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The Physicians of Jundishapur

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Once there was a poor physician of Baghdad named Asad ibn Gani who never had enough patients to make a living, even during an epidemic, because he lacked the three qualifications everyone sought: he was neither Syrian nor Christian and he was not from Jundishapur:

‘First of all,’ he answered, ‘to the patients, I am a Muslim; it was known before I was a doctor and even before my birth that Muslims do not succeed in medicine. In addition, I am named Asad instead of Salib, Gabra’il, Yuhanna or Bira. My honorific is Abu l-Harit, while it should be Abu Isa, Abu Zakariya or Abu Ibrahim. I wear a garment of white cotton although I should wear black silk. I speak Arabic instead of expressing myself in the language of the people of Jundi-Shapur.’¹

Although this story illustrates that the people of ninth-century Baghdad, the new Abassid capital of the Islamic Empire, preferred to seek out doctors from the Persian city of Jundishapur, it offers no explanation, as though expecting the reader would already know. What distinguished this city and its physicians?

¹ Abu Utman Amr ibn Bahr al-Gahiz, *Le Livre des Avars*, trans. Charles Pellat (Paris: Éditions G.P.Maisonneuve et Cie, 1951), 148. From stories dated 837-842. Unless otherwise stated all translations from French or German are my own.



Fig. 1. Relief showing Shapur I's victory over Valerian. (Photo by Harry Marlow, 1958.)

Jundishapur was a planned city, rather than an ancient one. Here Shapur I (reigned 241-71 C.E.), Emperor of Sassanid Persia and twice conqueror of Antioch, relocated Graeco-Syrian prisoners captured in his triumph over the Roman Emperor Valerian in 260 C.E., commemorated in a massive stone relief at Naqsh-e-Rustam (Fig.1).² Of the founding of Jundishapur, Persian historian Tabari (838-923 C. E.) writes: "The king made a single circle there; and gave (the city and the circle) the name 'Beh-az-Andēw-i-Šâpūr,' that is 'better than Shapur's Antioch;' that is the place that one calls Jundi-shapur."³ The city of Jundishapur, known to the Syrians as Beth-Lapat, flourished for nearly a thousand years. Yet by the thirteenth century, the Syrian geographer Yaqut reported: "I have gone through the city many times, but there is nothing to see of it, not even a trace."⁴ In 1963, archeologists from the Oriental Institute of the University of Chicago

² Paul Schwarz, *Iran im Mittelalter nach den Arabischen Geographen* (Leipzig: Verlag von Wilhelm Heims, 1921), 346.

³ "Der König richtete dort einen eignen Kreis ein; und gab (de Stadt und dem Kreis) den Namen 'Beh-az-Andēw-i-Šâpūr', d.h. 'besser als Antiochia Šâpūr's'; das ist der Ort, den man Gundê-Šâpūr heisst." Theodor Nöldeke, *Geschichte de Perser und Araber zur Zeit de Sasaniden aus de Arabischer Chronik des Tabari* (Leyden: E. J. Brill, 1973), 41.

⁴ "Jākūt erzählt: 'Ich bin mehrmals durch die Stadt gekommen, aber man sieht nichts mehr davon, findet auch keinen Spuren.'" Schwarz, 349.

constructed a map of the rectangular gridlike pattern of the streets of Jundishapur from aerial photographs (Fig. 2).⁵ Today not even these remain. In 2003, freelance writer Andrew Lawler reported that despite objections from the Iranian Cultural Heritage Organization Jundishapur had been converted to farmland.⁶

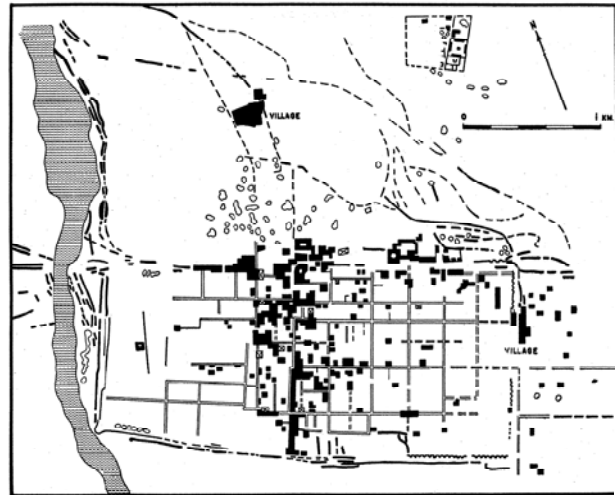


Fig. 2. The planned city of Jundishapur.
(Robert McC. Adams, 1968, by permission)

