

HISTORY OF MEDICINE

FROM THE

EARLIEST AGES TO THE COMMENCEMENT

OF THE

NINETEENTH CENTURY.

BY

ROBLEY DUNGLISON, M.D., LL.D.,

LATE PROFESSOR OF THE INSTITUTES OF MEDICINE AND MEDICAL JURISPRUDENCE
IN THE JEFFERSON MEDICAL COLLEGE OF PHILADELPHIA,
ETC. ETC.

ARRANGED AND EDITED BY

RICHARD J. DUNGLISON, M.D.



PHILADELPHIA:
LINDSAY AND BLAKISTON,
1872.

Entered according to Act of Congress, in the year 1872, by
RICHARD J. DUNGLISON, M.D.,
in the Office of the Librarian of Congress. All rights reserved.

PHILADELPHIA :
COLLINS, PRINTER, 705 JAYNE STREET.

P R E F A C E .

THE history of the progressive steps in the development of medicine, embraced in these pages, is an embodiment of the course of lectures delivered by my father at the University of Virginia many years since. The arduous duties devolved upon him in that institution covered a much more comprehensive field than would be possible or practicable at the present day. The labor now usually allotted to almost an entire faculty of professors was there assigned to him alone; for, according to the terms of his appointment, he was expected "to teach to the best of his ability, and with due diligence, Anatomy, Surgery, THE HISTORY OF THE PROGRESS AND THEORIES OF MEDICINE, Physiology, Materia Medica, and Pharmacy." Such an aggregation of branches of instruction must have severely taxed the energies, while it doubtless stimulated the ambition, of the then young professor.

It seemed to be the desire of Thomas Jefferson, at that time Rector of the University, and of those associated with that illustrious personage in its government, that the student should learn something of the earlier progress of the science and the art, while he was at the same time pursuing a course of instruction in the usual technical details of a collegiate medical education. It was a wise provision that thus incorporated with the other

features of a didactic course a knowledge of medical literature, which, however valuable, is generally considered as an accomplishment rather than as an indispensable necessity. The students of those times were therefore, in this particular, a step in advance of the condition of their successors of the present day, who are left to gather their information on the previous state of medicine in whatever manner they may find it practicable or convenient to do so, after graduation. Even at this period, however, the difficulty arises that there is scarcely a convenient congenial work on the history of medicine to which they can have access, and the study of this subject is therefore usually wholly neglected.

It is believed that the present work will supply the want, long felt by the profession, of a condensed history of the progress of medicine, presenting all the main facts in systematic order, avoiding, as much as possible, prolixity or unnecessary discussion of the merits of men and theories, and not laying any claim whatever to the title of an exhaustive treatise. When these lectures were delivered, the works of Freind, Sprengel, and a few other foreign authors, were the main reliance of the medical historiographer. It is but just to state that some of the material used in the lectures, on which this volume is based, were derived from these trustworthy sources. Some portions, especially those referring to the history of the progress of medicine among the most primitive nations, are translated or condensed from the celebrated *Geschichte der Arzneykunde* of Kurt Sprengel, published near the beginning of this century.

The section included in brackets, relating to American medical history, has been added by the Editor, to give greater completeness to the work.

R. J. D.

CONTENTS.

CHAPTER I.

ORIGIN OF MEDICINE.

PAGE

Introduction—Early history involved in obscurity—Superstitious practices—First treatment of the sick	17
--	----

CHAPTER II.

MEDICINE OF THE ANCIENT EGYPTIANS.

Medical powers of Isis and of other deities—First books on medicine—Early works on anatomy, diseases of females, &c.—Priest-practitioners, their manners and customs, dietetic rules, &c.—Practitioners of specialties—Treatment of various diseases—Medicines used by the ancient Egyptians—Description of the process of embalming—Early aversion to dissection—Ignorance of anatomy, physiology, &c.	23
---	----

CHAPTER III.

MEDICINE OF THE ANCIENT GREEKS.

Medical mythology—Orpheus—Æsculapius; his life and medical opinions—The sons of Æsculapius—First recorded operation of bloodletting—Practice of medicine in the temples—Votive tablets—Early medicines—First notions on anatomy, &c.	36
--	----

CHAPTER IV.

MEDICINE OF THE ROMANS TO THE TIME OF CATO THE
CENSOR.

	PAGE
Their early knowledge derived from the Greeks—Establishment of medicinæ or shops by the freedmen—Medical practitioners exempted from banishment—Archagathus, the executioner—Porcius Cato, censor and physician	53

CHAPTER V.

MEDICINE OF THE JEWS UP TO THE CAPTIVITY OF
BABYLON.

Egyptian origin of their medical knowledge—Medical attainments of Moses and the lawgivers—Cure of the lepra—The healing art a vocation of the prophets—Medical work of Solomon—Recorded cases of paralysis, affections of the intestines, leprosy, etc.—First origin of monks and monk physicians	57
---	----

CHAPTER VI.

MEDICINE OF THE HINDOOS.

Early state of civilization—Brahmin physicians—Laws in regard to poisons—Diseases caused by evil genii—Superstitions—Pathology of the Hindoos—Treatment of fevers, smallpox, &c.	65
--	----

CHAPTER VII.

MEDICINE OF THE CHINESE AND JAPANESE.

Causes of their imperfect civilization—Ancient code of the Chinese physicians—Medical schools—Chinese knowledge of anatomy, physiology, &c.—Exploration of the pulse—Physicians of the court of Pekin—Medical knowledge and practice of the Japanese—The moxa, its preparation and uses	71
---	----

CHAPTER VIII.

MEDICINE OF THE SCYTHIANS.

	PAGE
Progress of their civilization—Wonderful cures—Abaris, the Hyperborean—Anacharsis—Toxaris	81

CHAPTER IX.

MEDICINE OF THE CELTS.

The Gauls and the Belgæ—The Druids, the Eubages, and the Bards—Medical sorceresses—Druidical remedies	84
---	----

CHAPTER X.

FIRST TRACES OF A MEDICAL THEORY IN THE PHILOSOPHIC SCHOOLS OF GREECE.

Medicine emerging from the age of superstition—Pythagoras and his school—His services to the cause of medicine—Dietetic and other regulations of himself and followers—Psychological and physiological theories—Medical practice of his time—Alcmæon, the first comparative anatomist—Most ancient treatise on physiology—Empedocles of Agrigentum—His valuable services in time of an epidemic—His views on anatomy and physiology—Successors of Pythagoras—Anaxagoras and his views—Democritus of Abdera—Democedes of Crotona—Gymnastic physicians—Political condition of the physicians of Greece—Military surgeons—Charlatans	86
---	----

CHAPTER XI.

THE AGE OF HIPPOCRATES.

Revolution in medical science—Important era in the history of medicine—Biographical sketch of Hippocrates—His medical career—The great plague at Athens—Brilliant cures—Authenticity of his works—Books falsely ascribed to him—His undisputed works—His knowledge and views on anatomy, physiology, semeiology, pathology, therapeutics, surgery, dietetics, bloodletting, &c.	104
---	-----

CHAPTER XII.

THE IMMEDIATE SUCCESSORS OF HIPPOCRATES.

	PAGE
Founders of the dogmatic school—Liberal views and civilization of the time—Aristotle—His views on anatomy, physiology, &c.—Theophrastus—Praxagoras and his physiological discoveries—The term arteries first employed—Medical practice of the period—The age of the Ptolemies—The library of Alexandria—Publication of doubtful works, interpolated manuscripts, &c.—Medical school of Alexandria—Herophilus and Erasistratus; their discoveries and views—Their followers—Division of medicine into its branches, surgery, pharmacy, &c.—The surgeons of Alexandria and their operations—Lithotomists—Surgical apparatus—Prohibitions to young surgeons	126

CHAPTER XIII.

THE EMPIRICAL SCHOOL.

Origin of the empirical sect—Views and theories of the empirics contrasted with those of their predecessors—Traumatic theory—Their neglect of anatomy and physiology—Distinguished followers of this school	146
---	-----

CHAPTER XIV.

STATE OF MEDICINE NEAR THE DAWN OF THE CHRISTIAN ERA.

Royal toxicologists—Rome a centre of attraction to the world—Asclepiades and his views on anatomy, pathology, &c.—Bronchotomy first proposed—Disciples of Asclepiades—Themison of Laodicea—First employment of leeching—Followers of Themison—The methodic school	153
---	-----

CHAPTER XV.

STATE OF MEDICINE DURING THE EARLY CENTURIES OF THE CHRISTIAN ERA.

Cornelius Celsus, the medical Cicero—His views on anatomy, surgery, etc.—Elegant Latinity of his works—Con-	
---	--

	PAGE
tempt of Pliny for the Roman practitioners of this age— Medical pretensions of Thessalus Trallianus—Symmachus and his clinics—The first medical lexicographer—The sub- divisions of the methodic sect—Aretæus and his medical practice—Medical writings of Soranus—Claudius Galenus (Galen), his life and services, writings, etc.—The imme- diate successors of Galen—State of medical literature at this period—School of Alexandria—Study of medicine in Persia—Celebrated medical school at Edessa, and its pro- fessors—Establishment of the first institution for clinical instruction.	160

CHAPTER XVI.

STATE OF MEDICINE IN EUROPE AND THE EAST FROM THE MIDDLE OF THE SIXTH CENTURY.

Epidemic of the sixth century—Aetius of Amida, and his use of charms—Alexander Trallian—Theophilus—Paulus Ægineta, the first obstetric physician—Medical writers and practitioners of the next centuries—Decay of medicine in the West and its rise in the East—Arabian physicians and schools—Spanish medical schools and libraries—Progress of Arabian practice of medicine and surgery—First writer on smallpox—First account of academic degrees conferred —Serapion the elder—Rhazes and his works—Avicenna— Albucasis—Avenzoar—Decline of science in Spain and the East in the eleventh, twelfth, and thirteenth centuries .	183
--	-----

CHAPTER XVII.

STATE OF MEDICINE AMONG THE MONKS OF THE MIDDLE AGES.

Monk physicians of the West—Cures by prayer, relics, &c.— English ecclesiastical physicians—Medical schools estab- lished by them in England and France—Schools of the cathedrals—Physicians first so called—Curious laws affect- ing physicians—Practice of medicine restricted to the lower clergy—Eminent medical ecclesiastics of the day
--

	PAGE
<p>—Medical celibacy—Practice of medicine by the nuns— The Abbess Hildegard—Laws in regard to pregnant women—Constantine the African—Influence of the Cru- saders—Celebrated schools of Monte-Cassino and Saler- num—Dietetical precepts of the latter—Chief physicians of this school—Degrees of bachelor, licentiate, &c. first granted to physicians in France—Doctors first so called .</p>	200

CHAPTER XVIII.

STATE OF MEDICINE DURING THE THIRTEENTH AND FOURTEENTH CENTURIES.

<p>Medical progress in France under St. Louis—Jean Pitard— Lanfranc of Milan—Progress of surgery in Italy—The school of Bologna and its followers—Encouragement of medical instruction in the fourteenth century—First dissec- tion of the human body—Rough modes of dissection— Astrology and theosophy intermingled with medicine— The Arabists—Decay of the school of Salerno . . .</p>	212
--	-----

CHAPTER XIX.

STATE OF MEDICINE DURING THE FIFTEENTH CENTURY.

<p>Absurdities taught in the schools and afterwards denounced by the faculty of Paris—Distinguished medical men of the day—Surgery in the hands of the barbers and bathers— Scarcity of operators in Europe—Operation for replacing the nose when lost—Basil Valentine, the monk, and his experiments with antimony, &c.—Lectures of Chrysolore, ambassador of the Emperor of the East—Invention of print- ing—Prevalence of scurvy, lues venerea, &c. . . .</p>	217
--	-----

CHAPTER XX.

STATE OF MEDICINE DURING THE SIXTEENTH CENTURY.

<p>Improved taste and knowledge of medicine—New trans- lations of Hippocrates and Galen—The Royal College of Physicians founded—Multitude of editors, commentators,</p>	
---	--

	PAGE
&c.—Distinguished writers on practical medicine—Medical controversies of this century—John Argentier and his principles of reform—Belief in demons as a cause of disease—Alchemy in medicine—Paracelsus, his life, opinions, and vagaries—Chemical medicines more generally employed—New pharmacopœias—Remarkable progress of anatomy and surgery—Improvement in surgical operations—Treatment of gunshot wounds—Study of special surgical diseases—Tagliacozzi and his rhinoplastic operation—Remarkable discoveries in anatomy—The days of Sylvius, Vesalius, Paré, Fallopius, Fabricius, and Eustachius	223

CHAPTER XXI.

STATE OF MEDICINE DURING THE SEVENTEENTH CENTURY.

Harvey's discovery of the circulation of the blood—Advance of practical medicine—Rosicrucians—Eclectic conciliators—Van Helmont and his doctrines—Sympathetic powder of Sir Kenelm Digby—Mathematical sect—Borelli, Bellini, Willis, Keill, and other celebrated physicians and philosophers—Humoral pathology—Malpighi, Bartholin, Steno, Aselli, Wirsung, Pecquet, Wharton, and their discoveries in the glandular system, &c.—The days of Sydenham, Baglivi, and Boerhaave—Distinguished contributors to medical science.	234
--	-----

CHAPTER XXII.

STATE OF MEDICINE DURING THE EIGHTEENTH CENTURY.

New systems of medicine—Doctrines of Stahl—Expectant medicine—Systems of Hoffmann and Boerhaave—Haller's physiological theory of irritability—The Cullenian system—Doctrines of Brown—Darwin and the laws of association—Brilliant progress of anatomy and physiology—Interesting researches on the circulation, respiration, nervous system, organs of the senses, generation, surgery, pathological anatomy, &c.—The concluding years of the century—Jenner and the discovery of vaccination—Xavier	
---	--

	PAGE
Bichat—John Hunter—Other contributors to medical science.	
Sketch of American medical history in the eighteenth century	
—Colonial condition of the country—Practice of medicine by the clergy and others—Absence of all restrictions in its exercise—Practice of midwifery by women—Modes of practice—Inoculation for smallpox—Systems of medicine—Medical authorship—Medical education—Medical schools of this era—Conclusion	245

HISTORY OF MEDICINE.

CHAPTER I.

ORIGIN OF MEDICINE.

Introduction—Early history involved in obscurity—Superstitious practices—First treatment of the sick.

As a point of history, pregnant with valuable deductions, it is good to look back upon the condition of medicine in former times and to find that it has always kept pace with the progress of the physical and moral sciences. Where these, however, have been marked by folly and credulity, it has exhibited the same imperfections. When we notice, in our professional ancestors, strange conceits, fantastic reasoning, and singular confusion in tracing the relation between cause and effect, it is well to reflect on the state of philosophy at the time; and if we investigate closely, we shall find that the men who appear to us so defective in their powers of observation and reflection were but examples of the general learning of the age in which they lived.

It may not be so easy for us to trace the gradual improvement in any two successive eras, which melt into each other by indefinable gradations; but if we

select distant periods, the evidences of mental advancement are signal. In ancient times, for instance, as with rude, untutored nations of the present day, the physician acted as the magician, and conversely. Physic was an art which was supposed to be most mysterious, and its practisers were presumed to hold communion with the world of spirits. The practice of medicine of those days was made up of such unreliable agents as the word *abracadabra*, hung around the neck as an amulet, to chase away the ague; an hexameter from the *Iliad* to allay the agony of gout, and a verse of the *Lamentations* to cure the rheumatism.

Many of the superstitions connected with the earlier history of medicine prevail now as they did formerly; but the facility for the reception of the marvellous and the imperfect state of experimental science at that time occasioned their prevalence in the higher intellects, whilst at the present day they are mainly restricted to the vulgar. Those higher intellects were indeed sadly deficient in wisdom. Learned they were in all the scholastic knowledge of the period; but where mystery existed on any subject, instead of submitting it to the test of experiment and observation, they received it as an heirloom from their predecessors, and never dared to dispute the word of the master. It has been said that the delusions under which they labored were inevitable—that the improvement of the world is destined to proceed in cycles, and that whenever a new light bursts upon the eye, it requires some time before the organ can discern clearly amidst the

unaccustomed blaze. In this there is truth; and, as the world proceeds, successive cycles and epicycles will doubtless exhibit the fruits of anterior experience. Ages of obscurity, bootless conjecture, and dreamy enthusiasm preceded those of sound sense and rational observation; but they were necessary antecedents, and intimately connected with the results.

The belief that some human beings could attain the power of conferring good or inflicting ills on their fellow-creatures, and of controlling the operations of nature, is one of the highest antiquity. It has appeared in every region of the globe; and, from its extensive prevalence, it is evident that the human mind, especially in its state of ignorance and barbarism, is a soil well adapted for its reception and cultivation. Life has so many evils, which the uninformed mind can neither prevent nor avert, and encourages so many hopes, which every age and condition are anxious to realize, that we can hardly be astonished to find a considerable portion of mankind become the willing prey of impostors, who, as we shall see, practised on their credulity by threats of evil and promises of good, greater than the usual course of nature would dispense. Even the lights of divine revelation, and the circumstance of their being discountenanced by both civil and ecclesiastical laws, did not prevent such frauds and absurdities from being encouraged. Their foundation seems to lie deep in the heart's anxiety about futurity, in its impatience for good greater than it enjoys, and in

its restless curiosity to penetrate the unknown, and to meddle with the forbidden.

Much time and learning have been wasted in attempting to depict the first origin of medicine. Thus Schulze, who was professor at Altorf in the beginning of the 18th century, has traced it to the fall of man, showing, with great gravity, what observations were likely to be made by Adam and Eve on the subject of their natural appetites; and Brambilla, a surgeon of Vienna, has asserted that Tubal Cain was the inventor of cauterizing instruments, machines for the reduction of fractures, and other surgical apparatus, whence he endeavors to prove that surgery is of more ancient date than medicine.

Medicine, it is evident, must have had a very early origin, for mankind, in the most uncivilized ages, would necessarily be exposed to a variety of casualties, and would gradually learn the means of alleviating the pain or averting the consequences of the more common external injuries. The more or less agreeable and salubrious qualities of the different articles of food would also cause them to form for themselves certain dietetic maxims and rules for the treatment of those diseases to which they found themselves liable. Their materia medica would probably, at first, consist of only a few herbs, of which they fancied they had found the efficacy in internal and external complaints. Unacquainted, however, with the economy of the human body, and incapable, for the most part, of tracing the progress of disease, the more fatal internal disorders would be

ascribed to the powers of sorcery, or to the displeasure of those deities whom they had been taught to fear, and they would resort for their cure to those rites and ceremonies by which they imagined they could dispel the charm or appease the wrath of the offended gods. Hence would arise various superstitious practices which would be handed down from generation to generation. Such we may imagine to have been the origin of the medical art, and such is nearly its condition at the present period amongst the savages of Africa, Australasia, Polynesia, Sumatra, &c.

The first individuals who raised themselves above the vulgar, made a particular study of medicine, and obtained success by practising it, were raised to the rank of gods. Altars were erected to them, and the priests who administered the duties became physicians themselves from being the oracles of the divinity whom the people wished to consult; so that for a long time the practice of medicine was a part of the priestcraft, and was taught by the ministers of the altars with many occult and mysterious ceremonies. For a long period there could have been no other medical instruction than that of the communication of the knowledge of the mechanical means and properties of remedies which had been previously employed with success in the cure of wounds and diseases. The science did not then exist; there were not even physicians. Each was probably physician in his turn, and recommended to him who was suffering the remedy which he knew to have succeeded, or whose virtues were attested by tradition. Herodotus informs us that even in

his time the Babylonians, Chaldeans, and other nations had no physicians. When any one was attacked with disease he was carried into the public street, and the passers-by who had labored under a similar affection, or had witnessed a similar case, advised the individual to adopt such means as their judgment and memory might suggest. No one was permitted to pass near a sick person without interrogating him on the nature of his sufferings.

The first writers on medicine trace its origin, in common with that of most other branches of knowledge, to the Egyptians; but its history is so involved in fable, and so mixed with the pagan mythology, that it is impossible to arrive at their knowledge of this, or of any other branch of science. The medicine of the Indians, Chaldeans, Chinese, Japanese, &c., was a mere collection of receipts applied at hazard by men without study and experience, according to vulgar, and often superstitious, traditions, as it is even at present, to a great extent, in those countries.

CHAPTER II.

MEDICINE OF THE ANCIENT EGYPTIANS.

Medical powers of Isis and of other deities—First books on medicine—Early works on anatomy, diseases of females, &c.—Priest-practitioners, their manners and customs, dietetic rules, &c.—Practitioners of specialties—Treatment of various diseases—Medicines used by the ancient Egyptians—Description of the process of embalming—Early aversion to dissection—Ignorance of anatomy, physiology, &c.

THE Egyptians appear to have been the first nation which cultivated medicine. The history of the progress of the art, during the period prior to the reign of King Psammetichus, who died about 617 years before the Christian era, is, however, wrapped in mythological obscurity. To the deity ISIS, the wife and sister of Osiris, a peculiar medical power was attributed, and a multitude of diseases were regarded as the effects of her anger. She had given an unequivocal proof of her power in the restoration of her son Orus to life. The Egyptians attributed to her the discovery of several remedies, and believed that she possessed considerable power in medicine. Even at the time of Galen, the *materia medica* contained several compound remedies which bore her name. As all diseases were supposed to originate from her anger, the Greeks compared her to Proserpine, queen of the infernal regions, or to

the redoubtable Hecate. In the temples of Isis a species of resin was burnt in the morning, myrrh at noon, and in the evening a composition termed cyphy, which was formed of sixteen drugs, regard being had in its preparation to the quaternary number, which was always considered sacred. After these preparations, the sick were made to sleep in these temples, in order that the oracle might reveal to them, during sleep, the means which ought to be had recourse to for their cure.

