



## DRUGS

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**DRUGS** (Pers. *dārū*, Pers-Ar. *dawā*, pl. *adwīa*), in medieval Muslim literature any vegetable, mineral, or animal substance that acts on the human body, whether as a medicament, a poison, or an antidote.

*Pre-Islamic Persia.* Information on drugs in the pre-Islamic period is very scarce and, apart from clues in sources from after the Islamic conquest, limited to a few mentions in the [Avesta](#) and other ancient texts. They indicate that ancient Iranians were aware of the therapeutic properties of various substances and made deliberate use of them. In a travel narrative sometimes ascribed to Pythagoras (Pseudo Pythagoras, tr., p. 54) unspecified herbal drugs are mentioned, including a sleeping draft said to have been used by Zoroaster. Herbal treatment is also mentioned in the Avesta (*Yt.* 3.3), where frequent reference is made to the plant *haoma* (Mid. Pers. *hōm*, identified by Flattery and Schwartz as harmal), which “gives good cures,” “keeps death away,” and “implants strength” (*Y.* 9-11, 20; *Yt.* 10.23). Mazdeans believed that Ohrmazd had created at least one herb to cure each disease (Christensen, *Iran Sass.*, p. 419). The most cogent evidence for ancient Iranian interest in pharmacy is the Iranian origin of many drug names in medieval medical and pharmacological treatises (Browne, p. 22). The first writers in the Persian empire to discuss drugs and their properties were mainly physicians from the college at Gondēšāpūr in Kūzestān or their pupils; their works were the sources on which later writers relied (cf. *al-Kūz*, a source for Bīrūnī, 1992, pp. 530, 611; and Rāzī, 1955-71, XXI, pp. 45, 70, which seems a reference to the physicians at Gondēšāpūr; *Konnāš al-kūz*, mentioned by Bīrūnī, 1888, p. 205, seems to be the



title of a book on pharmacology composed there).

*The caliphate until the rise of the Buyids.* The medical college at Gondēšāpūr remained active under the Omayyads, but very little is known about the work of Persian physicians and pharmacologists there. In keeping with the ancient theory of humors, drugs were classified as cold, hot, moist, or dry (e.g., Ṭabarī, p. 400). The essential function of a drug, according to this theory, is to help the body keep or recover a stable balance among the humors and temperaments. Contrary to the modern medical assumption that patients normally react to a drug in the same way, medieval physicians thought that reactions varied with the temperament of the patient, as well as the nature of the drug. Drugs were classified as “simple” (*mofrad*, ‘*aqqār*, pl. ‘*aqāqīr*) and “compound” (*morakkab*, *qarābādīn*, *aqrābādīn* < Gk. *graphidion*, lit., “small treatise”). Compounds were designed to achieve a balance among the component simple drugs (see, e.g., Ebn Sīnā, II, p. 222).

One of the first known Persian pharmacologists was Māsarjūya (Pers. Māsargōya), a prominent Jewish physician from Baṣra who lived in the early ‘Abbasid period and was said to have written books about drugs, including *Qowā al-‘aqāqīr wa manāfe‘ehā wa maẓārrehā* (Ebn al-Qeṭṭī, pp. 324-25); his treatise on substitute drugs still survives. It was, however, the arrival of Jorjīs b. Boḳṭīšū’ (see [BOḲṬĪŠŪ’](#)) from Gondēšāpūr at the court of the caliph al-Manṣūr (136-58/754-75) that marked the beginning of the transmission of Persian pharmacological knowledge in the ‘Abbasid capital, whence it was diffused throughout the Muslim world. Jorjīs himself was said to have written *al-Konnāš*, a collection of essays on medical and pharmacological subjects. His pupil at Gondēšāpūr ‘Isā b. Ṣahārboḳṭ (Čahārboḳṭ) Jondīsābūrī wrote *Qowā al-adwīa al-mofrada* (Ebn al-Nadīm, p. 356; cf. Sezgin, *GAS* III, p. 243) on simple drugs. Another noted contemporary was Māsūya, who practiced pharmacology at Gondēšāpūr for forty years (Ebn al-Qeṭṭī, pp. 383-84; cf. Sezgin, *GAS* III, p. 229). His son Yūḥannā (d. 243/857) wrote essays on the subject, including *al-Adwīa al-moshela* and *Eṣlāḥ al-adwīa al-moshela* on aperient drugs, which were cited several times by Rāzī (1955-71, XV, p. 234, VI, p. 109, XX, pp. 105, 133, XXI, p. 653; cf. Sezgin, *GAS* III, pp. 231-36). From remarks by Ebn Abī Oṣaybe‘a (I, p. 157) about the experiences of pharmacists in the camp of Afšīn during the war against Bābak the [Korramī](#) in the early 9th century, it appears that early pharmacists constituted a professional or occupational class, including untrained quacks.

One of the most widely used pharmacological books written in the 9th century



was a treatise on compound drugs, *Aqrābādīn*, by Sābūr (Šāpūr) b. Sahl Jondīsābūrī (d. 355/869; Ebn al-Nadīm, p. 355); it included formulas for pills, ointments, poultices, and other drugs (Bābā, 1976, p. 579). At about the same time Boktīšū' b. Jebrā'īl (d. 256/870) wrote *Naṣā'eḥ al-rohbān fi'l-adwīa al-morakkaba*, of which a manuscript survives in the Taymūrīya library in the Dār al-kotob, Cairo (Sezgin, *GAS* III, p. 243; Sāmarrā'ī, I, p. 391; cf. Ebn al-Qeftī, p. 103).

The outstanding physician of the 'Abbasid period was, however, Ḥonayn b. Eshāq (192-260/816-73), who wrote and translated many works, including a book about drugs, *Ektīār al-adwīa al-mojarraba*, and another about antidotes, *al-Teryāq* (Ebn al-Nadīm, p. 353; Ebn al-Qeftī, pp. 173-74). One of his translations, *al-Adwīa al-mofrada*, was a pharma-copoeia attributed to Galen, and the seventh discourse (pp. 147-58) of his *'Ašar maqālāt* is about simple drugs in general. Ḥonayn followed the old classification of drugs according to humors and further subdivided them by the degree of change induced in the human organism (pp. 152-53). He also revised Eṣṭefān b. Basīl's Arabic translation of a portion of the Greek *De Materia Medica* by Dioscorides (Diosqoredīs) under the title *Hayūlā'l-tebb fi'l-ḥašā'eš wa'l-somūm*. This work had a strong influence on pharmacology in Ḥonayn's lifetime and subsequently (Sezgin, *GAS* III, p. 59), but its importance was more theoretical than practical because many of the cited drugs were unobtainable in the eastern part of the caliphate and could not be tested or prescribed; local pharmacists relied on Persian and Indian drugs instead (Bābā, 1977, pp. 188-89).

