



## DENTISTRY

---

**DENTISTRY** (*dandān-pezeškī*) in Persia. No specific information about dentistry in pre-Islamic Persia has survived, but a reference in the Avesta (*Vd.* 2.29) indicates that oral and dental diseases were not uncommon among Iranians. Significant advances in medicine were achieved, particularly at the college hospital at **Gondēšāpūr** (in the Islamic period Jondīšāpūr), which was founded under the Sasanians and continued to function in the early Islamic period. As Abū Bakr Moḥammad Rāzī (d. 313/925) based his discussion of dental therapy (1955) on the methods of Boktīšū' b. Jewarjīs (d. 185/801), the latter's son Jebrā'īl (for both these men, see **BOKTĪŠŪ'**), and other physicians trained at Gondēšāpūr, it can be inferred that dentistry was part of the program of study at the hospital, inherited from pre-Islamic times.

*Dental medicine before the Mongol invasion.* The ancient tradition endured into the Islamic period. There is reason to suppose that such physicians as Māsarjawayh (Māsarjūya), a Persian employed at the Omayyad court in Damascus and probably trained at Gondēšāpūr, also did dental work (*Sāmarrā'ī*, I, pp. 291-92, 305). Ebn al-Nadīm (ed. Flügel, p. 59) ascribed a book entitled *Ketāb al-asnān* (Book of teeth) to Abū 'Obayda Ma'mar b. Moṭannā, nicknamed Saḳt (110-207/728-822), an author of Persian descent; if the title is correct, it must have been one of the first monographs on the subject written by a Persian in the Islamic period, but Ebn Kallekān (ed. 'Abbās, V, p. 239) gave the title as *Resālat al-ensān* (Treatise on mankind), which seems more in keeping with Abū 'Obayda's other writings.

More is known about dentistry under the 'Abbasids and the autonomous



dynasties that arose on Persian soil. The fact that Rāzī, when writing on drugs for dental ailments (1955, III, pp. 130, 136), frequently cited prescriptions of the Boktīšū' family and other physicians from Gondēšāpūr (e.g., Ḥonayn b. Eshāq [192-260/808-73], Eshāq b. Ḥonayn [d. 289/911], and Yūḥannā b. Māsawayh [Māsūya; d. 243/857]) is evidence that this branch of medicine was practiced in Persia. According to Ebn Abī Oṣaybe'a (p. 99), Ḥonayn b. Eshāq wrote *Resāla fī ḥefẓ al-asnān* (Treatise on the preservation of the teeth), a source for Rāzī (1955, III, p. 145-50), who noted that it was about hygiene of the gums and teeth. Ebn Abī Oṣaybe'a also mentioned (I, p. 83) *Resāla fī'l-sewāk wa'l-sonūnāt* (Treatise on toothpicks and tooth powders) by Yūḥannā b. Māsawayh; this and another work by the same writer, *al-Masā'el*, were also cited by Rāzī (1955, III, pp. 117, 141, 142, 150). If Yūḥannā b. Māsawayh is to be identified with Māsawayh the Younger, as Cyril Elgood has supposed, he deserves credit for being the first to use gold to fill dental cavities and to diagnose sympathetic toothache (Elgood, 1951, pp. 93-95, 287). The renowned physician 'Alī b. Rabban Ṭabarī (d. 247/861), a contemporary of Yūḥanna, discussed dental ailments in several passages of his medical compendium *Ferdows al-ḥekma* (pp. 47, 188, 189); he described the loss of milk teeth and the growth of molars and prescribed medications to toughen the gums, stop hemorrhages, whiten the teeth, and hasten the growth of teeth in children.