ORUS or HORUS, the son of Isis—the Apollo of the Greeks—was the last Egyptian king of the mythological dynasty of the gods, and is said to have acquired from his mother the knowledge of diseases and of their modes of cure. Independently, however, of this family of the gods, the Egyptians revered Theath, Thouth or TAAUT—the Hermes Trismegistus of the Greeks—whom they regarded as the inventor of arts and sciences. All ancient historians accord in representing Taaut as the friend and confidant of Osiris. He first taught the Egyptians the use of writing, invented arithmetic, geometry, astronomy, and music; gave laws to the people, regulated their religious ceremonies, and first cultivated the olive.

When the Egyptians had discovered a mode of forming paper from the stalk of the papyrus, the knowledge of Taaut was described, engraved upon the columns and collected in a book entitled *Embre*, or *Scientia Causalitatis*. This book, according to Diodorus, contained the rules of medical science, to which the physicians were compelled scrupulously

to adhere, and comprised various additions made by the more immediate and celebrated successors of Taaout or Hermes. When the physicians strictly conformed to the regulations, they were held free from blame, should the patient even die; but if they wandered from them they were punished with death, whatever might be the issue of the disorder. It is by no means improbable that this book contained a collection of the semeiological observations made up to that period, for we are informed by Horapollo in his *Hieroglyphica*, that the priests or physicians referred to it for the purpose of predicting whether any disease would have a favorable or unfavorable termination. Diodorus gives us reason to suppose that their diagnosis was principally formed on the position which the patient assumed in bed, a mode of discrimination, as may readily be conceived, at once nugatory and absurd. The blind adherence to the opinions and rules of their predecessors, and the criminality, as it was considered, of all innovation—whilst they continued—effectually prevented any improvement in the science, or as it might, at that time, be more properly styled, the art of medicine.

At the time of Iamblicus, who lived A.D. 363, the priests of Egypt showed forty-two books which they attributed to Hermes. Of these, according to that author, thirty-six contained the history of all human knowledge; the last six of which treated of anatomy, of diseases, especially those of females, of affections of the eyes, instruments of surgery, and medicines. It is probable, however, that several of these were of a more modern date, as Iamblicus is very

doubtful regarding their authenticity, and Galen does not hesitate to declare them apocryphal. Sprengel asserts, and with some degree of probability, that several of these works were penned about the time of the existence of the school of Alexandria, when alchemy and some of its kindred branches had their origin, from a wish to show that these chimerical investigations were of an ancient date, and consequently entitled to more consideration than they might otherwise have received. The number of works attributed by some to this Egyptian deity is truly prodigious. Seleucus estimates them at 20,000, and Manetho at 30,000! Galen, however, attempts to reconcile these incredible assertions by observing that we should read books or dissertations in place of books or volumes.

APIS, another divinity of the Egyptians, was also regarded as the inventor of medicine. They likewise adored as a tutelar genius, ESMUN or Schemin, the Pan of the Greeks; but greater influence was attributed to SERAPIS, whose most ancient temple was at Memphis, and who was worshipped by both Greeks and Egyptians. The history of the last disease of Alexander the Great shows that Serapis was much revered as a medical divinity at the time of that conqueror.

In whatever way these divinities may have first attracted the adoration of the people, it seems clear that the priests from among whom the ancient kings of Egypt were chosen were the practisers of the medical art. As diseases were considered to be the effects of the anger of the gods, they could not

be cured until the wrath of these estimated powerful beings was appeased. The awe, however, with which the deities were regarded, and the weakness of the diseased, required the aid of mediators who might implore pardon for them. In the hands of the priests, consequently, the healing art was nothing more than an absurd worship paid to the different divinities of the country. They concealed the medicines which they administered by the aid of an allegorical language, and medicine was esteemed a secret, the knowledge of which was only vouchsafed by the gods to their favorites. A description of the manners of these priests and the dietetic restrictions which they imposed upon themselves will throw some additional light on the *ars sanandi* of these remote ages.

The six books of the works of Hermes, just referred to as being the part devoted to medicine, were studied by the Pastophori or Image-bearers, an inferior order of the priesthood on whom the practice of common medicine devolved. The higher branches, which required more magical formulæ, as well as a greater knowledge of the virtues of drugs, were reserved for the superior priests. These latter, the wise men and magicians of whom Moses speaks, boasted of the power of producing a multitude of supernatural effects and of possessing in themselves alone all erudition. At the time of Heliodorus, who lived about 167 years before the Christian era, there existed, clothed in a symbolical language, several works on natural history, in which the plants and animals were designated by mystical

appellations. Thus the ivy was called the plant of Osiris; the vervain, the tears of Isis; a species of lily, death's blood; a variety of the artemisia, the heart of Bubastis; the saffron, the blood of Hercules; the squill, the eye of Typhon, &c. The more modern fanatics, and chiefly the alchemists, eagerly laid hold of these symbolical names, in order to attract more consideration amongst the ignorant.

The manner of living of all orders of the priesthood was subjected to very severe rules. They were especially obliged to attend to the greatest cleanliness; were expected to wash themselves twice in the day and as often during the night, and to have the hair cut every three days, except in time of mourning. It was likewise, according to Herodotus, with views of cleanliness that the operation of circumcision was introduced amongst them, an operation to which Pythagoras himself was compelled to submit. They subsisted on the produce of their lands and the offerings made to their gods. Their nourishment was confined to the vegetables and meats which might be offered to their deities. The animals intended for sacrifice were ceremoniously marked with a seal of clay. It would seem that this custom had its chief origin in the care which it was considered necessary to take in the well distinguishing of the sound from the unsound meat. It was, indeed, at an early period remarked that the diseases of the eyes, lepra, and different other corporeal affections, frequently supervened on the immoderate use of certain articles of food. But, independently of this salutary precaution, certain

animals were chosen in preference to others from some symbolical signification attached to them from the most early period. Those were sacrificed by preference, which had some similarity to the genius of evil, as, for example, red oxen, because Typhon, who murdered their favorite Osiris, was of that complexion.

The farinaceous legumina and onions were especially proscribed; the first, according to Herodotus, because they are difficult of digestion and engender flatulence, or, as Plutarch supposes, because they afford too much nourishment, or, perhaps, rather from mystical reasons which are unknown to us. Onions, according to Plutarch, were forbidden because they excited thirst. The regimen of the people, although not so much restricted as that of the priests, was nevertheless subjected to certain rules, from which they were not permitted to wander, and which were always intended for the preservation of health. Even to the kings, according to Diodorus, a fixed quantity of meat and drink was prescribed, beyond which it was not permitted for them to pass. On the temple at Thebes was placed an inscription filled with imprecations against king Mēnes, who first led the people from their simple and frugal life, and introduced amongst them the luxury of the table. Diodorus informs us that almost every function, even the act of generation, was regulated, and had a time assigned for its performance.

The education of the children tended to fortify them against fatigue and to accustom them to frugality. They always ran about barefooted, and

almost wholly subsisted on fruits, roots, and the pith of the papyrus. Until manhood the food was never suffered to exceed twenty drachms a day, and gymnastic exercises were proscribed from a belief that they occasioned but a momentary vigor. Each Egyptian, according to Herodotus and Diodorus, was expected every month to make use of emetics, purgatives, and clysters, for it was imagined that the majority of diseases originated from intemperance and crudities in the alimentary apparatus. Herodotus asserts that in his time there was in Egypt a particular physician for each disease; one occupying himself with diseases of the eyes, a second with affections of the teeth, a third with those of the stomach, &c.

As for the rationale of their medicine, we have received too few data to judge of it with certainty; it seems, however, probable that diseases were principally left to nature, and that the Egyptians contented themselves with promoting those evacuations which she might endeavor to establish. If we may credit Strabo, they exposed those who were dangerously ill in the streets, in order that the passers-by might afford them advice. Sprengel, however, is of opinion that this observation applies more especially to the Assyrians, as the fact respecting them is stated by many authors, whilst Strabo is the only authority on which the assertion rests as regards the Egyptians. That they were not very skilful in the cure of external diseases is evidenced by their not having been able to cure Darius of a simple luxation of the foot which he received whilst

hunting. The prophets predicted the changes and termination of diseases, and the inferior priests or *pastophori* treated them strictly according to the rules laid down in the books of Hermes, and were personally responsible for everything which they undertook in acute diseases before the fourth day of their invasion.

Very few of the practical observations of the Egyptians have come down to us. Amongst other medicines, however, which they were in the habit of prescribing, was the squill, especially in the environs of Pelusium, in the dropsical affections which were very common in that neighborhood. In honor of this plant they erected, according to Panus, a temple, where it was adored under the name of *Κρόμμυον*. By Horapollo we are informed that in cases of cynanche or sore throat great use was made of a species of adianthum, or maiden hair. The *ἀετίτης*, or eagle-stone, a species of oxide of iron, was likewise successfully employed against dropsies and tympanitis. Horapollo relates a case to show that the dissection of rabid animals may occasion hypochondriasis or mania.

Two arts were practised by the Egyptians which have some connection with medicine, and the perfection of which amongst them the lovers of the marvellous have highly extolled.

The first is that of *embalming*. If we are to credit several modern writers, we ought to give the Egyptians credit for considerable anatomical acquirements from their skill in this art; but if we carefully and unprejudicedly inquire into the circumstances, we

shall find that the mode in which the operation was performed was not such as to demand any of these qualifications, whilst there were some feelings against the dissection of the dead which must effectually have tended to the retardation of anatomical investigations. The mode in which the operation was performed and the ceremonies attending it are thus described by Herodotus: As soon as an individual was dead, the persons employed for embalming him repaired to the house of his relatives, and showed them different coffins of painted wood of the shape of a mummy. The first or chief were of very exquisite workmanship, the second were less beautiful and costly, and the third were still more moderate.

The embalming was performed in the following manner: The brain was first drawn through the nose by means of an iron crotchet, or hook, and aromatics and spices were then pushed into the cranium. The abdomen was opened by a sharp Ethiopian stone; the intestines were removed and the abdominal cavity cleaned out, and then washed with palm wine, and spicy substances dissolved in water poured into it. It was subsequently filled with myrrh, cassia, and other aromatics, and the integuments were brought together. The body was now washed with a solution of salt, and suffered to remain at rest for seventy days, but not longer. At the expiration of this time it was again washed and covered everywhere with a gum, which the Egyptians used in the place of size, and enveloped in a linen cloth. The relations then took the body, inclosed it in a wooden cradle modelled after its form,

and deposited it in the catacombs. With those of a poorer class, they were satisfied with injecting liquid resin into the abdomen through a tube, without opening it. The body was then treated with the solution of the salt as before, and, at the expiration of the seventy days, the resin, and the viscera along with it, was withdrawn, and there remained nothing but the skin and bones. The third species of embalming, reserved for the poor, consisted in cleansing out the dead body, and macerating it for seventy days in the solution of the salt.

Women of unusual beauty, or of high birth, were not put under the hands of the embalmers until three or four days after their decease; a precaution rendered necessary, according to Herodotus, from some of the *pastophori* having been known to violate the dead persons of such females. The first species of embalming cost a talent of silver, or about three hundred dollars, and the second twenty minæ, or about one hundred dollars. A holy functionary, termed by them a scribe, marked on the left side of the body the place where the incision should be made, when the *paraschistes*, or operator, made the incision and hastily withdrew, from a dread of being assailed with imprecations, and even with stones, by the assistants, so great was their horror at any one who dared to inflict an injury, by means of a cutting instrument, on the remains of a friend. Diodorus afterwards describes the process of embalming nearly in the same manner as Herodotus, with this slight difference, that he makes mention of a process, by

means of which they preserved in the dead body the form which the individual had during life.

* The conduct of the assistants towards the parascistes strongly exemplifies the aversion which the Egyptians had for dissection, and it could not consequently be expected, whilst such sentiments prevailed, that many discoveries would be made relating to the structure, position, and connections of parts of the body in states of health and of disease. Moreover, the process which was followed was too rude to contribute to enrich the science. Besides, we have historical proofs that the Egyptian priests were ignorant of the first elements of anatomy and physiology. They believed, for example, that every year the weight of the heart was increased by two drachms, until the age of fifty, and that afterwards it diminished in the same proportion; and that a small nerve or tendon had its origin in the little finger which proceeded to the heart, and this was the reason why they dipped that finger in the liquor of their libations.

In chemistry and in metallurgy the ancient Egyptians certainly possessed a degree of knowledge which is still an inexplicable enigma to our most celebrated scientists. They were acquainted with the art of applying silver of a blue color to surfaces, and of fabricating emeralds of a prodigious size. It was formerly believed that cobalt was used in these preparations, but Gmelin has demonstrated that there was none of that metal in all Egypt, and that probably they made use of the blue scum which swims on the surface when the hematite is melted. Finally,

it seems very doubtful whether even the ancient Egyptians had made sufficient progress in chemistry and pharmacy to have even known, as Galen and Bergmaan pretend, how to prepare plasters and ointments of verdigris and ceruse.

Being possessed of but a very small number of data regarding Egyptian medicine prior to the 600th year before the birth of Christ, the details here presented must necessarily be imperfect and unsatisfactory, but they are sufficient to show that although the healing art was cultivated by the Egyptians, it never attained with them any degree of importance. Confined to the priests, forming an essential part of their divine worship, and not being permitted to be freely exercised by every one, its progress was necessarily insignificant. No scientific plan, no union of observation with theory, formed the basis of their studies, and medicine, therefore, became nothing more than the art of prophesying, and was confined to a blind adherence to rules for a long time adopted. The son received, as a divine deposit, the knowledge of his fathers, and transmitted it to his posterity without it having undergone the least change.

CHAPTER III.

MEDICINE OF THE ANCIENT GREEKS.

Medical mythology—Orpheus—Æsculapius; his life and medical opinions—The sons of Æsculapius—First recorded operation of bloodletting—Practice of medicine in the temples—Votive tablets—Early medicines—First notions on anatomy, &c.

THE condition in which we find medicine amongst all the rude and uncivilized nations is absolutely the same as that which it originally presented in Greece, a country, however, in which, at a later period, the human mind developed all its resources, and where the most brilliant discoveries were made. Without dwelling on the medical mythology of Orpheus, Musæus, Melampus, and Bacis, who are considered to have been its first founders, or the history of the miraculous nature of the healing powers of Apollo, Diana, Ilithyia, or Chiron and his disciple Achilles, or Aristæus, we may at once direct our attention to the most renowned of Chiron's pupils, and to one who is deserving of the most conspicuous place in the history of medicine—Asclepius or ÆSCULAPIUS.

Pausanias has transmitted to us several popular traditions respecting the place of his birth. Phlegyas, king of Thessaly, had a daughter named Coronis, who became pregnant by Apollo. That prince having invaded Peloponnesus and destroyed a part

of the inhabitants of the peninsula, took his daughter along with him. Coronis was delivered clandestinely, and her son was left on Mount Myrtion. The infant was suckled by a goat and guarded by the dog of a shepherd called Aresthanas. The goatherd, observing that his dog as well as goat was missing, went in search of it, and discovered them with the infant, which was surrounded by an areola of light. According to another tradition, says Pausanias, Coronis, when pregnant with Æsculapius, was too familiar with Ischys, when Apollo killed her for her perfidy, but at the instant when the body, already placed upon the pile, was about to become a prey to the flames, Mercury drew from it the infant still living. Æsculapius, like the greater part of the young heroes of his time, was instructed by the Centaur Chiron in all the arts, and especially in that of curing external diseases. In process of time he acquired so great a dexterity in the treatment of those affections that he obtained the pre-eminence over all his companions on the expedition of the Argonauts.

Several ancient writers have described to us in what his science consisted. One passage of Plato is especially deserving of attention. That philosopher begins by observing that medicine cannot exist without luxury, and that man, in a state of nature, has need only of physicians for wounds and epidemics to which he may be exposed; that consequently the medicine of Æsculapius must have been extremely simple, and that experience must have taught him the knowledge of some useful remedies,

especially in external affections. At that time we are told they had no idea either of catarrhs or of the gout, nor of flatulency, nor, according to him, were they acquainted with dietetics or gymnastics. The skill of *Æsculapius* was, therefore, nearly confined to the dressing and healing of wounds with herbs proper for arresting hemorrhage and assuaging pain. Plutarch asserts that such comprised the whole of the ancient Grecian medicine. Pindar describes nearly in the same manner the method pursued by *Æsculapius*. He cured, we are told, persons laboring under old ulcers, those who had been wounded, or who had been indisposed from heat or cold. He employed, for the restoration of health, agreeable songs, drinks, and external medicines or incisions. If, therefore, we except some simple remedies obtained from the vegetable kingdom, *Æsculapius* had almost always recourse to prayer and invocation to the gods, a method of cure, as has already been observed, the most ancient of all. Pursuing such a plan, however, it seems absurd to find the author of an introduction to the works of Galen, ranking the medical skill of *Æsculapius* at so high a standard. "Before *Æsculapius*," observes that writer, "medicine was nothing but blind empiricism, and was confined to the external application of plants; but that hero knew how to perfect and form it into a divine art."

Various accounts have been given by authors respecting the death of *Æsculapius*. Diodorus Siculus asserts that he restored so many people to life, that Pluto beseeched Jupiter to destroy a man who

so materially injured the population of his empire. Jupiter, therefore, hurled his thunder at Æsculapius, and Apollo revenged the death of his son, by destroying the Cyclops who forged the bolts. Sextus Empiricus repeats this story in nearly the same words, and almost all the writers of Greece follow his example. Heraclitus, a more modern writer, explains his death in a more natural manner; being occasioned, according to him, by a violent inflammation, the seat of which Suidas places in the chest.*

The sons of Æsculapius also enjoy a conspicuous place in the history of the healing art; they are considered as the fathers of surgery. MACHAON and PODALIRIUS—so they were called—were as skilful in the sciences and in eloquence as in the healing art. The two brothers were at the siege of Troy, where they distinguished themselves so much by their valor that Homer always ranks them amongst the chief Greek heroes. They lived together in the most perfect union, attending jointly on the wounded, and they acquired so great a reputation amongst their companions that their presence in battle was dispensed with, and they were not expected to take part in the other fatigues of war. That internal medicine was in a very rude state is evidenced by the observations of Homer, that Nestor, when Machaon was wounded at the siege of Troy, ordered him Pramnian wine,

* Æsculapius is always painted with a staff, because the sick have need of a support; and the serpent entwined round it is the symbol of wisdom. The figures of the sons of Æsculapius form the supporters to the arms of the Royal College of Surgeons of London.

with cheese, onions, and meal, as Pope has correctly rendered it, with the exception of omitting the onions:—

——“The nymph of form divine,
Pours a large potion of the Pramnian wine,
With goat’s milk cheese a flavorful taste bestows,
And last with flour the smiling surface strows.
This for the wounded prince the dame prepares.”

Villoison in his *Scholia* considers that these substances presented to Machaon,—“the wounded offspring of the healing god,”—were considered less as remedies than as refreshments necessary in consequence of his fatigue; and a nearly similar observation is made by Eustathius in his commentaries on the works of Homer.

Neither Machaon nor Podalirius seems to have possessed the kingdom of their father, after the end of the Trojan war. Machaon passed the remainder of his days in Messenia near the sage Nestor; he was killed by Eurypylyus, the son of Telephus, and his bones were preserved as sacred deposits. Eurypylyus himself was afterwards wounded, and the surgical treatment of his case is thus described by Homer:—

“Patroclus cut the forky steel away.
When in his hand a bitter root he bruised;
The wound he washed, the styptic juice infused.
The closing flesh that instant ceased to glow,
The wound to torture, and the blood to flow.”

(*Iliad*, Book XI.)

The sons of Machaon—ALEXANOR, SPHYRUS, POLEMOCRATES, GORGASUS, and NICOMACHUS—also practised medicine. On the return of Podalirius from Troy,

a tempest cast him on the coast of the Isle of Scyros, where he landed, however, safe and sound. He wandered alone in the peninsula of Caria, in the neighborhood of this island, until a shepherd showed him hospitality and took him to King Damœtas. At the court of that prince he soon gave proofs of his medical skill by curing Syrna, his daughter, of the effects of a fall from a roof. He bled her in both arms, when her life was despaired of, and succeeded in restoring her to health. Damœtas, agreeably surprised at the fortunate issue of an operation which was then rarely practised, consented to the marriage of Podalirius with Syrna, and gave him the whole of the peninsula of Caria. Here Podalirius founded, in honor of his wife, the town of Syrna, and likewise built another to which he gave the name of the shepherd who had been the first cause of his good fortune. This is the first instance which we have upon record of the performance of bloodletting, an operation regarding the origin of which we know nothing certain.

The life of Podalirius is related differently in another place. Lycophron asserts that he was assassinated on the coast of Ausonia, in the country of the Dauni, who adored him under the name of *πόσιον ἀειστής*. These people bathed in the river Althenus, and listened, whilst lying under hides, to the infallible oracles of the god of medicine. Strabo remarks, also, that the tomb of Podalirius might be seen at a hundred stadia from the sea, in the country of the Dauni, the capital of which, Luceria, exists at the present day in the Capitanata at the bottom of the

Gulf of Manfredonia, and he adds that the waters of the river Althenus (at the present day called Candelaro) cured all the diseases of cattle.