The medical treatise *Ferdaws al-ḥekma* by the Persian physician 'Alī b. Rabban Ṭabarī (d. ca. 250/864) also deserves mention. It includes chapters on simple and compound drugs; uses of drugs made from the bodies of animals (pp. 420-23); oils, juices, seeds (pp. 374-99), and antidotes (p. 449-66); and various antitoxic and anticholeric pills and remedies (pp. 467-72). Ṭabarī wrote another treatise, on the medical uses of different foods, drinks, and simple drugs, *Manāfe' al-aṭ'ema wa'l-ašreba wa'l-'aqāqīr* (Ebn al-Nadīm, p. 354; for a different title, see Sezgin, III, p. 240), an abridged version of which, by Mūsā Motāṭabbēb Yamānī (ca. 1250/1834), survives in a private library at Aleppo (Sezgin, *GAS*, pp. 236-40; Sāmarrā'ī, I, p. 471).

Pharmacology was often linked in the early sources with the study of botany, alchemy, mineralogy, and even zoology. In fact, these studies were often motivated by the desire for pharmacological knowledge (Şeddīqī, p. 448; Naşr,



p. 459), and any general medical treatise usually included a chapter on simple and compound drugs. Abū Bakr Moḥammad b. Zakarīyā' Rāzī (d. early 10th century) devoted three volumes of his great medical encyclopaedia *al-Hāwī fi'l-ṭebb* to pharmacology. His precise and highly technical studies of drugs and compounding were positively influenced by his knowledge of alchemy. The various drugs are discussed in alphabetical order; for each entry the theories of earlier pharmacologists are given first, then varieties and properties. Sometimes the Greek or Syriac name is also given. Rāzī's main achievement in this field, however, was to bring the practice of pharmacy under scientific scrutiny. In a preliminary essay he pointed out that pharmacology is not a branch of medicine but a tool in its service; the best physicians were also qualified pharmacists, and one who knew only about the characteristics of drugs was not a physician (1955-71, XXII, pp. 2, 4; idem, 1977, pp. 2, 3, 13; cf. Elgood, 1951, p. 272). He also emphasized the importance of freshly gathered herbs and mentioned the sources of supply for many. He even noted the volumes and weights to be used in mixing drugs and measuring doses and provided tables highlighting different names (1955-71, XXII, pp. 2-66). Rāzī wrote several other books on pharmacology, including *al-Aqarābādīn al-kabīr*, *al-Qarābādīn al-ṣaḡīr*, *al-Adwīa al-mawjūda be-koll makān*, and *Abdāl al-adwīa* (Ebn al-Qeṭī, p. 274; Sezgin, GAS III, pp. 274-94).

*The Samanids and Buyids.* In Samanid Bukhara Abū Bakr Aḳawaynī wrote a medical textbook, *Hedāyat al-mota'allemin*. Although it is not primarily concerned with pharmacology, it includes descriptions of about 3,000 simple and compound drugs, many with Persian names, in connection with relevant diseases. The author apparently intended to write a separate book on drugs (p. viii). Aḳawaynī claimed to have personally tested most of the drugs mentioned in his book (pp. 407, 455, 589) and did not hesitate to criticize earlier physicians for misusing them (pp. 457, 560, 580). He also classified them as foods, drugs, medicinal foods, and poisons (p. 3). Whenever possible, he gave the Persian, Arabic, Syriac, and Greek names of each drug. From the same period is preserved the oldest surviving pharmacological work in Persian, *Ketāb al-abnīa*, by Abū Mans'ūr Mowaffaq Heravī, in which 584 drugs are described (Meyerhof, pp. xvi-xvii). Aḳmad b. Abī'l Aš'at' (d. 360/970), a Persian physician living in Mosul and author of many medical books, wrote a manual of simple drugs, *Ketāb al-adwīa al-mofrada*, and a book on compound drugs, *Tarkīb al-adwīa* (Ebn Abī Oṣaybe'a, I, pp. 246-47; Sezgin, GAS III, pp. 301-02).

The great Avicenna (Ebn Sīnā) completed his major work, *al-Qānūn fi'l-ṭebb*, in



the early 11th century. Books 2 and 5 are devoted to simple and compound drugs respectively. Avicenna, who had personally prepared and tested many drugs, recommended balanced remedies blending the four basic humors (II, p. 224); the properties of such remedies could be ascertained by experimentation and inference (II, p. 223 ff.). Whenever a simple drug failed to cure a given sickness, proved harmful to another part of the body, or was found to be excessively hot, cold, dry, or moist, it was to be mixed with other simple drugs in order to strengthen its curative properties, counteract its harmful effects, and balance the nature of the drug (III, p. 309 ff.). Avicenna provided the earliest descriptions of a number of remedies, including opium (*al-teryāq al-kabīr*) for stomach and liver disorders (III, p. 321). According to Ebn al-Qeftī (p. 418), he also wrote a monograph on cardiac drugs, *al-Adwīa al-qalbīya*.

