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AVICENNA.
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In considering the life of Avicenna, who has been quite [157] worthily given the Arabian title of "the Prince of Physicians" (el Sheik el Reis), it would certainly not be amiss to enter a little upon the interesting history of that period, and so place ourselves thoroughly in the times when Avicenna lived and taught.

The Arabic period in medicine may be embraced between the years 640 to 1400 A. D.; for about a century previous to the beginning of this, medical science had been slowly degenerating from the wonderful times of Galen and the other celebrated Greek physicians. The nations of the earth were much upset by war and internal troubles, the Roman Empire had been gradually decaying, so with the impetus following the foundation of the strong Eastern Empire under the famous Haroun al Raschid, the Arabians, as well as the Persians, Syrians, Christians and Jews all took prominent parts in an active regeneration of the arts and sciences. The great interest, firm support, protection, fostering care and enrichment, given by the Moslem rulers to either foreign or domestic celebrities, contributed greatly to this advancement.

Many Grecian and other nationalities flocked to the Eastern cities, or to Spain, where the Moors were already shedding light on the learning of the West. The great universities, at Bagdad, Bokhara, Damascus, Alexandria, and other places were founded, and the annual budget allowed to the many

[1] Read before the Johns Hopkins Historical Club, November 11, 1907.

[157] universities during some years amounted to over fifty millions of dollars, a very large sum for that period. At Bagdad there were often 6000 teachers and students from all parts of the world. In Spain the cities of Cordova, Toledo, Seville and Murcia possessed great public libraries and academies; the famous university of Cordova in the tenth century having a library of about 250,000 volumes.

The Arabic education of the time was not at all limited, but embraced most of the faculties, so that physicians were often mathematicians, deep philosophers, jurists, theologians and natural scientists. The close intercourse in commerce with the Grecians and the presence of many of their doctors among the early Arabians, paved the way for the foundation of Greco-Arabian medicine, based on the principles and theories of Hippocrates, but especially of Galen: these, however, were not the only influences, as Indian medical views as well as those of the earlier Asiatic people and Egyptians, together with some astrology and alchemy, all entered into the make-up of Arabian medical thought.

As a rule the medical branches were subsidiary to the study of theology, philosophy, mathematics, physics, astronomy, and were not taught separately: "Practical anatomy was excluded utterly by religious belief, and midwifery and gynæcology were then (as almost universally in the East to-day) forbidden to men. The practice of operative surgery, too, was
[158] considered unworthy of a man of honor, and was permitted only to the despised lithotomists and persons of the lower class. Operations performed by the hands, such as venesection, cauterizations and incision of arteries were suitable for physicians' assistants only."

Personal observation was little cultivated though there was some clinical instruction. Rhazes says "a thousand physicians for probably a thousand years have labored on the improvement of medicine; he who reads their writings with assiduity and reflection discovers in a short life more than if he should run after the sick a thousand years"; yet later he confesses very truly, "reading does not make the physician, but a critical judgment and the application of known truths to special cases."

Students after a medical course passed through special ex- [158]
aminations before a board before getting their diplomas. The teachers as a rule were well paid, some receiving over 200 dollars a month; this was most important as the medical fees of those days were small, except among the most famous men. The following schedule of fees is rather interesting:

A. The poor must be treated gratuitously.
B. The physician must visit his patient at least twice each day, and if requested by the latter, once also at night. For this he received for every day of treatment:
   (a) In the city or at his residence—half a tarenus=$0.14.
   (b) Away from his residence, when
      (1) The patient paid his travelling expenses—3 tareni = $0.85.
      (2) The doctor paid his travelling expenses—4 tareni = $1.17.

The fee was usually stipulated in advance or during the course of the disease, as one writer says: "make it high (the fee) as, after recovery, recollection of the services rendered declines rapidly."

