

THE SECTION ON CARDIAC DISEASES AND THEIR TREATMENT
IN THE QĀNŪN OF IBN SĪNĀ

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In his medical work the *al-Qānūn-fi-Ṭibb*, Ibn Sīnā (980-1037 A.D.) describes all the known diseases according to the anatomical parts which they affect, starting from the head and finishing with the foot. In this paper an attempt has been made to present briefly a study of Section xi of Book III of the *Qānūn* which deals with different kinds of cardiac diseases, their causes, effects, and treatment.

The complete Arabic text of the *Qānūn* is available in several editions.¹ The three well-known editions are : the first printed at Venice as early as 1582, the second published at Rome in 1593, and the third printed by the 'Āmira Press, Cairo in 1294/1877. They are not satisfactory at all and none of them is easily available. Therefore, a good critical edition of this work is a long-felt necessity. But it would not be an easy task to perform.

The section on cardiac diseases is divided into two discourses or *maqāla*. The first and second discourses are subdivided into seven and five chapters (*faṣḥal*), respectively. In all they cover 18 long closely printed pages of the Cairo edition.²

The section opens with the chapter entitled *Faṣḥun fi Tashriḥ al-Qalb* which describes the physiology and anatomy of the heart, its veins, arteries, right and left ventricles and cavities. It is stated that the heart is composed of firm flesh (muscles) and surrounded by hard bones so that it may be kept protected from harm. It is stated to be located in the centre of the chest between the two lungs, slanting on the left side so that it may be at a distance from the liver. Of the ventricles the left one pumps blood. The right one is close to the liver so that the liver is left to perform its function in the digestive system. He explains four causes for the location of the heart on the left side.³ Generally speaking, the detailed description of the heart is not very different from that given by the predecessor of Ibn Sīnā.⁴ But he clearly states that the heart is the noblest and the best of all the chief organs of the human body.

Then the heart diseases are discussed. Ibn Sīnā explains the eight different ways by which the condition of the heart of a patient can be diagnosed : (1) by

pulse, (2) breathing, (3) formation of the chest, (4) hair growing on the chest, (5) hardness or softness of the body felt by touching it, (6) character, (7) strength or weakness of the body, and (8) worries.⁵ He also explains how a close examination of the above eight will reveal whether the heart is hot or cold, healthy or sick, weak or strong.

Ibn Sīnā states that heart diseases do not occur on account of something happening to the heart only but may be due to some affliction caused to its outer covering (*Ghilāf*), the sides of the body, lungs, liver, intestine, the whole bowel, specially the stomach and other organs, and the whole body as in the case of fever when palpitation of the heart results owing to fever and its effects.⁶

This is followed by a discussion of the possible causes which affect the heart and an explanation of the general principles for the treatment of heart diseases. Ibn Sīnā states that a person will be benefited if he knows the science of medicine as well as the principles (of physics) which are more general than the medicine itself.

Broadly speaking, Ibn Sīnā has discussed the symptoms, the causes, the effects, and the treatment of the following two heart diseases :

- (i) *Awrām*, inflammation due to swelling and
- (ii) *Khafaqān* or palpitation, which is of two kinds (a) hot and (b) cold.

Ibn Sīnā first of all explains the three general and broad causes of cardiac diseases : first, *Sudud* or anything which obstructs the smooth circulation of blood.⁷ Blood which is pure and thin circulates easily owing to the inherent heat of the heart but blood which is thick and impure causes obstruction. Hot or cold, thick and impure blood supplied by the liver causes heart diseases.⁸ He clearly states like a modern doctor that this is sometimes due to excessive eating and drinking or continuous indigestion. He adds that undigested food spreads in different parts of the body and causes the choking of arteries and injury to the vital faculties.⁹

Secondly, they may be due to disharmony in the temperament, *Sū'mizāj*. It may also be due to excess of heat or excess of cold or excess of moisture or excess of dryness in the temperament or in the heart. In the *Sū'mizāj al-Hāār* there will be excess heat over and above the natural heat ; in *Sū'mizāj al-Bārid* there will be excess cold over and above the natural cold and so on and so forth.¹⁰ This may be due to internal or external causes or on account of dampness caused to the heart or its outer covering. Disharmony of the temperament causes disharmony in the function of the heart which is a Galenic concept. Some animals have large hearts but they are cowards such as hares and birds because of less heat in them whereas other animals have small hearts but they are brave because of more heat.¹¹

