahmedabad, L. D. Institute 535, f. 24v, dated 1680 CE; centre, MS Mumbai, Asiatic Society of Mumbai, S. C. $\frac{19}{2}$; right, MS Jaipur, Universal Institute of Orientology, 184 (Dominik Wujastyk 2019).

One folio shows two variants of the *dolāyantra*: the drawing on the left shows the ball containing the drug suspended above the liquid, while in the drawing on the right, the ball touches the liquid (see Figure 2). One may speculate about how these drawings were produced. Were they taken from Indic texts or based on oral exchanges between scholars, or on the direct observation of these apparatuses? Future comparisons with the illustrations present in Indic manuscripts such as those in Figure 3 will certainly contribute to a better understanding of this point.

Persian texts provide detailed descriptions of the benefits and therapeutic

properties ascribed to mercurial and metallic drugs in Ayurvedic medicine. Moreover, authors add comments and opinions on the translated material, especially on the key issue of the internal use of these substances. Several scholars express critical viewpoints on the internal use of metals prescribed by Hindu physicians. In the introduction to the chapter on *rasa*, Firišta remarks that physicians from other countries also use oxides, however not to the extent of the Indians. This question is discussed in the article on Arsenic oxide (*sumbul-khār*) in the *Ta'līf-i Šarīfī*. After having enumerated the different types of this substance in the Indian lexicon, Šarīf Ḫān highlights the disagreement that exists between the Indian physicians who use it frequently, and the Muslims, who on the contrary, believe this type of toxic substance should not be employed, except in association with other corrective substances (*muṣliḥāt*). Šarīf Ḫān specifies it should be used sparingly internally (*jahat-i ḫūrdan*) and at the end of the article he advises that it should be used with caution.[98] In the *Qarābādīn-i Qādirī*, Akbar Arzānī refers to a similar difference of opinion between Indian and Muslim physicians, regarding the usage of litharge (*murdār-sang*).[99]

Criticism of the Hindus' alchemical remedies and powers is a theme also found in the Sufi context. Notwithstanding the fact that Sufi groups interacted with the Indian environment, certain Sufi scholars criticised the Hindus and competed with the yogis to affirm their spiritual supremacy. Ḥamīd al-Dīn Nāgawrī, a thirteenth-century member of the Čištiyya order, already criticises the emphasis yogis place on medicinal plants and the *rasāyana* remedies, without however denying their efficacy in certain situations.[100] A master of the same order, Burhān al-Dīn Ġarib's (d. c 738/1337) criticizes a yogi of his acquaintance for using fraudulent alchemical techniques and drugs.[101] At the same time, critical voices do not prevent Muslim authors from widely incorporating these drugs into their texts. Critical voices may, in fact, also be interpreted as evidence of, and a response to the assimilation of these practices by Muslim physicians, as in the case of Ḥakīm Muḥammad of Farrukhabad (see above).

6 CONCLUDING REMARKS: SOUTH ASIA AND BEYOND

I WOULD LIKE TO MENTION A FEW ISSUES that remain open and should be addressed in a more comparative manner by future research, especially in the area of scholarly interactions underlying knowledge transfer, and the reception of these writings in both the South Asian intellectual environment and beyond. The contemporaneity of writing in different languages needs to be

[98] Šarīf Ḫān, Ḥakīm Muḥammad, 1280/1863: 124–5.
[99] Bari 2002: 29, 31.
[100] Rizvi 1978: 327. On the Sufis' refusal of the yogis' alchemical powers, see Digby 1970: 21–3.
[101] Ernst 2005: 27.

studied, and the content of the writing deserves to be compared in greater detail. The production of major Sanskrit texts dealing with mercury and metals is a phenomenon contemporary with the writing of Persian texts in this field. The *Majmūʿa-yi Żiyāʾī* is composed not long after the *Śārṅgadharasaṃhitā*, one of the earliest Sanskrit medical texts dealing extensively with processed mercury and metals. The *Maʿdan al-šifāʾ* is compiled in the early sixteenth century, probably the same century that Bhāvamiśra's *Bhāvaprakāśa* and the *Rasaratnasamuccaya* were written.[102] The fact that knowledge of, and practices involving, *rasaśāstra* are crystallised in Sanskrit medical writings during the period that sees the creation of a Persianate version of this trend of studies, suggests that, i) the interactions between Hindu and Muslim physicians are well developed by this time, and ii) thanks to these interactions Muslim authors are aware of new trends of Ayurvedic studies and practice when they select materials to be incorporated into Persian texts. Another factor to be considered, is that in both Hindu and Muslim society the knowledge and uses of these substances are taught and transmitted among physicians.