*The Ghaznavids and Saljuqs.* The outstanding pharmacological work of the later 11th century is *Ketāb al-ṣaydana* (comp. 442/1050) by [Abū Rayḥān Bīrūnī](#). It begins with definitions of the terms “pharmacy” (*ṣaydana*) and “simple drug,” a substance intermediate between a food and a poison that can neutralize either; like his predecessors Bīrūnī emphasized that drugs can be evaluated only by expert physicians (pp. 9-10). He distinguished two kinds of substitute for scarce or unobtainable drugs: an inferior variety or a different drug (pp. 12-13) with similar curative properties. He also observed that a given drug may have different effects, depending on whether it is administered as a potion, a poultice, or an ointment (p. 13). He then described individual drugs in alphabetical order, with Arabic, Persian, Greek, Indian, and Syriac names as appropriate. One of his sources was probably the Syriac *Poššāq šmāhē* (Explanation of the names), which some Christians had permitted him to see; it was also known as *Čahār nām* (Four names) because it included the Persian, Syriac, Greek, and Arabic names of drugs (Bīrūnī, *Ṣaydana*, pp. 16-17; cf. Ebn Abī Oṣaybe‘a, I, p. 318; Ullmann, pp. 335-36). In the medieval Persian translation of the *Ṣaydana* 819 drugs are mentioned; the chapter on properties of drugs, including only 799 entries, is a later addition (1992, p. xxvii).

The leading author in the 12th century was Sayyed Esmā‘īl Jorjānī (d. ca. 531/1136), who devoted book 10 of his lengthy medical encyclopedia *Daḳīra-ye k̄vārazmšāhī* to pharmacology (pp. 651-745). In the first discourse he described drugs in thirty-eight categories according to their effects on various ailments. The second discourse begins with a discussion of experimentation and analogy as methods for determining the curative properties of drugs (p. 686). His view of circumstances calling for compound drugs was broadly similar to those of



Avicenna and Bīrūnī. Book 9 comprises four discourses on poisons, antidotes, and harmful herbal, mineral, and animal drugs (pp. 626-51). At the end of the Saljuq period Najīb-al-Dīn Moḥammad b. ‘Alī Samarqandī (d. 619/1222) wrote the lengthy treatise *Qarābādīn* on compound drugs, classified by the diseases they helped relieve, and a work on simple drugs, both preserved in manuscript (*al-Darī‘a* XVII, p. 60).

*The Mongols and Timurids.* The *Tansūq-nāma-ye il-kānī*, a treatise on precious stones and rare minerals ascribed to Naṣīr-al-Dīn Ṭūsī, includes discussion of medical uses, for example, powdered pearls for certain eye diseases, headaches, and bleeding in the throat (p. 105) and lapis lazuli for bilious dysentery and melancholia (pp. 116-17). Similarly ‘Abd-Allāh Kāšānī, in his book on precious stones and perfumes, mentioned medical properties attributed to such substances as diamonds, rubies, mercury, and **camphor** (pp. 36, 82, 212, 262), which are known to have actually been used as remedies for several diseases in later centuries (see, e.g., Chardin, V, p. 187). Zakariyā’ Qazvīnī (d. 682/1283) attributed medical properties to the hair, skull, blood, and other parts of the human body, as well as to parts of the bodies of asses, camels, giraffes, hares, and so on (pp. 253-55, 264-340).

Large hospitals (see **BĪMĀRESTĀN**) had specialized pharmacists and pharmaceutical laboratories (*šarāb-kāna*, *bayt al-adwīa*, *dārū-kāna*) headed by officials called *mehtar-e šarāb-kāna* or *kāzen* (Rašīd-al-Dīn, 1977, pp. 42, 146, 148; Qalqašandī, III, p. 472, X, p. 4, V, pp. 469-70). The Il-khanid vizier Rašīd-al-DŪīn Fażl-Allāh founded a hospital and dispensary in the Rab‘-e Rašīdī at Tabrīz, where drugs were dispensed to patients every Monday and Thursday. They had to be prescribed by a physician and were administered under his direct supervision or in the presence of the pharmacist (*šarābdār*) and the manager of the pharmacy (*kāzen*; 1977, pp. 146-47). Rašīd-al-Dīn ordered that drugs be obtained from every city and declared that one of his reasons for traveling to India was to arrange for medical supplies (1945, pp. 16, 53-54).

On the other hand, concoction and sale of drugs by unqualified pharmacists and itinerant vendors became so widespread that in every city special regulations were adopted; they were enforced by the *moḥtaseb* (market supervisor), who was empowered to enter the premises of any apothecary, even at night, without the owner’s permission, in order to inspect substances and equipment and to ensure conformity with the official formulary, in principle that of Ebn Abi’l-Bayyān (d. 640/1242) or that of Ebn al-Telmīd (d. 560/1165); the latter survives in manuscript but has not been published.



Druggists were forbidden, for example, to dilute simple drugs like essence of violets with such substances as lemon juice. Violations were punishable under Islamic law (Ebn al-Oḳūwwa, pp. 115-25).

The great influence of *Jāme' al-mofradāt* by Ebn al-Bayṭār (d. 646/1248), a work on pharmacology, throughout the Muslim world can be seen in Naṣīr-al-Dīn Jovaynī's *Mā lā yasa'o'l-ṭabība jahloho* (comp. mid-14th century), in two parts on simple and compound drugs respectively. Jovaynī claimed (fol. 4a) that his book replicates *Jāme' al-mofradāt* but is an independent work, insofar as Persian names of many drugs are given; he attempted to find Persian equivalents for many Syriac, Greek, Indian, and Arabic drug names. Some of these drugs cannot yet be identified, for example *arand sorand*, a bulb (fol. 12a); *oštorgān*, called *ṭākak* in Ṭabarestān (fol. 13a); *koškanjabīn* (fol. 83b); *bādāmak*; and *bārzad* (fol. 31b). In one respect his book is superior to that of Ebn al-Bayṭār: More attention is given to appraising the properties of drugs and specifying quantities to be used in compounds. Jovaynī also noted undesirable side effects of certain drugs and discussed appropriate countermeasures (fols. 3b-4a).

Among authors of the Timurid period the most distinguished were Najīb-al-Dīn Samarqandī, whose works survive in manuscript (e.g., *Oṣūl-e tarkīb-e adwīa* and *Tarkīb al-adwīa al-qalbīya*, Ketāb-ḵāna ye Majles-e Senā, Tehran, ms. nos. 536-37) and Borhān-al-Dīn Nafīs.