Rāzī himself made much more detailed observations of the teeth and dental diseases (1955, III, pp. 93-155). It is clear that he had personally tested the properties of many of the drugs that he prescribed. He believed that most dental diseases are related to nerves in the roots (1955, III, p. 106). In accordance with the prevalent theory of hot and cold diseases, he divided his prescriptions for toothache and other dental ailments into corresponding categories (1955, III, p. 147 and passim). For tooth extraction without recourse to forceps, he recommended that a thick ointment of wild tarragon root (*āqerqarḥā*) mixed with vinegar or wine be rubbed on the gums, in order to soften them and loosen the tooth, but he advised care in application, so that other teeth would not fall out (Rāzī, 1908, pp. 11, 12; idem, 1955, III, pp. 98, 152). His prescriptions for toothache included drops, poultices, and cauterization, then widely used for many diseases (1945, p. 42); for some kinds of toothache he prescribed eardrops (1955, III, pp. 93, 95) or letting blood from the gums, but he found that gum inflammation could often be healed by rinsing the mouth with damask-rose oil (1955, III, p. 121). For prevention of tooth decay and disease he advised rinsing twice monthly with milkweed (*yattū*) root stewed in wine (1945, p. 99). A section on the teeth and jaws in an



early work, *Ketāb al-ṭebb al-manṣūrī*, now lost, was almost certainly the first work ever written on the structure of the tooth and the functioning of the jaw (Malvin, p. 66).

‘Alī b. ‘Īsā Ahvāzī (d. 384/994) included in his general medical work *al-Kāmel le’l-ṣenā’a* (or *al-Ṭebb al-malekī*) a section on dental and gingival diseases and injuries (pp. 302-04); his prescriptions are mostly mixtures of substances like tarragon root with vinegar or other liquors, opium, and camphor. Abū’l-Faraj Ebn Hendū (d. 410/1019 or 420/1029), a native of Ray, in his categorized lists of body parts, diseases, and remedies, placed teeth in the category of organs (pp. 112-13). The botanist Mowaffaq-al-Dīn ‘Alī Heravī (10th century; pp. 85, 115, 125, 151) noted the value of several plant products for relief of toothache, and [Abū Rayḥān Bīrūnī](#) (d. 442/1050) also drew attention to the effects of certain herbs in relieving toothache (I, nos. 284, 623) and advised against the use of the poison hellebore.

Abu’l-Ḥasan Aḥmad b. Moḥammad Ṭabarī, physician to the Buyid prince Rokn-al-Dawla, devoted several chapters to treatment of dental ailments in the sixth discourse of his *Ketāb al-mo’alajāt al-boqrāṭīya* (Tehran University, Central library, ms. no. 6331; cf. *Sāmarrā’ī*, I, pp. 534-35). In the late 10th century [Abū Bakr Aḳawaynī Bokārī](#) not only made interesting observations about causes of tooth decay, for example, food particles wedged between the teeth and malnutrition, but also described apparently tested methods for relieving and curing the problem and preventing further decay. He rejected the opinion of the ancients who had classified teeth as either bone or nerve, though he recognized toothache as resulting from irritation of the nerves. If the ache could not be relieved by drugs, he recommended lancing the root and removing the nerve (pp. 296-97, 299, 302-03).

[Avicenna](#) included some noteworthy clinical observations on toothaches and other diseases of the teeth and gums in his encyclopedic *Qānūn* (pp. 97-98) and recommended cold water for quick relief of toothache. He regarded teeth as bone, which he considered capable of growth at all times, and thus claimed that teeth next to the site of an extracted tooth would grow larger (p. 95). Like earlier physicians, he advised use of medication, as well as forceps, for extracting rotten teeth but emphasized that extraction of a tooth that was not loose is dangerous because it can injure the jawbone, cause eye trouble, and lead to fever through infection (pp. 99-100). He classified possible treatments by method of administration: drugs to be chewed, poultices, mouthwashes, compresses, cauterization, fumigation, and bloodletting; he also identified



eight factors that help to keep teeth sound (p. 96). For severe toothache he prescribed a compress of salt, millet, heated olive oil, and melted candle wax, to be applied repeatedly to the site of the inflammation. The proper way to cauterize was to insert a red-hot needle smeared with olive oil into a cavity or a hole made with a very thin metal rod, in order to kill the nerve (pp. 97-98).