Thirdly, weakness of the heart is one of the causes of heart diseases. If the heart is of moderate and natural temperament it would be strong but its imbalance will be the cause of its weakness. Ibn Sīnā adds that if the body is strong it indicates the strength of the heart, and the weakness of the body, if not due to an affliction to the brain or nerves, is the symptom of heart's weakness.¹² The weakness of the heart is the cause of heart disease, which leads to fainting which in turn results in death.

As regards inflammation due to heat, it manifests itself at the beginning in the irregularity of the pulse-beat, which is unpredictable, creating burning sensation in the body¹³ specially in the organs connected with breathing which leads to fainting.¹⁴ The heart may be affected owing to inflammation of its outer covering or any other organ close to it. A minor inflammation of an organ close to the heart will cause harm to it while an acute inflammation of an organ located far away from it will also cause the same amount of injury to the heart.¹⁵

The inflammation does not actually affect the heart so that its symptoms might appear in the pulse but the patient dies even before that.¹⁶ Moreover, this inflammation is the cause of palpitation and fainting and leads to instant death. In this connection Ibn Sīnā mentions the example of the monkey of Galen which had become lean and thin. When it died, Galen dissected its body and examined its heart whose outer covering was found to be inflamed due to swelling.¹⁷ Some physicians state that if a wound or ulcer appears in the heart, blood will come out through the left nostril and the patient will die and its symptom is pain on the left side of the chest.¹⁸

Khafaqān or palpitation is a physiological affliction of the heart caused by anything which injures it particularly or its outer covering or the anatomical organs which are placed close to the heart.¹⁹ It is of two kinds :

- (i) *Al-Khafaqān al-Hāār*, palpitation due to heat.
- (ii) *Al-Khafaqān al-Bārid*, palpitation due to cold.

It occurs when the movement of the heart is not natural. All kinds of weaknesses of the heart result in palpitation on account of disharmony in its temperament which does not indicate any particular cause. Palpitation is caused by the faculty of feeling of the heart which increases the rate of heart-beat.²⁰ It may be due to simple worries or the flatus rising upwards inside the body.²¹ Palpitation may also occur due to heat or cold. In this connection he writes clearly about the relation between the heart and the lung.²² Sometimes it is the result of cowardice caused by something which is unfamiliar to the heart, for example, suddenly hearing an unknown voice.²³ When palpitation increases it leads to fainting and this ultimately results in the death of the patient.

The causes, symptoms, and effects and treatment of palpitation are explained in greatest detail by Ibn Sīnā.²⁴

Ibn Sīnā mentions, among others, three effects of these heart diseases : (i) *Ghashī* or fainting, (ii) *Suqūt al-Quwwah Baghtatan* or sudden loss of vital energy and (iii) *al-Maut Fujatan* or sudden death. In his *Risāla fī al-Adwiyāt al-Qalbīyah* (*Treatise on Cardiac Drugs*) he adds *Tawahhush* or restlessness or discomfort also.

Fainting is caused when the faculties of feeling and movement are sapped owing to the weakness of the heart. It occurs when the whole animal pneuma collects in the heart on account of its movement inside or owing to its retention in it.²⁵ For this reason, heart cannot function properly. Any injury caused to the heart, the brain, the liver, the superior orifice of the stomach or any other part of the body may cause fainting.²⁶ When fainting becomes acute, it is incurable, specially when the face of the patient turns green and his neck becomes loose.²⁷ When the worms bite the superior orifice of the stomach, the heart is injured and leads to fainting. Sometimes fainting is caused by the pain in the heart and sometimes because of inflammation.²⁸ Sometimes it is caused by cowardice and by an unknown cause, for example, hearing of unfamiliar voice all of a sudden.²⁹

Ibn Sīnā asks the question. "How can the stomach cause fainting?" and answers as follows :

The stomach is located close to the heart and it is also highly sensitive. In spite of all these it is the centre where the different humours are collected. The stomach will cause fainting on account of either coldness or heat found in the stomach in excess or it becomes painful, or there is thick, impure and cold matter in it or it has an itching, painful wound or pimple or pustule at the superior orifice. As regards the other organs of the body which may be the cause of fainting any organ placed close to the heart, if it is painful, will cause fainting.³⁰

Ibn Sīnā repeats the statement that when palpitation becomes acute it leads to fainting and when the latter becomes acute and constant it causes death.