*The Safavids, Afsharids, and Zands.* In the 16th-18th centuries few physicians and pharmacists presented new ideas or original research. 'Alī Afzal Qāṭe', apparently a hospital administrator at Qazvīn in the Safavid period (ca. 1051/1641), characterized his *Manāfe'-e afzālīya* as a selection of excerpts from the works of earlier authorities (fol. 1b); after classifying diseases and drugs according to the four humors (fols. 8a-20b), he discussed aperients, sedatives, and drugs for stomach and liver disorders (fols. 20b-finis). Many pharmacological books of the Safavid period include the word *qarābādīn* in the title, for example, *Qarābādīn-e Šefā'ī* by Moẓaffar b. Moḥammad Ḥosaynī Šefā'ī (d. 963/1556), a work preserved in numerous manuscripts (*al-Ḍarī'a* XVII, p. 61; Monzawī, *Nosḵahā* I, p. 580), the main source for the *Pharmacopoeia Persica* of Father Angelus, published in France in 1681 (Elgood, 1970, p. 34). A large number of medical and pharmacological treatises were written in India in the Persian language, often with Sanskrit or Urdu, as well as Persian, drug names, for example, *Eḳtīārāt-e qoṭbšāhī* (on simple and compound drugs; ca. 972/1563) by Mīr Majd-al-Dīn Moḥammad Ḥosaynī Kāšānī, *Ganj-e bādāvard*



(1035/1624) by Amān-Allāh Khan b. Mahābat Khan, *Alfāz al-adwīa* (1038/1627) by Nūr-al-Dīn ‘Abd-Allāh Šīrāzī, *Qarābādīn* by Moḥammad-Hāšem ‘Alawī Khan (d. 1162/1749), *Qarābādīn-e jalālī* by Jalāl al-Dīn Amrūdahī, and *Majmū‘a-ye Ḥakīm-al-Molk* by Ḥakīm-al-Molk Gīlānī (Wāseṭī, pp. 51, 91, 115-16; Šahmardān, p. 684).

In contrast to the practice in earlier periods, in the 17th century it was customary for apothecaries (*‘aṭṭār*) to examine sick customers in their shops and to prescribe drugs (Elgood, 1970, p. 31). Sometimes (Chardin, V, p. 176) a physician and a druggist might consult on the diagnosis and prescription. The English traveler Thomas Herbert (in Persia 1627-28) praised Persian physicians and remarked on their preference for vegetable, rather than mineral, drugs (Elgood, 1951, pp. 406-07), but his countryman John Fryer (in Persia 1676-78) criticized their ignorance of the medicinal properties of juices and extracts from plants and roots; nevertheless, Fryer found the apothecary shops unequaled in the world for the variety of drugs and medicinal herbs on offer (Elgood, 1951, pp. 392-406). Jean Chardin noted that physicians kept collections of medicinal herbs for use in training apprentices (V, p. 175). Among the drugs then in common use in Persia were *šīrkešt* and *gazangabīn* (two kinds of manna), *morr-e makkī* (Meccan myrrh), *folūs* (cassia), *senā* (senna), *rīvand* (rhubarb), *šīrīn-bayān* (licorice), *nošāder* (sal ammoniac), *saqmūnīā* (scammony), and *čūb-e čīnī* (China root; Chardin, V, pp. 187-88).

The most eminent physician of Safavid Persia was Ḥosayn Nūrbakš, who drew on both experience and precedent in his medical treatise *Ḳolāṣat al-tajāreb* (957/1550), several chapters of which were devoted to pharmacology and the pharmacopoeia. In chapter 26 he defined poisons and antidotes, distinguishing toxic substances from drugs with harmful side effects, then named and described various poisons (fols. 308b-10a); vegetable antidotes included *jadvār* or *māhparvīn* (zedoary), *zarāvand* (birthwort), *zorombād* (broad-leaved ginger), and *mūrd* (true myrtle), and among mineral and animal antidotes he mentioned Armenian bole, black and white naphtha, and rhinoceros horn (fols. 320a-25b). In chapter 27 he described compound drugs of his own invention, including *ḥabb al-šefā* (cure pills), *ḥāfez al-šeḥḥa* (health preserver), *teryāq-e jadīd* (new theriaca), and *teryāq al-ṭīn-e jadīd* (new mud theriaca; fols. 335a-34b), several aperients, and such potions as *čahār-šarbat* (four syrups, fol. 337b) and *pālūda-ye ṭebbī* (medicinal *pālūda*, a sort of jelly, fol. 338a-b). Chapter 28 is about technical terms and weights and measures used in compound drugs (fols. 340b-41a).



The most widely used pharmacological manual in the Safavid period was *Toḥfat al-mo'menīn* by Moḥammad-Zamān Tonakābon, personal physician to Shah Esmā'īl I (907-30/1501-24), and his son Moḥammad-Mo'men. It consists of two parts, the first with names and descriptions of drugs, the second explaining preparations. The authors noted the regions and seasons in which the plants grow (pp. 6-9) and their corresponding effectiveness. There is also a chapter on poisons and treatment of poisoning (pp. 883 ff.).

No information about pharmacology survives from the Afsharid period, apart from some references by personal physicians of Nāder Shah (1148-60/1736-47) to drugs that they themselves prepared (Bazin, tr., pp. 31-32). A report by Antony Forbes in 1726 shows that drugs in use at the hospital of the English [East India Company](#) at Gombroon ([Bandar-e 'Abbās](#)) included pills, pastes, salts, juices, seeds, and roots, all apparently imported from India (Elgood, 1951, p. 409).

An important pharmacopoeia, *Makzen al-adwīa*, was compiled in the reign of Karīm Khan Zand (1163-93/1750-79) by Moḥammad-Ḥosayn 'Aqīlī Korāsānī. The author drew his material from pre-Safavid works, listing simple and compound drugs in respective sections, each organized alphabetically. In 'Aqīlī's opinion the effects of drugs depended on their properties and generic types (p. 4). On the assumptions that every drug is a substance from one of the three "kingdoms" (mineral, vegetable, animal) or a compound of such substances and that, as the ancients believed, these kingdoms are subject to influences from the seven planets, he argued that the medical properties of drugs depend on the "temperaments" of the planets. He therefore included in his book several diagrams of these influences and linkages (pp. 59, 66-79). As a consequence of these relations, drugs of demonstrated medicinal value in one region would not necessarily be as effective in others (p. 23). 'Aqīlī also discussed in detail how long drugs remain usable and proper storage (pp. 36-37).