A century later the renowned physician Esmā'īl Jorjānī (d. 531/1136-37) also wrote extensively on dental anatomy and diseases. Among the subjects discussed in his *Daḳīra-ye k̄vārazmšāhī* are different types of teeth and roots, the baby teeth and why they are lost and replaced, and medications for hastening the growth of children's teeth (1976. pp. 18-19, 112, 209). He reported his observations of pyorrhea and receding gums and gave details on remedial drugs (p. 379). Emphasizing the importance of oral and dental hygiene, he advised on the use of toothpicks and explained how teeth become discolored (pp. 387, 390). He appears sometimes to have used local anesthetics (p. 388). His prescriptions for toothache include poultices, fumigation, nosedrops, and injections into tooth cavities (p. 389). Like some earlier physicians he believed that rot was caused by worms hatched in the teeth (p. 363).

*In the Mongol period and later.* In the Mongol period Najm-al-Dīn Maḥmūd Šīrāzī (d. 720/1320) devoted chapters 50-51 of the first discourse and chapter 101 of the third discourse of his medical compendium *Hāwī* to dental and gingival diseases and treatments. The outstanding physician of the Timurid period was **Borhān Nafīs**; in his lengthy *Šarḥ al-asbāb wa'l-'alāmāt*, a commentary on an earlier *Ketāb al-asbāb wa'l-'alāmāt* by Najm-al-Dīn Samarqandī, he discussed in detail the anatomy of teeth and associated nerves and the causes of loosening and loss of teeth, discoloration, and abscesses at the roots. He recommended bloodletting and cupping for toothache and mentioned a "popular antidote" composed of castor (*jond-e bīdastar*; see **BEAVER**), asafetida (*ḥaltīt*), pepper, ginger, opium, honey, and *felūnīā* (*Philanium romanum*; henbane?; see Schlimmer, pp. 227, 456-57), which people rubbed on sore teeth or pressed into cavities (fols. 157-64).

From that time until the beginning of the Qajar period detailed information on dentistry in Persia is not available, probably owing to a general stagnation of scientific activity and reluctance to innovate in the Safavid and ensuing periods. Particularly in medicine Persians were content to rely on earlier authorities. Unlike ophthalmology dentistry never became a separate specialty before the modern period and was practiced mainly by physicians. There is no



evidence before the Safavid period that barbers and masseurs performed dental work and minor surgery; professional physicians and surgeons had apparently been the only providers of dental treatment. Under the Safavids and long afterward, however, barbers and masseurs did perform dental work, especially extractions (Elgood, 1951, pp. 143, 249). Nevertheless, some contemporary medical writings did touch on dental matters. Moḥammad Heravī, in his medical dictionary, written in both Arabic and Persian, described the properties of a number of drugs used in dental treatment (s.vv. *sandarūs*, *āqerqarḥā*). Yūsof Heravī, who was apparently his son and wrote on medical subjects in prose and verse, advised on treatments for various diseases of the teeth and gums in his best known work, *Ṭebb-e yūsofi* (comp. Herāt, 917/1511; pp. 46-50). Gīāt-al-Dīn Eṣfahānī discussed these diseases in his *Mer'āt al-ṣeḥḥa fi'l-ṭebb* (Tehran University, Central library, ms. no. 293) and recommended treatment of tooth decay by removal of the decayed matter with a sharp instrument and filling of the cavity with a special substance (Elgood, 1970, p. 143). The outstanding physician of the Safavid period was Moḥammad Ḥosaynī Nūrbakš, whose *Ḳolāṣat al-tajāreb* was used as a medical textbook for many years in Persia, India, and the Ottoman empire. It embodies some of his own research and clinical experience. He described in detail such ailments as receding, loosening, and bleeding of the gums; caries (*kerm-ḳordagī*); and loosening and loss of teeth, discussing causes and prescribing treatments. For various kinds of toothache he recommended narcotics, fumigation, and cauterization and for certain severe cases injection of a few drops of nitric acid (*tīzāb*) mixed with opium into the cavity; he cautioned, however, that no acid should touch the gums (fols. 189-92).

