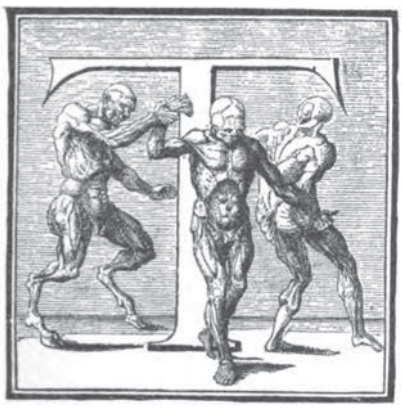
HISTORICAL AND BIBLIOGRAPHICAL NOTES.

A SERIES OF SKETCHES OF THE LIVES, TIMES AND WORKS OF THE OLD MASTERS OF ANATOMY AND SURGERY.

By GEORGE JACKSON FISHER, M. D.

XVIII. ABÚ BECR MOHAMMED IBN ZACARÍYÁ AR-RÁZÍ, COMMONLY CALLED RHAZES.

852—932.



THE writings of the Arabian physicians were the almost exclusive authorities in medicine for several centuries during the Dark Ages. They were not merely the great repositories of medical and surgical science for the Saracens, all the Arabic-speaking nations, and the Persians, but they were equally authoritative throughout Europe during the decline and almost extinction of Greek and Latin learning and literature.

How did it come to pass that the Arabians were so long the conservators of medical science, and the dominant authorities in medicine throughout Western Asia and all Europe for several consecutive centuries? Why were the Greek and Roman medical luminaries eclipsed and the

Moslem crescent substituted as the light of the world? Were the Arabians actual cultivators and original investigators, real discoverers and genuine improvers of the science and art of medicine and surgery? What was the cause of their long supremacy in medicine? What were the sources of their knowledge? What is the character of their writings? What did the middle ages owe to them? Is anything to be learned from them at this day? Are all the ponderous folios of Arabic medicine that bend the shelves of my antiquarian medical library so much trash and lumber? Is there no gold in these old mines? Have the voluminous works of Rhazes, Avicenna, Hally Abbas, Albucassis, Avenzoar, Averroes, Mesue the elder and the younger, Serapion, and the rest of them, passed deservedly and forever into utter oblivion?

These are interesting questions to the medical historian, to a brief and imperfect answer of which I will devote a few pages, which will serve as an introduction to several individual sketches, of some of the most famous Arabian medical authors, which I propose to write.

In the latter part of the third century of the Christian era, Sapores the First, king of the Persians, married the daughter of the Roman emperor Aurelian, who sent several Greek physicians with her to her Oriental home. It is said that these court physicians exerted themselves very successfully in propagating the medical doctrines of Hippocrates among the Persians. The influence of these physicians became so great that Sapores soon after founded a school of medicine at his new Capital Jondisabour (Grandisapora, or Nisabur), which school, by the munificent patronage of his successors, rose in time to great celebrity. The most illustrious professors and authors which the Arabians have ever produced, Rhazes, Hally Abbas, and Avicenna, were all educated at this and other eastern parts of Persia. This

was probably the first introduction of Greek medicine into Eastern Asia.

The next definite channel by which the medical literature of the Greeks was carried into the East was through the Nestorians.

About the year 489, the religious zeal of the emperor Zeno put a stop to the Nestorian school at Edessa, the "Athens of Syria," where the Greek philosophy had long been cultivated. The banishment from Edessa of this sect of heterodox Christians, drove many of the Nestorian scholars to Eastern Persia, where they were heartily welcomed. At Grandisapora, the medical school above alluded to, was already founded, whence Greek medical science, and philosophy, by the aid of this immigration of the Nestorians, soon spread over the lands of Iran.

Mahomet flourished from the year 622 to 632, at which time Hareph-Ebn-Kaldaht, a pupil of the Greek medical school of Grandisapora, came to Mecca, where he settled and received the commendations of the prophet for his medical skill. He was afterwards appointed physician to his successor, Abu Beker ; rose high in personal favor ; and was poisoned with him.

In spite of all the misfortunes that had befallen Alexandria, it still continued in the ninth century to be the centre of civilization and science, and, by means of her large commercial transactions with the cities of Mecca and Medina, knowledge and science were gradually disseminated throughout the uncultured regions of Arabia. The taking of Alexandria by the Saracens, the sacking and destruction of its famous library, was, probably, the period when the Arabians first procured the works of the old Greek medical writers. It is quite certain that the destruction of this great library at that time was not as complete as is commonly believed to have been the case. The Arabians were

most anxious to destroy heterodox and idolatrous books, while they entertained a selfish respect for any means of preserving health and prolonging life, and, hence, they doubtless preserved many of the valuable works which related to medicine and surgery. Tradition informs us that Mohammed himself was fond of the study of medicine and appreciated the results of experience in the healing art. The old Arabian historian of Almamon, Abulpharagius, tells us that many manuscripts were preserved from destruction by private hands, and were transcribed and diffused by learned men, as is quite reasonable to believe. The Alexandrian school of medicine was long after kept up, and some of its professors embraced the faith of the Prophet.

The sect of Monophysites followed in the steps of the Nestorians, and employed themselves in the East in multiplying Syriac versions of the logical and medical treatises of the Greeks. The Christians who fell under the Moslem yoke were principally Syrians who were highly civilized, being cultured in science, literature and art. These were the industrious translators of the Greek writings on philosophy, poetry, natural history, and medicine. From these Syriac versions many of these works were subsequently translated and incorporated into Arabic literature.