Although Clemens Alexandrinus dates the origin of the worship of Æsculapius at fifty-three years before the destruction of Troy, nothing is to be found in the poetry of Homer which can lead us to suspect that this hero had been classed amongst the gods. Hesiod would also unquestionably have admitted him into the Theogony, if at his time they had paid him divine honors. Pindar, indeed, far from regarding him as a god, reproaches him, on the contrary, with being avaricious, although he calls him the hero and vanquisher of a great number of diseases:—

“ Those whom nature made to feel
 Corroding ulcers gnaw the frame ;
 Or stones far hurl'd, or glittering steel,
 All to the great physician came.
 By summer's heat or winter's cold
 Oppress'd, of him they sought relief.
 Each deadly pang his skill controll'd,
 And found a balm for every grief.
 On some the force of charmed strains he tried,
 To some the medicated draught applied :
 Some limbs he placed the amulets around ;
 Some from the trunk he cut, and made the patient sound.
 But wisdom yields to sordid gain :
 Hands which the golden bribes contain
 Are bound by them alone.”

(*Third Pythian Ode.*)

Hygeia—from whence comes hygiene, or the art of preserving health—the pretended sister of Æsculapius, and also Hercules, were both worshipped by the Greeks. Epilepsy was called the disease of Hercules,

after the latter, as it was believed that he had been affected with it. Several plants, as the *Teucrium Chamæpitys* ("Teucer," Hercules), take their names from him, and there is also an entire genus called *Heracleum*.

We need not attempt to describe the various temples erected to the different deities in Greece, but rather refer briefly to the manner in which medicine was practised in those temples. The mode there adopted clearly proves that all diseases were regarded as the effects of the anger of heaven; and the gods alone could consequently cure them. It was in those sacred places that *Æsculapius* gave the most ostensible marks of his power. The ceremonies and religious customs by means of which they endeavored to obtain, as a gift from heaven, the restoration of the sick, varied at different periods. They were almost all, however, especially directed, in acute and simple diseases, to the excitement of the imagination and to the re-establishment of the health by a very strict regimen. The entrance to the temples of *Æsculapius* was interdicted to all those who had not previously undergone purification. These preliminary processes necessarily contributed to excite hope in the minds of the sick, to inspire them with consoling ideas respecting the future, as well as to give them full confidence in the important revelations about to be made to them. When permitted to appear before the idol, and to present him their offerings, they found him surrounded with so many mysterious symbols, and witnessed the performance of so many imposing ceremonies, that their strained imagination made

them regard as infallible every oracle which emanated from the mouth of the god.

Most of the temples too were situated in very salubrious places, and had either in their interior or in the environs mineral and thermal springs. It is therefore easy to conceive that the purity of the atmosphere and the change which the sick experienced in their pilgrimages to consult the oracle had a powerful influence on their cure. The preliminary ceremonies, however, to which they were subjected, and the sacrifices which were required of them, contributed still more effectually to exalt their imagination and to strengthen their hope. In the first instance the most rigorous abstinence was enjoined. They were obliged to fast for several days before they could approach the cave of Charonium. At Oropus, in Attica, it was required of them before consulting the oracle of Amphiaraus, to abstain from wine for three days and from every kind of nourishment for twenty-four hours. At Pergamus this abstinence from wine was equally necessary in order that the ether of the soul, as Philostratus expresses it, might not be sullied with that liquor.

The priests did not work less on the minds of the sick by the wonders which they recited to them, as they led them through all the avenues of the temple, explaining to them, in considerable detail and with every sort of mystical expression, the miracles which the god had operated on other persons whose offerings and votive inscriptions they preserved. It will be readily conceived that these ceremonies made a deep impression on the minds of the sick, especially

as the priests, in relating to them so many histories of extraordinary cures, had the art of dwelling particularly on those diseases which had some relationship to theirs. After these promenades in the interior of the temples, sacrifices were offered to the divinity. These commonly consisted of a ram, the skin of the animal being reserved for another use ; but frequently also a cock or hen was killed in his honor. At Cyrene a goat was offered to him, a custom which was not observed at Epidaurus, and at Tithorea all kinds of animals were sacrificed except goats. The sacrifice was accompanied with fervent prayers to obtain the revelation. Pliny relates that no offering could be made without prayers, but that, as some of the principal names of the divinity might be forgotten, the priest read or chanted the hymn, and the individual who presented the offering repeated it in a high voice. The patients were also obliged to bathe before being admitted to hear the oracle, a custom to which Euripides alludes :—

“The law ordain’d in reverence we must hold.
 First I would cleanse them with ablutions pure ;
 All man’s pollutions doth the salt sea cleanse.”

(*Iphigenia in Tauris.*)

The Plutus of Aristophanes was also washed by a slave with sea-water before entering the sanctuary. The baths were always accompanied with frictions and other manipulations which produced surprising effects on those whose nervous systems were delicate. Anointing, according to Aristides and others, was also employed on coming out of the bath. The sick were almost always subjected to fumigations before

receiving the answers of the oracle: they were afterwards prepared by prayers, and slept in the neighborhood of the temple on the skin of the ram which they had offered up, or by the side of the statue on a bed, awaiting the appearance of the god of health.

It is not surprising that under such circumstances they fancied they obtained the revelation of future events. In their dreams, we are told, they saw *Æsculapius* or some other divinity appear to them and indicate the means which they ought to use for their cure. "When the dreams transmitted by the god are dissipated," says Iamblicus, "we hear an interrupted voice telling us what we shall do. Frequently the voice strikes our ears when in an intermediate condition between sleeping and waking. Some patients are enveloped in an immaterial spirit, which their eyes cannot perceive, but which impinges upon some other sense. Not unfrequently a mild and resplendent light spreads around, obliging them to keep the eyes half shut," &c. Sometimes the god of health presented himself accompanied with other divinities or appeared under different forms. Venus appeared in the shape of a dove to the celebrated *Aspasia*, and cured her of an ulcer which she had on the chin. All these visions, however, it is probable were only so many evidences of the jugglery of the priests.

The medicines recommended in the dreams were generally of a kind to do neither good nor harm, such as, for example, gentle purgatives prepared with stewed Corinth raisins, or food easy of digestion, or

fasting, baths, and mystical ceremonies. Occasionally, however, remedies so powerful and advice so absurd were recommended, that it required a person to be wholly blinded by superstition to make use of them. Gypsum and hemlock were prescribed to Aristides, who had become dropsical from weakness produced by the repeated emetics which *Æsculapius* had ordered him. He was recommended to alternate their employment with that of bloodletting, and once the god prescribed that one hundred and twenty pounds of blood should be abstracted. Advice so inconsistent with good sense might have led him back to reason had he not been imbued with the most ridiculous prejudices, and if an absurd credulity had not formed the basis of his character.

When the patient died, the fatal event was attributed to his want of confidence or of obedience; at least such was the excuse offered by Apollonius in the name of *Æsculapius* on the occasion of the death of a dropsical patient, and of another individual whose eye had been torn out. The interpretation of the dreams was the province of the priests, and sometimes of the guardians of the temple. These guardians dwelt in the vicinity of the edifice. At a more recent period orators, sophists, and philosophers might be met with in the avenues and peristyle of the temples, with whom the sick could discourse, and who assisted the priests in explaining the dreams. Aristides speaks of his learned conferences with the sophists in the peristyle of the temple of *Æsculapius* at Pergamus, and Philostratus

cites similar examples. Frequently there were at the side of the temples gymnasia, where persons laboring under chronic diseases recovered their strength by the use of gymnastics, and of baths and unctions.

When the patients were cured, they returned to give thanks to the god, and to carry him offerings; they made also presents to the priests, and gave some ornament for the use of the temple. In that of Amphiaraus the custom was to throw pieces of gold and silver into the holy wells, and occasionally the sick, after their cure, had modelled in ivory, gold, silver, or other metal, the part which had been the seat of the affection, species of offerings which were called ἀναθήματα, and a number of which were preserved in the temples.

Gruter, in a work entitled *De incrementis artis medicæ per expositionem ægrotorum in vias publicas et templa*, published at Leipsic, in 1749, has given a copy of several votive tablets discovered in the Isle of the Tiber, of which the following is a translation: "Within these few days a certain person named Gaius, who was blind, learnt from the oracle that he ought to repair to the altar, offer up his prayers, traverse the temple from right to left, place his five fingers on the altar, raise his hand, and place it over his eyes. He did so, and immediately recovered his sight in the presence and amidst the acclamations of the people. These signs of the omnipotence of the god were manifested in the reign of Antoninus." Again, "A blind soldier named Valerius Aper, having consulted the oracle, received

for answer that he ought to mix the blood of a white cock with honey and make an ointment to rub the eye with for three days. He recovered his sight, and returned thanks to the god in presence of the people." Again, "Julian seemed lost without resource from a spitting of blood. The god ordered him to take on the altar some pine-apple seeds, to mix them with honey, and to eat this preparation for three days. He was saved, and returned thanks to the god in presence of the people."

There is one circumstance which not a little contributed to confirm to the priests the exclusive exercise of medicine. As soon as an important remedy was discovered, the mode of preparing it was written on the gates and columns of the temple of *Æsculapius*. Those who invented surgical instruments deposited them also in the temples of the god of medicine. Thus, *Erisistratus*, according to *Cœlius Aurelianus*, presented one to the temple at Delphi, intended for extracting teeth. At Cos the priests of *Æsculapius* appear at a very early period to have had in view the assistance of nature, and thus to cause her to develop her energies. The *Prænotiones Coacæ*, which are usually ranged amongst the writings of *Hippocrates*, exhibit a proof of this. By some authors, indeed, it has been asserted that the works of *Hippocrates* were in a great measure composed from the votive tablets preserved in the temple at Cos. The remembrance of the benefits of *Æsculapius* was perpetuated by the institution of feasts, which were celebrated with much solemnity at *Epidaurus*, *Ancyra*, *Pergamus*, and *Cos*, and at which the greater

part of the inhabitants of the cities of Asia Minor congregated at certain periods.

The descendants of Æsculapius dwelt, some in Peloponnesus, and others in the island of Cos. They transmitted to their children the medical knowledge which they had inherited from their ancestor, without divulging the secret to any stranger. The family of Æsculapius consequently formed, like the priests of Egypt, a particular caste, professing the practice of medicine and the mysterious worship of its founder. One of its most ancient laws expressly says, "Sacred things can only be revealed to the elect, and ought not to be confided to the profane until they are initiated in the mysteries of the science." All these who were so initiated were compelled by the Asclepiades to swear according to the statutes of the order of Apollo, Æsculapius, Hygeia, Panacea, and of all other gods and goddesses, not to profane the mysteries, and only to divulge them to the children of their masters, or to those who would bind themselves by the same oath. Galen asserts that medical knowledge was originally hereditary, and that the parents transmitted it to the children as a family prerogative; but that afterwards they relaxed and communicated it to strangers after their initiation, and it consequently became less exclusive property. The theurgic physicians of the school of Alexandria afterwards restored this old habit, in order, by the obligation of a religious silence, to excite more consideration to their superstitious practices. The Asclepiades wholly neglected two essential parts of the healing art, dietetics and

anatomy. Plato asserts that the former was not cultivated before the time of HERODICUS, of Selybria, who lived 396 years before Christ, and Hippocrates confirms the assertion.

Anatomy could not flourish in Greece, because they condemned and regarded as a crime worthy of an exemplary punishment all conduct towards the dead which was contrary to the popular prejudices. These prejudices had their source in the opinion for a long time entertained that the soul, when freed from its material covering, was obliged to wander on the banks of Styx until the body was consigned to earth, or consumed by the flames; hence the eagerness with which sepulture was performed on the dead to insure the rest of their souls, and the duty imposed upon all travellers of covering with earth the dead bodies which they might meet with, as well as the religious respect entertained for the tombs, and the severe punishments inflicted on those who profaned them; and, finally, the utility of imploring the clemency of the gods in favor of those who had perished in foreign countries or in fleets, and to whom sepulture could not be given. Sacrifices and libations were made; the dead were loudly invoked by name, and monuments erected to them, for which they had frequently as much respect as for the graves themselves. At Athens a speedy burial of the dead was esteemed the most sacred of all duties, and the transgressor of the laws was severely punished.

The attention of the Greeks to the bodies of their warriors who had died in battle went so far, that

six officers, who had gained a brilliant victory at Arginusæ over the Lacedæmonians, were sentenced to death because they had not collected with sufficient care the dead bodies which had fallen into the sea. At the time even of the war of Troy, the two armies, at the prayer of Priam, suspended hostilities until they had burnt the dead :—

“ Next, O, ye chiefs ! we ask a truce to burn
Our slaughter'd heroes, and their bones inurn,
That done, once more the fate of war be tried,
And whose the conquest, mighty Jove, decide.”

After each battle the first duty of the conqueror was to inter the dead bodies of the enemy. The fear of a fate similar to that of the heroes of Arginusæ prevented Chabrias from prosecuting the victory which he obtained at Naxos over the Spartans, and he occupied himself in burying those warriors who had fallen during the action.

There is no question but that the Greeks had some notions of osteology, or the description of the bones, and syndesmology, or the description of the ligaments, suggested by the treatment of luxations, fractures, and other diseases of the bones ; but the extent of these notions will be more particularly detailed in tracing the history of Hippocrates.

CHAPTER IV.

MEDICINE OF THE ROMANS TO THE TIME OF CATO THE CENSOR.

Their early knowledge derived from the Greeks—Establishment of medicinæ or shops by the freedmen—Medical practitioners exempted from banishment—Archagathus, the executioner—Porcius Cato, censor and physician.

OF the medicine of the Romans up to the time of Cato, or prior to the 150th year before Christ, but little need be said, as their manners and customs connected with the healing art so nearly resembled those of the Greeks, so much so, indeed, that Strabo affirms, "all that they know they owe to the Greeks, without having made the least additions themselves, and whenever any hiatus is observable, it need not be expected to be filled up by them; even all their technical expressions are of Greek origin." Their mythology, both general and medical, resembled that of Greece, modified according to the different characters of the people; and, the more their relations with this nation multiplied and luxury made progress amongst them, the more physicians were observed to establish themselves in the capital of the world. The Greek physicians who first settled there were all keepers of baths, except a small number of philosophers who were anxious for the improvement

of the theory of medicine, by the introduction of the dialectic or logical method.

The majority of these adventurers were slaves, whom their masters, incapable at first of appreciating the advantage of the sciences and afterwards enervated by the luxury of the Greeks, frequently sold or freed, after having made them considerable presents, when they had received from them any eminent services. These freedmen established shops which the Romans called *medicinæ*, and where they sold medicines and exercised their art. Other physicians, however, who came to Rome under more favorable circumstances, enjoyed those advantages and privileges which so important an art as that of medicine has a right to expect from polished nations. It would even seem that the midwives, to whom Pliny attributes the prerogatives of nobility, and one of whom had the title of *Iatronæa, regionis suæ prima*, were originally from Greece, and, when the Romans expelled the Greeks from Italy, the laws which proscribed them excepted all those who practised medicine.

ARCHAGATHUS of Peloponnesus, and son of Lysanias, is the first Greek mentioned in history as having gone to Rome to practise the healing art. He went thither 219 years before Christ, under the consulate of Lucius Æmylius Paulus and Livius. The Senate granted him the right of citizenship, and bought him a shop in the suburbs. He soon, however, treated diseases in so barbarous a manner that he received the surname of *the executioner*, and all the inhabitants refused his assistance.

Several celebrated personages amongst the Romans detested the Greeks on account of their avidity, the latter regarding Italy as a country for their own aggrandizement. PORCIUS CATO, the Censor, especially distinguished himself for the aversion which he had for that nation. Scipio Africanus, on the contrary, admired and protected it. This reason determined Cato to inspire his son with an implacable hatred of the Greek physicians. The austere censor possessed, also, an old book of formulæ, which he religiously followed, and which contrasted in a striking manner with the ideas of the Greeks.

Cato himself practised medicine after his manner and conformably to the precepts contained in his book. Some idea may be given of the principles on which all his science rested, when it is known that, like Pythagoras, he regarded the cabbage as a universal remedy; that he expressly interdicted females from administering anything to diseased cattle; that he regulated according to the ternary number the medicines which ought to enter into the composition of a remedy for cows; and, finally, that he pretended to cure dislocations, after the manner of the Etrusci and Pythagoreans, by barbarous expressions and magical songs, such as "*Motas vaeta daries dardaries astatutaries;*" or "*huat, hanat huat ista pista sista, domiabo damnaustra et luxato;*" or, finally, "*huat, haut haut ista sis tar sis ardanuabon dunnaustra,*" and such absurd and unmeaning compositions. These superstitious notions, however, are not confined to the ancients, but have found advocates even in much more recent periods, when it

would naturally be supposed that, in the march of civilization, they would have long since been obliterated.*

*They were even cherished until very recently in some districts of Great Britain, and there are frequent allusions to them in the popular poetry of the 17th century :—

“ Tom Pots was but a serving man—
But yet he was a Doctor good ;
He bound his kerchief on the wound,
And with some kind words staunch'd the blood :”

And Sir Walter Scott, in his “ Lay of the Last Minstrel,” remarks :—

“ She drew the splinter from the wound,
And with a charm she staunch'd the blood.”

CHAPTER V.

MEDICINE OF THE JEWS UP TO THE CAPTIVITY OF BABYLON.

Egyptian origin of their medical knowledge—Medical attainments of Moses and the lawgivers—Cure of the lepra—The healing art a vocation of the prophets—Medical work of Solomon—Recorded cases of paralysis, affections of the intestines, leprosy, etc.—First origin of monks and monk physicians.

HAVING already referred to the medicine of the Egyptians up to the reign of King Psammetichus, or prior to the 600th year before the Christian era, we may now appropriately investigate the history of the art amongst the Israelites to the captivity of Babylon. The conformity which existed between the constitution, manners and degree of civilization of the Egyptians and those of the Israelites ought not so much to astonish us when we reflect on the various journeyings of Abraham and his children into Egypt, and the sojourn of four hundred years' duration which the descendants of Jacob made in that country. It is true that the Israelites professed the worship of the true God, and continued to a certain extent faithful to the customs of their ancestors; but it is easy to perceive that they borrowed considerably from the Egyptians, even under the legislation of Moses. The resemblance, indeed, be-

tween the two nations is so striking that it has induced Strabo and others to believe that the ancient Jews were descended from the Egyptians.

For four hundred and thirty years the descendants of Jacob lived in Egypt under the dominion of the Pharaohs, when a liberator appeared to deliver them from servitude, and to conduct them to the borders of the country which the Almighty had promised to their ancestors. This liberator was Moses, who, having been adopted by the daughter of the king of Egypt, was instructed in all the arts and sciences of that empire. Ancient writers pretend that the priests taught him arithmetic, geometry, and medicine, and Philo Judæus asserts that the Greeks, established in the country, instructed him in the other profane sciences, but this is evidently an anachronism.

As the domination of the priests formed in Egypt the basis of the constitution, Moses also established amongst the Israelites a religious government. "And ye shall be unto me a kingdom of priests, and an holy nation." (Exod. xix. 6.) Like also as in Egypt, knowledge of every kind was hereditary in the priesthood, the Levites forming also the hereditary noblesse amongst the descendants of Jacob. They were at once the judges and physicians of the people. A variety of passages in the Scriptures, and especially in the laws of Moses, show that the lawgiver had considerable knowledge of natural history and medicine. Not only he surpassed the magicians of Egypt, his instructors, but he also succeeded in burning and reducing to powder the

golden image which Aaron had made for the people to worship, and changed the bitter water of Marah to sweet by casting a certain wood into it. Without more exact information, however, respecting the means which he employed on those occasions, it is impossible to form any accurate estimate of his degree of physical or medical knowledge.

Moses has given the least equivocal proofs of his medical proficiency in that portion of his laws which comprises his hygienic precepts, and in the description of those characters by which the white leprosy might be discriminated, as well as of the means which ought to be had recourse to for its cure. He teaches how to distinguish the spots which announce the speedy invasion or existence of the lepra from those which ought not to inspire suspicions, and treats fully in the 13th chapter of Leviticus of the various symptoms of that dreaded affection. The cure of the lepra, like that of all other diseases, was considered as the immediate effect of the omnipotence of God, and prayer was the chief means employed for its removal. An immediate revelation to Moses declared that, if the people did not observe all the laws of Moses, God would make their plagues wonderful, visit them with sore sicknesses, and bring upon them all the diseases of Egypt. (Deut. xxviii. 59.) When Miriam murmured against the lawgiver, she was struck with leprosy, from which she was not freed until Moses had prayed God to cure her. The people, also, having revolted, an epidemic arose which destroyed 14,700 men, and did not yield until Aaron the high priest

had offered up incense. The Levites alone knew how to treat the lepra. They isolated the patient, purified his body by repeated ablutions, and offered up expiatory sacrifices.

The exercise of medicine remained in their hands even after the Israelites, having become masters of the land of Canaan, abandoned their nomadic life, in order to form a state which might be considered as an agricultural republic. The healing art became subsequently the avocation of the prophets, up to the reign of Solomon, which elevated, for some time, the Jewish nation to the highest point of splendor. Civilization made but little progress, from their avoiding every kind of connection and admixture with the neighboring people, although the divine laws expressly enjoined them to treat all nations with friendship. Notwithstanding their proximity to the Syrians, with whom they kept up commercial relations, presented a valuable opportunity for perfecting themselves in the sciences and arts, they knew so little how to profit by it, that Solomon was compelled to procure workmen from Sidon to build the temple, because he could find no person in all Judea who could work the wood with so much dexterity as the inhabitants of that industrious city.

In the time of Samuel, the Philistines who had carried away the ark of God were struck with hæmorrhoids, from which they were not freed until they had offered to Jehovah figures in gold of those excrescences. When King Saul was attacked with melancholy, the affection was attributed to an evil

spirit, which the melodious sounds of David's harp alone succeeded in expelling.