The medical writings of the Zand period have hardly been studied, but there are passages on dentistry in the manuscripts of 'Emād-al-Dīn Maḥmūd Šīrāzī's *Manāfe' al-tašrīḥ* and Ḥakīm Moḥammad-Hāšem 'Alawī Khan's *Šarḥ-e mūjaz bar al-Qānūn* (cf. marginal notes to his *Šarḥ al-asbāb wa'l-'alāmāt*), Mīrzā Ḥakīm Naṣr's *Asās al-ṣeḥḥa* and *Šefā' al-asqām*, and Ḥakīm Sayyed Moḥammad-Ḥosayn Šīrāzī's *Majma' al-jawāme'* (Mīr, pp. 72, 73, 85-86, 192, 197).

In the Qajar period dentists at first held fast to the old methods but later, as more and more Persians acquired knowledge of European medicine, they began to change. Although such well-known medical writers of the early years as Mīrzā Aḥmad Tonokābonī, physician to Faṭḥ-'Alī Shah (1212-50/1797-1834) and author of *Moṭleb al-so'āl* and *Bor' al-sā'a* (pp. 77-78, 206-07), and Filsūf-al-



Dawla Kāẓem Raštī, author of *Ḥefẓ al-ṣeḥḥa*, did occasionally deviate from traditional practice, Persian acquaintance with European medicine seems to have begun after *Kīmīā'l-šefā'* had been translated from Turkish into Persian by Moḥammad-'Alī Khan Šīrāzī in 1246/1830 (*Dānešpažūh*, in *Ebn Hendū*, p. 202).

It is, however, difficult to give a date for the actual introduction of modern dental practice in Persia. The first European surgeons posted to Persia by the [British East India Company](#), for example, Andrew Jukes and John McNeill, probably performed dental, as well as general, surgery. The first mention of false teeth occurs in a letter dated 24 Ḍu'l-ḥejja 1273/15 August 1856, addressed by the grand vizier, Mīrzā Āqā Khan Nūrī, to the special Persian envoy to Europe [Farroḵ Khan Amīn-al-Dawla](#), in which he instructed the latter to engage and bring to Persia a “reliable doctor for making substitute teeth” (*Amīn-al-Dawla*, II, p. 178). No mention of such a doctor has yet been found in the sources, but only four years later, in 1277/1860, the shah’s personal physician Dr. Joseph Tolozan brought from Paris a dental technician, “Sāpīvafor”), who remained in Persia for many years and received the honorific *Mosannen-al-Salṭana*. He not only made dentures but also taught the technique in Tehran (*E'temād al-Salṭana*, *Rūz-nāma-ye kāṭerāt*, p. 881; *Hedāyat*, p. 69; *Maḥbūbī Ardakānī*, p. 376). According to *E'temād-al-Salṭana*, the first “tooth-making workshop” was opened in the reign of Nāṣer-al-Dīn Shah (p. 126). During this period Mīrzā 'Alī Doktor, French-trained and a teacher of medicine and anatomy at [Dār al-fonūn](#), incorporated material on oral and dental diseases and European methods of treatment in his textbook (pp. 224-25); Mīrzā Abu'l-Ḥasan Khan Doktor, also a teacher at [Dār al-fonūn](#) and head of the government hospital, translated a book on anatomy that included the structure and physiology of the teeth (*Tašrīḥá*, Tehran, 1308/1891, pp. 45-48). These books represent the first efforts to propagate modern dentistry in Persia. Sufferers of toothache from all classes, however, continued to have recourse to barbers, goldsmiths, and druggists for extractions, fillings, and medication (*Najmī*, pp. 201-02; *Šimjūr*, p. 12) until the enactment of the Medical practice law of 1339/1921, which provided that only those holding licenses from the Ministry of education could practice dentistry (*Komīsīūn*, II, p. 1406).