Jundishapur was located not far from the royal capital of Susa in the province of Khuzestan in southwestern Iran, a region known for its fertile plains watered year-round by the Karkheh, the Jarahi, and the Karun rivers. Ninth and tenth-century geographers remarked on the area's lush beauty. Persian geographer Ibn Khordadbeh referred to Jundishapur as the loveliest place on earth and especially noted its beautiful rivers.⁷ Al-Istahri wrote that the city "lies in fertile surroundings and has a rich harvest; there are palm trees and fields of grain in abundance, and various streams," while al-Mukaddasi recorded, "Jundishapur was a prosperous, famous [provincial city]."⁸ A complex system of irrigation canals had watered the fields since Parthian times and a combination of archeological investigation and aerial photographs show that these were expanded under the Sassanians who ruled the Persian Empire from 224 to 651 C.E. Archeologist Robert McC. Adams reported

⁵ Robert McC. Adams, "Agriculture and Urban Life in Early Southwestern Iran," *Science* 136 (13 Apr 1962), 119.

⁶ Andrew Lawler, "Iran Reopens Its Past," *Science* 302 (7 Nov 2003), 972.

⁷ Schwarz, 348.

⁸ Istahri: "sie liegt in fruchtbarer Umgebung und hat reiche Erträge; es gibt dort Palmen und Getreidefelder in Menge, auch mancherlei Wasserläufe." Mukaddasi: „Gundaisābūr war eine blühende, bedeutende (Provinzial-Hauptstadt).“ Schwarz, 348-49.

in 1963 that the remains of the dams in this region were still referred to as “Roman” and records of medieval Arab geographers indicate they were built by the 70,000 Roman legionnaires brought in from Edessa by Shapur I (Fig. 3).⁹

Khuzestan profited from connections with the international trade and travel networks of the Persian Empire bringing in a continuous flow of knowledge and produce. Grape cultivation in the region followed Alexander’s conquest. The first-century Greek philosopher Strabo wrote of Khuzestan that “the vine did not grow there until the Macedonians planted it.”¹⁰ In the fifth century, Armenian historian Moses Khorenensis reported seeing sugar cane, brought in from India, first as a medicine, growing in the region

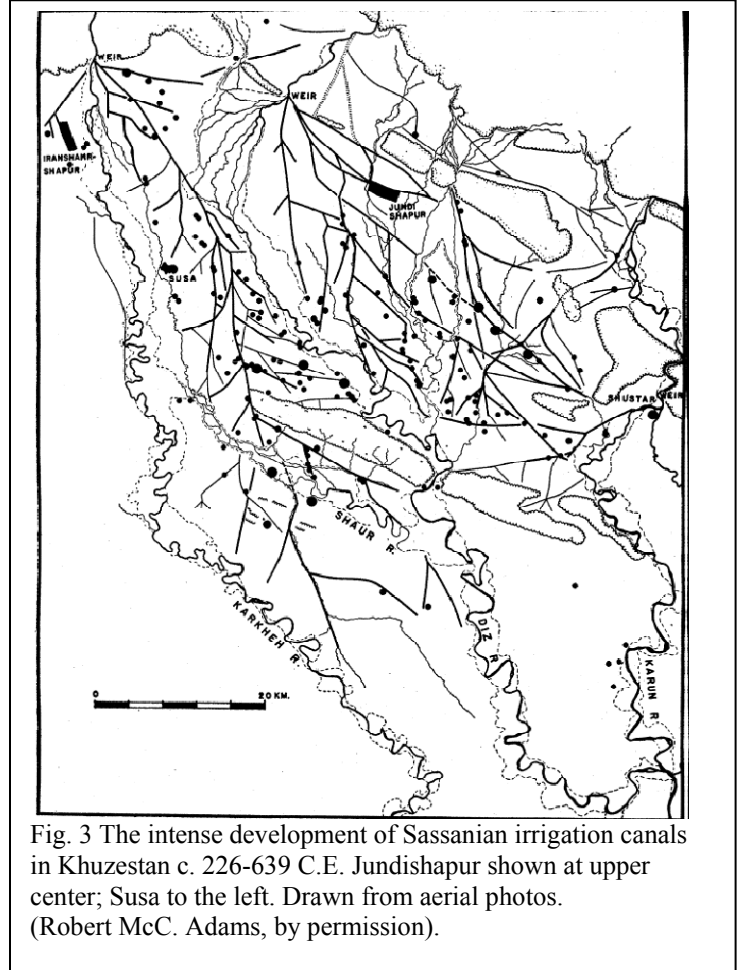


Fig. 3 The intense development of Sassanian irrigation canals in Khuzestan c. 226-639 C.E. Jundishapur shown at upper center; Susa to the left. Drawn from aerial photos. (Robert McC. Adams, by permission).

where the Karun River flows into the Persian Gulf.¹¹ Textile industries such as silk, satin, brocades, cotton, and wool began with the resettlement of the prisoners.¹² Other local products made possible by Khuzestan’s irrigation systems included plums, pears, melons, pomegranates, olives, citrus trees, date

⁹ Adams, 116.

