

CELEBRATED ARABIAN PHYSICIANS.

By JAMES MOORES BALL, M. D., of St. Louis, Missouri.

THE first Arabian medical writer of whom we have any account was **Ahrun**, a priest of the city of Alexandria, who was a contemporary of Paulus Aegineta and wrote a work entitled *Pandects of Medicine*. This treatise, which consisted of thirty books and formed a complete system of medicine, has been lost; but many of the statements contained in it are to be found in the writings of Rhazes and Hali-Abbas, whose works exist. Ahrun's book is said to have been written in Syriac and to have been translated into Arabic by a Jew of Bassora named Maserjawaih.

The Bachtishua Family was celebrated in the annals of Arabian medicine. They were Nestorians and lived between the years 750 and 1050. All were famous translators, being the first to render Greek medical works into Arabic. George Bachtishua was body-physician to the Caliph, Al-Mansur; his son served Haroun Al Raschid, and other members of this medical family were physicians to other Caliphs.

Jahiah-Ebn-Masawaih, or Mesue, as he is usually called, was a celebrated physician who belonged to the sect of Nestorians. The Caliph, Haroun Al Raschid, called him to Bagdad and chose him for the instructor of his son Almamoun and directed this learned physician to make translations of Greek philosophical and medical works. Mesue attributed the cause of variola to a fermentation of the blood; and was the first to direct attention to the injurious effect of drastic cathartics, which he replaced with mild laxatives, such as cassia, senna, tamarinds and myrobalan. When, in the year 813, Almamoun came to the throne, Mesue was loaded with honors. This sovereign collected learned men from all countries, formed them into a college and appointed Mesue for their president. On his father com-

plaining that so distinguished an honor had been conferred upon a Christian, Almamoun replied: "I have made choice of Mesue, not as a teacher of religion, but as an able preceptor in useful sciences and arts; and my father well knows that the most learned men, and the most skillful artists, in his dominions, are Jews and Christians." Mesue is said by his biographer, Abulphargius, to have held conferences in his own house, where he gave instruction in the mysteries of the healing art. This physician must not be confounded with another of the same name.

It was in the ninth century that **Hhonain-Ebn-Ishak**, a pupil of the celebrated Mesue, made many translations of Greek medical writings into Arabic. Born at Hartha, Hhonain studied at Bagdad and Alexandria, and, when his education was completed, was called to the court of the Caliph. His greatest service was in translating, and in this respect he was better qualified than any other person, since he was familiar with both the Greek and Arabic languages. He always assured himself that no words were omitted, and that he had made no mistakes in rendering the author's meaning. All later historians testify that he was the best translator of his time. He made translations of the works of Galen, Hippocrates, Aristotle, Ptolemy the astronomer, Paulus Aegineta, and Alexander of Aphrodisias.¹ During his lifetime several physicians were living at the court of the Caliph, where they were engaged in literary work under his direction. He has been called "the Erasmus of the Arabic Renaissance." Hhonain labored for forty years, and for every book translated he was paid, literally, its weight in gold. He received from the school at Bagdad what already was inaugurated in the schools of the Nestorians, viz., the academical degree of Rabbi, or Master.² He died in the year 874.

Serapion, the Elder, who is not to be confounded with another Saracenic physician of the same name, was a Syrian, born at Damascus, and flourished in the first portion of the ninth century. His work, entitled, according to the fancy of translators, "*Aggregator*," "*Breviarum*," or "*Therapeuticæ Methodus*," was written originally in Syriac; its object was to present a complete *résumé* of Grecian and Arabian medical learning. Like most works of the time, this treatise was a compilation made up, for the most part, of extracts from the writings of Galen; but it contains a few original observations which are worthy of note. Among these are his descriptions of a form of cephalalgia, in which the patient feels as if his head were cleaved in twain. This distressing malady was curable by the use of the finest oil of roses, obtained from Persia. Phthisis, according to this author, is caused by weakness of the lungs; while jaundice is due to organic change in the spleen. For the cure of diarrhœa, he directs the physician to prescribe the use of boiled milk, into which a piece of iron has been dipped. Serapion first described an eruptive disease, called by him echra, which name was after corrupted into essera. This affection would seem to be identical with nettle-rash.

¹ Wuestenfeld: Geschichte der Arabischen Aerzte und Naturforscher, Goettingen, 1840.

² Simeon, son of Hillel, who succeeded his father as president of the Sanhedrim about the time of the birth of Christ, was the first Jewish rabbi. The title was conferred with great ceremony. When a person had gone through the schools and was thought worthy of the degree of rabbi, he was first placed in a chair, a little raised above the company; then were delivered to him a key as a symbol of the power and authority conferred upon him to teach others, and a table book as a symbol of diligence in his studies. The key he afterwards wore as a badge of honor, and when he died it was buried with him. The custom of giving the title of rabbi to learned men passed from the Nestorians to the Arabs, from whom, in time, the rite was appropriated by the Europeans.