The reigns of David and Solomon considerably advanced the civilization of the Jews, but the progress which they caused in it was not of great duration, for the division of the kingdom and the incapacity of the rulers were not long in replunging the people into sloth and stupidity. The extensive wisdom of Solomon does not less merit our attention than his enlightened taste for commerce and the fine arts which so much contributed to the welfare of his people. His wisdom, we are told, excelled the wisdom of all the children of the last country and all the wisdom of Egypt; "he spake three thousand proverbs: and his songs were a thousand and five. And he spake of trees, from the cedar tree that is in Lebanon, even unto the hyssop that springeth out of the wall; he spake also of beasts, and of fowl, and of creeping things, and of fishes." (1 Kings iv. 32.)

It is not, consequently, surprising that tradition should have attributed to him a book which instructed how to treat diseases by natural means, a book which, according to Suidas, Ezechias destroyed, because the use of the remedies pointed out in it might injure the interests of the Levites, who cured diseases by expiatory sacrifices. The qualifications of this great prince are thus spoken of by Josephus: "God," says he, "had accorded him the power of appeasing his rage by prayers, and of driving impure spirits out of the bodies of the sick by conjurations." "This method," he adds, "is the one followed in our own days." He mentions also having been

witness of the cure of one possessed of an evil spirit, performed by Eleazar in the presence of the Emperor Vespasian. The prophet introduced into the nose of the patient a root recommended in such cases by Solomon, pronouncing at the same time the name of that prince.

The Jews became so corrupt, and the Levites degenerated to so great a degree, under the successors of Solomon, that God was constrained to send prophets to bring back the people to their duty and the observance of the law. These missionaries were more agreeable to the people than to the Levites, from whose hands they took away the practice of medicine. King Jeroboam having been wanting in respect to one of these servants of the Lord, his hand dried up, "so that he could not pull it in again to him," and in order to get rid of the paralysis he was compelled to supplicate the prophet to intercede for him with the Almighty. Abijah, the son of Jeroboam, having fallen sick, and the queen being desirous of knowing what would be the event of the disease, she went to Shiloh for the purpose of consulting the prophet Ahijah, who predicted the approaching death of her son. He, however, who rendered himself the most famous for his prophetic cures was Elijah, who restored to life the son of a widow at Zarephath, laboring under "a sickness so sore that there was no breath left in him" (1 Kings xvii. 17), who predicted to King Jehoram a disease of the intestines in which his bowels should fall out, and to Ahaziah that he should surely die.

Elisha inherited the prophetic spirit of Elijah.

He restored to life the son of a woman of Shunem, and freed Naaman, the Syrian general, from leprosy by prescribing bathing in the waters of Jordan. The prophet Isaiah cured also King Hezekiah of an imposthume by the application of a cataplasm of figs. King Asa, in the twenty-ninth year of his reign, was diseased in his feet, until, we are told, his disease was exceedingly great: in his affliction, however, he sought not the Lord, but the ordinary physicians,—the Levites,—and died after having languished for two years. King Uzziah was also struck with leprosy for having burnt incense in the temple and for having resisted the priests when they represented to him the impropriety of his conduct.

Such are the principal facts which can give us any idea of the state of medicine amongst the Israelites prior to the captivity of Babylon. The habits and modes of thinking, however, of that people changed considerably after ten tribes had been led by Shalmaneser, king of Assyria, into the cities of the Medes and into Halah and Habor by the river of Gozan, and when the tribe of Judah was led to Babylon by Nebuchadnezzar. The Jews then found themselves transported into nations more polished than themselves and whose civilization had followed a different march. Possessing no longer a temple, they offered up their prayers in secret, living a contemplative life, conjoined with the severe abstinence of the Orientals. It is thus, according to Sprengel, that the first monks sprang up amongst the Israelites, and the members of that con-

gregation were regarded as saints and physicians. The first who devoted themselves to this new mode of life were the Rechabites, who never drank wine, built houses, sowed seed, nor cultivated the vine, but dwelt in tents according to the rule established by their founder Jonadab.

CHAPTER VI.

MEDICINE OF THE HINDOOS.

Early state of civilization—Brahmin physicians—Laws in regard to poisons—Diseases caused by evil genii—Superstitions—Pathology of the Hindoos—Treatment of fevers, smallpox, &c.

ALTHOUGH these people date at too early a period the origin of civilization amongst them, and their chronology extends to a most astonishing antiquity—their period Caliuga being 3100 years before the Christian era, at which time they pretend to have calculated the equations of the moon and performed other difficult astronomical investigations—it cannot be denied that Alexander, when he undertook his expeditions into Egypt, found the social institutions at a very high degree of perfection and almost in the same condition as they are at the present day. Although the chronology of the Brahmins above referred to is evidently absurd, it is unquestionable that the inhabitants of India had made some astronomical observations a long time before they had any intercourse with Greece.

As among the Egyptians, the Hindoos were, at the time of Alexander, and are still, divided into several tribes or original castes, of which that of the Brahmins comprised the savans and physicians. From the testimony of Strabo, these Brahmins ob-

served the greatest sobriety, passed their lives in contemplation, and in solitude meditated on the causes of all natural phenomena. There was also in India another sect of philosophers which Clemens of Alexandria calls the Samaneans, and which are the same as the Schamans of Thibet and of the coast of Malabar. The Samaneans were also divided into two distinct classes, the Hylopians and the physicians properly so called. These latter led a very simple life, but did not dwell in the woods like the Hylopians. Their food consisted of rice and meal. They cured diseases, less by medicine than by regimen, and their ordinary remedies were ointments and cataplasms, for they ascribed a less certain action to means of every other kind. From this caste of physicians were distinguished the magicians and sorcerers who wandered from village to village to exercise their imaginary art.

The *surveillance* of the sick was entrusted in the towns to a particular class of magistrates, who were also charged with the burials and under whose inspection the Samaneans practised physic. It appears also that there existed a law for the purpose of preventing any one who should discover a poison from making it known before he had found out an antidote to combat its effects. Should he, however, succeed in doing the latter, the king loaded him with honors, but if he published the formula for the poison without pointing out that of the remedy, he was punished with death. At the time of Megasthenes, about 300 years before Christ, the knowledge of the Brahmins and the laws of the Hindoos were

not 'consigned in books, and were only transmitted by tradition. All diseases were considered as the effect of the influence of evil genii, and could not be cured until the latter had been expelled by purifications and magic words.

The Brahmins of more recent days have not been wholly devoid of medical knowledge, but they exercised medicine as a vulgar profession, scarcely ever endeavoring to improve it, and transmitted their mode of treatment to their children such as they had received it from their parents. They had not the slightest knowledge of anatomy, but possessed some old works on the healing art, written in verse and containing collections of formulæ, of which sugar formed the chief ingredient, applicable to all diseases. In the exercise of medicine as much superstition existed amongst the Hindoos as amongst the Chinese. Of this there is a striking example in the treatment of the bites made by venomous serpents. Oil was poured into a vessel containing the urine of the person bitten, and according as it might swim or be precipitated they prognosticated death or recovery. Future events were also looked for in the aspect of the stars, the flight of birds, and other similar futilities. It has been asserted that there at one time existed on the coast of Coromandel eight classes of physicians, having each their particular department, some adhering to the diseases of children and acknowledging the wind as their patron; others confining themselves to the cure of the bites of serpents, and considering the air as their protecting deity, &c.

The pathology of the Hindoos was extremely con-

fused. They attributed to worms all the diseases of the skin, and every other they ascribed to three principal causes, wind, vertigo, and change of humors. According to one of their theories, the body is composed of 100,000 parts, in which are comprised 17,000 vessels, each of which has seven different canals, and in which are ten species of wind. Diseases arise from the irregular directions of these winds, and as the external air which enters the lungs in the act of respiration is the source of all the winds, the best preventive of these disorders consists in not breathing too quickly. According to the memoirs of the Danish missionaries, there were some Gentoos who reckoned 4448 different species of diseases.

Regimen formed the principal part of Hindoo medicine. A considerable portion of them lived only on vegetables, even in a state of health, an observation which Strabo and Suidas had already made. They do not, at the present day, attain the very advanced age of which these authors speak, and which might in some measure be expected as the results of their mode of life. According to Clarke, however, it would seem that their sobriety preserved them from several severe disorders, especially the intermittent fevers occasioned by the insalubrious air of marshes. Their excessive cleanliness, the frequent use of the warm bath, and particularly the custom of using friction and brushing of the skin on coming out of the bath, also had a powerful influence on their health.

It has been affirmed that the Brahmins were well acquainted with the virtues of plants, and that they

employed certain medicines with much advantage. They made use of lime-water and the *dolichos pruriens* in cases of worms; formed with juice of the euphorbium and maize flour, pills which they administered, as well as the excrement of the cow, in a considerable number of cases. They prescribed rice in cholera morbus, and sand-baths in the beriberi, a disease of the nervous function not uncommon in those parts. They were not in general advocates for the operation of bloodletting, but regarded the opening of the lingual veins as an excellent remedy in angina and different other affections. Caustics were their favorite means, and they applied them like the Japanese in bone fever and in cholera morbus; they scarified the eyelids, and made incisions in the forehead in ophthalmia, which was very frequently observed amongst them, but they had no idea of amputation. In acute fevers they prescribed the most rigid diet, and, when the indications were pressing, bloodletting. The chief occupation, however, of the physician was to explore the pulse, which he never felt without attentively considering the countenance of the patient, for, according to their opinion, every change in the pulse drew on an alteration in the features. In the smallpox they ordered an antiphlogistic regimen, modified according to the individual constitution of the patient, and, according to Mackintosh, but which, to say the least of it, is problematical, they knew how to remove the scars left by the variolous pustules, by the aid of an ointment, of which the Europeans have not yet discovered the composition. They used, in the treat-

ment of venereal diseases, some particular and indigenous medicines, principally pills of euphorbium, which enjoyed with them a great reputation. They had an aversion to glysters, and possessed, according to one authority, an arcanum which, against the bites of serpents, acted like the most energetic opiates, and almost always cured those who might have been bitten.

Such is a summary of what we know regarding the medicine of the Hindoos; but under the influence of greater civilization many of these views may have become modified, and other remedies and modes of treatment adopted by them. It is impossible, in the accounts we have given of the medical relations of the Brahmins, to make any chronological arrangement. It is probable that many of the agents referred to are of purely modern employment among them, and we have no reliable data to inform us how many of the ancient remedies have been discarded.

CHAPTER VII.

MEDICINE OF THE CHINESE AND JAPANESE.

Causes of their imperfect civilization—Ancient code of the Chinese physicians—Medical schools—Chinese knowledge of anatomy, physiology, &c.—Exploration of the pulse—Physicians of the court of Pekin—Medical knowledge and practice of the Japanese—The moxa, its preparation and uses.

A VARIETY of insurmountable obstacles have opposed themselves to the Chinese ever attaining the same degree of civilization that the European arrives at with so much comparative facility. The first is situated in his organization, whether natural or acquired by education; the second in the frightful despotism which hangs over his head; the third, in the foolish vanity which has induced him to believe that China is the country of wisdom and the sciences. Du Halde, although a panegyrist in other respects of the handicraft of the Chinese, has accused them, with reason, of pushing superstition to blindness, and of being in absolute ignorance of every branch of natural history. According, also, to Ghirardini and Sir Geo. Staunton, they possess neither an inventive spirit, taste for the fine arts, nor genius in works of the mind.

Isolated from every other nation, the Chinese were, comparatively speaking, known only in modern times

to Europeans. The first remarks which we possess of them were communicated in the 13th century; but it is highly probable that they had previously had communications with the advanced nations of Europe, and that they had acquired from them some of their knowledge. It is known that Bactriana and Sogdiana were conquered by the Scythians, 126 years before the Christian era. The sciences and arts have flourished in those countries since the time of Alexander, and the Chinese themselves relate, in their ancient chronicles, that towards this period several savans, especially astronomers, went from those countries to reside amongst them. It is consequently not unreasonable to presume that the astronomical knowledge of the Chinese may be dated at that period, and that it was introduced through that channel. It is said by Le Comte, in his *Mémoires sur l'État présent de la Chine*, that Hoang-ti composed, four thousand years ago, the code by which the Chinese physicians have been until recently and may at the present day be guided. According to the testimony, however, of the best informed mandarins, this code was not substituted for the ancient, until after the burning of a considerable library in China, which occurred 230 years before the Christian era.

There were formerly in China imperial schools, in which medicine and astrology were at the same time taught, the latter forming a favorite branch with the Chinese. The physicians were but little esteemed and very badly paid, and those of the court, according to Du Halde, were commonly deprived of their virility. Every one, however, was

permitted to exercise medicine according to his own fashion, and to prepare his medicines in the manner which he considered the most suitable. The physicians who enjoyed the highest consideration were those who had learned the healing art from their fathers and who transmitted it to their children. Even at the present day it is probable that there does not exist in China a school in which the art can be studied, so that it may be considered as in a state of comparative infancy.

The notions which the Chinese possess regarding the structure of the body mainly rest on old traditions, which probably originated from the Greek physicians of Bactriana; superstition preventing them from dissecting. It is on this account that their anatomical information has been so very incorrect and confused as to scarcely deserve mention. A single glance at the plates given by Cleyer, in his *Specimen Medicinæ Sinicæ*, will at once show their slight knowledge of the human organization.

Their physiology is not less contemptible. They admit two constituent elements of the body, heat and moisture. These elements residing in the blood and in the vital spirits, their union produced life, and their separation occasioned death. The six chief parts in which the radical moisture is seated are,—on the left side, the heart, the liver, and the left kidney; on the right, the lungs, the spleen, and the right kidney. To these they give the name of the *gates of life*. The viscera in which the vital heat resides are,—on the left side, the small intestines, the gall-bladder, and the ureters; on the right side, the large

intestines, the stomach, and the genital organs. There exists, moreover, according to them, a certain concordance between these viscera, the small intestines being in harmony with the heart, the gall-bladder with the liver, the ureters with the kidneys, the large intestines with the lungs, the stomach with the spleen, and the organs of generation with the right kidney. The vital heat and radical moisture pass at certain periods from the limbs into the viscera, and *vice versâ*. The body they consider to heal in connection with certain external matters which exert a constant agency upon it. Thus we are told that in summer heat acts upon the heart and large intestines; that the viscera are in harmony with the south; the liver and gall-bladder with the atmosphere, and both one and the other with the east as well as with spring; that the metals exert an influence over the lungs and large intestines, and are in harmony with the west and with autumn; and a variety of sundry absurdities.

To the Chinese the credit has generally been given of understanding the circulation of the blood, but if we believe Cleyer nothing can well be more absurd than their ideas on this subject. According to that author, the Chinese physicians make the circulation of the vital heat and radical moisture to begin at three o'clock in the morning. It commences in the lungs, and terminates at the expiration of twenty-four hours in the liver. They have even calculated the rapidity of the circulation, and pretend that in twenty-four hours the number of pulsations amounts to from 54,000 to 67,000, whilst

the number of respirations in the same period is generally about 35,500; a calculation, however, evidently most absurd, the pulsations being estimated no higher than twice the number of respirations.

The exploring of the pulse is the most important part of Chinese medicine. They compare the human body to a musical instrument, and conceive that such an accordance exists between its different parts and the viscera, that we may be able to know whatever is going on in it by inspecting the eyes and tongue, and especially by feeling the pulse. They flatter themselves that they can discover by the aid of the last, viz., the pulse, not only the seat but also the causes of diseases. Most of the examples, however, which the credulous missionaries have related as proofs of their extraordinary dexterity in that respect are only so many proofs of the charlatanry and deceit of their physicians. The mode in which they explore the pulse is as mystical as it is ridiculous; they apply the four fingers upon the artery, raising and depressing them over the vessel as if they were playing upon the piano-forte.

In diseases of the heart, they feel the pulse of the left arm; a little higher, but on the same side, in affections of the liver; in the right arm, in those of the stomach; at the wrist in those of the lungs, and above the joint of the hand in those of the kidneys. According to an old codex quoted by Cleyer, the Chinese distinguish three different places at the wrist where the pulse may be felt: the nearest to the hand on the left side they consider as the pulse for affections of the heart and pericardium, and on

the right side for diseases of the lungs ; the highest place of those indicated, on the left side, diseases of the left kidney and small intestines ; on the right side, those of the right kidney and large intestines ; the middle between the two, on the right side, is considered the pulse of the liver and diaphragm ; on the left side, that of the stomach and spleen. They pretend also that they can determine the variation which the pulse undergoes during the phases of the moon and at the changes of the seasons.

The other principles of Chinese medicine are equally devoid of rationality with their theory of the pulse. The physicians of the court of Peking attributed the greater part of diseases to spirits or winds, and dysentery to the want of heat in the fluids. The chimerical idea of a panacea capable of causing everlasting life existed in China as in other countries. The ancient Scythians had labored hard to discover the important secret, but the Chinese fancied that they possessed it in the root of ginseng, if properly administered. The sect Tao-tse pretended that they knew the composition of a similar means adapted for indefinitely prolonging life. Staunton presumes that there entered into this preparation opium and other similar substances capable of for some time exalting the imagination. The Chinese made use of the China root in the majority of diseases ; and they even now sell in all the markets, under the name of cordials, an incredible quantity of medicines, which the common people employ indiscriminately. Du Halde has given an extract from an old Chinese book on botany, in which the virtues

of various simple and compound medicines are exposed with much superstition. If we may credit the recital of some missionaries, the Chinese were at one time neither subject to the stone nor the gout, exceptions which are attributed to the use of tea. They frequently employed the bile of the elephant, white vegetable wax, ivory, and musk. They rarely used bloodletting, but were great friends to baths, dry cupping, and cauterization, which they principally used for expelling wind, the cause, according to them, of the major part of disorders.

The Japanese have borrowed of the Chinese the majority of their principles, and the practice of the art has been with them enveloped in the same prejudices. They were afraid of bloodletting, and had not the least notion of anatomy. All their science consisted in the exploring of the pulse. They employed the actual cautery in all diseases, but especially in the gout. The most common form of the cautery was the moxa, which was afterwards, although under a modified construction, introduced into Europe.* The Chinese moxas were formed from the dried leaves of the *Artemisia vulgaris latifolia*, or *Artemisia Chinensis*, a species of mugwort. The Japanese considered that it was proper to gather the artemisia for this purpose only on those days which had been selected by their astrologers, and which

* A description of the mode in which it may be extemporaneously formed for practical purposes, and the cases in which the physician may advantageously avail himself of its administration, may be found in the author's translation of Baron Larrey's Memoir on the Use of the Moxa, London, 1822.

were thought to possess the advantage of a particularly benign influence of the heavens and stars, by which the virtues of the plant were considered to be greatly increased. These were the first five days of the fifth Japanese month, called by the natives *Gonguatzgoritz*, which, according to the Gregorian calendar, answers to the beginning of June, and sometimes, but seldom, to the latter end of May, the Japanese commencing their year with the new moon next to the spring equinox. The artemisia received the name of moxa when dried. Its preparation, which it is not necessary here to describe, was formerly kept a great secret by the Chinese.

According to Kaempfer, the Chinese and Japanese burned with the moxa indifferently and without regard, old and young, rich and poor, male and female; women big with child were alone spared, if they had not been burnt before. The intent of burning with the moxa was either to prevent or to cure diseases, but it was more particularly recommended by their physicians as a preventive medicine, for which reason they prescribed it to the healthy more frequently than to the sick. This practice they grounded upon the principle that by the very same virtue by which it dispelled and cured present distempers, it must of necessity destroy the seeds of those to come, and by that means prevent them. It was at one time the custom for all persons who had any regard for their health to cause themselves to be burnt once every six months, and this custom was so thoroughly and so religiously observed in Japan, that even those unhappy persons who were

condemned to perpetual imprisonment were not deprived of this benefit, but were taken out of their dungeons once in six months in order to be burnt with the moxa. The neighboring black nations made more use of this agent than the Chinese and Japanese themselves, in epilepsy and all chronic cephalic disorders, their plan being to burn a considerable quantity of it on the crown of the head, which, it is said, was sometimes attended with so much success, that some patients are said to have recovered who had been previously given over by their physicians.

In all the northern provinces of China the principal remedy for most diseases consisted in making deep punctures in the body, after which small balls of the down of the artemisia were burnt, these punctures being made with needles of gold, silver, or steel, without drawing blood; and all the skill required in the physician was to determine their number and depth, and where it was necessary to make them. It was formerly considered that every kind of fire was not proper for lighting these salutary balls, and, therefore, mirrors of ice or metal were employed for that purpose, which caused the water, according to the Abbé Grosier, to freeze in a round convex vessel, and the ice, being presented to the sun, collected its rays and set fire to the down of the plant. Ten Rhyne observes that acupuncture became a peculiar art in Japan, and that the houses of the practitioners were known by the wooden image of a man in the vestibule, on which the places for

acupuncture and the application of the moxa were delineated.

The last absurdities respecting those people which may be mentioned are the belief that the color of red was very advantageous in the smallpox, for which purpose they lined the chambers of those laboring under it with cloth of that color; and the plan pursued by some of their magicians, who are said to have cured the majority of their diseases by placing before their idols the description in writing of particular characters of the affection under which the patient labored, making the paper afterwards into pills and causing the patient to swallow them. Some of these absurdities, from all we can learn, still influence, with slight modification, the practitioners of the modern empire.

As previously remarked in regard to the Hindoos, it is impossible to speak definitely of the more recent progress of medicine in China and Japan, especially as so large a portion of the interior of each vast country is still in a state of only semi-civilization or partial barbarism. In a brief sketch of Oriental pathology and practice, much that is modern is necessarily mingled with a large amount of ancient traditionary information, which it would be a useless task to classify chronologically.

CHAPTER VIII.

MEDICINE OF THE SCYTHIANS.