Medicine having been introduced among the Arabs under the most fortunate auspices, principally through the medium of translations from the Greek, the establishment of a college at Baghdad by the Caliph Almanzor, established it on a solid foundation. The lovely city of Baghdad was founded by this Caliph about the middle of the eighth century, after having established a permanent and prosperous peace, and here the arts and sciences were destined to receive every encouragement and flourish, as they only can in such a state of society. This college, or university as it should be called, became the most famous of any in all the

Mussulman dominions. A medical college was established, public hospitals, and laboratories for the benefit of students. The culture and education of the medical faculty was so enlightened, that powers were granted to examine all persons who intended to devote themselves to the medical profession. So great was the number of professors and pupils which flocked to this celebrated centre of learning from all parts of the world, that at one time it was no less than six thousand.

"In the days of the Caliph Haroun Alraschid" (or, el Raschid), who began his reign in the year 792, the beautiful city of Baghdad was made magnificent. Alraschid—how lovely and sweet this name falls upon the ear—what charming memories of those delightful Abrabian Nights tales does it recall—Haroun Alraschid erected several of those grand and picturesque, gilded-domed and minareted Mosques, increased the number of hospitals and colleges, and established public schools for the education of the masses. This Caliph patronized and encouraged the Syrian Christians, by the most liberal benefactions, to still more extensively translate from the Greek their most precious scientific and philosophical works.

Almamon, the seventh Caliph of the line, reigned at a time when the people were thoroughly imbued with a love for learning and intellectual pursuits. He rendered his name immortal by his exertions in favor of the sciences. His munificent patronage embraced every department of mental culture. The arts and sciences flourished, under his fostering care, and his influence extended to other Mahometan states, and brought them from semi-barbarian to a high degree of civilization.

Almamon solicited the Grecian emperors to send him all the books on philosophy and science which they had, which was accordingly done, whereupon he employed the best of

translators to render them available to his own people, encouraged their reading and study of them, and such was his zeal, that often with delight he listened to the lectures and disputations on these subjects. He ordered astronomical instruments to be made, in order to take observations of the stars, and in every way was the royal patron of learning.

Mesue the Elder was a Chaldean of the Christian religion, who joined the Nestorian sect. He settled at Baghdad, was made the physician of the son of Haroun Alraschid, the viceroy of Korassan, inspired the young prince with a love for letters, and did much himself in translating the Greek classics. The writings of the elder Mesue are lost, a few fragments only are preserved by Rhazes, of which I shall have occasion to speak further on.

The last of the translators of whom I shall make special mention is the illustrious scholar, pupil of Mesue, Honain-Ben Izhak. He was a Christian, born in Hira, became displeased with the treatment which he received from his master, Mesue, left Baghdad, spent two years in Grecian territories, became master of the Greek language, made a great collection of Greek classics, returned to Baghdad, soon after went to Persia, where he perfected himself in the Arabic tongue, then settled permanently in Baghdad. He lived a hundred years. (A. H. 164–264—A. D. 786–886.) The translations of Honain never ceased to be in vogue. He translated into Arabic, the works of Hippocrates, Galen, Pliny, Alexander of Aphrodiseum, Ptolemy, and Paulus Ægineta.

Such were the several modes by which the Arabians came to be the possessors of Greek learning, and, what concerns us most, of Greek medical literature. Arabian medicine was the medicine of the Greeks banished from its native country, and nurtured, though not specially improved, by its temporary foster mother, yet, more or less modified by

oriental influences. Europe at that time was too benighted, ignorant and rude, to be the home of science and learning, and knowledge took her "flight into Egypt," and then further East; and so it came to pass that the hitherto semi-barbarian Arabs and Persians kept the intellectual lamps trimmed and burning until Europe should awaken from its long stupor and re-assert her mental energies, establish free thought, and put her oppressors beneath her feet.

Although the Arabians exhibited but little originality in any of the sciences, and blindly embraced with an almost superstitious reverence the Greek teachers, the Arabic translations and commentaries, completely usurped the place of the originals, nearly extinguished the name of the Greeks, whose works were seldom or never looked into until the end of the fifteenth century. The strangest part of the story is that all this science was brought back to Europe in the garb of the Arabians, and from the eleventh to the end of the fifteenth century was the all-prevailing authority among the learned. So much was this the case, that the studies of philosophy and science were called the "Studies of the Saracens."

The twelfth century exhibits the decadency of liberal mental activity among the Caliphs, and the gradual ascendancy of Turkish races, with its Mahometan faith and cruel intolerance. The science of the Arabians ended when the sceptre of the Moslem world passed from the dynasty of Persia. In the middle of the twelfth century the library of philosophical books at Baghdad were burned by command of the Caliph; and in 1192, at the same place, the books of a physician were first publicly cursed, and then committed to the flames, the owner, in the meantime, being cast into prison. The same acts were repeated in Mahometan Spain.

This introduction would be sadly defective should

I omit to mention the state of learning under Moorish rule in Spain in the middle ages. The period of scientific development in Spain was shorter than it was in the East. In the reign of Al-Hakem the Second (961–976) philosophy and science were prosecuted and cultivated with great enthusiasm in Spain by the "Society of Barsa." Books, old and new, were procured at any price from Cairo, Alexandria, Baghdad and Damascus, for the library of the Prince. Not less than twenty-seven free schools were opened in Cordova for the education of the poor, and useful knowledge was at that time more freely diffused in Moslem Spain than in any other part of Europe. The Mosques were crowded with eager listeners to the lectures on science and literature, law and religion. All was soon changed.

The usurping successor of Hakem ordered the doctors of the sacred law to examine the royal library, and every book treating of philosophy. astronomy, and other forbidden topics, were condemned to the flames. The spirit of research, however, was not entirely crushed under this severe rule. In the twelfth century philosophy was highly cultivated by Averroes and other illustrious men. But about 1195 the old distrust of philosophy revived, the learned men were banished in disgrace, works on philosophical subjects were ordered confiscated and burned; and the son of Almansor condemned the philosopher Ben-Habib to death for the crime of philosophising.