In the tenth century there were in Bagdad as many as 860 physicians, the compounding of whose remedies was most interesting, as almost universally in those days the doctrine of geometrical proportions and musical harmony were employed, thus:

Cardamon is	1°	warm	½°	cold	½°	moist	1°	dry.
Sugar "	2°	"	1°	"	1°	"	2°	"
Indigo "	½°	"	1°	"	½°	"	1°	"
Emblica "	1°	"	2°	"	1°	"	2°	"
Sum "	4½°	"	4½°	"	3°	"	6°	"

As the warm and the cold are equal and the dry twice as much as the moist, the above prescription gives us a compound dry in the first degree.

As regards the hospitals of those times, among the most famous was that at Cairo, as it had both male and female nurses, special wards for wounds, diseases of the eye, diarrhœal diseases, and fevers (this ward being cooled by fountains), a ward for women, one for convalescents, and many other rooms.

[158] Among the most noted of the Arabian physicians were Rhazes (850 to 923), famous for his Liber Continens, with its wonderful description of small-pox and measles. Ali Abbas, who flourished about the same time, and said so aptly that "the physician should control the accuracy of the pictures of disease found in books, by his own careful bedside observations." Albucases (936 to 1013), a Spanish Arabian physician; Avenzoar (1113 to 1162); and Averröes (1166 to 1198) his pupil, whose book we have here to-night written as a compendium of Avicenna's celebrated "Canticum."

The most famous of all these and one whose name and fame lived longer, was Avicenna (the Latinized contraction of his Arabic name, Abû Ali el Hosein, Ibu-Abdallah Ibn-Sina), who was born A. D. 980 at Afschena, a hamlet in the district of Bokhara; his mother being a native of the place, but his father a Persian official, who was able to give him full freedom in his education. He showed such wonderful progress in his work that he is said to have mastered the whole Koran at the age of ten years. After studying various branches of the day, as grammar, dialectics, astronomy and geometry, he learned Indian figures from a travelling merchant, and soon mastered more than his teachers; he spent some time at Aristotelian philosophy, and finally studied medicine at Bagdad, where at the age of 16 he qualified to teach and practice medicine.

His first appointment was that of physician to the Emir, whom he cured of a serious sickness and was rewarded by access to the Royal Library, which he found of great help. Among his earliest works was the Collectio, or a short synopsis of general knowledge. Having lost his father at the age of 22 Avicenna began some years of wandering about the various towns, living under the patronage of the different Emirs, practicing his art, working on his various books, and beginning his famous "Canon." Finally he settled at Hamadâu, where for medical services to the Emir he was made Vizier. Later, however, he was banished, but restored again to power, after a period of seclusion, which was a most profitable time for his writings and studies.

During the last ten years of his life he lived at Ispahan, continuing his work but at the same time leading a life of

great excesses. Gradually his once robust constitution was so [158]
undermined that he was seized with his fatal illness (a colic)
while on the way to Hamadâu with the Emir's army. Find-
ing the disease gaining ground he resigned himself to death,
and in his remorse, freed his slaves, gave his wealth to the
poor, and listened to the reading of the Koran. He died in
June, A. D. 1037, in his 58th year, and was buried at Hama-
dâu, where, according to M. Schlimmer (Leclerc Vol. I.) the
tomb still exists, but has fallen to ruins.

Among the most important works of Avicenna is the Canon,
an early edition of which was published in Padua in 1476,
but the most complete one in Rome in 1593, this latter in
Arabic. Many other editions followed even as late as 1658.
This famous work was the text-book for most of the nations
for many centuries, and in fact up to 1650 it was still used in
the universities of Louvain and Montpellier. This may be
noted in the following schedule of studies from the medical
curriculum of the University of Leipsic, about the fifteenth
century, according to Haeser (Baas).

Hour.	1st Year.	2d Year.	3d Year.
6–7 a. m.	1st Canon of Avicenna with explanation of Jacob of Forti.	The "Ars Parva" of Galen with the exposition of Torrigiano.	The Aphorisms of [159] Hippocrates with the commentaries of Galen and Jacobus.
1 p. m.	Book No. 9 of Rhazes with the exposition of Arculanus.	1st fen. 4th book of the Canon of Avicenna.	4th fen. 1st book of the Canon of Avicenna with the commentaries of Dinus de Garbo, or Hygo.
3 p. m.	The "Doctores" read some work aloud in the semester, as the "Prognosticon of Hippocrates."		