Progress of their civilization—Wonderful cures—Abaris, the Hyperborean—Anacharsis—Toxaris.

THE southern part of Russia from the Black Sea to Mount Oural has been inhabited, from time immemorial, by the Scythians. This nation descended, like almost all others, from Caucasus, and, always more and more compressed by those which surrounded it, were at last obliged to abandon their territory to the Huns or Oriental Mongols, at the period when Europe and Asia were inundated by hordes of barbarians from the icy regions of the north.

The Greeks were acquainted with this nomadic nation a short time after the Trojan war, for the excellent productions of the country which they inhabited excited the cupidity of the merchants of Miletus and several other Greek cities of Asia Minor, who established at the mouth of the Danube, of the Tyras, the Borysthenes, and on the banks of the Palus Mæotides numerous colonies, by means of which they entered into a more intimate connection with the Scythians, to whom they gradually communicated a certain degree of civilization.

Many singular and incredible traditions reigned

in Greece on the mode of life, manners, and knowledge of this people. So many surprising facts are related of Abaris, Zamolxis, and of different other Scythians who had travelled in Greece or received some tincture of civilization in the Asiatic colonies, that, if we believe the tales, it would seem that the inhabitants of Scythia had discovered the means of attaining knowledge beyond the ordinary capability of man. It is true, however, that the Chaldeans, Egyptians, and other nations have not been less held up to admiration.

The history of ABARIS, the Hyperborean, is a tissue of so many fables, that we are tempted to believe him an absolutely imaginary personage. He undertook, in the quality of priest, a journey to Delphi, cured several patients by magical means or by charms, as was the habit of all the priests of that period, and as we are assured put a stop to an epidemic. According to some authors, he built the temple of Κόρη σώρειρα at Lacedæmon, pronounced several oracles, and arrested by charms the plague which desolated that city.

Another Scythian not less famous, ANACHARSIS, travelled into Greece at the time of Solon, and, on his return from his travels, instructed his countrymen in the regimen which they ought to observe in acute diseases, as well as the means best adapted for appeasing the wrath of the gods. He rendered himself celebrated for his great wisdom and the purity of his manners.

A third, named TOXARIS, accompanied Anacharsis in his travels to Athens. He acquired great reputa-

tion in that city, from his becoming one of the Asclepiades, and practising medicine with the greatest success. After his death he is said to have arrested a plague by appearing to the wife of one of the members of the Areopagus, and the Athenians, in gratitude, erected him an altar on which was sacrificed every year a white horse.

CHAPTER IX.

MEDICINE OF THE CELTS.

The Gauls and the Belgæ—The Druids, the Eubages, and the Bards—Medical sorceresses—Druidical remedies.

UNDER the name of Celts we include especially the Gauls and the Belgæ. The former lived at first in France between the Seine and Garonne, but subsequently crossed into England and were replaced by the Belgæ, who had previously resided between the Loire and the Rhine. Although the latter were a little more enlightened than the others, there is every reason for believing that the knowledge of their priests was very limited.

The learned amongst the Celts were called Druids. They were at the same time judges, legislators, priests, physicians, and divines. The isle of Anglesey in England was, according to Rowland, at first the place of their congregating, and they would seem to have been more highly estimated by the inhabitants of Great Britain than amongst the Gauls; several Druidical remains being still observable in that country. Subsequently they became divided into three classes, the Druidi or Druids properly so-called, who were the legislators; the Eubages, who studied nature; and the Bardi or Bards, who confined themselves to poetry and history. Clemens of Alexandria compares them, with considerable justice, to the Schamans of Thibet, of whom we have

already spoken. In fact these Druids were so many impostors who had succeeded in rendering themselves free from all authority by persuading the people that they kept up a correspondence with the gods. Their wives, who were called Alraunes, exercised also the calling of sorceresses, causing considerable evil by their witchcraft, but taking charge of those warriors who might have been wounded. They gathered those plants to which they attributed magical virtues, and unravelled dreams. Women in childbed especially implored their assistance.

The Druids revealed only their principles and methods to those who were initiated in their mysteries, and communicated their instructions in the woods and unfrequented places. As they celebrated their religious ceremonies under the oak, they attributed to the mistletoe, a plant sacred amongst them, the virtue of curing all diseases. They collected it in great pomp on the first day of each year, and immolated white bulls immediately after having found it. They regarded also the selago, a plant resembling savin, and the vervain as sacred plants, capable of curing all sorts of diseases and wounds. This latter was always gathered at the rising of the star Sirius, and the time of collection was preceded by mystical ceremonies.

From this brief account of the Druids it appears how erroneous it is to ascribe to them, as has been done by some writers, considerable knowledge. All the barbarous nations resembled them; their priests being only so many impostors, who arrogated to themselves the exclusive possession of medicine and other sciences.

CHAPTER X.

FIRST TRACES OF A MEDICAL THEORY IN THE PHILOSOPHIC SCHOOLS OF GREECE.

Medicine emerging from the age of superstition—Pythagoras and his school—His services to the cause of medicine—Dietetic and other regulations of himself and followers—Psychological and physiological theories—Medical practice of his time—Alcmæon, the first comparative anatomist—Most ancient treatise on physiology—Empedocles of Agrigentum—His valuable services in time of an epidemic—His views on anatomy and physiology—Successors of Pythagoras—Anaxagoras and his views—Democritus of Abdera—Democedes of Crotona—Gymnastic physicians—Political condition of the physicians of Greece—Military surgeons—Charlatans.

THE fragments which we possess of the works written by the ancients, and the wreck of the monuments of antiquity which has escaped from the destructive jaws of time, exhibit but a feeble glimmering amidst the profound darkness which enveloped the ancient world, and demonstrate that the condition of the science charged with watching over the preservation of health was nearly the same amongst all the first people of the earth. Closely connected with the adoration of the gods, it was itself everywhere a species of secret and mysterious worship. Left exclusively to the priests, it was with the Egyptians as with the Greeks, with the Romans as with the Hindoos, a tissue of absurd juggleries, a system of

more or less refined imposture, by aid of which the ministers of religion amused themselves with the credulity of the profane.

The Greeks were the only nation in whose temples the dignity of medicine was not entirely overlooked, and although the priests might equally seek to deceive the people by oracles, they were compelled to improve the science by attentively observing the operations of nature, and by profiting with discernment from the votive tablets of the sick. No person, however, had given any satisfactory explanation of these natural effects, because the ancient Egyptians, Israelites, Greeks, and Romans, adoring, with perfect confidence, the gods whose worship their fathers had introduced, and attributing all natural phenomena to the absolute and immediate pleasure of these divinities, regarded every ulterior research as useless and superfluous.

Two great reasons induce us to assign to PYTHAGORAS (580–489 B.C.) and his school a distinguished place in the history of medicine. First, he rendered important services to physiology by directing the attention of his disciples to the explanation of the functions and phenomena which are observable in man when in a state of health; and secondly, he acted with considerable wisdom in rendering medicine serviceable to the progress of legislation and the art of governing, it having, as has been already seen, formed prior to his time a part of the divine worship. Writers worthy of credit speak of the long journeys which Pythagoras made into foreign countries, especially into Asia Minor, Phœnicia, and

Egypt. It is a matter of inquiry whether he obtained his philosophical doctrine from the inhabitants of the last country, and whether he learned from the priests metempsychosis and the several other dogmas which he subsequently professed. It seems, however, probable that he borrowed from them the use of several medicines, and the severe rules for the preservation of health which he established among his disciples; and his symbolical language also, according to Porphyrius, was absolutely the same as the sacred dialect of Egypt.

The mildness of the climate, fertility of the soil, and vigor and robust health of the inhabitants of Crotona in Græcia Major, determined him, when he had ended his voyages; to try in that small state whether his schemes were capable of being put into execution, as the government of that Grecian colony seemed to be the most susceptible of reform. The mode in which he was received there fully answered his expectations. His venerable figure, engaging manners, and irresistible eloquence gained all hearts, and he appeared to the Crotonians a messenger from the gods. Instead of undeceiving them in their belief, he endeavored to keep up that idea, and, in order to give more weight to his institutions, he made them pass for inspirations from heaven. He himself indeed, according to Diodorus, was so filled with the grandeur and importance of his objects, that he probably believed that he really acted through the influence of the divinity.

This society was composed of a certain number of persons assembled together for receiving instruction in every department of knowledge with which he

was acquainted, and in concurring with him in the execution of his vast projects. His disciples lived in the most perfect union, all their works tending towards that consummation. Every hour was appropriated, and each duty accurately determined. The whole of their lives was devoted to preserving the forces of the body and soul in a continual state of harmony, and to the shunning of the least infraction of the rules of the order, and the least error in the moral and physical regimen which their master had prescribed for them. To arrive more certainly at that end, they lived in a habitation common to all, dressed in a uniform manner, and with the linen of Egypt, observed the greatest cleanliness and frequently cut the hair, shaved and used baths, in order to maintain the body as pure as the soul. They accustomed themselves to certain exercises, such as promenading, wrestling, running, and dancing. Sobriety was one of their principal obligations. No example of strictness similar to that of Pythagoras had ever been witnessed in Greece, as regarded the choice and quantity of food. Several articles were forbidden, not alone because he believed them to be dangerous, but because the voluptuous inhabitants of Græcia Magna abused them, or because they were proscribed in the sacred mysteries of the Egyptians, his masters.

Aliments drawn from the animal kingdom were not all interdicted to his disciples. Those only of which they could not make use were fish and certain parts of other animals, which probably the Egyptians excluded also. It has been generally, and for a long period, considered that the Pythagoreans did

not eat beans, and several different explanations have been given of their reasons for abstaining from them; some asserting that this was introduced because beans engender wind, which oppresses the mind and disturbs its functions, others believing that the cause of the proscription was the resemblance of a bean to one of the organs of generation, and pretending that it was a symbol of the laws which interdicted all kinds of debauchery; and others, again, considering that the custom owed its origin to some affinity which they conceived beans to bear to the human body, or to the opinion that the souls of the dead transmigrated into that legumen.

A modern Pythagorean, however, Aristoxenus, affirms that the Samian philosopher particularly recommended beans and ate them frequently himself, because he regarded them as an article of food easy of digestion. It has consequently been considered that the expression "abstain thou from beans" was of a political meaning. The election of magistrates took place by a sort of scrutiny, for which beans were employed; a custom which existed not a very long time ago in Holland.* Diogenes Laertius

* Horace alludes to the mode of conducting elections amongst the Romans, as well as to the proscription by Pythagoras of the use of beans; of the latter he remarks:—

"O, quando faba Pythagoræ cognata simulque
Uncta satis pingui ponentur oluscula lardo?"

(*Sat. Lib. 2, 6, 63.*)

"Oh when shall I enrich my veins,
Spite of Pythagoras, with beans?
Or live luxurious in my cottage
On bacon, ham, and savory pottage?"

(*Francis.*)

and Porphyrius consequently conceive that, by the expression just quoted, Pythagoras wished to warn his disciples not to search after honors, in order that they might be more attached to his order.

He accustomed them so much to self-denial, that when they were tormented with hunger, he placed before them the most delicate dishes, and immediately removed them, without their being permitted to touch a morsel. His precepts regarding sobriety and moderation in the pleasures of love agreed perfectly with his age and the nation in which he lived. He forbade them, especially, to addict themselves at too early an age to venereal excesses, and, in order to remove from the young men every voluptuous idea, he wished them to be constantly occupied either with works of the mind or gymnastic exercises. The Pythagoreans were warned against giving way to any passion, even of the most innocent nature, such as effusions of joy, for fear of disturbing the harmony between body and soul.

To this unalterable moral tranquillity they joined exercises of piety, founded on pretended intimate relations with the gods. They not only chanted hymns, prayed, and offered up sacrifices, but also predicted the future by dreams or the flight of birds, and attempted to conjure up the shades of their friends. The latter qualities procured them a degree of consideration equal and even superior to that of the priests, who were almost all beneath them both in piety and knowledge.

With the psychological ideas of Pythagoras we have not much to do, and his physiological theories

were sufficiently absurd. He pretended that the principle of life resides in heat, and that that of locomotion is of an ethereal nature, or, according to the expression of Aristotle, of an aerial character; he defined health to be a continuation of the primitive constitution, and disease to be a derangement of such organization. Pythagoras also practised medicine, but we may, from the ruling spirit of the age, readily form an idea of the way in which he exercised it. Up to that period, the healing art had been closely connected with the divinatory. The priests alone had cultivated it in the temples of Æsculapius, and the multitude regarded all the cures performed by them as the immediate effects of the divine power, or as miracles. Pythagoras himself had acquired his knowledge in Egypt, where magic, the divinatory art, the interpretation of dreams, and medicine formed one and the same science. These circumstances account for the strange way in which the Pythagoreans practised medicine.

Pythagoras attributed magical virtues to plants, and employed them in the treatment of diseases: Pliny asserts that he believed the vinegar of squills capable of lengthening the term of existence. He considered the cabbage to be possessed of many virtues, recommended aniseed wine against the bite of the scorpion, and fancied that aniseed, held in the hand, possessed considerable efficacy in epilepsy. Mustard he esteemed a most penetrating remedy, principally affecting the head, and very appropriate for the bites of serpents and scorpions. The Pythagoreans made more frequent use of external than

of internal remedies, and especially of fomentations and ointments, but they had never recourse to the great operations of surgery, or even to incisions and cauterization. History, however, informs us that they were much distinguished for their skill in the treatment of internal diseases. In fact, the Crotonians passed for the most experienced physicians of all Greece.

One of them, who, according to Diogenes, had been a disciple of Pythagoras, acquired a very brilliant reputation. This was *ALCMÆON*, the son of Pirithus. Chalcidius assures us that he was a naturalist, and that he first occupied himself with anatomy, and composed several writings on the structure of the eye; but that commentator lived at too late a date for his evidence to be regarded as convincing. Several reasons, which have been already mentioned, oppose the belief that they could, at that time, easily dissect human bodies, and a Pythagorean would have greater scruples than any other individual. There is some reason, however, for believing that Alcmaeon was the first anatomist, as far as regarded the dissection of animals, although that was also contrary to the principles of Pythagoras. The opinion of his having been the first comparative anatomist, or one of the first, is strengthened by the circumstance of Aristotle refuting Alcmaeon, who had asserted that goats breathe through the ears, and it has since been imagined, although with very insufficient evidence, that he must have known of the existence of the Eustachian tube, which extends from the middle ear to the pharynx.

The animal functions and those of generation appear to have awakened in a particular manner the attention of the Pythagoreans. Diogenes and Clemens Alexandrinus assert that Alcmaeon wrote a work on the functions, which would consequently be the most ancient treatise on physiology known. Like his master Pythagoras, he placed the seat of the reasonable soul in the brain, and regarded the human semen as an emanation from that organ. He pretended that the head of the foetus was first developed, because it is the seat of the reasonable soul, and that the foetus received its nourishment not by the mouth or umbilical cord, but from the whole surface of the body, absorbing the nutritive juices like a sponge. He explained in the same manner the nutrition of the chick *in ovo*, regarding the white as the milk which nourishes the yolk and the embryo to which it gives birth.

EMPEDOCLES of Agrigentum (504–443 B.C.) lived at a later period than Alcmaeon, and was one of the most celebrated philosophers of the Pythagorean school, wandering, however, very considerably from the system of his master. He was, like the majority of the sages of antiquity, at once poet, legislator, physician, and divine. He rendered a great service to his native city, whose inhabitants had given themselves up to all sorts of debauchery, by correcting the public manners, changing the form of government, and defending the cause of liberty, after the example of the philosopher of Samos. His imposing appearance and miraculous cures caused him to be considered as the confidant of the gods, and as a prophet whose

power extended so far as to arrest the progress of nature and to stay even death.

What most of all contributed to render him immortal was the ingenious means which he adopted for arresting the severe epidemics occasioned by the sirocco, a hot, suffocating wind which prevailed in those parts. This consisted in closing up a passage which existed between two mountains, through which the wind blew with the greatest fury. Hence, he received the epithet of ἀλεξάνεμος or "tamer of the wind." During a tempest which broke out at the time of an eclipse of the sun, he saved many persons by means of fumigations and fires. Philostratus relates what would be another brilliant action of this philosopher were it but correct, that he prevented the total ruin of Agrigentum, by putting a stop to a rain which menaced the city with inundation. He is also said to have restored to life a female in a state of asphyxia or apparent death, who had been for a long time considered dead.

These different occurrences and several other similar ones obtained him so much celebrity, and inspired him with so much vanity, that he considered himself as a fit companion for the gods. A great portion of this presumption, however, he owed to the principles of the Pythagoreans, who regarded themselves as the equals of the gods, so soon as they had received their initiation. Diodorus of Ephesus relates a remarkable fact of this philosopher. The city of Selinus was ravaged by a pestilential disease, owing to the exhalation from the stagnant and corrupt waters of a neighboring

river. Empedocles put an end to the cause, by conducting a river of pure water into the marsh, and emptying it in that manner of all the stagnant water which it contained. Since that circumstance, the inhabitants of the city have adored him as a beneficent deity.

The opinion most generally received regarding the death of this philosopher is that he threw himself, from pride, into *Ætna*, or that, having approached too near the crater of this volcano, he fell in, and was swallowed up by the flames. At the lower termination of the limits of perpetual congelation on *Ætna*, at the present day, is found a little plain named *Piano del frumento*, on which are the ruins of an ancient monument, generally known under the name of the Philosopher's Tower, because tradition assigns it as the residence of Empedocles.

Empedocles in his ideas was decidedly a materialist, and believed that everything in nature was the effect of pure chance. He was of opinion that, as the universe one day resulted from the attraction of its elements, so one day it would return to chaos in consequence of their disunion or repulsion, and again appear after an incalculable lapse of time, without there ever being any interruption between these alternations of creation and destruction. This last opinion will account for the ideas of Empedocles respecting the production of animals from accidental causes, or what has been termed equivocal generation. According to him, the animal body is not regulated by necessary laws, no intelligent being presided at its construction;

chance alone produced it. Empedocles believed that the vertebræ and the different joints composing the spine resulted from the distortion or fracture of one bone, which ran at first the whole length of the vertebral column. He attributed the formation of the abdominal cavity and that of the intestines to the sudden and rapid passage of water through the body at the moment of its formation, and the external openings of the nose to a current of air, which had established itself from the interior to the exterior. He believed also that animals might spring up from earth when it had warmed to a certain extent, for, according to him, it was but necessary for the four elements, fire, air, earth, and water, to meet under special circumstances in order to produce the origin and formation of all bodies.

These physiological views he trusted only to his most intimate pupils. Openly, he made use of expressions which were within the conception of the vulgar, and accorded with their social prejudices. Thus, like the Ionians and Pythagoreans, he taught that in nature everything is animated, and filled with divinities; that consequently the soul of man is identical, not only with the gods, but also with that of vegetables, as they all, without distinction, emanate from the general soul of the world. He admitted also in vegetables a soul endowed with the same powers as those which he accorded to the soul of animals, possessing consequently a voluntary faculty, and being capable of feeling joy as well as grief; in this respect, however, not differing from the Pythagoreans in general. This opinion of

the affinity between plants and animals determined him to employ, when he spoke of the former, the same expressions which are wont to be used when treating of the latter. Thus, he called their seed eggs, and their fructification gestation and pregnancy. The principal difference which he established between them was that the organs of generation were united in the same individual in vegetables, in place of being distinct and separate as in animals. He compared also the leaves of plants to the hair of the mammalia, the feathers of birds, and the scales of fishes.

The principal object of his physiological researches, as well as of those of his contemporaries, was the theory of generation. Already there reigned amongst philosophers a great diversity of opinion relative to this theory, and all those who were desirous of distinguishing themselves made a point of embracing one sect or another. The philosopher of Agrigentum asserted that the embryo is not the product of the semen of one party, either of that of the male or of that of the female, but that it results from a mixture of each, and receives the form of the father or of the mother, according as the semen of the one or the other may predominate, or according as the imagination of the mother may be more or less called into action. The semen of each sex he believed to be composed of different parts, between which there existed a mutual attraction. The sex he conceived to depend solely on the degree of heat in the womb, the infant being of the male sex if the semen enter a warm uterus or womb, and of the female if the

organ which receives the fluid be cold. He attributed monsters to the superabundance or want of semen, or to the dispersion or erroneous direction of that fluid, and twins to the too great quantity or dispersion of it.

Inspection of some fetuses which had come into the world before their time had probably taught him that all the parts of the embryo are developed from the thirty-sixth to the forty-fourth day, and he applied his theory to the mode in which each organ is formed. The muscles, according to him, result from a mixture of equal parts of the four elements, fire, earth, air, and water; the tendons from a superabundance of fire and earth; the nails from exposure of the tendons to air; and the bones from a predominance of earth and water. In a similar manner he explained the formation of sweat and tears. It was Empedocles who first gave the name of amnios to the membrane which incloses the fœtus, and to the water in which it swims. He has the credit also of having first dissected the ear with accuracy.

The above are all the visionary theories of Empedocles which need be detailed, but, although visionary, they are highly interesting as being some of the first dawns of medical philosophy and characteristic of the times in which they were conceived.

Ancient history makes also mention of several other successors of Pythagoras, but we have no examples of their works regarding either the theory or practice of medicine. Pliny, Diogenes, and Eudoxus mention EPICARMUS, who was born at Cos, but who passed his life in Sicily. He wrote several

works on medicine, which no longer exist, and from which no author has given extracts. Tiraquel, indeed, asserts that his productions still exist in the library of the Vatican, but it would seem that this assertion is devoid of foundation.