¹⁰ Ibid. Note: On p. 117 there is a map of the irrigation canals which shows Jundishapur.

¹¹ “Cultivation of Sugar in Persia,” *Science* 14 (26 Jul 1889), 62.

¹² Adams, 117.

palms, rice, wheat, and barley.¹³ In addition to their more conventional uses, the wine, sugar, honey, plums, pomegranates, and citrons grown in Jundishapur were important components of medicinal formulas used in its hospital, along with imported ingredients such as Malabar cardamom, Chinese rhubarb, Indian hazelnut, and Syrian apples.

However, Jundishapur is not remembered today for its abundant crops, its textile industries or for the ingenious hydraulic system that made all these possible. It has no great palaces or architectural monuments and the buildings it once possessed have passed with time. Jundishapur became known as a center of learning and medical expertise, building over the centuries a reputation that associated it with the origin of the hospital as an institution. Middle Eastern scholar Richard N. Frye states: "The organization of Islamic hospitals, or the hospital system, seems to have been built on the Sassanian model of Jundisabur, later copied in Baghdad, Shiraz, and elsewhere."¹⁴ This conclusion has come into question in recent years.¹⁵ Some scholars doubt the existence of a learning academy or medical school at Jundishapur and, although they do not question the establishment of a hospital, there is controversy concerning its role as the model for the hospital in Baghdad.¹⁶ Lacking archaeological remains of either hospital today, the historian must rely on documents. However, contemporary

¹³ Ibid.

¹⁴ Richard N. Frye, *The Golden Age of Persia: The Arabs in the East* (New York: Harper & Row, 1975), 163-64.

¹⁵ Cyril Elgood, *A Medical History of Persia and the Easter Caliphate from the Earliest Times until the Year A.D. 1932* (Cambridge: Cambridge University Press, 1951), 173.

¹⁶ Historians who have raised these questions include: Michael W.Dols, "The Origins of the Islamic Hospital: Myth and Reality, *Bulletin of the History of Medicine* 61 (1967): 367-90. Dols cites Peregrine Horden, "The Nestorians, Gondeshapur, and Islamic Medicine: A Skeptical Comment." 1983. Presented at the Summer Conference of the Society for the Social History of medicine in Oxford in May, 1985 on p. 371, FN 17. To my knowledge, this paper has not been published. Conrad, Lawrence I. "The Arab-Islamic Medical Tradition." In *The Western Medical Tradition 800 B.C. to A.D. 1800*, ed. Lawrence I. Conrad, Michael Neve, Vivian Nutton, Roy Porter, and Andrew Wear, 93-138. Cambridge: Cambridge University Press, 1990. Reprint, 1995.

texts are scarce and many of the sources for both the hospital at Baghdad and the learning institutions of Jundishapur were written much later by historians and geographers in the twelfth and thirteenth centuries.¹⁷ This article will review what they have said about Jundishapur and why this city has achieved a prominent place in the history of medicine.

The history of medicine in Jundishapur begins with its founder, the Persian emperor Shapur I. Like later Sassanian monarchs, Shapur I called on physicians from a variety of medical traditions. Syrian bishop Bar Hebraeus writes that Shapur's wife, a daughter of the Roman Emperor Aurelian, came attended by Greek physicians who taught Hippocratic medicine.¹⁸ In later years, tired and ill after his many military campaigns, Shapur returned to Ahwaz, a city near Jundishapur in Khuzestan, and sent for a physician from India. He was so pleased with his recovery that he asked his new doctor where he would like to live and the physician chose Susa. The eleventh-century historian al-Tha'alibi writes: "It was thus that the people of Susa, because they were introduced to the knowledge of this Indian and the learning which they had received from him and from the Greek prisoners who lived near them that they passed down one to another, became the most adept physicians of Ahwaz and Fars."¹⁹ According to this passage, the expertise of the resident "Greek prisoners" in this area was already established, and by the third century, during the reign of Shapur I, a sharing of Greek, Indian, and Persian medicine had begun in the area of Jundishapur. Historian Douglas Morton Dunlop places the founding of the

¹⁷ Some of these include: "Tarikh-ul-Hukama" by al Qifti (1172-1248), *History of Dynasties* by Bar Hebraeus (1226-86), and *Uyun ul-Inba*, a history of physicians, by Ibn Abi Usaybi'a (1203-69).

¹⁸ Elgood, 47.