*The Qajar period and the beginnings of modern pharmacy.* A long time passed before the work of a few European physicians in the employ of the Persian court or foreign diplomatic and commercial establishments had any significant impact on traditional Persian theories and methods. The first European officially licensed to practice pharmacy in Persia was apparently [William Cormick](#), who ran an apothecary business in Tabrīz in about 1260/1844 (Wright, p. 124). There is also a record of a Mr. Gerald at the East India Company hospital at Būšeher (Elgood, 1951, p. 485). The work of foreign



physicians and the efforts of such Persian leaders as ‘Abbās Mīrzā to spread knowledge of European science, particularly medicine, paved the way for the introduction of modern pharmaceutical studies at the *Dār al-fonūn*, which opened at Tehran in 1268/1852.

The first professor of chemistry and pharmacy at the *Dār-al-Fonūn* was the Austrian Fochetti. Dr. Eduard Jakob Polak also taught pharmacy, as well as medicine and surgery. Among the numerous textbooks that Polak wrote during his stay in Persia was one on simple and compound drugs (*Mofradāt-e ṭebb*). Mīrzā Kāzem Maḥallātī, known as Šīmī, succeeded Fochetti as professor of pharmacy in 1279/1862 (Maḥbūbī, pp. 14, 53; Najmābādī, 1975, pp. 205-06; Naranjihā, p. 35-36). Later a Frenchman, one Dr. Georges, took charge of the pharmacy department (Najmābādī, 1975, p. 210). The best-known professor of medicine at *Dār al-fonūn* was, however, Dr. Johann Schlimmer, whose *Terminologie médico-pharmaceutique* was the first Persian medical dictionary in the European style; it included currently used medical terms and names of drugs in French, Latin, English, German, Persian, and Arabic as used in Persia. Several translations of other works by Schlimmer appeared in this period, among them *Meftāḥ a-kawāṣṣ* on drugs and *Asbāb al-adwīa* on methods of preparing simple and compound drugs (Maḥbūbī, p. 25; Najmābādī, 1975, p. 318).

During the later Qajar period Western missionary groups established hospitals and dispensaries in several Persian cities (see [CHRISTIANITY viii](#)). Owing to dedicated workers like Mary Bird, who opened a dispensary for women at Isfahan in 1308/1891, they gradually won public trust. Clinics and dispensaries maintained by foreign legations and consulates and the Indo-European Telegraph Department also served members of the public free of charge (Wright, pp. 118-20, 126). Among prominent Persians Mīrzā Ḥosayn Khan Sepahsālār (prime minister 1288-90/1871-73) built a hospital beside the Sepahsālār Madrasa and appointed a pharmacist and an apprentice to work there (S. Nafisī, p. 19). There was some opposition to European pharmacology; for example, the physician Mīrzā Bābā Moḥammad-Taqī Šīrāzī wrote *Jawhariya*, in which he condemned European drugs as harmful (Fīlsūf-al-Dawla, I, pp. 242-43). Nevertheless, increasing public demand prompted composition or translation of several books on modern scientific pharmacology. One of them was *Meftāḥ al-adwīa-ye nāserī* by Ḥosayn Khan Hanjan Neẓām-al-Ḥokamā’. It covers the properties, manufacture, and uses of drugs in treating diseases. The author claimed to have discovered the



antipyretic value of a plant of the thistle family, the effects and applications of which he discussed in detail (pp. 522-25). Much the same ground was covered in *Terāpūtīk wa dārūsāzī-ye ṭebbī* by Abu'l-Ḥasan Khan Doktor Tafrešī, who declared in his preface that he had based his work on European books about drugs and their therapeutic functions. Also worthy of note is *Asrār al-ḥekma*, translated by Mirzā 'Alī-Naqī Khan Eftekār-al-Aṭebbā', "chief physician of the army in Persia," from a work by Sydney Rinkser, "professor of clinical research and director of the university hospital in England." This work is devoted to European drugs, most of which were already in use in Persia. The medical treatise *Pezeškī-nāma* (comp. 1314/1879) by 'Alī-Akbar Khan Nafīsī Nāẓem-al-Aṭebbā' became extremely popular; it included Arabic, French, Latin, Greek, and Persian names for the drugs described.

After the departure in 1316/1898 of Roquebrune, who had been director of the pharmacy department at Dār al-fonūn since 1313/1895, it was headed successively by the German Schwerin and the Frenchman Mauléon (Nāranjīhā, p. 36). In 1322-23/1904 the French pharmacist Gustave Lecomte was hired by the Persian government; he established a pharmaceutical laboratory at Takīya-ye dawlat, where he trained students (Maḥbūbī, p. 363).

Despite these advances, modern drugs were not yet available in all Persian cities and towns. In about 1910 the English medical officer at the quarantine station at Bandar-e 'Abbās had to obtain necessary drugs from the British consulate, for the stocks in town were rotten or too old to be used (Sadīd-al-Salṭana, p. 169). Although some modern apothecaries had been established in Tehran, their customers were mainly embassy officials, resident Europeans, and highly educated Persians; few members of the general public patronized them. Schwerin opened a retail pharmacy on Nāṣerīya avenue but encountered violent public opposition. The traditional apothecaries ('aṭṭār), who usually also gave medical advice, remained prosperous and influential throughout the Qajar period (Šahrī, 1958, p. 29; idem, 1990, IV, pp. 327-28).

*The modern period.* Real progress in the teaching and practice of modern pharmacology in Persia began in 1301 Š./1922, when a pharmacy department was established in the College of medicine, which had been split off from Dār al-fonūn in 1297 Š./1918. Initially the three-year course was taught by professors at the College of medicine. In 1304 Š./1925 a Dr. Papariyan from Turkey was engaged by the Persian government to teach pharmacology; he remained four years, and at his suggestion preparations were made to compile a manual of the laws and rules governing pharmacy in Persia. Among other



teachers in the early years were Drs. 'Alīm-al-Molk (pharmacodynamics), Ḥakīm-al-Salṭana (drug preparation), and Maḥmūd Šīmī (chemistry). From 1304 Š./1925 to 1313 Š./1934 the number of graduates from the pharmacy department totaled 114 (Maḥbūbī, p. 363; *Rāhnemā-ye Dāneškada*, pp. 49, 67). The first set of regulations governing the sale of drugs was issued in 1298 Š./1919 by the Ministry of education (Wezārat-e ma'āref). One requirement was that every seller of drugs be licensed (Komīsīūn, II, p. 144).