[To be Continued.]

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THE complete name of the physician commonly called Rhazes, is given above. The various modes in which this name has been written, as is also somewhat the case with other Arabic names, is exceedingly perplexing; indeed, in some instances it is almost unrecognizable. Thus we find it disfigured: *Rasaeus*, *Rases*, *Rasis*, *Razeus*, *Razi*, *Razis*, *Razee*, *Rhazeus*, *Rhazis*, *Arrasi*, *Ar Razee*, *Ar Razi*, *Errasis*, etc., he was also called *Abubeter*, *Albubecar*, *Albubeter*, *Abubater*, *Abuchare*, *Bubikir*, etc.

Rhazes was born in the town of Rai, from which he derived his name, Ar-Rázi. This town is in the north of Irák 'Ajemí, near Khorasan in Persia, at that time a province of Baghdad. The exact year of his birth is not known; it was

probably about the middle of the ninth century. "In his youth," says Ibn Juljul (quoted by Ibn Khallikán in his *Biog. Dict.*, v. iii., p. 319), "he played on the lute and cultivated vocal music; but, on reaching the age of manhood, he renounced these occupations, saying that music proceeding from between mustachios and a beard had no charms to recommend it. Having then applied himself to the study of medicine and philosophy, he read the works on these subjects with the attention of a man who seeks to follow the author's reasonings step by step; and he thus acquired a perfect acquaintance with the depths of these sciences, and appropriated to himself whatever truths were contained in the treatise which he perused. He then commenced attending the sick, and composed a great number of books on medicine." According to Abú-l-Fedá, he was more than forty years old when he began to study medicine; his tutor in the healing art being At-Tabari, to whose works Rhazes frequently refers.

Rhazes also traveled extensively into Jerusalem, Syria, Egypt, Persia, and even as far as Spain, the better to perfect himself in medicine, by conversing with botanists, oculists, and surgeons. Leo Africanus relates the following incident, which occurred in Spain. One day, in the streets of Cordova, Rhazes fell in with a crowd surrounding the body of a man, who was said to have suddenly fallen down dead. He caused him to be beaten all over with rods, and particularly on the soles of his feet, by which means, in less than a quarter of an hour, he restored him to animation. The populace who at first derided him, now lauded him for having performed a miracle Rhazes frankly declared "what I have done I once saw practiced in the desert where a fellow traveler fell as this man has fallen; an old Arab ran and cut some switches, and distributed them for administration, as we have done, and with the same effect." His friend, the

Caliph Almanzor, said the country wherein he resided could, at least, boast of possessing a Galen; to which Rhazes replied, "experience is of more use than a physician." Rhazes, having become master of his profession, settled at Baghdad, and so great was his reputation for learning and skill, he was selected, from amongst more than a hundred very eminent competitors, as the director and head of the grand hospital of that capital (Amoreaux, *Essai Hist. et Littéraire sur la Méd. des Arabes*, p. 100). He is said to have been the ablest and most distinguished physician of his age; a perfect master of the art of healing, skilled in its practice and thoroughly grounded in its principles and rules; so that pupils travelled from distant countries to receive the benefit of his tuition. He was likewise called to distant parts of the country to attend several princes of renown. He was a person of studious and industrious habits, and of a remarkably generous and liberal disposition, so much so, that, while he frequently relieved the wants of his poorer patients, he himself lived and died in comparative penury. Several of his sayings have been preserved by his biographers—*e. g.*: "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;" and again, "With a learned physician and an obedient patient, sickness soon disappears;" "Treat an incipient malady with remedies which will not prostrate the strength;" again, "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 and certainty in medicine is an aim which is not to be attained; and the healing art, as is described in books, is far inferior to the practical experience of a skillful and thoughtful physician."

It must not be understood by this aphorism that Rhazes was indifferent to the writings of medical men. It will be

seen by the following translated extract from his *Liber ad Almansor* (iv. 32) concerning "What kind of Physician is to be made choice of and approved," (Freind's *Hist. of Physic*, vol. ii, p. 60), that Rhazes placed a very high estimate upon medical literature and urged the student to pursue it diligently and profoundly.

"It is highly necessary to be considered, in the first place, how, and in what manner the physician you intend to choose has employed his time, and how he has spent it in his private studies. If he has been very industrious in a diligent perusal and examination of the books of the ancient physicians, and has carefully read and compared their writings, we may justly form to ourselves a good opinion of him. On the contrary, if we find he has spent the greater part of his time in anything rather than in what we have mentioned; if he seems to be much delighted in music, drinking, and other ill habits; we can entertain no great opinion of him. But if it is evident he has been all along very studious, the next point to be considered is, his genius and sagacity, whether he has been very conversant with men able to dispute with and oppose him, and what just grounds we have to think he will ever arrive to the talents of inquiring into, as well as of curing, distempers; we ought to know in the next place, what time he has spent in the conversation of those persons we just now mentioned, and whether he has acquired by their means the art of judging of a distemper, as well as relieving it. It will be material, moreover, to observe whether he well understands what he pretends to have studied, or no; if we find he does, the next inquiry will be whether he has been used to attend the sick, and happy in the cure of them. We ought to be satisfied, whether he has practiced in popular cities, where there are great numbers of patients, as well as of physicians; and if upon inquiry we find that he is well qualified as to both these particulars, we may safely pronounce