¹⁹ "C'est ainsi que les gens de Sous, parce qu'ils s'étaient initiés à la science de cet Indien, qu'ils avaient reçu de lui et des prisonniers grecs qui demeuraient près d'eux la doctrine et qu'ils ont hérité la science médicale les uns des autres, sont devenues les plus habiles médecins de l'Ahwaz et du Fars." Abou Mansour abd Abd al-Malik ibn Muhammad al-Tha'alibi, *Histoire des Rois des Perses*, trans. H. Zotenberg (Paris: Imprimerie Nationale, 1900): 531-32

hospital in Jundishapur around this time based on the death of Mani, the founder of Manichaeism, as recounted in the *Epic of the Kings* by Ferdowsi: "According to Ferdowsi (*Šāh-nāma*, Moscow, VII, pp. 252 v. 600), the body of Mani, who was killed on the orders of Bahrām II (r. 274-93), was suspended in front of the wall of the hospital there."²⁰ However, most historians place the founding of the hospital somewhat later.

Jundishapur's international population and central location continued to involve the city in the consequences of imperial conflict. After the Council of Nicaea, which defined the Trinity, the Byzantine Emperor Zeno (c. 425-491) deposed the nonconforming Nestorius, Patriarch of Constantinople, expelled his followers from Edessa and closed their university in 489 C.E. Elgood describes the dispersal of the Nestorians as they sought refuge in Persia: "The theologians returned to Nisibis [at that time under Persian rule]; the medicals for the most part went into a voluntary exile at Jundi Shapur, a town well within the Persian frontiers, a town which had been the seat of a Nestorian bishop for several years, and a town which already contained a university."²¹ The newcomers spoke Syriac, a language related to Aramaic, and knew Greek and Hebrew, the languages of their scriptures. They came to Jundishapur bringing Greek philosophical texts and the medical works of Galen and Hippocrates translated into Syriac.²²

Many historians trace the founding of the hospital to this period. Middle Eastern scholar Richard Frye designates the arrival of Nestorian Christians from Edessa as the beginning of the hospital and medical teaching center of Jundi-

²⁰ Douglas Morton Dunlop, "Bimarestan," in *Encyclopedia Iranica Online* 1990 available at www.iranica.com.

²¹ Elgood, 46.

²² Allen Whipple, "Role of the Nestorians as the Connecting Link Between Greek and Arabic Medicine," *Bulletin of the New York Academy of Medicine* (1936): 457.

Shapur.²³ Cyril Elgood (1892-1970), cites the *History of Dynasties* by Bar Hebraeus (1226-86) as placing the teaching of medicine in Jundi-Shapur in the fifth century and claims that the city had a university as well by that time. Elgood later suggests that the Persian emperor Khosrow I Anoshirvan (531-579) either founded or enlarged the hospital in the sixth century.²⁴ Eighteenth-century historian Edward Gibbon credits Khosrow I with founding an academy: "At Gondi Sapor, in the neighborhood of the royal city of Susa, an academy of physic was founded, which insensibly became a liberal school of poetry, philosophy, and rhetoric."²⁵ All three historians agree that Jundishapur was a center of learning and medicine by the sixth century.

Arab historian Al-Qifti (1172-1248) described Jundishapur as a center of medical synthesis and innovation:

They made rapid progress in the science, developing new treatments along pharmacological lines so that their therapy was judged superior to that of the Greeks and the Hindus. Furthermore these physicians adopted the scientific methods of other peoples and modified them by their own discoveries. They elaborated medical laws and recorded the work they had done.²⁶

Jundishapur became the focus of a convergence of medical knowledge and translation, bringing Greek and Indian medicine together with Persian and Aramaic traditions.²⁷ Italian historian Aldo Mieli writes, "The city. . . was a point of union for Greek, Syrian, Persian, Hindu and Jewish scholars and doctors, invited by the sovereigns of Iran and enjoying their protection."²⁸ The Sassanid

²³ Frye, 22.

²⁴ Elgood, 51.

²⁵ Robert Maynard Hutchins, *Great Books of the Western World*, vol. 41, *Decline and Fall of the Roman Empire* by Edward Gibbon (Chicago: William Benton, 1952), 40.

²⁶ Al-Qifti, *Ta'rikh-ul-Hukama* (Lippert's ed.): Leipzig, 1903. Quoted in Elgood, 48.

²⁷ Richter-Bernburg, "Gondesapur," in *Encyclopedia Iranica Online*, 2003, available at www.iranica.com.