ANAXAGORAS of Clazomenæ (B. C. 500–428), a cotemporary of Empedocles, whose strange theory of the heavens and earth being made of stone are well known and have been celebrated by Butler in his *Hudibras*, is the next physician worthy of notice. The greatest portion of his physiological observations, like those of most others about that period, are concerning generation. He believed that the embryo or foetus proceeds solely from the paternal semen, and that the mother provides only a place for its development, and he explained the reason of the difference of sexes by the situation which the child occupied in the womb, boys being, he absurdly enough says, always on the right side and girls always on the left. Another and a still more gross absurdity, however, is his belief that the crow and the ibis coupled by the beak, and that the polecat brought forth its young through the mouth. There is another of his opinions of a pathological nature, which proves how common the belief in the multiplicity of bilious diseases was even in those days,—that the bile, by passing into the lungs, air-vessels, and pleura, becomes the cause of acute diseases. Aristotle, however, in contradicting this assertion, affirms, and supports his affirmations by anatomical observations, that in a very great number of such cases the bile is not found to predominate.

DEMOCRITUS of Abdera (B.C. 494–404) is painted by the ancient writers of Greece in nearly the same colors as Pythagoras. He had, they remark, all the powers of nature at his disposal, and owed his science to the priests of Egypt. Pliny informs us that he busied himself much with the anatomy of the chameleon, and wrote a whole book on that reptile. His physiological theories very much resembled those of Empedocles.

There were some other theorists about this time as well as practitioners of medicine, such as Hemelitus of Ephesus, Acron of Agrigentum, Iccus of Tarentum, Herodicus of Selybria, Euryphon, and Thales, but their theories were visionary and unworthy of consideration. Before passing, however, to a period when a luminary appeared in the medical world, who is fairly entitled to the appellation of the father of medicine, and whose works are still considered by some as the guiding star, by whose light their theories and practice are regulated, we may briefly refer to other persons who devoted themselves about this time to the profession of physic, and who were occasionally remunerated by a fixed salary.

DEMOCEDES of Crotona, for example, was retained at the court of the Samian tyrant, Polycrates, with an allowance of two talents yearly. Being afterwards taken prisoner, and carried as a slave into Persia, he acquired great reputation by curing Darius of a sprained foot after the Egyptian physicians had failed; and also by his successful treatment of a tumor of the breast, under which Atossa, the daughter of Cyrus and wife of Darius, had labored

for a considerable period. Such practitioners, from their wandering lives, were sometimes called *perio-deutai*; of this class, one of the most conspicuous was ACRON of Agrigentum, the contemporary and rival of Empedocles. According to Diogenes, he was the author of some books on medicine and dietetics written in the Doric dialect, and signalized himself at Athens at the time of the great plague by introducing the practice of fumigation, and thus affording relief to many.

The gymnasia of ancient Greece seem also to have contributed to the improvement of the healing art. It belonged to the gymnasiarch or palæstrophylox to regulate the regimen of the youths who were trained in those seminaries; the sub-directors or *γυμναστοι* treated all diseases which occurred; and the sub-alterns or bathers, the *ἀλεπταί*, performed bloodletting, administered injections, and dressed wounds, ulcers, fractures, and other surgical cases. Of the class of gymnastic physicians, one of the most celebrated was HERODICUS of Selybria. He is frequently mentioned by Hippocrates, who censures him for extenuating his patients by excessive fatigue, and of sometimes causing their death.

It is to be regretted that we have so little information regarding the political condition of the physicians of Greece. All that we know must be gathered from some obscure passages in various Greek writers. In a State so polished as that of Athens, the physicians would necessarily be subjected to certain laws. Plato seems to insinuate that at his time the Athenian physicians, as formerly

those of Egypt, directed the treatment of their diseases according to certain precepts marked out for them, and that they were responsible to the State for all the deaths occasioned by their negligence. A passage of Xenophon also proves that the young men, before establishing themselves on the territory of the republic of Athens, were obliged to ask permission in a public discourse, in which they explained the manner they had previously, or whether they had at all, practised, and proclaimed by whom they had been instructed. Hyginus says that there existed a law amongst the Athenians forbidding slaves to exercise medicine, and reserving it exclusively for freemen.

The Greeks had in their pay military surgeons; but it would seem, from Xenophon, that they were only called in after sanguinary battles to dress the wounded. There seems also some reason for believing that there were at Athens charlatans who sold their nostrums in the public places. Aristophanes introduces in one of his comedies a person seeking in all the streets and shops for a potion which might accelerate the delivery of a pregnant woman. The *aleiptai* or physicians sold also secret remedies at the public baths, and were frequently consulted in cases of wounds, &c.

CHAPTER XI.

THE AGE OF HIPPOCRATES.

Revolution in medical science—Important era in the history of medicine—Biographical sketch of Hippocrates—His medical career—The great plague at Athens—Brilliant cures—Authenticity of his works—Books falsely ascribed to him—His undisputed works—His knowledge and views on anatomy, physiology, semeiology, pathology, therapeutics, surgery, dietetics, bloodletting, &c.

THE first year of the 80th Olympiad gave birth to HIPPOCRATES (B.C. 460–370), the second of that name, who was destined to effect a greater revolution in medical science than had previously been accomplished, and whose authority continued to be regarded with almost implicit veneration by his successors during a period of more than two thousand years, and is still in some parts of the European continent, especially, looked up to with the greatest deference and respect.

“He saw,” says M. Cabanis,* “that too much and yet not enough had been done for medicine, and he accordingly separated it from philosophy, to which it had never been united by its true and reciprocal relation. He brought the science back again into its proper channel, that of rational experience.

* Coup d’Œil sur les Révolutions, &c., de la Médecine.

However, as he himself observes, he introduced both these sciences into each other, for he considered them as inseparable; but he assigned to them relations which were altogether new. In short, he freed medicine from false theories, and formed for it new and solid systems; this he, with justice, said was to render medicine philosophical. On the other hand, he elucidated moral and natural philosophy by the light of medical science. This we may, with propriety, call, with him, the introduction of one into the other. The new spirit of improvement which was then communicated to medicine resembled a sudden light that dispels the phantoms of darkness, and restores to bodies their proper figure and natural color. By rejecting the errors of former ages, Hippocrates learned more fully to avail himself of the useful part of their labors. The connection and dependence both of the facts which had been observed, and of the conclusions which had been legitimately deduced from their comparison, were now perceived with a degree of evidence, which, till then, had been unknown. All the discoveries were certainly not yet made, but from that moment inquirers began to pursue the only path which can conduct to them. From that moment, if they had been able to preserve themselves from delusion, they would have possessed sure means of estimating, with precision, the new ideas which time was destined to develop; and if the disciples of Hippocrates had understood his lessons well, they might have laid the foundation of that analytical philosophy, by the aid of which the human mind will be henceforth enabled

to create to itself, as it were, daily some new and improved methods of advancement."

Unfortunately, however, for the progress of the art, the disciples of Hippocrates soon wandered from the path which he had marked out. Instead of quietly and carefully watching the operations of nature, they kept inventing, like his more immediate predecessors, to whose visionary speculations we have already referred, fanciful hypotheses to explain them, and in place of studying assiduously the works of the master whom they professed to worship, they falsified his writings in order to make them meet their own particular views; so that it has become a matter of very considerable difficulty to distinguish the genuine from the spurious compositions which have been ascribed to the father of medicine.

Of Hippocrates, as Dr. Parr has correctly observed, it is difficult to speak with impartiality, in a manner that will satisfy his warm admirers, or those who reject everything which is not of a modern era. If we look at him as a physician, when medicine had scarcely escaped from the trammels of superstition, the refinements of philosophy, or the dictates of antiquated tradition, our admiration will rise almost to enthusiasm, for we shall perceive sound judgment, accuracy of reasoning, and acuteness of observation superior to his era or the state of science at that period. But to study and admire Hippocrates at this time is very different. Science has opened newer and more extensive views; diseases are distinguished with greater accuracy, and the remedies, as they are more numerous, may be more appro-

privately adapted to the circumstances. He forms, however, so vast a space in the history of medicine, that a detailed notice of himself and of some of his doctrines is necessary and of the highest interest.

Hippocrates, whose science and skill made the age in which he lived memorable, was descended from a line of physicians, and inherited the instructions of his father and grandfather, who were themselves descendants of the Asclepiadæ. His biography would be extremely interesting, had it been transmitted to us by authors wholly worthy of confidence, but with the exception of some fragments preserved by Soranus, we have but a small number of authentic accounts regarding the circumstances of his life. His father Heraclides gave him the first part of his education, and probably taught him the art of observing diseases as they presented themselves in the temples, and the mode of treating them as practised by the Asclepiadæ. Herodicus of Selybria and Gorgias Leontinus are also mentioned as having been his masters, and, according to others, he was a disciple of Democritus of Abdera. The votive tablets of the temples of *Æsculapius* furnished Hippocrates with a part of his observations on the progress and nature of diseases. Andreas asserts that he reduced the temple at Cos to ashes, in order to prove that he was the author of the semeiological observations which he has given, but in this there is not the least shade of probability, as no other author has made any mention of the act, and it could not have failed to produce a considerable sensation at the time, so considerable, indeed, as not

to have been passed over in silence. Nor could it be conceived, supposing it were true, how Hippocrates, after such an act, could have preserved himself from the fury of a people who vowed implacable hatred to the despoilers of their temples.

Soranus asserts that Hippocrates went to the court of Perdiccas, king of Macedonia, and that he cured that prince of a consumption occasioned by an unfortunate affection for his mother-in-law, Phila, a fact which is not controverted by chronology, as Perdiccas the Second did not mount the throne until the fourth year of the 87th Olympiad, a time when Hippocrates was enjoying his greatest celebrity; but what makes it a little suspicious is, that history relates a similar circumstance to have occurred at the court of Seleucus Nicator. It is not improbable that he passed some time at the court of Perdiccas, as Pella, Olynthus, and Acanthus are all situated in Macedonia, at which place he is asserted to have observed several diseases. He appears to have resided a long time in Thrace with the Edonians, for he frequently speaks, in his book on Epidemics, of the towns of Abdera, Datus, Doriscus, Cœnus, and Cardia, situated in Thrace or on the isle of Thasos. It may likewise be conjectured that he travelled into Scythia, and into the country surrounding the kingdom of Pontus and the Palus Mæotides, for he gives a faithful picture of the manners and mode of life of the Scythians.

The same Soranus remarks that Hippocrates delivered Athens, Abdera, and Illyria from a plague which occasioned great ravages. This cannot refer to

the terrible plague at Athens, which occurred during the Peloponnesian war, as Thucydides, who has given a full account of that epidemic, of which he was an eye-witness, makes no mention of Hippocrates, and, on the contrary, expressly asserts that the skill of the physicians failed in it, as well as in all those diseases the knowledge of which the gods had revealed to man. Soranus goes on to observe that, in consequence of the above circumstance, the Athenians out of gratitude initiated him in the mysteries of Ceres, according him the right of citizenship, and directing that he should be feasted, as well as his descendants, in the Prytaneum, where all those who had rendered a service to their country were entertained. Galen also refers to the circumstance of his arresting the epidemic, and adds that Hippocrates caused fires to be burnt as well as aromatics, over the whole city, in order to purify the atmosphere, which he observes perfectly succeeded and arrested the disease, so that the epidemic mentioned by Soranus and Galen cannot have been identical with that referred to by Thucydides. In another place, Galen holds that Hippocrates practised the healing art amongst the Athenians, supporting his assertion by the case of a patient who dwelt in the market of Cecrops.

Amongst the most brilliant cures ascribed to Hippocrates is that of Democritus of Abdera, whom he took under his care at the request of the Abderites. Soranus confines himself to observing, that, having cured the philosopher of his insanity, he returned to the town of Abdera, having rendered it as great a service as if he had delivered it from

the plague. Tzetzes, however, adds that the inhabitants, full of gratitude, offered him ten talents, but that, the conversation which he had with Democritus having proved the Abderite to be the wisest of all men, he refused the same, thanking the Abderites, on quitting them, for having made him acquainted with so great a philosopher.

The last years of his life this illustrious physician passed in Thessaly, more especially at Larissa, Cranon, Pheræ, Tricca, and Melibœa, as proved by the observations which he made regarding the diseases of those different towns. Soranus asserts, also, that he succeeded in arming the Thessalians in favor of his countrymen, when the Athenians declared war against the inhabitants of Cos and attacked them. According to the same author he died at Larissa in the 99th year of his age, and a long time after his death his grave was to be seen between that town and Gyrtone.

It is much to be regretted for the sake of the science that we have no certainty respecting the authenticity of several of the works which have been published as those of Hippocrates. The ancients themselves questioned the authenticity of a multitude of writings ascribed to the son of Heraclides, and many of them were attributed to his relatives, but frequently they were uncertain to whom to give the credit, and fixed them almost indiscriminately on the different members of the family of Hippocrates. Hippocrates, the son of Heraclides, lived at a period when paper was uncommon amongst the Greeks. They were acquainted, it is true, with the papyrus,

which the Greek colonists in Egypt had learned to prepare after the reign of Amasis, but the use of paper was by no means common in Greece until the time of Alexander the Great. Hippocrates therefore wrote his observations in a very concise style on tablets covered with wax, or on the skins of animals. Several of these collections were not intended for the public eye, but were kept for his own private use. His two sons, however, Thessalus and Dracon, and his son-in-law Polybus, who adopted the principles of the modern sects, falsified his writings, changing their arrangement, making interpolations, and endeavoring to elucidate obscure passages by additions of their own.

The greatest disorder also took place when the Ptolemies, after the example of Aristotle who collected the first large library, founded several collections of books, and amongst others that of Alexandria, and forbade the exportation of paper in order that they might procure for themselves a greater number of copies of the works of the ancients. Hence, numerous mercenary individuals profited by the enthusiasm of the kings of Egypt, either by selling to them the writings of the other Hippocrates under the name of the most celebrated, or by adding to the writings of Hippocrates their own productions, satisfied that the Ptolemies, who were ambitious of forming a richer library than that of the kings of Pergamus, would readily take without examination everything which was offered to them.

To distinguish the real works of Hippocrates has hence been a problem of very considerable difficulty.

The literati of Alexandria were extremely doubtful, even at that time, of their authenticity, and endeavored to select the true from the false. At the expiration of five hundred years, also, the task was attempted by Galen, who, with an intimate knowledge of what the successors of Hippocrates had written, possessed a discriminating genius and critical discernment of the style and manner of the Coan sage, which peculiarly fitted him for the task. Mercurialis, too, a man of very extensive erudition, and Haller, a physician of the first literary eminence, as well as Gruner, have all labored in the same field, assuming as a principle that Hippocrates was a man of singular abilities, extensive information, and consummate candor and modesty. By these tests, although as uncertain as it is possible to imagine, they have tried every imputed work.

The undisputed works of Hippocrates are said to be the first and third book of *Epidemics*, two books of the *Prænotiones* (a different work from the *Prænotiones Coacæ*, published by Elzevir in 1660, by Duretus at Paris, and with commentaries by Hollerius at Leyden, which is considered to be certainly spurious) containing the *Prognostica* and the second book of the *Prorrhetica*; *De Diæta in Acutis*; *Aphorismi*; *De Aere, Aquis et Locis*; *De Natura Hominis*; *De Humoribus Purgandis*; *De Alimento*; *De Articulis*; *De Fracturis*; *De Capitis Vulneribus*; *De Officina Medici*; and *De Locis in Homine*. This is nearly the enumeration of Haller, but even the authenticity of several of these has been strongly called in question.

Even the disputed works of Hippocrates are, however, entitled to very attentive perusal from the information they give respecting the mode of reasoning and practice of medicine at that period. The writings of Hippocrates, as Dr. Parr has correctly observed—and the remark may be extended to the whole of the literature of medicine—merit attention. “Where the title of doctor,” he proceeds, “is assumed merely as a claim to receive the fee of a physician, it is of little importance whether the practitioner can read, the world is contented to take his talents on trust; but the man who claims the rank of a regular, well-instructed physician should not be ignorant of the opinions of Hippocrates or of the state of physic at the earliest period of recorded observations. He will derive no little satisfaction from the candid relation of facts, whether favorable or otherwise, and from the firm, undeviating integrity which seems to have regulated the conduct of this father of medicine.”

Having thus briefly sketched the life of the Father of Physic, Hippocrates, the “divine old man,” as he has been denominated by some writers, and pointed out those of the works generally attributed to him which have been considered authentic, and the necessity of an acquaintance with the state of physic at the earliest period of recorded observation, and especially of its condition at the time of Hippocrates, we may next proceed to glean some particulars of the knowledge of that distinguished individual in the different branches which comprise the science of medicine.

First, with respect to his acquaintance with anatomy, this would not seem to have been considerable, and it is extremely doubtful whether he had ever acquired it by regular dissection. Galen, it is true, attributes to him the invention of scientific anatomy, and asserts that the Asclepiadæ were at that period very skilful in the art; but it is well known that at the time of Hippocrates there still existed the prejudice of interring the dead with the greatest possible celerity. It is consequently probable that Hippocrates, like Empedocles, Aclmæon, and Democritus, confined himself chiefly to the dissection of animals. Those of his writings which bear the stamp of authenticity prove in fact that, with the exception of a tolerably exact knowledge of osteology, he was completely ignorant of anatomy, or at least had but a very vague and superficial knowledge of the organization of the human body. Between arteries and veins Hippocrates established no difference. He called them collectively $\phi\lambda\epsilon\psi$, and $\acute{\alpha}\rho\tau\eta\rho\acute{\iota}\eta$ designated with him the trachea. The nervous system was not more known to him. He called without distinction $\tau\acute{o}\nu\omicron\varsigma$ or $\nu\epsilon\ddot{\upsilon}\rho\omicron\nu$ a ligament or a nerve. He was totally ignorant that the nerves are the conductors of the sensations, and that they arise from or are connected with the brain.

With regard to his theory of generation, it was quite conformable to the spirit of the age. He regarded the accumulation of phlegm in the womb as the cause of abortion. The signs which he mentions as indicating pregnancy strongly exhibit the inaccuracy of his ideas regarding the organization

of the animal frame. He believed that the semen secreted by the right testicle passes into the right side of the uterus, where the conception is of the male sex, and that females are engendered by the semen of the left testicle deposited in the left side of that viscus. Hippocrates was so convinced of the correctness of this theory that he pretended to have remarked that a shrinking of the right breast announces that the female will be prematurely delivered of a boy, whilst a sinking of the left denotes that the aborted fœtus will be a female. He also asserts that those men who have the right testicle larger than the left constantly beget male children. He was of opinion that the complexion of the female is more lively and animated when she bears a boy than when she is pregnant of a girl. The reciprocal action of the warm and cold spirit in promoting the growth of the fœtus, which he mentions, is of course wholly imaginary. The soul, he supposes, is drawn in with the air and communicated through the vessels of the placenta to the fœtus.

He supposed the existence of four fluids in the body,—blood, phlegm, and yellow and black bile. Their common source he ascribed to the stomach, but each had also its particular origin,—the blood from the heart, phlegm from the head, yellow bile from the gall-duct, and black bile from the spleen. The last organ, in his opinion, attracts not only the black bile, but water also, which it conveys to the urinary organs or to the belly.

It was Hippocrates who first fixed the three general periods or stages of diseases, those of crudity,

concoction, and crisis, believing that the morbid matter ought, before being expelled from the body, to undergo a certain elaboration. The signs of these three periods he has laid down with considerable minuteness, although the whole theory is extremely visionary. He may, however, be regarded as the real inventor of the art of prognosticating. He had also observed that nature is, in simple diseases, subjected to certain laws, and that in fevers, more especially, the evacuation of the morbid matter is apt to take place at certain and regular days. These days he called *critical*, the principal of which are, according to him, the fourth, seventh, eleventh, fourteenth, seventeenth, and twentieth. With regard to these crises themselves, he observed them to happen in a variety of ways. It has been asserted that sweating was not ranged amongst them; but it is requisite only to cast a glance over his writings to find many cases of patients reported to have been cured by critical sweats.

He paid much attention to the urine, the appearances of which in general, and the sediment in particular, he regarded as very important signs in diseases. The sediment and the cloud which is often visible in the midst of the fluid were, in his eyes, proofs of a salutary effort of nature. He noticed also, very carefully, the marks of a favorable or unfavorable termination in the stools, the sputa, the coating of the tongue, &c., although the appearance of the patient, the state of his eyes, the color and temperature of his body, the augmentation or dimi-

nution of his bulk, the functions of respiration and of the intellect, &c., were very diligently attended to.

The practice of Hippocrates must be divided into his dietetic, his medical, and his surgical. The chief dietetic work under his name is attributed by the critics to Polybus, his son-in-law, but there is much reason to think that the rules are derived from himself. His first precept is to continue those exercises which are not found to be absolutely hurtful. He who has contracted a habit of some duration had always better follow it, even when it is contrary to health, than abandon it for another, and especially than abandon it suddenly. Every too rapid change in the manner of living is prejudicial to the body, which renders it requisite to pass gradually from one change to another. Excesses of all kinds are dangerous—sleeping and waking, motion and rest, nourishment and evacuation, ought never to transgress the limits marked out by nature. Those who are in perfect health should abstain from all kinds of medicine. Purgatives he asserts to be those which individuals bear with the greatest difficulty. Too strict a regimen is always more noxious, in a state of health, than a freer and less regular mode of living, because, in the former case, the least wandering from or forgetfulness of the laws imposed upon the individual may induce unpleasant consequences.