him an able physician, and to be made choice of before many others. But if it should be found, he were failing in *one* of these qualifications, it were rather to be wished he were wanting in the practical part (I do not mean to be utterly unacquainted with at least some part of it), than to know nothing at all of the learning of the ancients. For he that is well versed in and has well digested, the writings of the ancient physicians, will with a little help of practice, easily attain to what others, who are wholly strangers to this branch of learning, can never be able to compass; those I mean, who know little themselves, and owe all the little knowledge they have to the long conversation they have had with others, who were practiced in places where both physicians and sick do abound. But if any pretender to letters sets up for a master, without having any learning himself; or, if he has some smattering, understands little of what he reads, or at least has not arrived to the use and understanding of his profession; such a one is not much to be relied upon, nor are his abilities to be confided in. Neither is it likely for him to become a proficient in his own way. For it is not possible for a man, though he lives to a great age, to attain to this part of knowledge so considerable in itself, unless he treads in the track of the ancients; the extent of this science far exceeding the bounds of human life; and the same thing is not in this alone, but in many other professions. The authors who have improved this art are not a few, but they are not to be comprehended within the compass of a few years; a thousand writers perhaps for a thousand years have been improving this art and profession, and he that industriously studies those authors, will, in the short period of life, find out as much, as if he had lived a thousand years himself, or employed those thousand years in the study of physic. But if the perusal of ancient authors comes once to be slighted, what can any

single person find out, or what proportion can his personal abilities, though much superior to others, bear to the immense treasures of the ancients? In short, he that reads not the books of the learned physicians, nor understands something of the nature of diseases, even before he comes to visit, will when he comes to attend the sick, either through ignorance or mistake, overlook the distemper, because he does not beforehand understand anything of it."

In contrast with his opinion of what a physician should be, we are informed in the same work of the infamous character and practices of the numerous quacks which infested Arabia and Persia in that day, as a similar herd continue to prey upon the credulity of, even enlightened, people in every land at the present time.

"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 they have of tormenting and putting persons to pain in their last hours, for no reason at all. Now some of them profess to cure the falling-sickness, and thereupon make an issue in the hinder part of the head, in 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 or lizzards 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 composed of liver, etc. Some are confident they can take out the white specks in the eye. Before they apply the instrument to that part, they put in a piece of fine rag into the eye, and, taking it out with the instrument, pretend 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 spurting the water out of their mouths, pretend it came from the ear. Others pretend to get out worms, which grow in the ear, or 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 some time, they take out again? Some, when they have taken out a stone from the bladder, persuade their patients that still there's another left; they do this, for this reason, to have it believed that they have taken out another."

Rhazes continues to recount numerous other frauds practiced by quacks in his day, and ends his chapter with the following sensible observation.

"Such counterfeits could not pass with discerning men, but that they did not dream of any fallacies, and made 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 so fatal to many."

More than a thousand years have rolled away since Rhazes wrote. It is sad, indeed, to contemplate the lamentably slow progress of mankind in ridding itself of fraud and counterfeit; and particularly, of impostors and quacks in medicine, The world needs to adopt a civil service reform, and require at least that no person be allowed to practice the healing art who has not received a medical education of a standard fully equal to the existing state of knowledge of the several contributary sciences which make up *Medicine*.

The exalted reputation of Rhazes among the Orientals is sufficiently attested by the surnames and appellations by which he was referred to. His original researches gave rise to the surname of the *Experimentator;* his extensive practical observations to the *Experienced;* and his erudition and the extent of his writings to the *Galen* of the Arabians.

Rhazes was certainly a very voluminous medical writer. Abi-Osbaia counted up no less than two hundred and twenty-six treatises, of which, Rhazes addressed ten books to his friend, the Caliph Almanzor. The titles of two hundred of his treatises have been preserved to the present time. He wrote in the Arabic language, notwithstanding he was a native of Persia. The principal part of his works were medical, consisting of short treatises; but he also wrote on various philosophical subjects, and at least one treatise on alchemy. Wüstenfeld's *Geschichte der Arabischen Aerzte und Naturforscher*, contains a complete catalogue of all the known titles of Rhazes' works. Most of these works are not now extant; several have been translated into Latin and published, and some of them have remained in MS. in several of the libraries of Europe. The "Treatise on the Small-Pox and Measles" is the only work of Rhazes which has been printed in Arabic.

This treatise was translated from the original Arabic into Syriac, from that language into Greek, and subsequently into Latin. The first Latin translation, made directly from the Arabic, was published by Dr. Richard Mead in 1747, he having had it translated from a MS. which he procured from the University of Leyden, which is rich in Arabic MSS. The Arabic text was, for the first time, published by Dr. Channing, at London, in 1766, together with his own Latin version. Dr. Channing's Arabic text is from the Leyden MS. Several Greek MSS. of this treatise of Rhazes are now existing in European libraries. Only two MSS. of

the Arabic text are known to exist at this time in Europe; the one in Leyden, above referred to; the other among the Codices Naniani, at Venice.

The first English translation, made directly from the original Arabic, was published by the Sydenham Society, in 1848, 8°, pp. 212. This is a very valuable book, containing many interesting notes and illustrations, to which I am much indebted, and of which I have made very free use in the preparation of this sketch. From a list of the various editions of Rhazes on the small-pox and measles, which Dr. Wm. Alex. Greenhill has given in the Sydenham edition, it appears that no less than thirty-six editions have been printed since the year 1498. This attests the high value in which this ancient work has been held even in modern times.

As an example of the easy and peculiar style of this writer, I will transcribe, from Greenhill, the commencement of Rhazes' preface to this work. The first sentence is from the Koran, and is used by all Arabian writers as the beginning of every work:

"In the name of GOD, the Compassionate, the Merciful."