Alkhenidi.—In the same century there lived a man who certainly was one of the most versatile of writers and the most celebrated literary character of his time. Born of a noble family, Jacob-Ebn-Ishak Alkhenidi familiarized himself with philosophy, mathematics, medicine and astrology. Possessing a knowledge of the Greek, Persian and Arabic languages, he was called, on account of his varied attainments, the subtle philosopher, the learned physician, and the Greek astrologer. Among the two hundred volumes comprising his works are translations of Ptolemy and of Aristotle. He was the first to apply the rules of geometrical proportion and of musical harmony to explain the action of remedies and to regulate their doses. This idea, however mistaken and ridiculous it may seem, was not entirely discountenanced until long after the Revival of Letters.

RHAZES. 860-932.

The physician who was the pride of the Saracenic school, and the only one whose writings are worthy to be read at the present day, was Abú Becr Mohammed Ibn Zacariyá Ar-Razi, commonly called Rhazes. By common consent, the first employment of chemical preparations in the treatment of disease is attributed to him, and not to Avicenna, as Le Clerc alleges. That the science of chemistry had reached a high degree of cultivation among the Arabs cannot be doubted. In the work of Rhazes such substances as corrosive sublimate, various preparations of arsenic, the sulphates of copper and iron, saltpetre and borax are all mentioned; and it is here that we find glass retorts, luting, and distillation first spoken of. He gives directions for the making of *Oleum Benedictum*, or *Oleum Philosophorum*, which is to be made in a glass retort, and heated by degrees until a red oil comes off by distillation. This is the first mention made by the ancients of true distillation, decoctions, of course, having been known previously.

A Persian by birth, Rhazes was a universal genius, versed in music, astronomy, mathematics, chemistry and medicine. At least, this claim is made for him by the Arab historians, who are naturally inclined to the marvelous. It is certain, however, that Rhazes traveled in many countries in pursuit of knowledge. Returning in his thirtieth year, he was chosen from one hundred competitors to fill the position of hospital physician, and soon became the most celebrated professor in the medical school of Bagdad. Rhazes was a voluminous author, and many of his books on philosophy, history, chemistry, and medicine have been lost, or are buried in the depths of some library. From his pen we have five treatises on medicine, viz.: the *Almansor* or *liber ad Al Mansorem*, which was dedicated to the Caliph, Al-Mansúr; the *Continens*, in ten books; the *Divisio Morborum*; the *De Variolis et Morbillis*; and an entire work on diseases of children, the first treatise written on this subject by the ancients.

The medical works of Rhazes were held in high repute. The ninth book of the *Almansor* was so highly prized that it was read publicly in the mediæval schools of medicine, and for many years was commented upon by the most learned professors. In the thirteenth century, Charles of

Anjon sent an embassy to the King of Tunis, expressly to secure the *Continens*, so valuable was it considered at that time.

It was during the reign of Al-Mansúr that Rhazes passed the best years of his life. This enlightened sovereign, on succeeding to the throne in 813, continued the liberal policy of his royal father, Haroun Al Raschid, collected vast numbers of Greek and Roman manuscripts, and employed competent scholars to translate them into Arabic. Among these works were the treatises of Galen, Hippocrates, Oribasius, Aetius, and Paulus Aegineta. It was from these books that Rhazes drew the bulk of his information, although he mentions many facts not recorded by his predecessors. The writings of Rhazes, in the Arabic text, are to be found in MS. in the libraries of Madrid, Dresden, the Bodlean at Oxford, and the Nanian at Venice. Gerhard of Cremona translated them into Latin, and they have been published in many editions between the years 1481 and 1787. *De Varolis et Morbillis*, translated from the original Arabic into English by Wm. Alex. Greenhill, was published in London in 1848. A translation of the same work was published in England in 1702, in the works of Dr. Meade.

The study of anatomy by dissection was forbidden by the Koran, consequently little anatomical progress could be made. Nevertheless, Rhazes first mentioned the infra-trochlear branch of the nasal nerve; first described the great pneumogastric, and distinguished the superior laryngeal from the recurrent. Rhazes knew that the course of the last named nerve is different on the two sides; and that the recurrent is sometimes double on the right side, a discovery which has been unjustly credited to Wrisberg in modern times. In speaking of the operation for fistula lachrymalis, he warns the surgeon against wounding the external or anterior branch of the ophthalmic nerve—a branch mentioned by none of the Greek writers, and in modern days particularly pointed out by Willis.¹

Like others of the ancients, Rhazes fell into the error that the human embryo possesses a true urachus for evacuation of the urine; and believed he could foretell the number of children a woman would bear, from the number of wrinkles in her abdomen at the time of the first confinement.²

That Rhazes was a safe and honorable practitioner of medicine is evident from the following advice upon the choice of a physician, which is taken from the *Almansor*:

"Study carefully the antecedents of the man to whose care you propose confiding all you have most dear in the world; that is to say, your health, your life, and the health and lives of your wife and children. If the man is dissipating his time in frivolous pleasures; if he cultivates with too much zeal the arts that are foreign to his profession, such as music and poetry; still more, if he is addicted to wine and debauchery, refrain from committing into such hands a trust so precious. He merits your confidence who, having early applied himself to the study of medicine, has sought skillful instruction and seen much of disease; who has united to the assiduous reading of good authors his personal observations; for it is impossible to see everything and try everything in one's own practice; and the knowledge and experience of a single individual, compared to the knowledge and skill of all men in all ages, is like a slender brook of water that flows by the side of a great river."