As regards sudden loss of vital energy he states that it may be caused owing to no apparent external reason. Sometimes it is the result of fainting and sometimes not due to it. When it is acute, the total vitality is lost ; if not acute, the vitality of the nerves and muscles only disappears.³¹

Over and above the four kinds of temperament mentioned by Galen such as hot, moist, cold and dry, Ibn Sīnā adds the combination of these, *Al-Hāār ar-Raṭḥ*, hot-moist ; *Bārid ar-Raṭḥ*, cold-moist ; and so forth.³² The temperament of the patient is to be considered of fundamental importance in the treatment of heart diseases and if there is any disharmony or imbalance of any kind, it should first

be treated and cured before the treatment of the heart disease starts. Ibn Sīnā takes great pain to prescribe different kinds of medicine for the correction of the different temperamental imbalances. For example, for the treatment of the disharmony of the cold temperament, he prescribes several electuaries, scented wine with moderate heat, *Sharāb ar-Rayḥānī*, and light exercise. The imbalance in the hot temperament can be treated by fruit juice, specially the juice of Syrian apples and quince. Similarly, he prescribes medicine for the disharmony in moist and dry temperaments.³³ In the case of imbalance in dry temperament the treatment suggested is plenty of food which may create moisture and bath after meals with warm water medicinally prepared. As regards the treatment of defects in the moist temperament he recommends the use of dehydrated medicines, light exercise and frequent bath with warm water before meals.³⁴

While the number and variety of simple and compound drugs prescribed for the treatment of heart diseases give the impression that Ibn Sīnā considered them curable, he emphasizes that they may lead to death or sudden death, *al-Maut fuĵ'atan*. He states that when there is an acute imbalance in the temperament of the heart it cannot be treated successfully and that heart disease does not easily admit of treatment.³⁵

The last part of the first discourse contains general and simple drugs for the treatment of heart diseases. In the second discourse, simple drugs and four compound prescriptions (*nuskha*) are recommended for hot palpitation,³⁶ and for cold palpitation only four prescriptions of compound drugs have been recorded.³⁷ The different drugs are characterized as hot, cold or moderate. Any medicine which can strengthen and stimulate the heart and its animal spirit is good for cardiac diseases. He also takes his predecessors to task for committing errors; for example, he criticizes those physicians who have dropped saffron and retained camphor because of their ignorance as the exclusion of saffron will considerably reduce the efficacy of the medicine prescribed for cardiac diseases. He attempts to explain this briefly.³⁸

He adds that because of the fact that the heart is the chief and noble organ, it is necessary that the physician should treat it after careful consideration and with a firm will. It is necessary that he should have faith in the success of his course of treatment.³⁹ Ibn Sīnā discusses the precautions to be taken in the use of emetic drugs and for bleeding the patient.⁴⁰

As regards the simple drugs useful for the treatment of heart diseases he refers his readers to the table of simple drugs included in the *Qānūn* adding that he would mention only those that are basic drugs.⁴¹

Among the near moderate drugs, he prescribes *Yāqūt* (ruby), *Sanjazaq*, *Firūzaj* (turquoise), *Dhahab* (gold), *Fidda* (silver) and *Lisān ath-Thawr* (borage).