"Abú Becr Mohammed Ibn Zacarîyá says: It happened on a certain night, at a meeting in the house of a nobleman of great goodness and excellence, and very anxious for the explanation and facilitating of useful sciences for the good of mankind, that, mention having been made of the small-pox, I then spoke what came into my mind on that subject. Whereupon our host (may GOD favor men by prolonging the remainder of his life) wished me to compose a suitable, solid and complete discourse on this disease, because there has not appeared, up to this present time, either among the ancients or the moderns, an accurate and satisfactory account of it; and, therefore, I composed this discourse, hoping to re-

ceive my reward from the Almighty and Glorious GOD, and awaiting His good pleasure."

The largest, and perhaps the most important work of Rhazes, is the book commonly called *Continens*, Al-Háwí, or *Comprehensive* book. It is divided into two parts, and sub-divided, sometimes into twenty-five, and sometimes into thirty-seven books, and fills two folio volumes. It seems to have been a sort of common-place book, being made up of notes, cases, and erudite extracts, without methodical arrangement, and apparently never intended for publication; at least, not in the confused state in which they have descended to us. The first part treats of the diseases of special parts and organs, beginning with the head and ending with the feet, as was done by subsequent medical writers for many centuries. The second part treats of diseases of a more general character, such as sometimes have their seat in one part, and then in another, as phlegm, erysipelas, the plague, fever, wounds, etc. The whole forms an undigested abridgment of medicine and surgery. Sometimes it repeats the same matter in nearly the same words; in other cases much is omitted that we would expect to find in it. This mass of valuable facts, practical observations, and numerous quotations from former writers, was not published until after the death of Rhazes, and then it suffered much by the interpolations of the editors.

The "Continens" is universally considered by scholars of antiquarian medicine to be one of the most valuable and interesting medical works which has survived the ravages of time. Haller—even Haller—who could not get to the end of the "Canon" of Avicenna, read the whole of the "Continens" without weariness or disgust (*absque taedis*), and has given (*Biblioth. Med. Pract. v. i., p.* 384 *et seq.*) a fuller analysis of its contents than is elsewhere to be found.

No part of the Arabic text has ever been printed, though MSS. are existing in the Bodlean library at Oxford, England, and also in the library of the Escurial, in Spain. Feragius translated it into Latin, in which language it has been printed in not less than half a dozen editions, first in 1486, at Breschia, and five times at Venice, from 1500 to 1542, always in two folio volumes.

Freind calls it the "Continent," and gives the opinion which Haly-Abas entertained of it, namely, that "it takes in everything relating to Physick, down from the time of Hippocrates to that of Isaac; but is writ in so crabbed and concise a manner, that it explains nothing as it should do. He omits the Naturals and Complexions. He fancies two reasons for Rhazes writing the book as he did; either that he designed it for a common place, which he might refer to in case of old age or forgetfulness; or if any accident happened to his other books, this alone would be sufficient. Therefore, he says, he paid no regard to the composition, or elegance of the work; so that if ever he did intend to put it into another dress, it is, however, now left very imperfect and embarrassed; and for this reason most physicians were deterred from transcribing it. So that in his time, he says, it was very scarce, and this seems to have been the chief design of Haly-Abas in compiling his great work, a work very nearly as large as the *Continent*."

Rhazes quotes from Serapion in the *Continens*, in some instances, word for word. He also, either quotes from the ancient Greek medical writers, or writes in remarkably par allel lines with them. In turn, the Arabian authors, who followed Rhazes, drew from his works for generations as from a common fund of knowledge. Most of the writers subsequent to Rhazes—Alsaharavius, and even Avicenna himself—compiled their treatises largely from the several works of this most distinguished of the Arabian authors, as

well as the most ancient one whose books on medicine have escaped oblivion. Thus it would appear that Arabic medicine was founded upon the Greek, and that the Arabian writers borrowed extensively from each other.

As to the utility of the Arabian medical writings, it is probable that their commentaries on the Greek medical authors supplied nutriment more readily assimilated by the pupils of that day than the pure text would have done.

In regard to the character and value of improvements to medicine and surgery made by the Arabs, they will be pointed out in this and the other sketches which are to follow, but, in passing, it may be said that they were few in number and not very important in character. They introduced chemical remedies, they added considerably to the materia medica and to botany. They were first to make pills and electuaries, and first to make syrups of sugar, in place of the honey of the Greeks. They added little or nothing to anatomy, yet surgery was much improved by them, particularly by Albucasis.

[To be Continued.]

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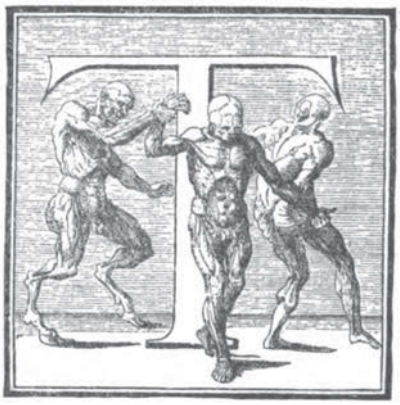
XVIII. ABÚ BECR MOHAMMED IBN ZACARÍYÁ AR-RÁZÍ, COMMONLY CALLED RHAZES.

852—932.



THE first employment of chemical preparations in the treatment of disease, is, by common consent, attributed to Rhazes, and not to Avicenna, as Le Clerc alleges. From his mention of corrosive sublimate and mercurial ointment, various preparations of arsenic, the sulphates of copper and iron, saltpetre and borax, it is evident that the science of chemistry had made much greater progress in his day than most of us are aware of. (*Liber Antidotarum*, vide Moir's *Outlines of the Ancient Hist. of Med., etc.*, 12°, Edin., 1831, p. 224.)