At about the same time two foreign dentists, Drs. Melczarski, a Pole, and Stump, an Austrian, arrived in Persia to treat patients and to train Persian dentists. In 1300 Š./1921 Dr. Moḥsen Sayyāḥ, apparently the first fully qualified



Persian dentist, returned to the country and, together with a Dr. Stepanian, trained in the United States, was licensed by the Ministry of education to initiate classes to train dental technicians. Together these men laid the foundations of scientific dental education in Persia (Maḥbūbī Ardakānī, p. 376; Sīmjūr, p. 14; Golparvar, p. 47).

After the accession of Reżā Shah (1304-20 Š./1925-41) plans for training dentists were outlined in a report by the Health department (*Dovvomīn rāport-e šeš-māha-yešeḥḥīya-ye koll*, 1305 Š./1926, pp. 4-5), and under regulations approved by the High council of education (Šūrā-ye ‘ālī-e ma‘āref) in the summer of 1307 Š./1928 the government medical college (Madrasa-ye ‘ālī-e ṭebb) in Tehran was required to include courses on oral and dental diseases in its curriculum (Maḥbūbī Ardakānī, p. 262). In 1309 Š./1930 a college of dentistry (Madrasa-ye ‘ālī-e dandān-pezeškī), was attached to the medical college, offering a five-year diploma course; the first class included fifteen candidates. Melczarski was the first director and Sayyāḥ his deputy. The staff was strengthened by the addition of Dr. Ašot Haratūnīān and Dr. Šahrīār Salāmat, who had studied under Melczarski. Haratūnīān also found time to complete the diploma course and afterward served for many years as a professor and associate dean in the Faculty of dentistry at Tehran University (Golparvar, p. 49).

During those early years such equipment as pedal drills and vulcanizers for hardening rubber compounds came into common use in Persia, replacing pincers, files, forceps, and cauterizing rods (Sīmjūr, pp. 16-18).

Under Sayyāḥ, who succeeded Melczarski as director in 1313 Š./1934, the school was incorporated as a department in the Faculty of medicine when Tehran University was established in the same year. The first professors in the department were Sayyāḥ, oral diseases and dental anatomy; Dr. Maḥmūd Sīāsī, oral and dental therapy and hygiene; Dr. Ḥasan Rīāżī, periodontics and orthodontics; Haratūnīān, dental technology; Dr. Ḥaydar Sarkoš, denture fitting; and Dr. Aḥmad Farhād, radiology (Sīmjūr, p. 19). Beginning in the summer of 1316 Š./1937 applicants for admission were required to hold secondary-school diplomas. University statutes enacted in autumn of the same year provided that a number of dental students should be selected annually for training in the denture laboratory. In 1317 Š./1938 the department set up a clinic for oral and dental diseases (*Rāhnemā-ye dānešgāh 1*, 1317-18 Š./1938-39, pp. 16, 32, 54).



In the academic year 1355 Š./1956 the department of dentistry was detached from the Faculty of medicine and established as a separate faculty with Sayyāḥ as its first dean (Maḥbūbī Ardakānī, pp. 377, 379; Golparvar, p. 49; Komīsiūn, II, p. 1441); it comprised departments of orthodontics, prosthodontics, dental surgery, practical dentistry, and oral diseases. In 1338 Š./1959 a school of dental nursing, offering a two-year course, was added. New chairs of dental anatomy, dental injuries, prosthodontics, perio-dontics, and surgery of the jaw and face were established in September 1961 (Bīnā, p. 74). In 1344 Š./1965 a two-year diploma course in oral hygiene was instituted (Maḥbūbī Ardakānī, pp. 377-78). A new building was opened on the Tehran University campus the next year, and subsequently the faculty established dental wards, with trained specialists and modern equipment, in most of the hospitals affiliated with Tehran University.