The Canon was divided into five parts: science in general,
materia medica, special diseases, common diseases of the dif-
ferent regions and organs, and lastly a general pharmacopeia.
We may in looking more thoroughly into this work be struck
not only with the wide range of the work, but the practical
importance of many of the things found therein, and their
application to modern ideas. In etiology and pathogenesis of
disease air and water are considered to be important factors;
he says "the body to be in a healthy state must have the heart
warm, the brain moist, the nerves cold, and the bones dry."

[159] He speaks of the predisposition to disease in certain individuals. In the description of a disease of the bone "Spina Ventosa" he notes that it is due to the acrid humor of the bones, but later has a remarkable statement that the "bone may be eaten away by some small animalculus, which enters through a wound and destroys the bone," though he says "this observation is not confirmed" (this might be quite applicable to the modern microbic theory of disease).

Under diagnosis and symptomatology his description of small-pox is quite clear and explicit, a careful description of the rash, whether discrete or confluent being given. Under measles he notes that when the color of the rash is red it is not nearly so fatal as when black (hæmorrhagic form). The fevers are considered under the general heading "epidemic fevers," and their general aspect is well described, especially as regards the appearance of the patient, the pulse, the urine, and the stools. He gives prominent place to mental diseases, describes tetanus, rabies, both in animals and man; three forms of chest inflammation, and also muscular rheumatism. According to Lichtenstein, he is said to be the first physician to teach the contagiousness of phthisis. He distinguishes fifteen kinds of pain, assumes the four peripathetico-scholastic causes of diseases (material, efficient, formal, and final causes), and preserves the Galenical, humoral pathology.

Under the heading of "Prognostics" Avicenna gives a great number of signs and symptoms indicating a favorable termination or not, which resemble somewhat the Hippocratic writings. The following may be quoted:

"The involuntary flowing of tears, especially when from one eye only is a bad sign."

"The eyes remaining open as in a state of watchfulness, even when the finger approaches them, is a sign of death."

"The running of a yellow fluid from the nose in acute fevers is probably a bad sign, and announces the approach of death."

"The deviation of the lips in grave fevers is a bad sign."

"The rejection of water through the nose is a bad sign."

"If the sick one lies upon his stomach contrary to his usual custom it is a bad sign."

"The swelling of the abdomen in acute diseases with diarrhœa, is a sign of death, especially if there appear livid spots."

"Extreme pain in the abdomen with intense fever is serious."

"If you see the sick one make movements with his hands, as if [159]
picking things off himself, it is a sign of death."

"If the pain over any organ ceases suddenly without any cause, this disappearance is to be feared."

"The excessive talking of one usually silent indicates the beginning of delirium."

"If the sick one has an exaggerated fear of death it is a bad sign."

"The loss of appetite in chronic diseases, and if thirst ceases in intense fevers; these are very bad signs, especially if the tongue is black."

A large part of the Canon is devoted to the various kinds and forms of treatment of diseases, together with descriptions of the different drugs and compounds so common in those times. The life and habits of the people are considered carefully; how the houses should be placed, the water supply and [160]
ventilation; the action and uses of exercise and massage are spoken of and the latter is said to be of great use when used judiciously.

Under "Hydrotherapy" hot and cold baths are discussed, and the times for their use noted. Mineral waters are of great use, and certain points as the following may be quoted:

"Sulphur water is good for leprosy, for inflammation of the joints and against the itch."

"Waters charged with alum are good for bloody sputum."

"Sulphur waters are good for disorders of the spleen and liver, and for the pains that accompany it."

"Iron waters are also good for the spleen and stomach."

"Saline waters produce diarrhœa first; then constipation follows."

"All mineral waters render micturition, menstruation and labor difficult."

"In case of snake bite sea water baths are useful."