He gives the first account of *Oleum Benedictum*, or *O. Philosophorum*, and says it was made in a glass retort, such as will bear the fire, and well luted, increasing the fire gent-

ly and by degrees till a red oil comes off by distillation. (Freind's *Hist. of Physic.*, vol. i., p. 278.) What Le Clerc calls distilled rose-water is not made by distillation, but by boiling. The old "waters" of plants were decoctions.

This is the first mention made by the ancients of true distillation, glass retorts, luting, etc.

It would appear that for a long period previous to the time of the great French surgeon, Guy de Chauliac, neither Celsus, the Roman, Aëtius the Greek, nor Rhazes the Arabian, were known to any of the scholars of the West. Charles of Anjou sent an embassy to the King of Tunis, expressly to obtain the *Continens* of Rhazes, so important was this work then considered to be.

From anatomy being a branch of study rigorously interdicted by the Mahometan religion, it may be readily inferred that little progress was made in that department by the Arabian physicians, who were thus compelled, almost slavishly to abide by the writings of the Greeks. But although the works of Rhazes are not particularly remarkable in an anatomical point of view, they are much more so than Portal seemed to be aware of, when he says they contained no observations different from those of his predecessors (*Hist. de l'Anat.*, t. i., p. 142). In treating of the operation for fistula lachrymalis, he cautions 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. (Cont. lib. ii., c. 5). He also pointed out the laryngeal nerve, and distinguished it from the recurrent, which is sometimes double on the right side. (Cont. lib. iii., c. 4.) The merit of this discovery has also been unjustly claimed for recent times. (Moir's "*Outlines*," p. 215–216.)

The next important work of Rhazes of which I shall speak is that which is generally called *Almansor*, or *liber ad Al-*

mansoreum, Cetábu-l-Mansúrí, or work dedicated to the Caliph Al-Mansûr.

Dr. Greenhill says it was certainly written before the "Treatise on the Small-Pox and Measles," as Rhazes refers to it in this work. It was probably written after the "Continens." It is composed on somewhat the same plan as the works of Paulus Aegineta, Hally-Abbas, Avicenna, etc., and was designed by the author for a complete body, or rather compendium of Physic; where what had been said confusedly in the "Continens" is much better methodized under proper heads, and reduced into a regular system.[1] It consists of ten books, the first of which treats of anatomy and physiology, taken largely from Hippocrates, Galen, and Oribasius. The second book, on temperaments, comes from the same sources, and from Aëtius and Paulus Aegineta. The third book, on food and simple medicines, is gleaned from all of the above authorities. The fourth book, on the means of preserving health, comes from Galen, Paulus, and Aëtius. The fifth book is on skin diseases and cosmetics, and is taken from Galen *De Compos. Med. sec. Locos.* The sixth book treats of the diet of persons on a journey. The seventh book is entirely surgical, and is taken from Hippocrates, Paulus Aegineta, Oribasius, and Aëtius. The eighth book, is on poisons, from Paulus (lib. v.). The ninth book, on the treatment of diseases of all parts of the body, is taken from all of the above cited authorities. The tenth and last book treats of fevers, and is from the same sources as the ninth.

The chief excellence of this work lies, not so much in its originality, of which it can boast of but little, excepting a considerable number of illustrative cases which he had observed in practice, as in its systematic arrangement and com-

[1] Greenhill's edition of *Rhazes on Small-Pox, etc.*, and Freind's *Hist. of Physic*, vol. ii., p. 46, *et seq.*

modius form. The ninth book was so highly prized in the middle ages, that it was publicly read in the schools, and commented upon by the most learned professors for more than a hundred years.

It is from the "Almansor" that the above extracts concerning the choice of a physician, and concerning impostors were taken.

The Arabic text of this work has never been published, with the exception of a single chapter (lib. ix., cap. 7). The whole or part of it is to be found in MS. in the libraries of Madrid, Dresden, and in the Bodlean at Oxford. (MSS. 529, 577, 592.) It was translated into Latin by Gerard of Cremona, and several times published in the fifteenth and sixteenth centuries together with the smaller works of Rhazes.

The last of his works of which I shall give any account is the *Takstmu-l-'ilal*, or "Divisio Morborum," commonly called "Divisiones." This is much shorter than the "Liber ad. Almansorem," and it is believed to have been written some time after it. It is a kind of manual of the symptoms and treatment of diseases, beginning at the head and descending to the feet. The Arabic text has never been printed, and the only MS. known to exist in Europe, is in the Nanian library at Venice. It was translated into Latin by Gerardus Cremonensis, and published with the "Liber ad Almansorem."

I should have mentioned before that Rhazes wrote an entire work on the diseases of children, which is the first treatise written by the ancients on this special subject, as far as our knowledge extends.

We are informed, by Ibu Juljul, that Rhazes composed, for Al-Mansúr, a treatise in which he endeavored to establish the certainty of Alchemy, and that he set out from Baghdad in order to present it to him. Al-Mansúr testi-

fied great satisfaction on examining the work, and, having rewarded the author with a thousand dinars (about five hundred pounds sterling), he said to him, "I wish you to put in practice what you have laid down in this book."

"That is a task," replied Rhazes, "for the execution of which ample funds are necessary, as also various implements and aromatics of genuine quality; and all this must be done according to the rules of art, so that the whole operation is one of great difficulty."

"All the implements that you require," said the Caliph, "shall be furnished to you, with every object necessary for the operation; so that you may put in practice the rules contained in your book."