In the second biannual report of the Persian Department of public health (Şeḥḥīya-ye koll) in 1305/1926 attention was drawn to the need for drug-manufacturing facilities in Persia, which led to establishment of pharmaceutical laboratories in several hospitals and plans for others (*Dovvomīn*, pp. 5, 13-14, 16). New regulations were also announced. They provided that only those with certification from approved training colleges in Persia or abroad could compound drugs and that all apothecaries had to be licensed by the Department of public health (*Dovvomīn*, p. 222). In the statutes of the College of medicine enacted in 1307 Š./1928 a diploma from lower secondary school was made the minimum prerequisite for acceptance in the department of pharmacy (*Rāhnemā-ye Dāneškada*, p. 201). In the same year Dr. Heinrich Strunk, then director of the German technical school (Madrasa-ye şan'atī-e ālmān) in Tehran, began teaching pharmaceutical chemistry in the department of pharmacy, and in 1309 Š./1930 Dr. Maḥdī Nāmdār, Dr. Şādeq Moqaddam, and Dr. Faṭḥ-Allāh A'lam, all graduates of French schools, joined the staff (Maḥbūbī, p. 364). In the same year the pharmacy course was fixed at five years (*Rāhnemā-ye Dāneškada*, p. 90). In 1316 Š./1937, three years after incorporation of the Medical college into Tehran University, it was decided to require completion of secondary school before admission to the pharmacy department (*Rāhnemā-ye Dāneşgāh* I, p. 33). In 1318 Š./1939, when Charles Oberlin became dean of the faculty of medicine, plans were drawn up for the creation of eight chairs of pharmacology. Among the faculty at that time were Drs. Nāşer Mālek, Nāmdār, and Ārmā'īs Vartānī (*Rāhnemā-ye Dāneškada*, pp. 80-81). The curriculum included Galenic pharmacology, chemical pharmacology, simple (herbal) drugs, organic chemistry, toxicology, biochemistry, pharmacodynamics, and botany. Chairs in chemical analysis and pharmacological physics were added in 1322 Š./1943 (Maḥbūbī, p. 365). Nāmdār served as technical director of the department and was later succeeded by Moqaddam in 1316 Š./1937.

In 1318 Š./1939 the Central pharmaceutical company (Şerkat-e markazī) was



established to centralize procurement of drugs in Persia (Komīsīūn, II, p. 1426), and the next year inspection of pharmacists' shops and stocks and coordinated distribution of drugs were instituted (*Rāhnamā-ye Dāneškada*, p. 97). In 1323 Š./1944 the University council (Šūrā-ye dānešgāh) changed the length of the degree course in pharmacology to four years and the period of study for the doctorate to at least one year (*Rāhnamā-ye Dāneškada*, p. 204).

In early 1942 responsibility for matters pertaining to drugs was transferred to the General pharmaceuticals commission (Bongāh-e koll-e dārū'i) in the Ministry of finance (Wezārat-e dārā'i). Ten years later the Ministry of health (Wezārat-e behdārī) was authorized to set up a directorate-general of pharmaceuticals (Bongāh-e dārū'i-e koll-e kešvar), in order to procure drugs, medical and surgical equipment, and laboratory apparatus (Komīsīūn, II, p. 1426). A syndicate of pharmacists was established in 1333 Š./1954; it later became the Persian pharmacists' association (Jāme'a-ye dārūsāzān-e Īrān). The association lapsed in 1337 Š./1958, owing to internal disunity, but resumed its activities in 1341 Š./1962 (*Māh-nāma-ye dārū-pezeškī* 40, Kordād-Tīr 1347 Š./May-July 1968, pp. 24-25).

In 1335 Š./1956 the Department of pharmacy became the independent Faculty of pharmacology (Dāneškada-ye dārūsāzī) within Tehran University, with Nāmdār as its first dean (Maḥbūbī, p. 365). Two courses were offered, a four-year degree course, the graduates of which were entitled to practice pharmacy, and a three-year postgraduate course leading to the doctorate (Maḥbūbī, p. 366). Nāmdār was succeeded in 1341 Š./1962 by Dr. Nāderqolī Šarqī, who was succeeded in turn by Dr. Alī Zargarī in 1348 Š./1969.

Over the years pharmacology departments were also established in the universities of Isfahan, Tabrīz, Ahvāz, Mašhad, and Shiraz, as well as in the Mellī university (now Beheštī university) in Tehran.

By 1370 Š./1991 the sale of drugs in Persia was subject to the general laws governing medical matters, which required that a special license be obtained from the Ministry of hygiene, health care, and medical education (Wezārat-e behdārī). Such a licence could be granted only to a qualified pharmacist, who was legally responsible in all matters pertaining to the preparation and issue of drugs. Deviation from a physician's prescription by a pharmacist was categorically forbidden, and pharmacists were not allowed to give medical treatment other than first aid ('Ebādī, pp. 62-64). Nevertheless, traditional remedies remain in use in many Persian villages and towns. Many believers in



herbal medicine still prefer to consult traditional practitioners, who also often prescribe for them (Bolūkbāšī, p. 136). Today some traditional herbal remedies are sold in modern packages bearing descriptions of their benefits and instructions for their use. Preparations like **camel thorn** (*taranjabīn*), licorice, absinthium, rice husks, wild tea (*čāy-e kūhī*), almond oil, and castor oil are taken mainly for relief of diarrhea, constipation, stomachache, skin diseases, pellagra, gout, and renal calculus (Jazā'erī, pp. 85-88).

## BIBLIOGRAPHY

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(For cited references not found in this bibliography and for abbreviations found here, see “Short References.”) Abu'l-Ḥasan Khan Doktor, *Terāpūtīk wa dārū-sāzī-e ṭebbī*, Tehran, 1304/1887.

Abū Maṣṣūr Mowaffaq Heravī, *Ketāb al-abnīa 'an ḥaqa'eq al-adwīa*, ed. A. Bahmanyār, Tehran, 1346 Š./1967.

Abū Bakr Aḳawaynī Boḳarī, *Hedāyat al-mota'allemin*, ed. J. Matīnī, Mašhad 1344/1965.