²⁸ Douglas Morton Dunlop, *Arab Civilization to A.D. 1500* (London: Longman, 1971), 219.

monarchs, particularly Khosrow I and Khosrow II promoted the exchange of ideas in philosophy and science. The sixth-century Greek historian Agathias, recounts how Khosrow I (531-579) invited the Syrian philosopher Uranius from the Byzantine court of Justinian to debate with his own Zoroastrian priests. Although Agathias unflatteringly portrays Khosrow as duped by a charlatan (“It was the monarch’s proud boast,” states Agathias, “that he was a student of philosophy, but his knowledge of the subject was utterly superficial.”²⁹), other writers attest to the emperor’s interest in philosophic discourse.³⁰ Gibbon suggests that even if Khosrow’s own philosophical knowledge was not that of a renowned sage, he was a king who encouraged learning, and “his example awakened the curiosity of an ingenious people.”³¹

Disputations on philosophy, astrology, and medicine had become a part of sixth-century courtly life. J. Walker states that: “Later Arabic and Persian sources confirm, for instance, Sassanian royal patronage of similar disputations on the topics of Greek and Indian astrology and medicine.”³² Even Agathias concedes that Khosrow insisted that a group of seven visiting philosophers be given leniency for their religious differences on their return to Byzantium. “A clause,” states Agathias, “was inserted in fact in the treaty which was at that time being concluded between the Romans [at this time, in Byzantium] and the Persians, to the effect that the philosophers should be allowed to return to their homes and to live out their lives in peace without being compelled to alter their

²⁹ Agathias, *The Histories*, Joseph D. Frendo, trans. (Berlin: Walter de Gruyter & Co., 1975), 65.

³⁰ J. Walker, “The Limits of Late Antiquity: Philosophy Between Rome and Iran,” *Ancient World* 33 (2002): 22. (From the unpublished article).

³¹ Hutchins, 40.

³² Walker, 30.

traditional beliefs or to accept any view which did not coincide with them. Chosroes insisted on the inclusion of this point.”³³

Al-Qifti describes a later medical-philosophical debate in Jundishapur under Khosrow II in 610.³⁴ Richter-Bernburg reports: “The assembly was presided over by ‘Jebra’il Dorostabad’ as physician-in-ordinary to the king; other leading participants were ‘al-Sufestai’ and ‘Yuhanna.’” Jebra’il or Gabriel held the title of “Dorostabad,” also written *Drustbed*, the Sassanian term for chief physician.³⁵ These debates on medicine and philosophy demonstrate that Jundishapur’s status as a center of learning. However, this debate took place near the end of the Sassanian Empire. Only twenty-six years later, in 636, Jundishapur surrendered to the Muslim forces. The hospital continued to function under the new Islamic Empire.

In 762, the Abassid Caliph al-Mansur moved the imperial capital to Baghdad (Fig. 4). Almost immediately following Jundishapur’s new proximity to the capital, the city’s connection with Baghdad began, through a prominent family of Christian Nestorian physicians. Their Middle-

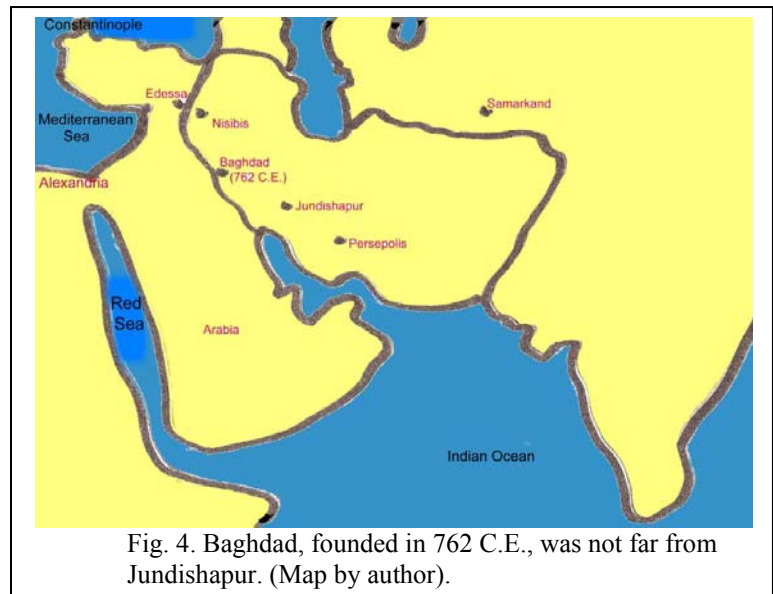


Fig. 4. Baghdad, founded in 762 C.E., was not far from Jundishapur. (Map by author).

Persian Syriac name *Bukht Yishu*, meaning “Jesus has redeemed” serves as yet

³³ Agathias, *ibid.*, 66.

³⁴ Richter-Bernburg, “Gondesapur,” in *Encyclopedia Iranica Online*, 2003, available at www.iranica.com.