¹ Moir: *Outlines of Ancient History of Medicine*, p. 217.

² Lessing: *Geschichte der Medizin*, Berlin, 1838, p. 212.

That which has rendered the name of Rhazes celebrated in the annals of medicine is his knowledge of small-pox and measles. The "*Treatise on Small-Pox and Measles*" has passed through many editions, between the years 1498 and 1848, and has been printed in Latin, French, English, German and Arabic. Two MSS. of the Arabic text are in existence: one in Leyden, the other in Venice. It was from the former that the celebrated Dr. Meade, physician to George II., made the first Latin translation. The preface of Rhazes' work is so curious that I will transcribe it as found in the writings of Dr. Meade (London, 1762):

"In the name of God, merciful and gracious: Abu-Beker Mohammed, the son of Zacharias, saith thus:

"On a certain night, at a meeting in the house of a nobleman of great goodness and virtue, and very fond of the explanation of useful sciences, that they might be made plain and intelligible for the publick benefit, the conversation having turned on the Small-Pox, I then spoke what came into my mind on that subject. Which, when that great man (whom may God long preserve for the good of mankind) had heard, he desired that I should write a discourse on that disease with sufficient aptness, solidity, and clearness; because there had never yet been published, either by the ancients or moderns, a satisfactory account of it. I therefore composed this treatise, hoping to receive my reward from the almighty and glorious God, as the effect of his good will."

After this pious preface, Rhazes divides his treatise into fourteen chapters, and gives a lucid account of the symptoms and treatment of small-pox and measles. Following are some extracts from this work:

FROM CHAP. I.:—"The moderns have, it is true, proposed some medicines for the cure of the Small-Pox, but not distinctly and clearly enough; neither has any one of them explained the cause of it, and why, except here and there one, nobody escapes it; nor shewed the methods of cure in a right order. Upon which account, I hope the good man, who encouraged me to undertake this work, will have his recompence; and that my reward will be doubled, when I shall have described whatever is necessary to the cure of this disease in due method, assigning to everything its proper place; by the help of God."

CHAPTER III. COMPLETE:—"The eruption of Small-Pox is preceded by a continual fever, a pain in the back, itching in the nose, and terrors in sleep. These are the proper signs of the approaching Small-Pox, especially the pain in the back, with a fever; and also a pricking, which the patient feels all over his body; together with a fulness and redness of the face, which at times goes and comes; a redness of the eyes, a heaviness of the whole body; frequent yawnings; a pain in the throat and breast, with a difficulty in breathing, and streightness in the gullet; then a dryness of the mouth, thick spittle, a hoarseness of the voice; headache, anxiety of mind, inquietude; sick qualms and heaviness of heart, oppress more in the Measles than in the Small-Pox, unless the Small-Pox be of a bad sort; for the Measles are from a very bilious blood. And, on the other hand, the pain in the back, the heat and inflammation of the whole body, especially in the throat, with a shining redness, are more proper to the Small-Pox than to the Measles.

"Wherefore, upon the appearance of these signs, or some of the worst of them, you may be assured, that one or the other of these diseases is nigh at hand.

"As to the safer kind of Small-Pox; in these, the quantity of blood is greater than its bad quality; and hence arises the pain of the back; the greater blood-vessels, which are situated near the vertebræ of the back, being distended with too great a quantity of blood."

FROM CHAP. VII.:—"As soon as ever the signs of Small-Pox appear, particular care must be taken of the eyes, the throat, the nose, and ears, and also of the limbs, in the way I am going to describe. Nay; sometimes it will be necessary to extend our care even to the soles of the feet, and the palms of the hands, for oftentimes violent pains arise in these parts, the hardness of the skin hindering the eruption.

"Upon the first appearance of the signs, drop rose-water into the eyes now and then; also wash the face with cold water often in a day, and sprinkle the eyes with the same. For if the disease be mild, this method will prevent the pustules breaking out in them. This, indeed, is to be done, for greater caution; for in the mild sort, it seldom happens, that any pustules break out on the eyes. But in a bad sort, when you see a large eruption in the beginning, with an itching of the eye-lids, and redness of the white of the eyes, some places of which are redder than others; you may be assured that the Small-Pox will break out there, unless great help be given; therefore immediately drop rose-water in which sumack has been infused, into the eyes, several times a day.

"It will be still more effectual to apply a collyrium, made of galls in rose-water, by dropping it into the eyes; or to instil into the eyes what is squeezed from the pulp and the skins of the sour pomegranate, first chewed. Then wash the eye-lids with a collyrium, made of the water of quinces, the juice of unripe grapes, boxthorn, aloe, and acacia: of each of these let there be one part, and a tenth part of saffron; and drop some of it into the eyes."