In the treatment of epidemic fevers Avicenna advocates rest and purgation first, thus seeking to drive out the cause of the disease; bleeding may also be resorted to. He gives his patients pastilles of camphor and cooling syrups, their food and drink should be acidulated with a little sour milk or vinegar. Cold water in large quantities is most useful and profitable. For the bites of mad dogs he advises the use of the cautery or bleeding, saying "all bites are less dangerous the more

[160] blood has been lost." As regards drugs he mentions camphor, amber, cubebs, and is especially noted for the introduction of some of the purgatives; manna, senna, rhubarb, tamarind and cassia: also for musk, nutmeg and cloves. Iron in its various forms he used, and considered gold and silver as blood purifiers, hence gilded or silver pills are most effective. He recommends bleeding at the outset of disease, at a point remote from the seat of the disease; but at the end of the illness at a point contiguous to the seat of the disease. In diarrhœa he gave gentle laxatives. In great coldness or in great heat he gave no medicine; considers the same medicine good in one locality, which would be injurious if employed in another.

In surgery he calls the extraction of a cataract a dangerous operation; declines to operate on strangulated hernias, and describes puncture of the bladder. He loosens teeth by means of the fat of tree toads in preference to pulling them. In obstetrics he follows the older writers, and in military surgery the methods of Galen. Baas says "his views (Avicenna) as to what is allowable to a physician are characteristic of Arabian thought and ideas; as a priest he could never employ reason; as a philosopher, however, he could, when, e. g., it is asserted that jaundice is removed on looking at yellow objects, he will not as a physician question the facts, but as a philosopher he cautions against superstitious remedies."

Next to the Canon his most important medical work is an abridgement of medicine in verse called the Canticum (this is the book we have before us to-night, with commentaries on it by Averröes, which was published in 1484 in Venice). Other medical works by Avicenna were those on the Pulse, A Compendium of Medicine, on Chicory, Principles of Therapeutics, and on Colic. Besides these he wrote many important philosophical treatises and works. It is most interesting that Avicenna, who was such an authority among both Arabians and Christians, and whose works had so many commentaries by many writers, was himself mainly a commentator and compiler.

your book

According to Baas,

Arabian medicine, entirely independent of its introduction into [160] nosology of a few new and important diseases, rendered itself of essential service to medicine in the following directions:

I. " It cultivated the study of the Greeks, and made them accessible to the West until through the revival of learning, the Greek writers could once more be studied in the original. This transfer of Grecian science including medicine, to the West, was accomplished through Italy and Spain, and even as early as the age of Charlemagne, though it became more marked in the following centuries. By it the Arabians acquired very high importance in the intellectual development of the West, and particularly in its medical culture. Hence the popular scorn of the Arabians, manifested by those who proclaim only 'new facts as acquisitions in medicine,' seems entirely out of place. Indirectly Arabian civilization and culture was of further advantage in that it awakened by its own too servile imitation an opposition against its teachers and even against itself."

II. " It introduced a great number of new and active remedies in the vegetable kingdom, especially from the department of chemistry (a science which it fairly created) and brought to life the pharmacies as an advance in practice."

III. " It contributed directly to the reform of practical medicine by the exhibition of chemical remedies: indirectly by the union of the natural sciences with medicine, which (on the advice of Aristotle) had its origin with them."

IV. " It first entered upon the clinical method of instruction, though it reaped very little advantage therefrom."

V. " It preserved a lay medicine at a time when, as in the West, priests and monks only, in Christian ignorance, treated the sick with superstitious remedies; a period which without the Arabians would have lasted longer than it actually did."

Such are the services which secured to the Arabians for all times an honorable position in the history of medical culture, starting as it did " in the sterile wastes of the desert, here the Arabians constructed a verdant oasis of science, in lands, today once more the home of absolute or partial barbarism. A genuine meteor of civilization were these Arabians, a meteor which arose from the long darkened Orient, and in its course towards the West, lightened the whole Occident before its final extinction."

[160] Park, Roswell: History of Medicine, 1901.

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