Perceiving the prince to be in earnest, Rhazes hesitated to undertake the task, and declared his inability to perform it; upon which Al-Mansúr said, "I should never have thought a philosopher capable of deliberate falsehood in a work represented by him as a scientific treatise, and one which will engage people's hearts in a labor from which they can derive no advantage. I have given you a thousand dinars as a reward for this visit and the trouble you have taken, but I shall assuredly punish you for committing a deliberate falsehood." He then struck him on the head with a whip, and sent him off to Baghdad with a stock of provisions for the journey. This blow was considered to have been the occasion of the formation of a cataract, which afterwards rendered Rhazes completely blind; though some writers attribute the failure of his sight to the quantity of beans he was accustomed to eat. He was at first inclined to have an operation performed on his eyes, but when the surgeon, who came to perform it, could not tell him how many membranes the eye contained, he refused to let him touch them; and when some one represented to him, that if he would allow the operation to be performed

he might probably recover his sight, he said, "No, for I have seen so much of the world that I am weary of it."

He died at an advanced age, either A. H. 311 (A. D. 923) or perhaps more probably A. H. 320 (A. D. 932).[1]

The remainder of this sketch will be devoted to some of the special modes of treatment adopted by Rhazes in his surgical practice. In the preparation of this part of my sketch I shall be indebted chiefly to the learned commentaries of Mr. Francis Adams on "The Seven Books of Paulus Aegineta," which were published in three volumes by the Sydenham Society, 8°, London, 1844–'48.

Mr. Adams observes: "In the 'Continens' of Rhazes, that precious repository of ancient opinions on medical subjects, if there be any surgical information not to be found in Paulus Aegineta, it is mostly derived from Antyllus and Archigenes."[2]

Blood-letting was much in vogue in the days of Rhazes. Four methods were employed, namely, leeching, cupping, venesection and arteriotomy. He gives a full account of the different varieties of leeches. He advises that they be kept in a vessel with water herbs (Cont. xxvii.). Before applying them the part should be smeared with either a little milk or blood. If considerable local bleeding is required, he advises the application of a glass or cupping instrument over the leech bites. Rhazes condenses all that preceding authors have written on venesection, and adds his

[1] The above is taken, quite literally, from Greenhill's ed. of Rhazes on Small-Pox, etc., p. 138, *et seq.*

[2] *Archigĕnes*, a physician, born at Apamea, in Syria. He lived in the reign of Domitian Nerva, and Trajan, (81–117 A.D.) He is regarded as the founder of the Eclectic School of Medicine. He was also one of the pneumatic sect. He enjoyed a high reputation for some generations after his time. He wrote on the pulse, on chronic diseases, pharmacy, etc. Galen often cites him with eulogiums. Only fragments of his writings now remain. (Anthon's Classical Dictionary.)

Antyllus, or *Antillus*, an eminent physician and surgeon, who lived in the third or fourth century after Christ. He wrote several works in Greek, which are quoted by Oribasius, but are not now extant.

own observations. In acute inflammation he directs that blood shall be drawn from the opposite part, so as to procure revulsion, but in chronic affections, to take it from the inflamed part. In delayed menstruation he drew blood from the saphena, or cupped near the ankle. In vertigo, and in some diseases of the eyes, an artery was opened on the cranium, sometimes the temporal artery, in which case it was afterwards ligated to arrest hæmorrhage.

Rhazes borrows his account of aneurism from Antyllus and Paulus. The operation of Antyllus consisted in tying the artery above and below the tumor, and then evacuating its contents. He states that when aneurism occurs in the hams, groin, or neck, it is dangerous to meddle with it, but that when seated in the extremities, it is easily cured. He speaks of one case cured by compression. (Cont. xxviii.)

The ligature was freely used by the Arabians to arrest hæmorrhage from wounds.

Excision of varices from the legs was a well recognized operation in Arabian surgery more than a thousand years ago. The tortuous varicose veins were carefully dissected from the neighboring parts, with the aid of a scalpel and blunt hook, then a portion of three or more fingers' breadth, of one or more of the veins was cut off and removed. The parts were then dressed with wool dipped in wine and rose-oil, and carefully bandaged. Rhazes also approved of compression for varicose veins. (Cont. xxviii.)

Amputation of the extremities, in cases of gangrene and for other causes, was performed by the Arabians. Rhazes directs that the flesh be stretched upwards and downwards, after it had been divided with the knife, with a linen cloth, so that it may not come in the way of the teeth of the saw. When a rib or other bone required to be sawed off near any important part or organ, he recommends the use of a plate (tabella), to protect the soft spots from the saw. He arrested

the hæmorrhage with the cautery; which practice continued to the time of Ambroise Paré.

The excision of bones was also practiced at that time. Rhazes directs that when a bone connected with a joint is diseased, it should be extracted at the joint. When the os brachii, or tibia, is diseased, he recommends us to extract it entire, but forbids to meddle with the head of the femur or the vertebræ. In another place he declares it as his opinion that when a joint is swelled, and the bone diseased, it will be impossible to effect a cure unless the whole diseased portion of the bone be cut out (Cont. xxix.). Thus we have proof that the ancients practiced excision of the bones and joints. Cooper, Liston and Carnochan, and all our modern surgeons have only repeated their bold surgical operations.

Rhazes strongly inculcates the propriety of promptly resorting to the operation of trepanning the skull, when the bone is fractured and depressed, before dangerous symptoms have supervened. Unless there be pressure on the brain, however, he does not approve of having immediate recourse to this operation.

The extraction of weapons was a very important part of surgery in ancient times. Rhazes gives a full description of the various forms and kinds of weapons employed in warfare, and minute directions for their extraction from different parts of the human body.