* * * * *

"As to the pustules which break out in the tunica cornea of the eye, these darken the sight, and are to be cured, according to the degree of their thickness, by such dissolving remedies, as I am going to describe: which indeed are sometimes effectual, and sometimes not; the success depending upon the matter being more or less thick, and upon the greater or less firmness and dryness of the body.

"But if large pustules show themselves in the tunica uvea, use the collyrium of rose-water several times in the day and night, with great diligence; or else that before-mentioned, leaving out the saffron; instead of which, put in a small quantity of blood-stone, to keep down the swelling."

The extracts given above are from the medical works of Dr. Meade (London, 1762).

In his writings Rhazes asserts that variola was known to Galen. It must be stated, however, that none of the moderns have succeeded in finding anything resembling an account of this disease in the Galenic writings, and it is probable, as Meryon remarks, that Rhazes, who was unable to read Greek, did not obtain his information from correct sources. Rhazes must be regarded as the first author who has described small-pox and measles.

In the *Almansor*, Rhazes gives an interesting account of the charlatans of his day. He says:

"Of Impostors" (*Liber ad Almansor*, vii., 27):—"There are so many little arts used by mountebanks and pretenders to physic, that an entire treatise, had I a mind to write one, would not contain them; but their impudence and daring boldness is equal to the guilt and inward conviction that they have of tormenting, and putting persons to pain in their last hours, and all for no reason. Now some of them profess to cure the falling-sickness, and thereupon make an issue in the hinder part of the head, in the form of a cross, and pretend to take something out of the opening, which they held all the while in their hands. Others give out that they can draw snakes and lizards out of their patients' noses, which they seem to perform by putting up a pointed iron probe, with which they wound the nostril until the blood comes; then they draw out the little artificial animal which is composed of liver. Some are confident they can take out the white specks in the eye. Before they apply the instrument to the part, they put a piece of fine rag into the eye, and, taking it out with the instrument, pretend that it is drawn immediately from the eye. Some, again, undertake to suck water out of the ear, which they fill with a tube from their mouth, and hold the other end to the ear; and so, spurning the water out of their mouths, pretend that it came from the ear. Others pretend to get out worms which grow in the ear or the roots of the teeth. Others can extract frogs from the under part of the tongue, and, by lancing, make an incision into which they clap the frog, and so take it out. What shall I say of bones inserted into

wounds and ulcers, which, after remaining there for some time, they take out again? Some, when they have taken out a stone from the bladder, persuade their patients that still there is another left: they do this for this reason, to have it believed that they have taken out another. Sometimes they probe the bladder, being altogether ignorant and uncertain whether there be a stone or no; but if they do not find it, they pretend at least to take out one they have in readiness before, and show that to them. Some say they take phlegm, of a substance like unto glass, out of the different parts of the body, by the conveyance of a pipe which they hold, with water in their mouths. Some pretend that they can contract and collect all the floating humors of the body into one place by rubbing it with winter cherries, and then they expect to be rewarded as if they cured the distemper, and after they have supplied the place with oil, the pain presently goes off. Some make their patients believe they have swallowed glass, so taking a feather, which they force down the throat, they throw them into a vomiting, which brings up the stuff they themselves had put in with that very feather. Many things of this nature do they get out, which these impostors with great dexterity have put in, tending many times to the endangering of the health of their patients, and often ending in the death of them. Such counterfeits could not pass with discerning men; but that they did not dream of any fallacies, and make no doubt of the skill of those whom they employed; till at last, when they suspect, or rather look more narrowly into their operations, the cheat is discovered. Therefore, no wise men ought to trust their lives in their hands, nor take any more of their medicines, which have proved fatal to so many."

Although Rhazes well understood the practices of charlatans, yet he was himself a firm believer in astrology. The aphorisms of Rhazes, modeled after those of Hippocrates, are much inferior to them. Unmindful of the modesty of true worth, he boasts of his discoveries and heralds his skill in prognosis. "In a strain of oriental magniloquence, he runs over the same topic again and again, imperfectly states some commonplace facts, and confesses his predilection for astrology" (Moir). Some of the wise sayings of Rhazes are the following:¹

"If Galen and Aristotle are of one and the same opinion, it is certainly correct; but if they differ, it is very difficult to determine which is in the right."

"Truth in medicine is an aim which is not easily gained; and the healing art, as it is set forth in books, is far inferior to the practical experience of a skillful and thoughtful physician."

"The febrile diseases are more fatal than the frigid ones, because of the rapidity with which heat spreads."

"Treat an incipient malady with remedies which will not prostrate the strength."

"When you can cure by regimen, avoid having recourse to medicine; and when you can effect a cure by means of a simple medicine, avoid employing a compound one."

"With a learned physician and an obedient patient, sickness soon disappears."