It is to the Coan sage that we are indebted for the first notions regarding the regimen to which patients should be subjected in acute affections. His principal object in those cases was always to assist concoction by cooling and diluent drinks, or

by other similar means. As the humors he considered undergo some change in all acute diseases, and as nature, in elaborating them, endeavors to render them fit for being evacuated, it is necessary to avoid interrupting her endeavors by diverting her powers for the purpose of converting them to the digestion of alimentary substances. Hence the following important precepts of the physician of Cos: "The more we nourish an unhealthy body, the more we injure it. Nothing should be given to the patient whilst the affection is increasing, and especially towards the time when the crisis is on the point of occurring. We ought, without delay, to prescribe a very spare diet when the violence of the fever is extreme at the commencement, and at the same time to examine into the strength of the patient, to satisfy ourselves whether he be in a state to bear a privation of food until the time when the affection may arrive at its highest point of intensity. The quantity of nutritive matters ought to be increased with very great circumspection; frequently, total abstinence produces the best effects when the patient is sufficiently strong to bear it during the whole course of the fever; but in the application of those rules, attention must always be paid to the degree of violence of the affection, its progress, the constitution of the patient, and the habits contracted both with regard to meat and drink." In the same book, the author exposes the precautions which should be taken when we are about to alter the customary regimen of patients, and lays down some excellent precepts, the observance of which he re-

commends to those who would pass from a severe regimen to one less strict, and *vice versâ*.

The utility of diluents in all fevers is a principle first noticed by Hippocrates, and which even at the present day is almost universally adopted with some slight modifications. As for his practical precepts, notwithstanding their excellence, several authors have pretended that he knew not how to apply them, from a considerable number of the diseases described in his book on Epidemics having had a fatal issue. This, however, ought rather to be esteemed a mark of his extreme candor. In medicine, as is well known, the correctness of the mode of treatment cannot always be appreciated by the results. The object of the practitioner, according to Hippocrates, ought always to be to carefully observe and assist the progress of nature. A physician as attentive as was the Father of Physic could not have failed to observe that there is an effort of nature which generally tends to the re-establishment of health, although a cure may not always follow; and it was in consequence of such observation that the axiom contained in the sixth book of his Epidemics was promulgated—“*Nature is the first of physicians.*” Dividing acute diseases into three periods, he made it a point to observe with the greatest care the powers of nature in each of those periods, of stimulating when they seemed to him insufficient, and of moderating them when they were superabundant.

He never interfered with what he considered to be salutary efforts, but endeavored, on the contrary, as much as he could, to favor them. On this account,

in acute diseases, and especially at their commencement, he did not prescribe evacuation until he had noticed, or fancied he had noticed, manifest signs that the morbid principle might be expelled. His endeavors were directed only to evacuating the matters elaborated by concoction, and during the period of crudity, as he termed it, he occupied himself with moistening all the passages, in order to accelerate the elaboration of the principle of the disease. In acute diseases, when the affection was at its highest point, and the paroxysm at its greatest intensity, he confined himself to attentive observation, but if any unpleasant symptom occurred, he attacked it according to the indications which might present themselves.

Hippocrates, however, did not confine himself to a blind pursuance of the indications of nature; on the contrary, having remarked that, in general, diseases are relieved as soon as the matter engendered during the course of the affection is expelled, he endeavored to evacuate the humors when they had undergone a particular alteration, but never before he was persuaded that they were sufficiently elaborated. Occasionally, therefore, his principal object was to produce effects opposite to those of nature. He bled when he noticed a state of fulness of the vessels, and endeavored to replenish them when he perceived that they were empty. The axiom *contraria contrariis opponenda* was not so universal a rule in medicine as has been pretended; it was always subordinate to the general maxim of following and imitating nature. Some of the modes of practice

pursued by Hippocrates will have elucidated this remark.

He generally practised bloodletting in acute diseases, where the patient was young and robust. His principal intention in having recourse to this operation seeming to have been to diminish the irregularity of the febrile movements and to accelerate concoction, he on this account almost always prescribed it during the first stage. He paid no regard to the day of the disease, but was guided by the violence of the attack. In the majority of cases, he recommended the bloodletting to be made as near as possible to the seat of the disease, but in determining the place where the vein should be opened, he was guided by his erroneous ideas of the distribution of the vessels in the human frame. Thus, it was necessary to open the inner vein of the arm in ischuria or suppression of urine, and the basilic in pleurisy. He recommended, with propriety, and the practice in some cases has been at various times revived, bloodletting in dropsy, when the patient was young and plethoric, and when the affection occurred in the spring time. The quantity of blood to be drawn was regulated by the severity of the symptoms, and frequently, when circumstances seemed to demand it, the bleedings were so copious as to produce syncope or fainting.

The rules to be followed for evacuating the crudities contained in the *primæ viæ* are indicated with considerable precision. Regard was to be paid to the climate, season, atmospherical constitution, age of the patient, and nature of the affection, in order to judge

whether the evacuation would be salutary or hurtful. Evacuation, and especially by purging, he inculcated ought never to be too copious, as under such circumstances it is always dangerous.

His purgatives were all drawn from the class of drastics; for in his time there were none known but the *veratrum album* or white hellebore, the peplain, —supposed to be an extract of *euphorbium*,—the seeds of the *amanta cretensis*, the root of the *thapsia*, the seeds of the *daphne laureola*, and the flowers and seeds of the *carthamus* or bastard saffron. They were also used as emetics; but Hippocrates seems to have employed them in many cases without having had any intention of particularly provoking either vomiting or purging. He was satisfied if they occasioned either one evacuation or the other. When he was desirous of purging gently, he ordered asses' milk, the juice of the herb *mercurialis*, the leaves of elder, or a decoction of beet-root with salt and honey. As adjuvants to these, he employed clysters and suppositories. In general, he used purgatives in chronic diseases, but he certainly employed them in acute ones more freely than the greater number of modern practitioners. The diuretics prescribed by Hippocrates were the leek, onion, *mercurialis*, wild parsley, &c., with wine and honey largely diluted, and sometimes the warm bath. *Cantharides*, however, he ordered also in dropsies. He endeavored to favor expectoration indirectly by fomentations and the copious use of drinks prepared with groats and acidulated with oxymel,—a composition of honey and vinegar. He made use of the same means for excit-

ing perspiration. In many circumstances, however, he necessarily treated diseases in a purely empirical manner, without acting according to any rational indication.

The majority of his remedies were obtained from the vegetable kingdom; with the exception of alum and some preparations of copper and lead, he employed only plants, for pharmacy, or the art of preparing compound medicines, was very rude in his time. In order to diminish, for example, the acridity of the juice of euphorbium, it was poured, drop by drop, on dried figs, and in this manner we are told a very useful remedy for dropsy was manufactured. It would be idle to look in the writings of Hippocrates for the least traces of chemistry, the origin of that science, properly so called, not having taken place for several years after this period.

The Coan sage enriched surgery with a considerable number of new observations and with several operations. He is said to have been the first inventor of the art of applying bandages. In all severe wounds he ordered rest, prescribed a strict regimen, and recommended the limb to be placed in the easiest position. He permitted the blood to flow copiously in extensive wounds when they were seated on the limbs or penetrated the cavities of the body. He rejected oils and every moist application, but in certain cases employed emollient cataplasms. He attributed to heat considerable efficacy in the cure of wounds. He frequently also administered emetics, especially in wounds of the head, having ob-

served that vomiting in such cases was a very common symptom.

He judged evacuations particularly necessary when the wound was complicated with erysipelas, of which gastric derangement is the most ordinary cause. He had noticed that suppuration is inevitable when the wound results from the action of an obtuse body. In his work on wounds of the head, the circumstances which require the application of the trepan are very carefully indicated. Hippocrates employed, for this operation, two different instruments, one of which resembled the trephine, and the other the common trepan. Before applying them the integuments were raised up, and the bone was scraped with a scalpel made for the purpose, in order to examine into its condition. In the same book the remark is made that pain is frequently felt in the side of the head opposite to that of the wound. He also penetrated the ribs to evacuate water from the chest.

In cases of fracture, extension and counter-extension were first made, afterwards a bandage was applied, and over this splints moderately tightened, so that they might compress the limb. Ten days after a fracture of the forearm, he recommended the patient to wear a sling when he began to walk about. He mentions also the time at which fractures are commonly consolidated, but has not omitted to remark that the age, sex, and several other similar circumstances may hasten or retard the formation of the callus. The machines which he made use of for reducing luxations of the large articulations were

very complicated; but he treated in a very simple manner less severe dislocations. His observations regarding distortion of the feet, both outwardly and inwardly, are particularly worthy of attention. He distinguishes several varieties of this curvature, describes the state of the parts with all the exactness of which his own experience rendered him capable, and proposes for the cure an apparatus which somewhat resembles one of much more modern invention.

The revolution which he caused in practical medicine, semeiology, pathology, and dietetics, was the more important from the plans adopted before him by the *Asclepiadæ* and the philosophic sects being in no respect adapted for the improvement of the science. He taught physicians that their first duty is to observe attentively the progress of nature. He demonstrated the inutility of theories, and proved that observation alone is the basis of medicine. The curative art, having become, from his example, a science of experiment and of facts, ought to have made the most rapid progress. If the route traced and pursued by Hippocrates with so much success had continued to be followed up, Grecian medicine would have attained in a short time a degree of perfection of which we can scarcely form an idea. These brilliant hopes were not, however, realized.

CHAPTER XII.

THE IMMEDIATE SUCCESSORS OF HIPPOCRATES.

Founders of the dogmatic school—Liberal views and civilization of the time—Aristotle—His views on anatomy, physiology, &c.—Theophrastus—Praxagoras and his physiological discoveries—The term arteries first employed—Medical practice of the period—The age of the Ptolemies—The library of Alexandria—Publication of doubtful works, interpolated manuscripts, &c.—Medical school of Alexandria—Herophilus and Erisistratus; their discoveries and views—Their followers—Division of medicine into its branches, surgery, pharmacy, &c.—The surgeons of Alexandria and their operations—Lithotomists—Surgical apparatus—Prohibitions to young surgeons.

SIMPLE observation was repugnant to the general spirit of the age in which Hippocrates flourished, and anatomy served only to confirm the speculations and theories of the dogmatic physicians; for so those who professed to tread in the steps of Hippocrates were termed.

THESSALUS, DRACO, AND POLYBUS were the founders of the dogmatic school, but they soon abandoned the principles of their renowned ancestor, and the science veered about perpetually, influenced by the different philosophic ideas which prevailed. Little improvement was made in practice, but few innovations occurred in physiology, and these latter were chiefly promulgated by PLATO (B.C. 430–348), whose reveries are highly entertaining; but not

being sufficiently important, we may pass them over, and proceed to the doctrines of one whose fame far eclipsed that of the medical theorists of the time, a man to whom every branch of natural science was highly indebted, and who united the most comprehensive views to the most acute genius and the most unremitting diligence.

The origin of natural history and anatomy is very closely allied with the career of ARISTOTLE (B.C. 384–322). The expeditions of Alexander the Great had more influence over medicine, and particularly over some of its branches, than the innumerable theories of the philosophical sects of which we have already spoken. The civilization of the Greeks took a different direction from that which it had previously followed; and although it had been generally spread over Athens and other great cities of Greece, the greater part of the nation had not lost the common prejudices of those who live isolated and have but a limited commerce with each other. They continued especially to consider the bodies of the dead as sacred and inviolable objects. So soon, however, as the conquests of the hero of Macedonia had opened to Greece the ports of India, Persia, and Egypt, and multiplied their relations with the whole of the East, the conflict of opinions soon diminished the prejudices and silenced the voice of superstition. The frequent travels of philosophers into different regions of their own, and an acquaintance with the opinions adopted by the sages of other nations, taught them to rectify their own ideas, and showed them, at least, that Greece was not the only part of

the world where the study of the sciences was encouraged. They found, indeed, amongst foreigners prejudices more barbarous and injurious than their own; but that discovery afforded them an excellent pretext for renouncing a portion of those which blinded their own countrymen.

Commerce, under the protection of Alexander, tended also considerably to the progress of science. That prince rendered Egypt the mart of the then known world, and opened a channel to the rich countries of India, whence Greece subsequently obtained so many valuable drugs and objects of natural history. The improvement of native industry and the multiplication of the means of existence were the results of the fresh activity impressed upon commerce. This gave rise to wealth, which in its turn aided the progress of science. Alexander himself fostered the sciences, a taste for which he had acquired from his master Aristotle.

To that philosopher he presented Nymphæum, a country situated near Mieza, in order that he might devote himself in tranquillity to the study of nature. Plutarch has striven to show that the son of Philip was himself a philosopher, but his conduct proves him to have been merely a virtuoso. According to Gellius he exhibited himself beyond measure jealous that Aristotle should divulge his secrets after having revealed them to him. He rendered, however, important services to natural history by sparing no pains or expense in collecting over all Asia animals which he sent to Aristotle, in order that the philosopher might study their organization. Pliny relates that

several thousand persons in Asia and Greece were employed in procuring him quadrupeds, birds, and fishes wherever they could be met with.

Several writers, in the number of which is found Athenæus, assert that, according to general opinion, Aristotle received from the king of Macedonia eight hundred talents, or upwards of eight hundred thousand dollars, to enable him to collect the materials for his history of animals; but this sum, according to Schulze, would seem to have been exaggerated. It is certain, however, that Aristotle was placed in circumstances the most favorable for enriching natural history and anatomy with a multitude of discoveries which contributed much to the progress of science. By all these circumstances he profited, and he acquired no less glory in philosophy than in the sciences accessory to medicine.

The principal discovery made by Aristotle in anatomy was that of the nerves, but, although he was well acquainted with the parts of the human frame designated under that name, he appears to have observed them only in animals. He maintains that the ear does not communicate by any opening with the brain, but yet he somewhat strangely argues that the brain sends to each ear a vessel, which seems to be the acoustic nerve. He perfectly describes the strong and tendinous optic nerves of the mole; but erroneously asserts that there is no continuity between the brain and organs of sense, and he therefore derives all the senses from the heart.

Although his angeiology, or description of the vessels, is very imperfect, he has the merit of having

first placed in the heart the origin of all the vessels. He refutes those of his predecessors who assert that they proceed from the head, and demonstrates that the structure even of the heart sufficiently indicates that that organ is intended to give origin to bloodvessels. He first gave the name of aorta to the largest artery of the body, but he attributed the same functions to it as to the veins. He not only calls it φλεψ, a vein, but also regards it as the trunk of all the other veins. He affirms that the brain does not receive bloodvessels, and this opinion is probably owing to his never having opened the human subject. He seems, in fact, only to have embraced it to serve as a point of support to his theory on the humid and cold nature of the cerebral mass; for he adds that the membranes of that viscus are covered with a multitude of bloodvessels.

In describing the distribution of the vessels, Aristotle falls into numerous errors, which are so many additional proofs of his not having studied the structure of the human body. The liver, he says, sends a vessel to the right arm, so that bleeding should always be practised from this limb in diseases of that organ. The vessels of the spleen are similarly distributed towards the left upper extremity. Those of the other viscera of the lower belly terminate in a common trunk. The aorta does not send any branch to the liver or spleen.

The doctrine of Aristotle respecting the origin and distribution of the vessels is united with another idea which had subsequently considerable influence on physiology and pathology,—that the

spirit or air passes from the trachea into the heart. Aristotle asserts that the heart communicates with the trachea by means of adipous and cartilaginous ligaments; and, as for the other viscera, he describes the brain as a moist body, deprived of blood and filling the cavity of the head, the cerebellum being situated posteriorly. There exists, he observes, in the brain an empty space, by which he probably means the ventricles. Man, also, he asserts, is of all animals the one whose brain, in proportion to the size of the body, is the largest. This observation, which proves how assiduously Aristotle must have dissected animals, has been confirmed by the moderns.

Aristotle is chiefly celebrated in anatomy for the great number of animals which he dissected, and the comparison which he instituted between their structure and that of man; he was also the first who made anatomical drawings and appended them to his works, but none of them have reached us. He first established the physical characters which distinguish man from the ape, by observing that the ape, like several other quadrupeds, has a bone in the male organ, and by describing the differences presented by the form of their skull and the bones of their faces. He remarked, also, that man is the only animal that extends itself on the back in sleep. The Stageirite is the first philosopher who described the four stomachs of ruminating animals and explained the phenomena of rumination.

Of the immediate followers of Aristotle, none is more celebrated than THEOPHRASTUS of Eresus (B.C.

371-288). He was the author of several productions on medical science, in which he accords with the principles inculcated by his master, Aristotle; but the subjects on which he rendered himself most famous were of a botanical nature, especially regarding the physiology and diseases of plants. He may, indeed, be considered as the father of botanical science. Theophrastus died loaded with years and infirmities, in the 107th year of his age, lamenting the shortness of life and complaining of the partiality of nature in granting longevity to the crow and to the stag, and not to man.

One of those who, about this period, most contributed to the improvement of anatomy was PRAXAGORAS, a native of Cos. He was the first who established a distinction between the arteries and veins, a discovery which is as important as all the others collectively with which he has enriched the science of anatomy. Although Aristotle had already, in some measure, traced for him the route, by describing, with a degree of accuracy previously unknown, the origin and distribution of the vessels, yet the only difference which he admitted between those vessels was that some of a tense and fibrous texture ought to be regarded as branches of the aorta, whilst others he considered to be attached to the vena cava. At this period, however, it was recognized that the ramifications of the aorta are those only in which pulsations are evident.

The honor of this great discovery belongs entirely to Praxagoras. Before him all the ancients had given to the arteries no other names than that of

bloodvessels. But whence is it that he applied to them the name of arteries, seeing that until his time it had been appropriated to the trachea or windpipe? According to Sprengel, the following are probably the reasons: 1. The arteries alone produced pulsations, and, as they executed them continually, their contractions appeared to him to depend on a primary vital force inherent in the vessels, and for a long period the air (*πνεῦμα*) had been regarded as the seat of the vital force. 2. Finding the arteries constantly dilated after death, he might have concluded that during life they contained only air. 3. Plato and Aristotle had judged it necessary, in order to explain the continual movement of the heart, to admit of air-passages for the purpose of carrying the pneuma from the lungs. The connection between the pulmonary veins and the aorta in the left ventricle appeared to Praxagoras sufficient to explain the presence of the pneuma in that ventricle, and consequently in the arteries, and hence he gives to the latter the name which had, until that period, been applied only to the trachea.

Galen, who attributes to him the opinion that the arteries, during life, are filled with air, is justly astonished that he should, notwithstanding, have pretended to judge of the state of the blood by feeling the pulse, as he did not admit the existence of that fluid in the arterial vessels. If Praxagoras, however, had been asked whence comes the blood which escapes from the artery when it is wounded, he would have replied, when the artery receives any wound it is in a preternatural condition, attracting the blood

from every part of the body, and thus causing it to flow out.

An erroneous opinion, common to Praxagoras, Aristotle, and several others of the ancients, was that the heart gives origin to all the ligaments, or at least that the strongest ligaments are united in that organ. Hippocrates likewise asserted, like all his predecessors, that the arteries, in process of time, become converted into ligaments, and acquire strength in proportion to the diminution of their diameter.

Praxagoras in his practice wandered but little from the principles of Hippocrates. He pretended that intermittent fevers arise in the vena cava, probably from having remarked that the rigors commence along the spine where that vein is situated. In his surgical practice he was bolder than his predecessors, for he removed the uvula in cases of inflammatory sore throat, and opened the cavity of the abdomen in those affected with the iliac passion for the purpose of replacing the intestines in their natural condition.

After the death of Alexander the extensive empire of the Macedonian hero was dismembered, and in the year 321 before Christ Egypt fell to his brother-in-law, Ptolemy, surnamed afterwards Soter. Not only was this prince the protector and friend of the learned, but all the sovereigns likewise of his time encouraged science, and established large libraries. The kings of Syria and of Pergamus were especially distinguished for their endeavors to contribute to the progress of human knowledge. This universal disposition, and the establishments which were the

consequence, necessarily increased the sphere of knowledge as well as the number of those who cultivated it, corrected its imperfections, and rendered it more useful in the commerce of life.

The Greeks were the first who inspired a taste for study in Egypt and other countries. The inhabitants were not tardy in becoming initiated in all the mysteries of Grecian philosophy, and thus a degree of emulation sprang up in consequence, which in the sequel was highly advantageous to all the sciences.

Ptolemy Philadelphus and Ptolemy Euergetes, who succeeded the founder of the kingdom of Egypt, followed also his example, and spared no pains in order to carry the sciences to the highest point of splendor. The library and museum of Alexandria, of which Ptolemy Soter had laid the first foundation, was, under their reign, enriched with valuable acquisitions. By the immense commerce which they carried on in the Indian seas they furnished naturalists with an opportunity of observing a multitude of animals and vegetables unknown until that period, and, lastly, they were the first who permitted physicians to open the bodies of the dead. They themselves did not disdain to study the human structure, and thus rooted out the old prejudice which caused anatomy to be ranked as amongst the greatest of crimes.

Ptolemy Philadelphus rendered himself particularly celebrated for his erudition. He had purchased at Athens, Rhodes, and other places, a number of the works of the ancient philosophers, and amongst

others those of Aristotle. His languishing state of health, according to Strabo, compelled him to seek all possible means of relaxation, and no study appeared to him more captivating than that of natural history. He kept at great expense hunters for taking all kinds of wild animals, which were kept alive at Alexandria.

During the constant wars which distracted the successors of Alexander, the sciences were nowhere cultivated with so much zeal as at Alexandria. That city seemed to be in some measure the centre of all knowledge and of the commerce of the whole world, and its inhabitants preserved, until the reign of the seventh Ptolemy, the peaceable enjoyment of the advantages which they owed to the cultivation of the sciences. That monarch was himself a learned disciple of Aristarchus the rhetorician, and wrote a large work on the natural history of animals. His predecessors all followed the footsteps of Alexander the Great, sparing no pains in embellishing the city founded by that conqueror, and in forwarding the progress of philosophy and of the sciences.