Paulus, from whom he quotes, says, "the shafts are made of wood or of reeds; and the heads themselves are either made of iron, copper, tin, lead, horn, glass, bones, and of reeds, too, or of wood." "Some pointed and lance-shaped, some have three points, some are barbed and some are without barbs; and of the barbed, some have the barbs turned backwards, so that in attempting to extract them they fasten in the parts," "some have them diverging in opposite directions like the forked lightning, in order that whether pulled

or pushed they may fasten in the parts. Some missiles have their barbs united by a hinge, which being expanded in the extraction, prevents the weapon from being drawn out." some of these infernal weapons were also poisoned. It is thus seen that considerable skill would be required to extract them and to heal the resulting wounds. Rhazes directs forceps, and when required, the enlargement of the wound by incision.

Catheterism, and injection of the bladder were practiced by the Arabs and Persians. Rhazes gives a fuller account of these operations than any other ancient author.

He directs the use of hot fomentations and warm baths before introducing the catheter. He states that it is best to have the openings of the catheter in its sides, as they are less likely to be obstructed by clots than when in the extremity. He also mentions that he in some cases used a ductile instrument of lead which accommodated itself to the passage. In some cases of urgency, where the catheter could not be made to pass, he resorted to puncture of the bladder.

Rhazes quotes from many authors all that relates to lithotomy, to all of which he adds his own directions. The method of operating is the Celsian, or "cutting on the gripe" which has already been given in the sketches of Celsus, and Germain Colot.

Rhazes describes the operations required to restore lost parts, as lips, ears, the prepuce, etc.; for phymosis, circumcision, imperforate glans penis, and imperforate pudendum.

Rhazes advises the performance of laryngotomy in cases of cynanche (croup) which threaten instant death. The operation was done after the manner laid down by Paulus Aegineta, who is the only one of the Greek authorities who has left a description of the operation. The skin was first stretched with a hook, then divided, the vessels removed aside, then the trachea is to be opened between the third and fourth ring. To close the opening, when no longer re-

quired, pare the lips of the incision so as to make them raw surfaces again, use sutures, but sew the skin only, and not the cartilage.

In cancer of the female breast Rhazes expresses himself rather favorably of complete removal of the organ and afterwards burning the exposed surface with the cautery. (Ad Mansor vii, 9; and Contin. xiii.). Rhazes claims to have had great success in the treatment of sciatica by bleeding freely from the veins of the leg, and by using extremely sharp clysters. He says that he had seen this practice tried in more than a thousand patients, and never saw one instance where it failed, unless the case was so inveterate as to require burning with the cautery.

It would be very interesting to follow Rhazes through many other surgical operations, and particularly what he has written about fractures and dislocations of the bones; but I have already exceeded the limits intended for this sketch. The curious reader who does not care to wade through the barbarous Latin translations of his works can find much of what Rhazes has written in Mr. Adams' commentaries on the works of Paulus Aegineta (vol. ii.), to which I have so often referred.

I have been deeply interested in the delightful study which the preparation of this sketch has required me to make, and sincerely hope that my readers may unite with me in ever-after associating the name and story of Rhazes, the celebrated physician of Persia, with much that is pleasant and profitable in the history of our profession.

Continens: The first edition, which is very rare, *Brixiæ, 2 vols., folio* 1486. *Venet., fol., 2 vols.*, 1500. *Venet., 2 vols., fol.* 1506. *Venet., 2 vols., fol.* 1509, 1511, 1542.

Liber ad Almansorem: Mediolani, fol. 1481. *Venet., fol.* 1494. *Venet., fol.* 1497. *Venet., fol.* 1500. *Lugduni*, 8°, 1510. *Basiliæ, fol.* 1544.

Divisio Morborum: This was published together with the

Liber ad Almansorem and the other smaller works of Rhazes.

De Variolis et Morbillis: Venet., fol. 1498. Paris, 4°, 1528. *Ibid*, 8°, 1529. *Basil.*, 8°, 1529, *Ibid, fol.* 1544. *Lutetiæ* (Paris), *fol.*, 1548. *Argentorati*, 8°, 1549. *Venet.*, 8°, 1555. *Patavii*, 8°, 1555. *Venet.*, 8°, *min.* 1555. *Ibid*, 8°, 1556. All of the above are in Latin. *Poitiers*, 8°, *min.* 1566, in French. *Argent*, 8°, 1570, Latin. *Venet.*, 8°, 1586, Latin. *Londini*, 8°, 1747, Latin. *London*, 8°, 1747, first English version. *London*, 8°, 1748, English. *Gœttingæ*, 8°, 1748, Latin. *Parisiis*, 8°, 1751, Latin. *Neap.*, 4°, 1752, Latin. *London*, 8°, 1756, English. *Parisiis*, 8°, 1757, Latin. *Neap.*, 4°, 1758, Latin. *London*, 4°, 1762, English. *Augsburg*, 8°, 1762, in German. *Edinburgh*, 8°, 3 vols., 1763, English, among Mead's works. *Edinburgh*, 12°, 3 vols., 1765, English, with Mead's works. *Londini*, 8°, 1766, in Arabic and Latin (Channing's edition). *Dublin*, 8°, 1767, English. *Paris*, 12°, 2 vols., 1768, in French, from Channing's Latin version. *Lansannæ*, 8°, 1772, (Latin, in the seventh volume of Haller's *Artis. Med. Principes*). *Bouillon*, 8°, 2 vols., 1774, in French, with Mead's works. *Edinburgh*, 8°, 1775, English, with Mead. *Gœttingæ*, 8°, 1781, Latin. *Lansannæ*, 8°, 1787 (a reprint of Haller, 1772). *London*, 8°., (Syd. Soc.), 1848, English, translated from the original Arabic, by Wm. Alex. Greenhill, M. D., from which this bibliography is taken, after comparing it with Haller, Eloy, Choulant, Jourdan, Dezeimeris, and other medical bibliographers.