³⁵ Ahmad Tafazzoli, “Drustbed,” in *Encyclopedia Iranica Online*, 1996, available at www.iranica.com. Elgood, 54-5.

another indication of the diverse cultural milieu that characterized this region of Sassanid Persia.³⁶ The first distinguished physician in this family to leave for the new capital at the request of Caliph al-Mansur was Jurjis ibn Bakhtishu, director of the hospital at Jundishapur. In 765, Jurjis made the journey to Baghdad leaving his son Bakhtishu in charge of the hospital.³⁷ Jurjis returned to his home before he died, but he must have served the caliph well, because both his son and grandson Jebra'il (Gabriel), were called to practice medicine at the Baghdad court under al-Mansur's successors. Of the younger Jebra'il, al-Nadim writes: "He learned more about medicine than anyone else, so that the caliphs entrusted their children's mothers to his care," indicating not only the skill of the physician, but that he treated both men and women.³⁸ Under Caliph Harun al-Rashid (reigned 786-809), the Bakhtishu family became increasingly established both at court and in the city.³⁹ It was at this time that the hospital (called by the Persian word *bimaristan*) was established in Baghdad, either at the direction of Harun al-Rashid or possibly his Persian wazir Yahya ibn Khalid.⁴⁰ The descendants of Jurjis ibn Bakhtishu continued their association with medicine in Baghdad for seven generations and nearly three centuries. Historian Abraham Yohannan recounts:

Of the later descendants of this family were: the son of Jebra'il (died 870); Yahya, or John (died about 900); Ubaid-allah the son of Jebra'il (died 940); Jebra'il the son of Ubaid-allah, who was the body-physician to Khalifah

³⁶ Lutz Richter-Bernburg, "Boktisu," in *Encyclopedia Iranica Online*, 1990, available at www.iranica.com.

³⁷ Elgood, 75.

³⁸ Al-Nadim, Muhammad ibn Ishāq. *The Fihrist: A Tenth-Century Survey of Muslim Culture*, vol. 2. Trans. and ed. Bayard Dodge. (New York: Columbia University Press, 1970), 697.

³⁹ *Ibid.*, 79.

⁴⁰ The *Encyclopedia Iranica* cites al-Qifti and ibn abi Usaybi'a for Harun al-Rashid's role in the establishment of a hospital; Dols refers to *The Fihrist* of al-Nadim, which talks about the Barmakid hospital, linking it with the wazir. *Encyclopedia Iranica*, s.v. Boktisu; Michael Dols, "The Origins of the Islamic Hospital: Myth and Reality," *Bulletin of the History of Medicine* 61 (1987), 382.

Abdud ad-Daulah, a teacher of the medical college and director of the hospital at Baghdad (died 1006).⁴¹

The last known descendent was Abu Sa'id Ubaid-Allah bin Jabra'il bin Ubaid-Allah bin Bukhtishu (d. circa 1058) who served as court physician to the Caliph al-Muttaqui and wrote several works including one on medicinal properties of animals.⁴²

The Bakhtishu family came from Jundishapur not only as physicians, but as experienced hospital administrators. Yet they were not the only hospital directors to be called to the Baghdad court. Jabra'il, the grandson of the original Jurjis ibn Bakhtishu, was succeeded as hospital director by pharmacist, Abu Zakariah Yahya ibn Masawaih (d.857) who had learned pharmacy from his father and studied under Nestorian patriarch 'Isa b. Nun.⁴³ The opportunities in Baghdad must have been hard to resist, for Masawaih soon moved to Baghdad as well, where he established his own reputation, in spite of a falling out with Jabra'il.⁴⁴ This altercation must not have damaged his reputation, however, because, according to the tenth-century catalogue of books, *The Fihrist of al-Nadim*, Masawaih served under four caliphs. He published a variety of medical books on various subjects, including "Adjusting of Laxative Medicines," "Treatment of Headaches," "The Toothpick and Dentifrices" and "Treatment of Women Who Do Not Become Pregnant," indicating that the common woes of mankind have not changed.

About the same time that al-Gahiz wrote the plaintive story about the Baghdad physician who faced such impressive competition from the physicians

⁴¹ Abraham Yohannan, "A Manuscript of the Manafi al-Haiawan in the Library of Mr. J. P. Morgan," *Journal of the American Oriental Society* 36 (1916): 384.

⁴² Yohannan, 384.

⁴³ Delacy O'Leary, *How Greek Science Passed to the Arabs* (London, Kegan Paul, 2001), 163.