Of the hot drugs, he mentions *Darunaj* (leopard's bane), *Jadwar* (zedoary), *Misk* (musk), *Anbar* (anbergris), *Zurumbad* (zedoary), *Abresham* (silk cocoon), *Za'fran* (saffron), *Bahmanān* (the root of a red and white plant resembling a large raddish) which is quick in usefulness, *Qarunfal* (clove)—wonderful drug; '*Ūd al-Khāmy* (green aloe-wood), *Badranjboya* and its seed; *Bazrūj* (mourtain balm) and its seed; *Shah-siparhm* (sweet basil) and its seed; *Qaqulla* (cardamom), *Kabāba* (cubeb), *Fananjmishk* (sweet basil) and its seed; *Warq al-Utrūj* (rind of citron), *Hummadah* (wild sorrel or the juice of an orange), *Sādhij al-Hindī* (Indian spikeard) and *Rasin* (juniper), a wonderful drug.

Regarding cold drugs, he recommends *lu'lū* (pearl), *Kahrubā'* (yellow amber), *busad* (coral), *kāfūr* (camphor), sandal (sandal), *Ward* (rose), *Tabāshīr* (sugar of bamboo), *Tīn al-Makhtūm* (wax), *Tuffāh* (apples), *Kazburat al-Yābisā* (dry coriander) and *Kazburat ar-Raṭba* (fresh coriander), and others.⁴²

It has to be stated here that the discussion of the simple and compound drugs prescribed for heart diseases in the special *Risāla* which Ibn Sīnā wrote on the subject is very detailed and substantial.⁴³

Ibn Sīnā is particular about the diet of heart patients. For a patient suffering from palpitation due to heat, he recommends light bread soaked in rose water mixed with a small quantity of scented wine; bread with sweet drink of apple juice or with curd which has not yet become sour or which is not very sour, pumpkin, potherb, and cold vegetables. If the patient can digest, he may be given tender chicken and quail.⁴⁴ He states that heavy diet should not be given to an unconscious patient. There are ignorant physicians who always find an excuse to give heavy diet to such a patient thinking that it would do him good and he would regain his strength and consciousness. But by taking such diet the innate heat of the patient is lost and he dies.⁴⁵ In fact, oxymel can be of great use to such patients. In the *kulliyāt*, where he discusses the four humours, he explains how yellow bile is formed. He states that spicy food increases this bile which when mixed with blood will increase the natural heat of the heart.⁴⁶ This may be the cause of palpitation due to excessive heat. In a sense, it may be stated that Ibn Sīnā like modern doctors recommends spice-restricted diet for heart patients.

In the *Qānūn*, Ibn Sīnā states that he has written a separate treatise on the drugs for cardiac diseases entitled *Risāla fi'l-Adwiyāt al-Qalbīyah* which is available. There are as many as three printed texts of this treatise—one incomplete and two complete. The full edition of this text was published with a Turkish translation at Istanbul in 1937.⁴⁷ This *Risāla* is a separate and independent work which is medico-philosophical in character. Any one who makes a comparative study of this section of the *Qānūn* and the *Risāla* cannot fail to realise that the former is a medical treatise written by a doctor of medicine while the latter gives the impres-

sion of a treatise on medicine compiled by a philosopher. An anatomist teaches that the heart is a physiological organ but "Ibn Sīnā gives to it a psychological and suprabiological function. The heart is the seat of emotions and regulator of animal heat. In paragraph 3 of his treatise on cardiac drugs Ibn Sīnā says that the source or the beginning of these energy-processes can be located in the heart".⁴⁸

He discusses the potentiality and capacity of the "cardiac pneuma or animal spirit", and adds that the heart is the physical seat of all emotions such as anger, anxiety, joy, and grief, which are now considered to be psychical. This whole discussion is based on what may now be called medical psychology.

In the second part of this *Risāla*, Ibn Sīnā prescribes simple and compound drugs for the treatment of heart diseases which are almost the same as those recommended in the *Qānūn* but before doing so he divides the drugs into several categories such as the stimulants, laxatives, diuretics, cooling, imparting warmth, vomit inducing, etc., giving illustration in each case.⁴⁹ In this connection he also explains the subtle difference between the property and nature of a particular drug as being hot, cold, moist, or dry. Altogether, 65 simple and 17 compound drugs in the form of theriacs, electuaries, crushed medicaments, pills, oxymel, tonic and syrup derived from the vegetable, mineral and animal kingdoms are discussed, explaining how they act on the heart and the pneuma.⁵⁰ In this treatment the Galenic concept of the four humours (blood, phlegm, yellow bile and black bile) predominates. Hot, cold or moderate drugs are prescribed according to the temperamental state of the patient, namely hot, cold, wet and dry.⁵¹ The temperaments of the drugs are moderated by their "aroma or by warming and cooling."