The surgical knowledge of Rhazes was obtained *en bloc* from Paulus Aegineta, Antyllus, and Archigenes. The numerous grave operations described by those authors are repeated by Rhazes. On the whole, the surgery of the Arabs was merely a compilation from the works of the Greek authors.

In his old age Rhazes was a victim to cataract. When one of his friends asked him to submit to an operation, that he might recover his

¹ Wuestenfeld: *Gesch. d. Arab. Aerzte*, pp. 41-42.

sight, he said: "No, for I have seen so much of the world that I am tired of it." Probably his reply would have been different had not the surgeon who was summoned to operate been ignorant of the anatomy of the eye.

HALI-ABBAS.

Hali-Abbas, a Persian by birth, was born in the year 944. He wrote a compendium of medicine, in twenty books, under the title *El-Maliki* or "*Opus Regium*." This work, which was compiled from the writings of Rhazes and of the Greek physicians, was the standard medical authority of the Saracens until the time of Avicenna. As regards literary merit, it is regarded as the best production of the Saracenic school. Hali-Abbas was a strenuous advocate of the use of mineral waters for the cure of disease. His practical directions regarding diet are worthy of notice, and, considering the time in which he lived, are creditable to him. In the treatment of disease he differs but little from Rhazes.

AVICENNA.

In the same year of the publication of the *El-Maliki* of Hali-Abbas (A. D. 980), there was born at Bokhara, a city of Khorassan, a child known to us by the name of Avicenna, and surnamed by the Arabians "The Prince of Physicians." He was possessed of a wonderful memory, and by his tenth year could repeat the whole of the *Koran*. Educated by celebrated Nestorian teachers and conversant with all branches of learning, Avicenna in his eighteenth year was so skillful in the healing art that he was called by the Emir, Nouk Ibn-Mansur, to be his physician. As was usual among the learned men of Bagdad, Avicenna united the study of philosophy with the practice of medicine; and he soon acquired such a degree of reputation that the Caliph consulted him with respect to his son, in a case which perplexed the physicians of the court. His prescription succeeded, and the success obtained him admission to the court and access to the library of the prince. Here he pursued his studies with great industry, but, at the same time, with a fanatical spirit scarcely consistent with sound judgment. When perplexed with any logical question, he was wont to repair to a mosque and pour out prayers for divine illumination; after which he fancied that the information which he had sought was communicated to him during sleep. For a time Avicenna was a great favorite at the court, but suddenly fell into disgrace, was sent to prison and kept incarcerated for two years. He died in 1036, at the age of fifty-six. He was one of those geniuses who consume themselves. His exuberance of spirits, the wild, inward fermentation of his mind, threatened to destroy him. He found repose only in drunkenness and debauchery, and died a victim to Bacchus.

In materia medica, Avicenna possessed some absurd ideas, for I find him recommending the administration of gold, silver and precious stones, with a view to purify the blood. It is to this ridiculous belief that the custom of gilding and silvering pills is to be ascribed. (Crichton: *Arabia*, Vol. II., p. 84. New York, 1834.)

Galen, Rhazes, and Hali-Abbas were his favorite medical authors. The numerous works of Avicenna unite, with choice language, an inordinate desire for compiling; and in him Asiatic prolixity is joined with a philosophical spirit lost in the speculations of alchemy and astrology. His principal work, constituting a complete system of medicine, is called the *Canon*, or *Liber Canonis Medicinæ*. For six centuries this classic work was the medical code of Europe and Asia, "the *Koran* of the healing art," and it exercised an influence over physicians which was surpassed only by the writings of Galen. The *Canon* consists of five books, of which the first treats of anatomy and physiology; the second of remedies; the third of diseases; the fourth of fevers, and the fifth of the theories of medicine. It supplanted the works of Rhazes and Hali-Abbas, and until the end of the fifteenth century it held, in the estimation of physicians, the rank of an oracle. Only the completeness of the work of Avicenna could secure for him such despotic sway. It was possible only at a time of darkness—an age when men avoided thinking for themselves; when experimentation with a view to the discovery of new truths was not known, and when the few learned men of whom the age could boast sought to obtain all kinds of knowledge from the writings of the ancients. Although it has been claimed by some writers that Avicenna was ignorant of botany, yet he must have possessed some knowledge of that science, as the name *Abutylon Avicennæ* attests.

The most complete treatises of the one hundred or more written by Avicenna are on diseases and materia medica. His surgical writings were less complete and were taken largely from the books of Hippocrates, Galen, Paulus Aegineta, and Rhazes. Avicenna was a great advocate of the actual cautery. In trichiasis he burned the roots of the hairs with a red-hot needle; he advised the removal of scrofulous glands and tumors by incision, and directs that the arteries severed shall be ligated. Cancer of the breast was treated by corrosive applications, the actual cautery or the scalpel. The operation of lithotomy is mentioned by Avicenna. If the stone is large the incision is not to be made correspondingly large, but the calculus is to be seized in a forceps and crushed. The bladder is to be washed out. Hydrocele is to be treated by incision and the application of strong medicines or the cautery to the membranes. Many other operations were described by this old Arab.