⁴⁴ Elgood, 87.

of Jundishapur, a Persian physician Alī ibn Sahl Rabbān at-Tabarī wrote in his medical compendium: “The director of the hospital in Jundi-Shapur [ra’is bīmāristān Jūndī-Shābūr] told me about a family in al-Ahwāz who possess a stone that protects the foetus if it is hung on the pregnant woman.”⁴⁵ This statement from about 850 C.E. may refer to yet another Jundishapur physician who moved to Baghdad, the last director of the hospital, Sabur ibn Sahl (d. 869.), a Persian from Ahwaz, who contributed not only his services but his compilation of Jundishapur’s medicines to the hospital in Baghdad. Sabur went to Baghdad sometime prior to 851, where he served the Abbasid caliph al-Mutawakkil (reigned 847-861) as court physician.⁴⁶ Kahl says of Sabur: “He spoke Arabic badly and with a heavy foreign accent.”⁴⁷ As we have seen, a Jundishapur accent was not necessarily a disadvantage for a doctor in Baghdad.

Like his predecessor Masawaih, Sabur ibn Sahl had a pharmaceutical background. Fortunately, Sabur wrote down (or compiled) the Jundishapur formulary, which provides a record of the medicines administered there. He wrote three versions of his pharmacological text: the *Aqarabadin-i-Kabir* or *Great Pharmacopoeia* consisting of 22 books, plus a medium and a small dispensatory derived from this master pharmacopoeia.⁴⁸ The shorter version, or *Small Dispensatory*, includes the instructions for making 408 pharmacological compounds. Reading through the recipes reveals the forms in which medicines

⁴⁵ Alī ibn Sahl Rabbān at-Tabarī, *Firdausu l-Hikmat or Paradise of Wisdom*, ed. Muhammad Z. Siddiqi (Berlin and Charlottenburg: Sonne, 1928), 39, quoted in Dols, 377.

⁴⁶ Oliver Kahl, *The Small Dispensatory: Translated from the Arabic Together with a Study and Glossaries (Islamic Philosophy, Theology, and Science)* (Leiden: Brill, 2003), 12.

⁴⁷ Ibid.

⁴⁸ Elgood, 92. Note: Kahl describes Sabur as a Nestorian Christian, but Elgood identifies him as Persian, which seems more likely, because he has a Persian name. See Kahl, 12. However, Al-Nadīm notes that Sabur “died a Christian.” Al-Nadīm, Muhammad ibn Ishāq. *The Fihrist: A Tenth-Century Survey of Muslim Culture*, vol. 2. Trans. and ed. Bayard Dodge. (New York: Columbia University Press, 1970). 698.

were given (for example: pills, liniments, suppositories) and the kind of ailments treated (for example: coughs, tapeworms, tumors). Sabur's *Pharmacopoeia*, cited in medical texts as far away as Andalusia, served as a hospital formulary in Baghdad.⁴⁹ The *Great Pharmacopoeia* from Jundishapur was in use in the Adudi Hospital in Baghdad in the early eleventh century, when it was modified to some extent, and revisions of the formulary were still in use in seventeenth-century Iran.⁵⁰

In addition, Sabur wrote five other medical texts: *The Substitute Drugs*, *The Beverages and their beneficial and noxious properties*, *The Discourse on Sleeping and Waking*, *The Potencies of Edibles, their noxious and beneficial properties*, and *The Reply to Hunain*.⁵¹

Sabur's pharmacopoeia demonstrates the ongoing synthesis of Persian, Greek, and Indian that was characteristic of the Sassanid medicine (Fig. 5). German historian Oliver Kahl, who translated the *Small Dispensatory* into English, provides a breakdown of the etymologies of the substances and

<p>(82) <i>The preparation of a purgative remedy which extracts moistures</i></p> <p>Take Malabar cardamom and anise two <i>dirham</i> of each; Chinese rhubarb, Indian salt, and scammony half a <i>dirham</i> of each; long pepper one and a half <i>daniq</i>; sugar four <i>dirham</i>. These ingredients are brought together by pounding and straining, (and) a potion (may be made by using) four <i>dirham</i> of it with hot water—God willing.</p>
<p>Fig. 5. Formula from the <i>Small Dispensatory</i> of Sabur showing origins of ingredients. (Oliver Kahl,</p>

products which shows this distribution of sources: Arabic: 38.9%, Persian: 22.6%, Greek: 12.5%, Sanskrit: 8.1%, Syriac: 4.8%, Other: 13.1%. (Fig. 5)⁵²

The synthesis of Greek, Indian, and Persian medicine did not begin with Jundishapur. The Sassanians used Zoroastrian medical texts which incorporated Greek and Indian knowledge. H. W. Bailey states: "In medicine it is known that

⁴⁹ Kahl, 29.

⁵⁰ Kahl, 29.