Several other universities also established faculties of dentistry: the National University (Dānešgāh-e mellī) in Tehran in 1344 Š./1965, Pahlavī University in Shiraz in 1348 Š./1969, and Isfahan University in 1354 Š./1975. Dental departments in private hospitals and clinics and individual dentists also contributed to improving standards of oral and dental health in the larger cities and provincial capitals. In remote towns and villages, however, dental surgery and extractions are still performed by general practitioners.

Traditional methods, handed down from father to son, remain in use among isolated communities, where modern doctors rarely if ever visit. In Lorestān, for example, the following treatments for toothache have been recorded in modern times: rubbing ground cloves, animal fat, or bark of the wild plum on the base of a sore tooth; cauterizing cavities with a red-hot packing needle; putting soot from an oil lamp on the tooth; and burning paper in an enameled bowl and smearing the resulting soot on the tooth with a piece of cotton cloth (Asadiān Korramābādī et al., p. 262).

As already mentioned, manufacture of false teeth was introduced in Persia in the time of Nāṣer-al-Dīn Shah. After World War I the industry expanded under the tutelage of Melczarski. Most Persian dental technicians and denture fitters in Persia today were trained by him and his successors, and they continue to train apprentices who then set up independently after passing licensing tests administered by the Ministry of health (Wezārat-e behdāšt). Some of them also illegally extract and fill teeth and fit crowns.



## BIBLIOGRAPHY

(For cited works not found in this bibliography, see “Short References.”) ‘Alī b. ‘Īsā Ahvāzī, *al-Kāmel le’l-šenā’a/al-Ṭebb al-malekī*, Būlāq, 1294/1877.

Mo’tamad-al-Aṭebbā’ Farroḳ Khan Amīn-al-Dawla, *Majmū’a-ye asnād wa madārek-e Farroḳ Kān Amīn-al-Dawla (Ġaffārī)*, ed. K. Eṣfahānīān and Q. Rowšanī, 2 vols., Tehran, 1347 Š./1968.

M. Asadiān Korramābādī et al., *Bāvarhā wa dānestahā dar Lorestān wa Īlām*, Tehran, 1358 Š./1979.

Avicenna (Ebn Sīnā), *al-Qānūn fi’l-ṭebb* III, Tehran, 1343/1925.

Š. Bīnā, “Gozāreš,” *Majalla-ye Dāneškada-ye dandān-pezeškī-e Dānešgāh-e Tehrān* 11, 1355 Š./1976, pp. 73-74.

Abū Rayḥān Bīrūnī, *Ketāb al-šaydana*, tr. Abū Bakr b. ‘Alī Kāšānī, ed. M. Sotūda and Ī. Afšār, Tehran, 1358 Š./1979.

Abū Bakr Aḳawaynī Boḳārī, *Hedāyat al-mota’allemīn*, ed. J. Matīnī, Mašhad, 1344 Š./1965.

Ebn Abī Oṣaybe’a, *‘Oyūn al-anbā’ fi ṭabaqāt al-aṭebbā’* I, Cairo 1299/1881.

Abu’l-Faraj Ebn Hendū, *Meftāḥ al-ṭebb wa menhāj al-ṭollāb*, ed. M.-T. Dānešpažūh, Tehran, 1368 Š./1989.

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

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

Gīāt-al-Dīn Eṣfahānī, *Mer’āt al-šeḥḥa fi’l-ṭebb*, Tehran University, Central library, ms. no. 293.

M.-Ḥ E’temād-al-Saltāna, *al-Ma’āter wa’l-ātār*, Tehran, 1307/1889.