Greek and Roman medical writers do not mention the obstetrical forceps. With the exception of Celsus, their knowledge of midwifery was extremely limited. The practice of midwifery was confined to women. Probably they were familiar with the use of the forceps, for a similar instrument was unearthed in the ruins of the house of a Roman obstetrix in the excavations at Pompeii. The first known reference to the forceps is that found in Avicenna.

He distinctly mentions the use of the forceps for the delivery of living children in cases of difficult labor, and makes it more evident by directing that in case the midwife fails with the forceps she must then resort to embryotomy, as in the case of a dead child: "Cap. 26. De Regimine ejus cujus partus sit difficilis causâ magnitudinis fœtus—Oportet obstetrix bona faciat retentio hujus modi fœtus: quare subtiliter in extractione ejus paulatim; tunc si valeat illud in eo, bene est; et si non liget eum cum margine



Illustration from the Title-page of the "Liber Canonica" of Avicenna (Naples, 1510).

Liber

I

Capitulum primum Sen prime Doctrine prime libri primi de diffinitione medicine.



Ico q̄ medicina est sciētia q̄ humani corporis dispositiones noscunt ex parte qua sanat vel ab ea remouet ut habita sanitas p̄seruet et amissa recuperet.

¶ Diuersimode p̄t diuidi liber deinceps s̄ leui^o sic posito p̄bemo hic exequit et h̄z p̄tes q̄nq̄z sic q̄nq̄z sunt libri. Pr̄m^o liber h̄z duas partes. An prima p̄mittit que sunt necēssaria ad sci-

entiā p̄ticipioꝝ vniuersaliū theozice et practice. Sc̄do exeq̄. ibi secunda (etia) Illa duo sunt diffinitio sciētie medicine ut sciam^o qd est scia: sc̄dm est que sunt subiecta de quib^o cōsiderat. ibi sc̄da (qm̄) Pr̄ia in duas. primo ponit diffinitionē. secūdo mouet instātiā circa illam. secūda ibi (p̄t aut̄) Dicit Guilielmus de Bixia medicina

Liber

II

Bētilis fulginatis sup sc̄do can. Auī. expositio.

Incipit liber canonis secūdus Auicē. verba principis Aboali.



¶ Quū libꝝ quos s̄ medicina specificauim^o: Pr̄im^o ē de iudicijs v̄libus ī medicina. Et sc̄ds eozū est hic liber aggregatus de medicinis singlarib^o. Et nos quidē hūc libꝝ in duos diuisimus tractat^o. Quozū prim^o ē de canonib^o v̄libus quos te scire oꝝ in re medicinaz: et ē sciētia vir-

tutu medicinaz in medicina. Et sc̄ds eozū ē de cognitōe virtutū medicinarūm particulariū.

Initial Letters and Text from the "Liber Canonis Avicennæ," 1510.

panni, et trahat cum subtiliter attractione post attractionem. Quod si illud non conferet, administrentur forcipes, et extrahatur cum ilis. Si viro non confert illud, extrahatur cum incisione, secundum quod facile sit, ut vegatur regimine fœtus mortui."¹

A century later Albucasis, the greatest of the Arab surgeons, described two forceps: the long forceps, or *Almisdach*, and the short forceps, or *Misdach*; but these instruments evidently were not intended for the extraction of living children, for they were provided with teeth.

Alhazen.—Although not a physician, Alhazen made observations which entitle him to remembrance. He was a mathematician of the eleventh century, and was the first great discoverer in optics following Ptolemy. The latter knew of atmospheric refraction and must have known of dioptrics, although he nowhere explains the subject. The ancients were familiar with plane mirrors, and with the use of glass spheres filled with water and employed as burning and magnifying glasses. Alhazen's optical views, although often erroneous, were sounder than those of his predecessors. He asserted that refraction takes place towards the perpendicular and that the angles of refraction do not follow the proportion of the angles of incidence. He taught, before Vitello, that vision does not result from the emission of light from the eye. In addition to informing us in regard to the reflection and refraction of light, Alhazen gives a description of the eye, mentioning three humours—*aqueus*, *crystallinus* and *vitreus*—and four coats: *tunica adherens*, *cornea*, *uvea*, *tunica reti similis*.

¹ Avicennæ Medicorum Arabum Principis, Libres Canonis de Medicinis, Cordialibus et Cantica jam olim quidem a Gerand Caumonensi ex Arabico Sermone in Latinum Conversa et pautia vero ab Andrea Alpago infinites penecorrectionibus, ev. P. 724, Benlac, 1556.

Serapion, the younger, lived in the eleventh century. His work on materia medica, *De Simplicibus Medicinis*, is a complete compendium of all that the Greek and Arab physicians had previously written upon this branch of medical science. His descriptions of certain drugs, such as asafœtida, nux vomica, spinage, musk and ambergris, are both complete and unique. "Ambergris grows in the sea, like a mushroom upon the land. In China, the greatest quantity of it is obtained from people who fish it up out of the ocean. Whales swallow the ambergris floating upon the waves, and immediately die from its effects. The natives then cut them open and find the most valuable pieces in the backbone; the poorest in the stomach." One can see from this specimen how utterly unreliable are the statements of the Arab writers on questions of natural history.