Generally speaking, Ibn Sīnā does not specifically mention his sources by name in his medical works. In this section of the *Qānūn* only Galen is mentioned twice but in the *Risāla*, Aristotle and Galen are mentioned twice each and Hippocrates of Cos only once. Here, he takes his predecessors to task for committing certain errors in the treatment of heart diseases as stated above but records neither their names nor the titles of their works.⁵² Ibn Sīnā has not acknowledged it but there is no doubt that he has used several medical works written by his predecessors such as Hippocrates, Galen, 'Alī bin Rabbān aṭ-Ṭabarī, Abū Bkr Muḥammad bin Zakariya ar-Rāzī and al-Majūsī. A comparison of this section of the *Qānūn* with the relevant section twenty-three of the *Kāmil aṣ-Ṣinā'at at-Ṭibbīyah* by 'Alī bin 'Abbās' al-Majūsī (d. between A.D. 982 and 995) shows that the former is based on the latter. Even the medical terms used by both are similar. However, Ibn Sīnā uses *Khafaqān* while al-Majūsī frequently uses *Ikhtilāj Qalb* for the palpitation of heart. It has been noticed that Ibn Sīnā's description

of the anatomy and the physiology of the heart is heavily indebted to that of al-Majūsī.⁵³ The similarity may be due to the fact that the approach of both these physicians to cardiac diseases is Galenic and their sources are by and large the same. Therefore, it would be incorrect to state that this section of the *Qānūn* is based entirely on book knowledge, i.e. works of his predecessors. In many passages, the reader feels that what Ibn Sīnā writes is based on his personal knowledge and experience as some clinical observations recorded here also prove this.⁵⁴

Without doubt, it is a well-organised, well-written, complete and comprehensive section of the *Qānūn* dealing with an aspect of medical science whose importance Ibn Sīnā had fully understood. There are some of the most brilliant pages written on the subject insofar as the Arabic (*Unānī*) medicine is concerned. The cardiac diseases and their treatment have been discussed systematically and thoroughly on the basis of available information and his personal experience. But it would not be correct to state that this section does not suffer from any demerit.

In the *Qānūn* as well as in the *Risāla*, he puts forward the traditional and conventional statement about the circulation of blood based mainly on the writings of Galen. Ibn an-Nafīs (*d.* 687/1288), a commentator on the *Qānūn* opposed it and he was the first to discover the pulmonary circulation of blood three centuries before Michael Servetus (1556) and Rinalde Colombo (1559).⁵⁵

What actually strikes the reader of this section of the *Qānūn* is the absence of a discussion of chest pain on the left which may have been quite common in the days of Ibn Sīnā. He mentions it in passing only once⁵⁶ and does not discuss it at all as a heart disease.

It seems likely that Ibn Sīnā had not seen a human heart. Since dissection of human body was not encouraged in Islamic tradition, monkeys were generally dissected and it is likely that Ibn Sīnā had seen a monkey's heart. He mentions the heart of a monkey twice.⁵⁷

This section of the *Qānūn* contains merits as well as demerits but it cannot be judged from the point of view of the advanced and scientific knowledge of heart diseases and their treatment available in modern times. Since they are the highest killer of human beings for those aged above forty years, even more fatal than cancer, much attention has been paid to them by physicians all over the world.⁵⁸ It is true that he had no idea of the obstruction of arteries, arteriosclerosis, elevated cholesterol levels and high blood pressure. It should be remembered that the *Qānūn* of Ibn Sīnā was written in early eleventh century and it should be reviewed in the light of the state of knowledge concerning heart diseases and their treatment attained at that time. Modern medical research added much to that of Ibn Sīnā

and rectified some of his errors but it has to be pointed out that he relied on unaided sense perception and tried to find out the causes of cardiac diseases and classify them in accordance with different signs and symptoms. Research to day has the advantage of highly sophisticated apparatuses and instruments which were not available to Ibn Sīnā one thousand years ago. That he wrote this section of the *Qānūn* in such detail and compiled a separate treatise on specific heart drugs are enough to prove that he had a clear understanding of the fatal character of heart diseases. This section of the *Qānūn* is the work of an astute observer and medical practitioner.