'Alī Afzal Qāṭe', *Manāfe'-e afzalīya*, Tehran University, central library, ms. no. 2546.

Moḥammad-Ḥosayn 'Aqīlī Korāsānī, *Maḳzen al-adwīa*, Calcutta, 1844; repr. Tehran, n.d.

M.-Z. Bābā, “al-Aqrābādīnāt aw dasātīr al-adwīa al-'arabīya,” *Abḥāt al-nadwat al-'ālamīya al-ūlā le-ta'riḳ al-'olūm 'end al-'Arab* (Aleppo) 1, 1976, p. 579.

Idem, “Mašāder al-adwīa al-mofrada aw al-'aqāqīr fi'l-ṭebb,” in *Abḥāt al-mo'tamar al-sanawī al-ṭānī le'l-jam'iyat al-Sūrīya le-ta'riḳ al-'olūm*, Aleppo, 1977.

P. L. Bazin, *Lettres*, tr. 'A.-A. Ḥarīrī as *Nāmahā-ye ṭabīb-e Nāder Šāh*, ed. Ḥ. Yaḡmā'ī, Tehran, 1340 Š./1961.

Abū Rayḥān Bīrūnī, *Ketāb al-jamāher fi ma'refat al-jawāher*, Hyderabad,



1305/1888.

Idem, *Fehrest kotob-e Rāzī*, ed. M. Moḥaqqueq, Tehran, 1366 Š./1987.

Idem, *Ketāb al-ṣaydana fi'l-ṭebb*, ed. 'A. Zaryāb Ko'i, Tehran, 1370 Š./1992; tr. Abū Bakr Kāšānī, ed. Ī. Afšār and M. Sotūda, Tehran, 1358 Š./1979.

'A. Bolūkbāšī, "Darmān-e bīmārīhā wa nākōšihā dar pezeškī-e 'amma," *Ketāb-e hafta* 101, 1342 Š./1963, pp. 134-41; 102, 1342 Š./1963, pp. 134-39; 103, 1342 Š./1963, pp. 73-84.

Borhān-al-Dīn Nafīs, *Šarḥ al-asbāb wa'l-'alāmāt*, Calcutta, 1251/1835.

E. G. Browne, *Arabian Medicine*, Cambridge, 1902.

*Dovvomīn rāport-e šeš-māha-ye Šeḥḥīya-ye koll*, Tehran, 1305 Š./1926.

Š. 'Ebādī, *Hoqūq-e pezeškī*, Tehran, 1368 Š./1989.

Ebn Abī'l-Bayyān, *Aqrā bādīn*, ed. P. Sbath as *al-Dostūr al-bīmārestānī fi'l-adwīa al-morrakkaba* Cairo, 1932-33.

Ebn Abī Oṣaybe'a, 'Oyūn al-anbā' fi ṭabaqāt al-aṭebbā', 2 vols. in 1, Cairo, 1299/1882.

Moḥammad b. Moḥammad Ebn al-Oḳowwa, *Ma'ālem al-qorbafī aḥkām al-ḥesba*, ed. R. Levy, Cambridge, 1937.

Ebn al-Qeftī, *Tārīk al-ḥokamā'*, ed. J. Lippert, Leipzig, 1903.

Ebn Sīnā (Avicenna), *al-Qānūn fi'l-ṭebb*, 3 vols., Būlāq (Cairo), 1294/1877.

C. Elgood, *A Medical History of Persia and the Eastern Caliphate*, Cambridge, 1951.

Idem, *Safavid Medical Practice*, London, 1970.

Mīrzā 'Abd-al-Ḥosayn Khan Fīlsūf-al-Dawla, *Matraḥ al-anzār fi tarājem aṭebbā' al-a'šār wa falāsefat al-amšār*, Tehran, 1334/1916.

D. S. Flattery and M. Schwartz, *Haoma and Harmaline. The Botanical Identity of the Indo-Iranian Sacred Hallucinogen "Soma" and Its Legacy in Religion, Language, and Middle-Eastern Folklore*, Berkeley, Calif., 1989.



- Ḥonayn b. Eshāq, *al-ʿAṣar maqālāt fi'l-ʿayn*, ed. M. Meyerhof, Cairo, 1928.
- Ġ. Jazā'eri, "Manša'-e peydāyeš-e ṭebb-e sonnati," in *Ṭebb-e sonnati-e Īrān*, Tehran, 1362 Š./1983.
- Sayyed Esmā'īl Jorjānī, *Daḳīra-ye ḳvārazmšāhī*, facs. ed., ed. 'A.-A. Sa'īdī Sīrjānī, Tehran 1355 Š./1976.
- Naṣīr-al-Dīn Yūsof b. Esmā'īl Jovaynī, *Mā lā yasa'o' al-ṭabība jahloho*, Tehran University, central library, ms. no 1999.
- Abu'l-Qāsem 'Abd-Allāh Kāšānī, *'Arā'es al-jawāher wa nafā'es al-aṭāyeb*, ed. Ī. Afšār, Tehran, 1345 Š./1966.
- Ya'qūb b. Zakariyā Kaškari, *al-Konnāš fi'l-ṭebb*, facs. ed. F. Sezgin, Frankfurt, 1405/1989.
- Komīsiūn-e mellī-e Yūnesko (UNESCO), *Īrān-šahr*, 2 vols., Tehran, 1342-43/1963-64.
- Ḥ. Maḥbūbī Ardakānī, *Tārīk-e taḥawwol-e Dānešgāh-e Tehrān wa mo'assasāt-e 'ālī-e āmūzešī dar Īrān*, Tehran, 1350 Š./1971.
- Māsarjūya, *Fī abdāl al-adwīa wa mā yaḳūm maqām ḡayrehe menhā*, tr. M. Levey in *Substitute Drugs in Early Arabic Medicine . . .*, Stuttgart, 1971.
- M. Meyerhof, *Introduction to Šarḥ asmā' al-'oqqār*, Cairo, 1940.
- J. Moḥammad Mūsā, "al-Adwīa al-mofrada wa ma'refat qowāhā," *Abḥāt al-nadwat al-'ālamīya al-ūlā le-tārīk al-'olūm 'end al-'Arab* (Aleppo) 1, 1976, pp. 805-08.
- 'A. Nafīsī, "Barḳī az gīāhān," *Jašn-nāma-ye Ebn Sīnā* III, Tehran, 1344 Š./1965, pp. 55-58.
- 'Alī-Akbar Khan Nafīsī Nāzem-al-Aṭebbā', *Pezeškī-nāma dar 'elm-e terāpūtīk*, Tehran, 1317/1899.
- S. Nafīsī, "Tārīk-e bī-mārestānhā-ye Īrān," *Majalla-ye šīr o ḳoršīd-e sorḳ-e Īrān* 3/9-10, 1329-31 Š./1950-52.
- M. Najmābādī, "Tārīk-e ṭebb wa behdāšt dar Īrān-e bāstān," *Našrīya-ye*