Masawaih Ben Hemech, or the younger Mesue, was born at Maridin, a city located upon the river Euphrates, and was probably a Christian and physician to the Caliph Alhakem, at Kahira. His work on materia medica, like that of the younger Serapion, was a compendium, which for several centuries was the universal text-book in the Christian schools of medicine; and even as late as the sixteenth century commentaries were written upon it. The theory of materia medica which Mesue propounds is, in the main, that of the Galenists. Upon its physical properties, full as much as upon the sensations which it produces, does he estimate the power of a drug; and in many respects, especially as concerns the influence of the color of the plant, his theory agrees with that advanced by Linnæus. He remarks that the source of many plants, and the condition of the soil in which they grow, has a marked influence in determining difference of strength. He divides intestinal evacuants into laxatives and purgatives; and purifies the blood by administering hops, whey, and asphodel. He sought to obtain a specific purgative for each part of the intestinal tract, observed that bitter remedies are stomachic tonics, and stated that the acids are useful in the treatment of fevers and inflammations. He remarks that if rhubarb be finely pulverized, its evacuant power is largely lost. His descriptions of sarcocolla, *penœa mucronata*, and the dog violet, *viola canina*, are worthy of notice. The practical part of his work, however, is made up of prescriptions directed against particular symptoms, without reference to their causes. His ignorance of anatomy is exhibited in his treatment of tic douloureux: for the relief of this affection he applied a blister to the vertebral column, whence he supposed the facial nerves to take their origin.

ALBUCASIS, 1060-1122.

I now come to an individual who, in respect to surgical acquirements, was not equaled by any member of the Saracenic school. Khalaf Ebn Abbas Abûl-Kâsem, a Spanish Moor, who is generally known by the name Abulcasis, Albucasis, or Alzaharavius, was born at Al Zahra, or Zahera, a city near Cordova, in Spain. The date of his birth is unknown, and is differently stated by various medical historians. Sprengel states that he died in 1122, and cites Casiri as his authority. This learned German historian of medicine censures Dr. Freind for stating in his *History of Physick* that Albucasis lived at an earlier period. Freind bases his conjecture upon the fact that the Arab mentions the Turks in his treatise on medicine, just as if Turks were unknown previous to the twelfth century. The attentive student of general history will, however, call to mind the fact that the Turks made their individuality felt even as early as the sixth century, at which time they supplanted the Avars and sent an embassy to the court at Constantinople. These are statements whose truth is vouched for by several Byzantine historians. The *Al-Tasrif*, or medical treatise of Albucasis, is a mere compilation, and of no value excepting that portion which treats of surgery; but in this respect it is unique. His works have been published in twenty-five editions, the first of which appeared at Venice, in 1471. The last and best edition was issued at Oxford, in 1778; and contained the text in both the Arabic and Latin languages.

When we remember that dissection was prohibited by the religion of the Mohammedans, and that the Arab physicians blindly followed and servilely copied the anatomical writings of the Greeks, it is not a little remarkable that Albucasis should have produced his treatise upon operative surgery. He tells us that surgery, in his day, was almost forgotten in Spain, and cautions his readers of the danger of undertaking operations without a previous knowledge of the parts involved. His reasons for writing this treatise are set forth, as follows:

"After having terminated, happily enough, the work on medicine which I undertook for your instruction, my sons, I have thought it proper to add a small treatise on manual operations, seeing that this part of our science is so much neglected in our country at the present time that there remain scarcely any vestiges of it. We can find only a few short descriptions of operations in the writings of the ancients; they are, however, disfigured by the ignorance of the book makers; the manuscripts are so faulty, that, at every step, we are in such doubt as to the sense of the authors, that no one dares enter into the study of surgery. I have, therefore, undertaken this little treatise for the purpose of reviving this most important and useful branch of our Art. I have detailed briefly the methods of operation, I have described all the necessary instruments, and I present their forms, by means of drawings; in a word, I have omitted nothing of what can shed light on the practice. But one of the principal reasons why it is so rare to meet a skillful surgeon is, that the apprenticeship to this branch is very long, and he that devotes himself to it must be versed in the science of anatomy, of which Galen has transmitted us the knowledge. He should know the functions of organs, their shape, and their relations; the number of the bones, and their modes of union; the origin and termination of the muscles, the nerves, the arteries, and the veins. In fine, no one should permit himself to attempt this difficult art without having a perfect knowledge of anatomy, and the action of remedies."