A more accurate understanding of these issues would probably need to go beyond an interpretation based solely, or chiefly, on the hierarchical and dichotomizing relation between original source/translated text and move towards a more horizontal approach, looking at writing on *rasayāna* and *rasaśāstra* as a multi-language discourse, involving different groups of scholars, acting in a multicultural society. The writing and reception of these topics even within Muslim society is a multilingual phenomenon that involves not only Persian, but other languages like Hindavi, for example in the text made for Sultan Naṣīr Šāh of Malwa, Urdu, especially during the colonial period,[103] and also Arabic. The case of Yākōpu, who lived between the 15th and 17th centuries, further illustrates this phenomenon. According to the autobiographical account provided in his texts, Yākōpu alias Irāmatēvar travelled to Mecca in search of alchemical knowledge. He then converted to Islam and took the name of Yākōpu, most likely the Arabic name Yaʿqūb.[104] He is the author of at least seventeen Tamil works on Siddha medicine, which are still used by contemporary Siddha doctors especially with regard to metallic drugs.[105]

The reception, during this period, of materials drawn from Indic medicine in the surrounding Muslim world, in both the Persian and Arabic speaking environment, is a topic largely neglected in modern scholarship. Moreover, we lack recent and accurate studies of the Persian medical literature produced in Safavid (1501–1736) and post-Safavid Iran. Nonetheless, certain texts and narratives seem to suggest that ideas, perceptions and scholars of *rasayāna* travelled

[102] On the *Bhāvaprakāśa* and the *Rasaratnasamuccaya*, see Dagmar Wujastyk 2013: 22–23, 34.

[103] See Preckel 2015.

[104] See Natarajan 2004.

[105] Kędzia 2017: 123.

to other regions of the Muslim world. The reputation of Indian drugs for prolonging life, and of the danger of such drugs, is already attested by a well-known event that took place at the Ilkhanid court in thirteenth-century Iran. Under the influence of a yogi from India, the Buddhist ruler Arġūn Ḫān (r. 1284–91) took a life-prolonging drug made of sulphur and quicksilver. However, the drug causes a chronic illness and Arġūn died five months later.[106] The employment of such scholars at Iranian courts is also referred to in a later context. The Indian alchemist Janī Hindī was attached to the court of Karīm Ḫān (r. 1750–1779), the founder of the Zand dynasty in Shiraz, and he is remembered for having played a role in Karīm Ḫān's decision to arrest and ban the Indian Sufi Ma'ṣūm 'Alī Šāh Dakanī (d. c 1211/1797) and his disciples from the city.[107]

Several Iranian and Central Asian physicians who migrated to India returned to their homeland after a time, and they were certainly aware of the contemporary trends of Persian medical studies in South Asia. A short entry on *rasayāna* is included in the *Baḥr al-jawāhir*, an Arabic dictionary of medical terms written by Muḥammad ibn Yūsuf al-Harawī (d. 949/1542), a physician who lived in Herat (Afghanistan) during the Safavid rule. His son Yūsuf ibn Muḥammad Yūsufī migrated to India where he was employed at the Mughal court and it is possible that al-Harawī also visited India, considering that Herat was not far from the borders of the Mughal territory. The entry in the *Baḥr al-jawāhir* explains that *rasayāna* "means the alchemy of the body (*kīmiyā' al-badan*)" and that books on *rasayāna* deal with electuaries and compound drugs. Al-Harawī's definition makes no reference to mercury and metals and, unlike the medical texts written in South Asia, he uses the term *kīmiyā'* to gloss *rasayāna*.[108]

Future studies of the *Ḫulāṣa al-tajārib* of Bahā' al-Dawla Nūrbaḫšī will certainly offer a more accurate perception of the circulation of Ayurvedic notions among Muslim physicians in Iran. This Persian medical handbook written in 907/1501–2 knew a certain readership in the Persian-speaking world. The author also drew from sources on Ayurvedic medicine and quotes many treatments and other notions taken from Indian physicians. Among these is the prescription known as *ghōḍācōḷī* (*gōrā čōbī* in the text), a compound drug made of mercury, sulphur and herbal drugs.[109] The formula of the *ghōḍācōḷī* (and probably variants of this recipe) is also described in several chapters on *rasayāna* in Persian medical books composed in India, and even ascribed to the Sufi master Muḥammad Ḥusayn Gīsūdirāz.[110] Tzvi Langermann recently presented and ed-

[106] Jackson 1986.