If a history of heart disease from the Greek to the beginning of modern times is written, it would not be possible to ignore this section of the *Qānūn* and the *Risāla* of Ibn Sīnā. Moreover, modern clinicians may study his heart therapy and may use it with good results.

NOTES AND REFERENCES

- ¹ Besides these editions, there are other editions that were printed at Tehran, Lahore and Lucknow. A comparison of the texts of Cairo and Lucknow (Nami Press, 3 Vols, 1307, 1308 and 1324 A.H.) shows that the latter is more correct and reliable than the former. The Venice edition of the *Qānūn* contains also the *De Medicinis Cardiacibus*, Ibn Sīnā's *Risāla on Cardiac Drugs*, translated by Arnaldo de Villanova into Latin. Several abridgements of the *Qānūn* are also printed.
- ² *Al-Qānūn*, Vol. II, 'Āmira Press, Cairo, pp. 261-279; Vol. III, Nami Press, Lucknow, pp. 210-224.
- ³ *Ibid.*, pp. 261-62.
- ⁴ See 'Alī bin Rabbān at-Ṭabarī, *Firdaws al-Ḥikmah*, ed. by M. Z. Siddiqui, Berlin, 1928, p. 225; al-Majūsī, *Kāmil aṣ-Ṣīnā'at at-Ṭibbiyyah*, 2 Vols., Cairo, 1294 A.H., Vol. I, pp. 107-108.
- ⁵ *Ibid.*, pp. 263-264 reading *al-Akhlāq* in place of *Ikhlāt* (Cairo text), which is incorrect. Al-Majūsī and at-Ṭabarī mention four and five ways respectively for diagnosis of the condition of the heart. See al-Majūsī, *op. cit.*, Vol. I, pp. 27-28 and at-Ṭabarī, *op. cit.* p. 86. See also Shabbīr Ahmed Khān Ghori, *Al-Qānūn : Shaykh ar-Ra'īs Kā Taqābuli Muṭāli'a* in the *Ṭibbiya College Magazine*, Aligarh, 1972-73, pp. 35-43. The text of the fourth symptom *wa mā Yanbatu 'ala aṣ-Ṣadr* (Lucknow ed. Vol. II, 212) is dropped from the Cairo edition.
- ⁶ *Ibid.*, p. 262.
- ⁷ *Loc. cit.* and p. 272.
- ⁸ *Ibid.*, p. 262.
- ⁹ *Ibid.*, pp. 262-73.
- ¹⁰ *Ibid.*, pp. 264-65.
- ¹¹ *Ibid.*, p. 262.
- ¹² *Ibid.*, p. 263.
- ¹³ *Ibid.*, p. 265.
- ¹⁴ *Loc. cit.*
- ¹⁵ *Ibid.*, p. 274.