Filsūf-al-Dawla Kāzem b. Moḥammad Raštī, *Ḥefẓ al-šeḥḥa*, Tehran, 1304/1887.

M.-T. Golparvar, *Tārīḳ-e ‘elm jehat-e dānešjūyān-e dandān-pezeškī*, Tehran, 1366



Š./1987.

M. Hedāyat, *Kāṭerāt wa қаṭarāt*, Tehran, 1363 Š./1984.

Moḥammad b. Yūsof Heravī, *Baḥr al-jawāher*, Tehran, 1288/1871.

Yūsof b. Moḥammad Heravī, *Ṭebb-e yūsofi*, Lucknow, 1294/1877.

Bahā'-al-Dawla Moḥammad Ḥosaynī Nūrbakš, *Ḳolāṣat al-tajāreb*, Tehran University, Central library, ms. no. 1400.

Esmā'īl Jorjānī, *al-Aḡrāz al-ṭebbīya wa'l-mabāḥeṭ al-'alā'īya*, facs. ed., Tehran, 1345 Š./1966.

Idem, *Daḳītra-ye ḳvārazmšāhī*, facs. ed. 'A.-A. Sa'īdī Sīrjānī, Tehran, 1355 Š./1976.

Komīsiūn-e mellī-e Yūnesko (UNESCO) dar Īrān, *Īrānšahr*, 2 vols., Tehran, 1343 Š./1964.

Ḥ. Maḥbūbī Ardakānī, *Tārīḳ-e taḥawwol-e Dānešgāh-e Tehrān*, Tehran, 1350 Š./1971.

E. K. Malvin, *Dentistry. An Illustrated History*, New York, 1985.

M.-T. Mīr, *Pezeškān-e nāmī-e Pārs*, Shiraz, 1348 Š./1969.

Mīrzā 'Alī Doktor, *Jawāher al-ḥekma*, Tehran, 1304/1887.

Abū Manšūr Mowaffaq-al-Dīn 'Alī Heravī, *Ketāb al-abnīa 'an ḥaqā'eq al-adwīa*, ed. A. Bahmanyār and Ḥ. Maḥbūbī Ardakānī, Tehran, 1347 Š./1968.

Borhān-al-Dīn Nafīs Kermānī (Borhān Nafīs), *Šarḥ al-asbāb wa'l-'alāmāt*, Tehran University, Central library, ms. no. 6354.

M. Najmābādī, *Tārīḳ-e ṭebb dar Īrān pas az Eslām*, Tehran, 1353 Š./1974.

N. Najmī, *Dār al-ḳelāfa-ye Tehrān*, Tehran, 1356 Š./1977.

Abū Bakr Moḥammad b. Zakariā Rāzī, *Bor' al-sā'a*, tr. A. Ṭabīb Tonokābonī, Tehran, 1326/1908.

Idem, *Man lā yaḥzoroḥo'l-ṭabīb*, Tehran, 1334 Š./1945.



Idem, *al-Ḥāwī fī'l-ṭebb*, 22 vols., Hyderabad, 1955.

K. Sāmarrā'ī, *Moḳtaṣar ta'rīḳ al-ṭebb al-'arabī*, Baghdad, 1984.

K. Sīmjūr, "Tārīḳča-ye dandān-pezeškī," *Majalla-ye dandān-pezeškī-e Dānešgāh-e Tehrān* 11, 1355 Š./1976, pp. 73-74.

Najm-al-Dīn Maḥmūd b. Elyās Šīrāzī, *al-Ḥāwī fī 'olūm al-tadāwī*, Tehran University, Central library, ms. no. 6356.

'Alī b. Rabban Ṭabarī, *Ferdows al-ḥekma*, ed. M.-Z. Şeddīqī, Berlin, 1928.

Mīrzā Aḥmad Tonokābonī, *Moṭleb al-so'āl* and *Bor' al-sā'a*, Tehran, 1297/1880.