⁵¹ Kahl, 12-13.

⁵² Kahl, 24.

both Greek and Indian scholars contributed. Laufer has pointed out contributions to Persian pharmacology from Indian sources.”⁵³ The translation movement in Baghdad from the mid-eighth to the end of the tenth centuries brought Persian, Greek, and Indian medicine into Arabic “from Greek and Sanskrit, either directly or through Syriac and Pahlavi intermediates.”⁵⁴ In other words, Syriac, the language of the Nestorians in Jundishapur, and Pahlavi, or Middle Persian, the language of the Sassanian Empire, were conduits for medical knowledge into the Arabic language of the Islamic Empire. For example, the Sanskrit medical text *Charaka Samhita* was translated into Arabic from a Pahlavi intermediate text in the ninth century, while Susuta’s *Susruta-Samhita* and Vagbhata’s *Astangahrdaya-Samhita* were translated directly from Sanskrit.⁵⁵

The medical writings of the physicians of Jundishapur were well-known even after the hospital had passed its peak. The tenth-century *Fihrist of al-Nadim* lists many of them. Persian medical encyclopedist al-Jurjani, writing about 1125, referred to “prescriptions which ‘used to be employed in the Hospital at Jundishapur’”⁵⁶ The famous Persian physician, al-Razi (d. 925), known to Europeans as Rhazes, referred to medical texts of Jundishapur along with Greek and Hindu authorities in his twenty-five volume *al-Hawi* or *Continens* which was known as “the most valuable of the nine volumes” in the University of Paris medical library in 1395 and included in European medical school libraries into the seventeenth century.⁵⁷ The *al-Hawi* cites both versions of Sabur’s formulary as well as excerpts from the writings of Jurjis and his grandson Jabra’il of the

⁵³ H. W. Bailey, *Zoroastrian Problems in the Ninth-Century Books: Ratanbai Katrak Lectures* (Oxford: Clarendon Press, 1971), 81.

⁵⁴ Kahl, 5.

⁵⁵ Kahl, 8.

⁵⁶ Elgood, 50. Citing Al-Jurjani, *Thesaurus*, bk. X, 2.6

⁵⁷ Edward Theodore Withington, *Medical History from the Earliest Times: A Popular History of the Healing Art* (London: The Scientific Press, 1894), 146. Robert P. Multhauf, *The Origins of Chemistry* (London: Oldbourne, 1966), 130.

Bakhtishu family.⁵⁸ These citations in al-Razi not only show how far the medical knowledge of Jundishapur spread over time, but, in the case of Jurjis, they also preserve selections of medical texts written by the Jundishapur physician which can no longer be found as separate manuscripts.

The loss of leading physicians from the hospital in Jundishapur to the Abbasid capital at Baghdad in the eighth and ninth centuries may have brought the hospital's best days to an end, prompting Elgood's lament that "Sassanian tradition was bled to death to infuse life into the recently born child of Islam."⁵⁹ In any case, references to the hospital cease until twelfth and thirteenth-century Persian and Arabic historians write of the prominence of Jundishapur. Yet Jundishapur could be proud of its history. German Islamicist Lutz Richter-Bernburg (1945-) points out: "In spite of the dearth of detailed and reliable information about local and regional conditions in the pre-Abbasid periods, Khuzestan and in particular the city of Gondesapur must be considered the locale where Syro-Persian Nestorians were weaned on what the later biobibliographical authors celebrated as superior medical learning."⁶⁰ The physicians of Jundishapur who attained such recognition did not emerge out fully formed. They clearly had a tradition of training and education, they wrote medical treatises which were used and cited far beyond their city of origin, and they had a credibility that had as much to do with their association with a respected institution as with their individual merits. Jundishapur was an international city, a crossroads of the Sassanid Empire, and a center of medicine

⁵⁸ Elgood, 92-3. Richter-Bernburg, "Boktisu," *Ibid.*, 1990. Kahl lists many authorities, in addition to al-Razi, who cite Sabur's dispenstatory, including: Persian physician and philosopher al-Husain ibn Abdallah Ibn Sina (Avicenna, d. 1037), Persian scholar Abu r-Raihan Muhammad ibn Ahmad al-Biruni (d. after 1050), and Arab Andalusian pharmaco-botanist Abdallah ibn Ahmad Ibn al-Baitar (d. 1248). For more, see Kahl, 29.

⁵⁹ Elgood, 173.

⁶⁰ Lutz Richter-Bernburg, "Gondesapur," *Encyclopaedia Iranica Online*, 2003, available at www.iranica.com.

which produced physicians like the Bakhtishu family, Masawaih, and Sabur. Their professional success and their published works are a testimony to the institutional excellence of the hospital of Jundishapur.

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