The philosophical advice of this old Arab is most excellent, and I would respectfully commend it to those men of the present day who, by

mistake, perform ovariectomy for ascites, and open abscesses of the neck only to find them spouting blood! His treatise is divided into three books: the first of which treats of cauterization for the relief of various diseases; the second, of operations made by cutting instruments; and the third, of fractures and dislocations. Like all the members of the Saracenic school, he was a great advocate of the use of the cautery. So popular was this instrument among his predecessors, that Dioscorides, centuries before this time, spoke of its application as the "Arabian burning." Albucasis recommended the use of a hot iron for the relief of all local diseases; in tic douloureux, he burned the corners of the mouth and the temples; in cataract he used caustics to the parts around the orbit, in order to draw the excess of humidity away from the eye; in spontaneous luxations he applied the same treatment to the tissues about the affected joint; and horrible, indeed, must have been the treatment of morbus coxarus. Cancerous growths were to be burned, not in the center, but at the circumference; and tuberculous leprosy was to be treated by fire alone. All this recalls to mind one of the aphorisms laid down by Hippocrates, fifteen centuries before the time of Albucasis: "Those diseases which medicines do not cure, iron cures; those which iron cannot cure, fire cures; and those which fire cannot cure are to be reckoned wholly incurable."

The second part of the *Chirurgia* of Albucasis deals with those operations which are done by means of cutting instruments. Nearly one hundred different operations are described by him; and among them are: phlebotomy, lithotomy, laryngotomy, paracentesis, castration, amputations, and operations for the couching and extraction of cataract, for the excision of tumors, for the cure of hemorrhoids, and many other standard surgical procedures. He was the first surgeon to use the silver catheter, the instrument of Erasistratus having been manufactured out of copper. The work of Albucasis contains the first systematic description of the surgeon's armamentarium, with illustrations. His book contains a description of a case of extra-uterine pregnancy, in which the fœtus was discharged through an abdominal fistula; and this is probably the first case of the kind on record.

AVERROES.

The Christian as well as the Saracenic world has done honor to Averroës, a philosopher and physician, esteemed by many as superior to Aristotle himself. He was born at Corduba, the capital of the Saracen dominions in Spain, in the year 1166, and died in Morocco in 1195, or, as some writers state, in 1206. Thoroughly instructed in Islamitic law, Mohametan theology, Aristotelian philosophy, and the medical science of the Arabian schools, Averroës became famous for extraordinary erudition, and was called to the court of the Caliph, Jacob Al-Mansor, King of Mauritania. He appointed Averroës supreme magistrate and priest of Morocco and all Mauritania.

The rise of Averroës had been rapid, and excited the envy of his rivals in Corduba. A charge of heresy, signed by one hundred witnesses and accompanied by evidence secured by those who had attended his lectures, was sustained, and the Caliph punished Averroës for teaching those things

which were contrary to the Mohametan religion. His goods were confiscated and he was obliged to reside among the Jews in the outskirts of the city. It is stated that he became an object of general persecution. From this unpleasant situation he managed to escape, and, after many vicissitudes extending over a long period, he was restored by royal mandate to all his former honors.

Averroës was a free-thinker and has been called "the Mohammedan Spinoza." As regards his medical knowledge, Moir says: "As far as regards medicine, it is evident that, if he loved Galen much, he loved Aristotle more; and wherever their doctrines are discordant, he shews



Averroës.

cause why we should adhere to the latter. At first, like him, he regarded the heart as the center of the vascular system, and the source of sensations; but latterly he came, like Plato, to divide these functions between the heart, the liver, and the brain; making the first the origin of the arteries; the second the source of the veins, and the nutrition conveyed through them; and the last the seat of sensation."

"His principal work, entitled *Kouullyath*, or the *Colliget*, and dedicated to Abdelech, the Miramamolin of Morocco, proceeds on the idea of combining the dialectics of Greece with medical science; and he sets out by warning his readers that they may not be able to follow him in his

reasonings, or appreciate their truth, without an acquaintance with logic. Indeed, it is evident that Averroës attended to medicine merely as a favorite branch of general study, and that his mind was often destined to occupations widely different from the calm pursuits of the physician. His *Colliget* contains a digest of the whole science of medicine, and is divided into seven books. We would look in vain, however, through its pages for anything new regarding practice; but although we are prepared to find much more of the philosopher than the physician, to Averroës must be conceded the merit of luminous and systematic arrangement—a rare quality in medical writings. His pathology differed little from that of Avicenna, as he explained the symptoms of each particular disease according to the inherent forces of the parts affected. He endeavored to bring into disrepute the doctrine of the degrees of medicine, which, introduced by Alkheni, had maintained its popularity and ascendancy over every other theory, with almost all his medical successors, as we have already had occasion to remark; and very pertinently asks, ‘On what grounds were geometrical proportions admitted in preference to arithmetical ones?’ He has given some admirable remarks on the application of general principles to particular cases; and reminds the physician that not only are therapeutic laws modified by age, climate, and constitution, but that experience and judgment should always be allowed to supersede these, when they apparently stand in opposition. Averroës is the first author who says that small-pox is a disease to which the human constitution is only once subject.”¹

The portrait of Averroës presented herewith is from a lithograph of the painting by Raphael, now in the Vatican. What authority there may have been for it, I am unable to state.