- ¹⁶*Ibid.*, p. 256. He adds that never was a slaughtered animals's heart found to be diseased as its other organs were sometimes found to be so.
- ¹⁷*Ibid.*, p. 262.
- ¹⁸*Ibid.*, 265.
- ¹⁹*Ibid.*, p. 267.
- ²⁰*Ibid.*, p. 268. Ibn Sinā records the changes that take place in the normal pulse beat of a patient suffering from the palpitation of heart.
- ²¹*Ibid.*, p. 268.
- ²²*Ibid.*, pp. 268-69.
- ²³*Ibid.*, p. 267.
- ²⁴*Ibid.*, pp. 267-272.
- ²⁵*Ibid.*, p. 272.
- ²⁶*Loc. cit.* Ibn Sinā adds that the same causes, if they are minor, will result in inflammation ; if they are acute they will lead to fainting, when very acute they will cause instant death. *Ibid.*, pp. 264, 267, 268 and 274.
- ²⁷*Ibid.*, p. 273.
- ²⁸*Ibid.*, pp. 273-74.
- ²⁹*Ibid.*,
- ³⁰*Ibid.*, p. 273.
- ³¹*Ibid.*, p. 278.
- ³²*Ibid.*, pp. 264, 267.
- ³³*Ibid.*, p. 267.
- ³⁴*Loc. cit.* Ibn Sinā adds that when the heart is afflicted with imbalance owing to heat or cold without matter it will lead towards phthisis and decay. The patient will suffer from three different kinds of hectic fever according to his heart being affected by imbalance owing to heat or cold or dryness. *Ibid.*, p. 265.
- ³⁵*Ibid.*, p. 262.
- ³⁶*Ibid.*, pp. 270-71.
- ³⁷*Ibid.*, pp. 271-72.
- ³⁸*Ibid.*, p. 267.
- ³⁹*Ibid.*, p. 266.
- ⁴⁰*Loc. cit.*
- ⁴¹*Ibid.*, p. 267, For the simple drugs and their strength, effect, and use discussed by Ibn Sinā see the *Qānūn*, Vol. I, pp. 243-470
- ⁴²*Ibid.*, p. 267.
- ⁴³*Risāla fī al-Adwiyāt al-Qalbiyyah*, Istanbul, 1937. The discussion of these cardiac drugs covers pp. 31 to 55.
- ⁴⁴*Ibid.*, p. 270
- ⁴⁵*Ibid.*, p. 276.

- ⁴⁶See the *Kalliyāt* in the *Qānūn*, Vol. I, p. 18. The actual words used is *al-Ḥarrif min al-Aghāhiyā* or spicy food.
- ⁴⁷See note 43 and M. S. Khan, "Ibn Sīnā's Treatise on Cardiac Drugs"—a paper presented at the Symposium in Commemoration of 1000th Anniversary of Ibn Sīnā held at Kuala Lumpur, Malaysia, June 1981. Published in *The Islamic Quarterly*, London, First Quarter, 1983, pp. 49-56.
- ⁴⁸Ḥakīm Moḥammad Sa'īd, "Ibn Sīnā as a Physician"—a paper presented at the above symposium at Kuala Lumpur.
- ⁴⁹Edition of the *Risāla* mentioned in note 43 above, pp. 21, 31.
- ⁵⁰See note 43 above.
- ⁵¹Ḥakīm 'Abdul Laṭīf "Introduction to Heart Drugs" in the *Avicenna Commemoration Volume*, Calcutta, 1956, pp. 245-54.
- ⁵²The exact words he uses about them are *al-'Ulamā' al-Aqdamīn* (Learned men of the past) or *Atibbā' as-Sābiqīn* (Former Physicians) (*Ibid.*, p. 266) or *al-Aṭibbā' al-Juhhāl* (the Ignorant Physicians) (*Ibid.*, p. 276).
- ⁵³See his work cited above, pp. 107 and 108.
- ⁵⁴One of these is his observation that if heat or cold affects the heart directly, the patient will die. He records that he had seen a person, whose heart had been affected by cold, die after sweating when he was talking. In another case the patient died even without sweating. (*Ibid.*, p. 264).
- ⁵⁵See G. C. Anawati, "Science" in the *Cambridge History of Islam*, Vol. II, p. 773.
- ⁵⁶See note 18.
- ⁵⁷*Qānūn*, Vol. II, pp. 268 and 262, where it is stated that hearts of some monkeys were found to have two heads. *Qirad* or monkey is mentioned thrice in this section.
- ⁵⁸See G. E. Olsen, *The Pathology of the Heart*, Stuttgart, 1974, pp. 11-224; Henry Russak, *Cardiomuscular Diseases; New Concepts in Diagnosis and Therapy*, Burlington, 1974, pp. xvii+520; John Homer, *Recent Advances in Cardiology*, 6th edn., Edinburgh, 1973, pp. vii+424. As regards Āyurvedic treatment of Cardiac disease see Vasant Balaji Attavale, *Cardiology in Ayurveda—Hridayjnyana*, Bombay, 1979, pp. 178.