*Dāneškada-ye adabīyāt-e Dānešgāh-e Esfahān* 7, 1350 Š./1971, pp. 81-92.

Idem, “Ṭebb-e Dār-al-Fonūn wa kotob-e darsī-e ān,” in Q. Rawšanī Za‘farānlū, ed., *Amīr-e Kabīr wa Dār-al-Fonūn*, 1354 Š./1975, pp. 202-37.

Ī. Nāranjīhā, “Tārīkča-ye dārū-sāzī dar Īrān,” *Māh-nāma-ye dārū-pezeškī* 3/28, 1343 Š./1964, pp. 33-36; 4/38, 1345 Š./1966.

S. Ḥ. Naṣr, “Tārīk-e ṭebb,” tr. Ḥ. Marandī, in *Tārīk-e falsafa dar Eslām* III, ed. M.-M. Šarīf, Tehran, 1367 Š./1988, p. 459.

Sayyed Ḥosayn Khan Hanjan Nāzem-al-Ḥokamā’, tr., *Meftāḥ al-adwīa*, ed. Amīn-al-Aṭebbā’ Tabrīzī, Tehran, 1309/1892.

Bahā’-al-Dawla Ḥosayn Nūrbakš, *Ḳolāṣat al-tajāreb*, University of Tehran, central library, ms. no. 1400. Pseudo Pythagoras (Fīṭāgūres), *Sīyāḥat-nāma-ye Fīṭāgūres dar Īrān*, tr. Y. E‘tešāmī, Tehran, 1363 Š./1984.

Abu’l-‘Abbās Aḥmad Qalqašandī, *Šobḥ al-a‘šā*, ed. E. Ebyārī, 16 vols., Cairo, 1963.

J. Š. Qanawātī, *Tarīk al-šaydala wa’l-‘aqāqīr*, Cairo, 1950.

Zakarīyā’ b. Moḥammad Qazvīnī, *‘Ajā’eb al-maklūqāt wa ḡarā’eb al-mawjūdāt*, Beirut, n.d.

*Rāhnamā-ye Dānešgāh-e Tehrān*, Tehran, 1317-18 Š./1938-39.

*Rāhnamā-ye Dāneškada-ye ṭebb wa dārū-sāzī wa dandān-pezeškī wa bīmārestānhā wa āmūzešgāhhā-ye vābasta*, Tehran, 1332 Š./1953.

Rašīd al-Dīn Fażl-Allāh, *Mokātabāt*, ed. M. Šafī’, Lahore, 1364/1945.

Idem, *Waqf-nāma-ye Rab‘-e rašīdī*, ed. Ī. Afšār, Tehran, 1356 Š./1977.

Moḥammad b. Zakarīyā Rāzī, *Ketāb al-ḥāwī fi’l-ṭebb*, 23 vols. in 15, Hyderabad (Deccan), 1374-90/1955-71.

Idem, *Qeṣaṣ wa ḥekāyāt al-marzā*, ed. and tr. M. Najmābādī, Tehran, 1356 Š./1977.

S. Rinkser (sic), tr. Mīrzā ‘Alī-Naqī Khan Efteḵār-al-Aṭebbā as *Asrār al-ḥekma*, Tabrīz, 1325/1908.



Moḥammad-ʿAlī Sadīd-al-Salṭana Kabābī, *Bandar-e ʿAbbās wa Kalij-e Fārs*, ed. A. Eqtedārī, Tehran, 1363 Š./1984.

R. Šahmardān, “Kār-nāma-ye Ḥakīm-al-Molk Gilānī dar Hend,” *Mehr* 10, 1365 Š./1986, p. 689.

J. Šahrī, *Gūša-ī az tāriḳ-e ejtemāʿī-e Tehrān-e qadīm*, Tehran, 1357 Š./1958.

Idem, *Tāriḳ-e ejtemāʿī-e Tehrān-e dar qarn-e sīzdahom*, 6 vols., Tehran, 1369 Š./1990.

K. Sāmarrāʿī, *Moḳtaṣar taʿriḳ al-ṭebb al-ʿarabī*, 2 vols., Baghdad, 1984-85. J. Schleifer and S. M. Stern, “Aḳrā-bādhīn,” in *EI2* I, pp. 344-45.

Salīm-al-Zamān Šeddīqī, “Šīmī,” tr. H. Aʿlam, in *Tāriḳ-e falsafa dar Eslām* III, ed. M.-M. Šarīf, Tehran, 1368 Š./1989, p. 448.

Abuʿl-Ḥasan ʿAlī b. Rabban Ṭabarī, *Ferdaws al-ḥekma fīʿl-ṭebb*, ed. M. L. Šeddīqī, Berlin, 1938.

Moḥammad Moʿmen Ḥosaynī Tonokābonī, *Toḥfat al-moʿmenīn (Toḥfa-ye Ḥakīm Moʿmen)*, Tehran, 1402/1986.

Našīr-al-Dīn Ṭūsī (attributed), *Tansūḳ-nāma-ye il-ḳānī*, ed. M.-T. Modarres Rażawī, Tehran, 1363 Š./1984. M. Ullmann, *Die Medizin im Islam*, Leiden, 1970.

N. Wāseṭī, *Tāriḳ-e rawābeṭ-e pezeškī-e Īrān wa Pākestān*, Rawalpindi, 1974.

D. Wright, *The English amongst the Persians during the Qajar Period 1787-1921*, London, 1977.