[107] Algar 1993. Ma'ṣūm 'Alī Šāh Dakanī, a master of the Ni'matullāhī order, had migrated from Hyderabad to Iran. 'Imād al-Dīn Maḥmūd al-Ḥusaynī (m. 1100/1689), the founder of the Hyderabad branch of the order, was reputed for his mastery of alchemy. On the Ni'matullāhī Sufis in the Deccan, see Speziale 2013.

[108] Harawī, Muḥammad ibn Yūsuf al-, n.d.: 139. See also Langermann 2018: 148, 150.

[109] Bahā' al-Dawla Nūrbaḫšī, 1893: 625.

[110] See above and footnote 57.

ited the discourse on *rasayāna* in the *Miʿrāj al-duʿā'*, an Arabic text which further illustrates how materials drawn from *rasayāna* may have been integrated in the wider Islamicate discourse.[111] The *Miʿrāj al-duʿā'* is a composite work dealing with prayers, incantations, health and medicine from a Shiite perspective. Its author, Muḥammad ʿAlī al-Qazwīnī, is an eighteenth-century Shiite writer who is presumed to have lived in Eastern Iraq. The part on *rasayāna* borrows Persian and Indic terms, and it is not unlikely that the Arabic text – or its sources – may have been based on one of the many Persian accounts of *rasayāna* composed in India, rather than on the direct translation of Sanskrit sources into Arabic.

These few examples seem to suggest that besides the extensive reception of *rasayāna* in South Asian Persian writings, Muslim readership of these materials extended beyond South Asia and these materials circulated through both Persian and Arabic texts. More comprehensive studies of the medical texts produced in Iran and Central Asia during the same period will certainly allow for more precise comparisons with the texts written in South Asia. Furthermore, certain texts like the *Miʿrāj al-duʿā'* show how looking beyond the field of medical and alchemical writings offers a wider understanding of the circulation of *rasayāna* materials in Islamicate societies. In what concerns the social environment where these materials were received, we should note that Bahā' al-Dawla Nūrbaḫšī belonged to an eminent Sufi family.[112] In South Asia, Sufis are also among the Islamic scholars most involved in cross-cultural contacts with Hindu society. On the other hand, Qazwīnī's text shows that other groups of Muslim religious scholars also participated in the reception of these materials, an issue that needs to be investigated in more detail in South Asia as well.

In conclusion, Persian writings open up new perspectives on the reception of *rasāyana* and *rasaśāstra* materials outside the Hindu society of South Asia, and among Hindu writers and readers of Persian texts. Persian-speaking scholars in South Asia have access to different types of texts dealing with *rasāyana* and drugs made of processed mercury and metals. The consistency of this phenomenon suggests that this kind of writing is not just a series of occasional efforts, but a continuous and interconnected trend of studies, which involves many generations of Muslim and Hindu scholars. Physicians and medical texts are one of the main vectors for the reception and dissemination of *rasāyana* materials in the Persianate culture of South Asia. It is often through the production of new Persian treatises dealing with Ayurveda, and new composite medical works, that these materials circulate among Persian-speaking readers. The main outcome of this interaction is the incorporation of a separate chapter dealing with *rasāyana* and metallic compound drugs in Persian medical texts.

[111] Langermann 2018.

[112] His grand-father, Muḥammad Ḥusayn Nūrbaḫš (d. 869/1464–5), was the eponymous master of the Nūrbaḫšiyya order, see Speziale 2010c: 253.

This trend develops over a period of seven centuries, includes texts written by Muslim and Hindu scholars, and stands out as a distinctive feature of Persian medical studies in South Asia. Different types of Persian medical texts deal with this subject, general handbooks, works on pathology and treatment, dictionaries of drugs and collections of *mujarrabāt* (tested formulas). Several of these texts focus chiefly on Ayurvedic medicine, while some deal primarily with Greco-Arabic medicine. Most of these works, including those by Hindu physicians, are in fact composite and heterogeneous writings, which combine Ayurvedic and Greco-Arabic materials – and from the Mughal period onwards, include elements and drugs drawn from Western physicians' practice (such as the China root, *čūb-čīnī*). Although further research is needed in this area, it seems that the translation of the complete Sanskrit works on *rasaśāstra* and alchemy may have played a less prominent role in the reception of these notions in the Persian-speaking environment. We do find certain Persian medical texts entirely devoted to *rasaśāstra*, such as the *Muʿālajāt-i hindī* made for the Niẓām of Hyderabad. However, Persian medical writings on this subject do not seem to develop as a separate genre, but rather in the form of chapters within medical works.

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Please write to ⟨wujastyk@ualberta.ca⟩ to file bugs/problem reports, feature requests and to get involved.
The History of Science in South Asia • Department of History and Classics, 2–81 HM Tory Building, University of Alberta, Edmonton, AB, T6G 2H4, Canada.