Alexandria became, under their reign, the centre of information, the asylum of philosophers, of rhetoricians, and of physicians, who flocked thither from every country of the civilized world, and its situation and uniform mildness of climate contributed much to render it an agreeable sojourn. The temple of Serapis contained an immense collection of books, which the Ptolemies had brought from all parts. Aristotle was appointed by Ptolemy Soter to form and conduct this library, the number of works in

which is estimated by some authors as high as 700,000, although, according to others, it was not greater than 500,000 at the time of Ptolemy Philadelphus. Ostentation, however, would seem to have had the greatest share in the formation of that immense collection, in which the kings of Egypt paid more regard to the number than to the merit of the works.

The establishment of these libraries occasioned a singular rivalry between the Ptolemies and the king of Pergamus. Eumenes had established one at Pergamus which consisted of 200,000 volumes. Those princes were desirous of surpassing each other in the richness of their collections and in the price which they paid for the works of the ancients, and the rivalry extended so far, that Ptolemy forbade the exportation of the papyrus, in order to deprive the kings of Pergamus of the means of surpassing him. The same jealousy also seems to have existed between the successors of Ptolemy Philadelphus and of Eumenes, under whom was discovered the art of preparing parchment.

It would have been indeed astonishing if the recompenses accorded to those who discovered ancient manuscripts had not induced many mercenary individuals to make interpolations, and to falsify important works for the purpose of acquiring money; and accordingly it is at this period that we may date the origin of many interpolations of manuscripts and the greatest number of doubtful works. Ammonius informs us that Aristotle himself was not spared; and a passage in Galen, which throws much

light on the prevailing spirit of the age, shows that the name of Hippocrates was frequently used by the sophists to give a higher value to the opinions they emitted.

The Ptolemies, moreover, had founded, in a part of the chateau called Bruchium, a museum, according to Suidas, established on the model of that of Pergamus. A number of learned men were there entertained and pensioned by the State, enjoying the privilege of making use of the library and the collection on natural history. Public discussions were there indulged, and, after the manner of the Olympic games, prizes were awarded to the conquerors. This institution became more especially celebrated as a school of medicine; and, for a long time, it was sufficient for a practitioner to say that he had studied at Alexandria to give him reputation.

The prominent individuals who arrest our attention in the Alexandrian school, connected with the medical profession, are Herophilus and Erasistratus, according to Galen and Celsus the two greatest anatomists known until that period. They both lived in Egypt at the time of Ptolemy Soter. **HEROPHILUS**, who was born at Chalcedonia, was probably the older. It is certain that he dissected a number of human bodies, whilst his predecessors were satisfied with opening animals. Celsus assures us that he obtained permission to dissect living criminals, and that he frequently profited by it. This tradition was believed, and was repeated by the fathers of the church. However his knowledge was obtained, the works of this physician were the more

useful to science, as his descriptions were not formed from analogy, but drawn from nature herself; and he certainly made a number of discoveries. One of the most important is that of the functions of the nervous system.

Herophilus was the first who regarded the nerves as organs of sensation. He was perfectly acquainted with the brain, for he says that this viscus gives rise to the nerves. We possess, besides, some details respecting the numerous discoveries with which he enriched anatomy. He first described the vascular membrane which lines the ventricle. He gave the earliest description of the fourth sinus, to which the term torcular Herophili has been assigned, and called by the name of *calamus scriptorius* the longitudinal fissure in the fourth ventricle. He described with great accuracy the different portions of the eye, and discovered by dissection the greater part of the membranes of that organ, giving them names by which they are distinguished at the present day, the retina, for example. He is said also to have first operated for the cataract by extraction of the crystalline.

Another discovery, and a no less important one, was the distinction which he established between the vessels of the mesentery proceeding to the liver and those which, terminating in the mesenteric glands, were subsequently called lacteal veins. He did not, however, describe them so accurately as Erasistratus. He was the first who called the intestine duodenum by that name. His description of the genital organs was very different from that of his predecessors. He discovered the epididymis, but

does not appear to have suspected any use for it. Scarcely had the natural pulsation of arteries been discovered when Herophilus established a system on the discovery. He observed the difference of those pulsations as regarded their strength and velocity, and remarked that it was not in the artery itself but in the heart that the origin of the force which induces pulsation should be sought after.

He rendered to the other branches of the healing art less important services than to anatomy, in which last branch he was so accurate that it was said of him by Fallopius, one of the greatest anatomists of the 16th century, that to contradict Herophilus in anatomy was like contradicting the Gospel. This doctrine of the pulse caused him to make researches on symptomatology, which he divided into three parts: diagnostics, or the signs distinguishing diseases; anamnestic, or the commemorative signs which discover the preceding state of the body; and prognostics, or the signs indicating the favorable or unfavorable termination of the disorder. His opinions, however, on this subject, as well as those of a practical nature, are so wild and visionary as not to merit comment.

A physician not less celebrated than Herophilus in the history of medicine was ERASISTRATUS, who probably lived at Alexandria in the time of Herophilus, about 300 B.C. He was a disciple of Chrysippus of Cnidos, of Metrodorus, and of Theophrastus, and lived for some time at the court of Seleucus Nicator, where a splendid cure is said to have obtained him a brilliant reputation. Appian and Lucan give us the most detailed account of this case without, how-

ever, naming Erasistratus, but Plutarch in relating it expressly mentions him. Antiochus, son of Seleucus, having become deeply enamored of his step-mother Stratonice, concealed his passion, and at last fell sick. The prince kept his bed, experienced no pain, but became considerably reduced without its being possible to discover the cause. Erasistratus, having remarked the sunken state of his eyes, the feebleness of his voice, the paleness of his complexion, and the tears which he unconsciously shed, fancied that he saw in the congeries of symptoms proofs of a violent passion. In order to throw light on his suspicion, and discover the object, he placed his hand upon the heart of the patient, and had all the females in the palace brought into the chamber, when Antiochus experienced no agitation; but on the approach of Stratonice he immediately changed color, his heart beat forcibly, he was covered with perspiration, and seized with a general trembling. Appian and Lucan render the subsequent part of the recital no less interesting by detailing the adroit manner in which Erasistratus announced the news to Seleucus, and the generous conduct of the king.

Soon after this Erasistratus abandoned the practice of medicine and went to Alexandria, where he devoted all his attention to theoretical speculation and to anatomy. His remains were deposited on Mount Mycale opposite Samos, whence arose the surname of Samian which several authors have assigned him. The profundity of his knowledge and his rare probity attracted around him so many friends and disciples that he passed generally for the first anatomist

and the greatest theorist of his age. Erasistratus supposed digestion to be performed by attrition. His own system of pathology rested on the idea of the arteries containing only a spirit, and that diseases, particularly fevers and inflammations, arose from their admitting blood. He was afraid of bleeding lest the blood should find a way from the veins to the arteries, and he dreaded purging because Pythagoras had forbidden it. He reduced his patients by abstinence or by violent exercise. Venesection he supplied by the use of ligatures round the limbs; purgatives by slight emetics or by glysters. He advised simple medicines, and reprobated in strong language the complicated formulæ of that era.

Erasistratus first observed the valves of the vena cava and gave them the name of triglochine, by which they are still frequently designated, although more commonly by that of tricuspid. According to Cœlius Aurelianus, he practised surgery with so much hardihood, that in abscesses of the liver and spleen he did not hesitate to open the abdomen for the purpose of applying the remedies immediately to the parts diseased.

The chief of the followers of Herophilus and Erasistratus during the next three centuries were, Eudemus, Demetrius of Apamea, Mantias, Baccheius of Tanagra, Zenon of Laodiceia, Apollonius of Citium, Apollonius of Memphis, Callimachus, Callianax, Chrysermus, Andreas of Carystus, Cydias, Heraclides of Erythræa, Apollonius of Tyre, Gaius, Dioscorides, Phacas, Straton of Berytus, Straton of Lampsacus, Lycon of Troas, Nicias of Miletus, Apollophanes, Arte-

midorus of Side, Charidemus and his son Hermogenes of Tricea, Icesias and Menodorus, but they are spoken of with but little respect by Galen, and are said to have been arrogant and loquacious. It is somewhat odd that not one of them has been celebrated for any anatomical acquirements; and yet, although the school of Alexandria, of which they were the supporters, fell more and more into a state of decay from the progress of the empirical and methodical sects, it was kept up until the time of Galen.

The division, which was made about that time, of medicine into surgery, dietetics, and rhizotomy or pharmacy, occasioned, as Celsus has well remarked, considerable progress in the art of surgery. The surgeons of Alexandria, where surgery was first successfully cultivated, performed the majority of the most important operations. PHILOXENUS was the first who distinguished himself by his dexterity. He left several works on surgery, which are all lost. Galen had preserved only a collyrium or eye-water of his invention. Celsus speaks in eulogiums of a person named HERO, who first taught that the epiploon is frequently found contained in an umbilical hernia.

Of all the operations, however, which were improved at Alexandria, that for the stone is the one which most merits our attention. Certain surgeons in that great city confined themselves to it exclusively, and were called lithotomists, as they are denominated at the present day. The unhappy end of Antiochus the Sixth, surnamed Theos, furnishes

us with a proof of the depraved condition of the lithotomists of Alexandria. The usurper, Tryphon, engaged some of them to propagate a report that the young prince was affected with the stone, and under pretext of freeing him from the disease he was made to perish under the operation.

The school of Alexandria is also remarkable for the attention paid to the improvement of surgical apparatus. Amyntas of Rhodes was the author of a bandage for fractures of the nose, Perigenes of one for dislocation of the humerus, Pasicrates and Nileus invented the pleinthium, a species of square box, furnished with pulleys, which was used in the reduction of luxations of the humerus; Nymphodorus a fracture-box for the extremities, etc. etc.

It is to be regretted that some of the works of the physicians and surgeons of Alexandria have not reached us. Even in the time of Julius Cæsar the celebrated library of the Bruchium had become a prey to the flames, which devoured 400,000 volumes, and doubtless destroyed a considerable number of the works of the Alexandrians. It is true that Egypt still possessed the library of the temple of Serapis, and that Marc Antony made a present to Cleopatra of that of Pergamus, which comprised, according to Plutarch, 200,000 volumes, but the loss of the royal library was not less irreparable.

It has been asserted that Herophilus taught the obstetric art, and that a woman named Agrodicea acquired so much dexterity in it that she obtained permission to practise it, although those of her sex were forbidden to exercise it; but this latter asser-

tion does not rest on a very clear foundation. It would seem, however, that the exclusive practice of particular branches of surgery was encouraged at Alexandria, as a law existed prohibiting young practitioners from undertaking the operation for the stone, which was always left to the lithotomists.

CHAPTER XIII.

THE EMPIRICAL SCHOOL.

Origin of the empirical sect—Views and theories of the empirics contrasted with those of their predecessors—Traumatic theory—Their neglect of anatomy and physiology—Distinguished followers of this school.

IF we apply the denomination of empirical to those who, neglecting the study of the causes of disease, confine themselves to the employment of those means of which experience had demonstrated to them the utility, the term is applicable to all the physicians of antiquity. There did not, however, exist until between the years 280 and 250 before Christ an empirical sect, properly so called, distinguished by the particular principles which they admitted.

The decaying condition of the dogmatic school, and the change which had occurred in the prevailing philosophy, were the causes which gave rise to the empirics. Physicians had abandoned too soon the route of observation which Hippocrates had pointed out to them, and made use of the few discoveries with which anatomy was enriched to establish on the functions of the body, in the state of health or disease, fresh speculations which were not founded on a sufficient number of observations. Hence, theory succeeded theory with extreme rapi-

dity, and this circumstance, joined to the several new medicines which the immense extent of commerce of the Ptolemies had made known, induced a considerable number of physicians to attend exclusively to the properties of drugs, without at all attaching themselves to the theories of the dogmatists.

The extension of scepticism also contributed to the rise of empiricism, the empirical school having separated from the dogmatical a short time after Pyrrho had become celebrated by the establishment of his particular doctrine. PYRRHO was born in the 101st Olympiad, and probably died about the third year of the 133d (288 years before Christ), and PHILINUS, founder of the empirical school, enjoyed his greatest reputation during the same Olympiad. The manner in which Pyrrhonism or scepticism in all probability encouraged the empirical sect was by inducing them to reject indiscriminately all the dogmas which had been previously admitted, for so they are asserted to have done.

The first empirics—by which is not to be understood anything similar in character to the unprincipled pretender of modern days, who has his nostrum which he gives indiscriminately in all diseases, and is also distinguished by the name of empiric—paid particular attention to symptoms, without occupying themselves with the causes of disease. By subjecting the art of observing to fixed and invariable rules, they rendered to the science a far more important service than all the vague theories of the physicians of antiquity, and improved it more than

all the speculations of the ancient dogmatic school. The theories of the latter have been long buried in oblivion, and now interest only the historian, whilst the rules which the empirics have left us on the manner of observing, although mixed up with several absurdities, are still at the present day the basis of our labors, and the touchstone of the conclusions which we draw from them.

The experience on which they rested was the result of the most perfect induction. It was necessary, before pretending to possess any rational knowledge, to have observed the same cases several times and under similar circumstances. Although the empirics neglected the search into the causes which do not fall under the senses, they attached the more importance to the judicious selection of those phenomena which might become an object of observation, for it appeared to them wholly superfluous to attend to the most trivial symptoms of disease. They besides carefully discriminated the symptoms which essentially belong to the disease, from those complicated with it. These cases the physician was expected to retain in his memory, and the name of theorem was appropriated to the remembrance of cases which they had observed. Several such theorems rendered the physician capable of pretending to empiricism; and the union of all constituted medicine, observation and memory forming its foundation.

The empirics admitted three distinct sources of observation, according as they obtained it by some fortunate accident, by inspection of the patient, or

by a comparison with other similar cases, or by analogy.

Empiricism or autopsy was consequently understood, when an individual preserved the remembrance of cases which had always been seen alike, and the application of which might be made to any one that presented itself. But as all men are not placed in circumstances which will permit them to observe a sufficiently great number of morbid symptoms, it is frequently necessary to have recourse to history, which is nothing more than the remembrance of a number of cases which have followed the same march, and to which any one may arrive by an acquaintance with the remarks of his predecessors. But here it was required that they should be influenced only by the most perfect possible induction. If, for example, the critical character of an evacuation had only been noticed by one physician, it could not be depended upon; it was therefore necessary to examine the opinions of different practitioners and to be guided by those of the majority.

It was necessary, again, that the observations should have been made in the same manner, that the circumstances should have been perfectly identical, and particularly that the disease should not have presented the least difference in its nature and character. Thus, the remarks made by a physician on inflammation were not considered to be applicable to simple or ephemeral fever. To him who knew how to profit by the observations of others with all requisite prudence, and who consequently possessed the history, it was not esteemed necessary that he

should have observed himself. As we are able, from the descriptions given by authors, to acquire a sufficiently exact knowledge of a country which we have never visited, so was it very properly considered are we by attention to the writings of others able to learn more, in the course of a long life, than if we ourselves had observed the diseases for ages.

As personal observation, however, and the knowledge acquired in the works of practitioners were not considered to be sufficient when new diseases presented themselves, or when medicines were employed which had not previously been used, the founders of the empirical school indicated a third method of arriving at a knowledge of the curative means which ought to be adopted. This was analogism, or a comparison between the existing case and similar ones. As Serapion had ranked this third method amongst the number of the foundation stones on which empiricism rested, observation, history, and analogism were subsequently called the tripod of that sect.

From this notice of the empirics it will be observed that they really imitated Hippocrates, as they adopted the same philosophy by which the Father of Physic had produced the most happy and salutary reform in medicine. But, although the principles which they established greatly contributed to the progress of the art, they were highly culpable in neglecting all occult cases. Nothing, they maintained, is more useless than the desire to fathom occult subjects; they are impenetrable, and no reasoning can make us acquainted with them. The

physicians, they asserted, would be always at variance with each other on those subjects, whilst there never would be the least discussion raised on those phenomena which strike the senses. They despised also anatomy, that firmest support of medicine, and paid no attention to it, but they agreed that where an opportunity accidentally occurred for examining the structure of the body it ought to be embraced; and, as the most frequent opportunities which were offered to them were in cases of wounds, they thought it necessary to give the name of traumatic theory to the knowledge gained in that manner.

The dogmatists could never forgive the empirics for attaching no value to physiology, and especially for not taking into consideration the different powers of the body. The efforts, indeed, of the empirics seem to have had no other object than that of curing diseases by the most suitable means. They occupied themselves but very little with the physiological and pathological speculations diffused about the same time, and admitted only amongst the powers of the body those the real existence of which experience had proved.

Philinus of Cos, the disciple of Herophilus, was the founder of the empirical school; but his successor SERAPION of Alexandria appears to have given to the system greater extension, so that by some authors he has been considered as its inventor. Serapion wrote against Hippocrates with much vehemence, and busied himself almost exclusively with researches on drugs. Cœlius Aurœlianus, in quoting his book *Ad Sectas*, censures him for

the acrid remedies which he prescribed in angina, and reproaches him with having neglected dietetics. It would seem, indeed, that in those remote ages a multitude of superstitious remedies were used in epilepsy; for Serapion, besides castor, recommended the brains of the camel, the rennet of the sea-calf, the excrement of the crocodile, the heart of the hare, the blood of the turtle, and the testicles of the wild boar. Several authors make mention of some other preparations and antidotes which bear his name, and not worth much more than the preceding.

The immediate followers of Serapion and of the empirical sect during the next two centuries and a half (B. C. 276–30) were Celsus, Glaucias, Baccheius of Tanagra, Heraclides of Tarentum, Nicander of Colophon, and Menodotus of Nicomedeia; but scarcely any of them made discoveries or promulgated sentiments of sufficient interest to be worthy of notice.

The empirical school terminates the most ancient period of the history of medicine, and that which gives a type to the healing art of the subsequent ages.

CHAPTER XIV.

STATE OF MEDICINE NEAR THE DAWN OF THE CHRISTIAN ERA.

Royal toxicologists—Rome a centre of attraction to the world—Asclepiades and his views on anatomy, pathology, &c.—Bronchotomy first proposed—Disciples of Asclepiades—Themison of Laodicea—First employment of leeching—Followers of Themison—The methodic school.

THE studies and the taste of the princes who reigned at this period spread considerable light on the *materia medica*, and advanced the knowledge of poisons and antidotes to a higher degree than that of any other branch of the science. Attalus Philometor, the last king of Pergamus (in the second century B. C.), was celebrated in antiquity for his skill in medicine and his great knowledge of botany. He cultivated in his gardens different poisonous plants, as the hyoscyamus, aconite, hemlock, and hellebore, with which he made experiments to ascertain the efficiency of antidotes. Several remedies which he prepared subsequently bore his name. The principal were a plaster made with cerusse and an internal remedy in jaundice.

Mithridates Eupator, king of Pontus, however, surpassed him in general knowledge and in skill in the healing art. This prince, who never required an interpreter when he received the ambassadors of even the most remote nations, spoke two

and twenty languages, if we may credit Pliny. The continued fear which he had of being poisoned caused him to contract a habit of daily taking poisons and antidotes, to habituate his body to the action of toxical substances. He was also accustomed to try on criminals the action of poisons and counterpoisons. After his death Pompey seized on all his goods, and found in his castle secret memoirs stating that he had poisoned two individuals and treating also of the interpretation of dreams. Pompey had these books translated by his freedman Leucus. Mithridates is especially celebrated for his antidote, in which there were fifty-three ingredients. Two plants bear his name, the eupatorium and a species of garlic called mithridatium.

The victories of Lucullus and of Pompey in Greece and in Asia first made known the Grecian philosophy to the Romans. After that period, attracted by the thirst of gain, philosophers, rhetoricians, poets, and physicians came in crowds from Greece, Asia Minor, and Egypt to Rome and into Italy, to display to the inhabitants of the capital of the world, knowledge and arts which were unknown to them. Of this number was ASCLEPIADES, who was born in Prusa, a city of Bithynia, about ninety years before Christ. He was by profession a rhetorician or Epicurean, and the friend of Cicero. If we may credit the report of Pliny, Asclepiades went to Rome without any knowledge of medicine; and failing in his attempts as a rhetorician, he with little preparation professed himself a physician. He was the first of this profession who gained general esteem in the capital of the

world, and whose name has reached posterity. Pliny gives a long account of the artifices by which he attained his reputation, but, as Dr. Parr has very correctly observed, they are such only as every fashionable physician employs,—pleasing the patient and avoiding everything that can give uneasiness, till nature cures or yields to the disease.

The philosophy of Asclepiades was that of Democritus as reformed by Epicurus, and his physiology rested on corpuscles or atoms flowing through invisible pores. The doctrines of Hippocrates respecting the intelligence of nature and her influence in the cure of diseases he rejected with contempt. He denied even the power of attraction in the magnet. Everything happened, in his opinion, from necessity, and nothing without a cause; nor was nature anything but the body or its motions, and instead of assisting it was usually injurious. His anatomical knowledge was very imperfect, or he would not have thought that the urine passed from the intestines into the bladder through pores. Digestion was, in his opinion, unnecessary; he supposed the food was carried into the blood, and there attenuated till it was adapted to the pores of the vessels which conveyed it as nourishment. Hunger was induced by the relaxation of the larger and thirst by that of the smaller pores. The fæces were not, he thought, excrementitious, as some insects feed on them.

His pathology was of a similar complexion. Inflammation was owing to obstruction either from the magnitude, the figure, the multitude, or the rapid motion of the atoms; pain to obstruction from par-

ticles of a large size, and the absence of the smaller ones. Fainting, dropsies, and hecticis arose from the too great size of the pores; and dropsies, in particular, he thought might be owing to the transudation of the flesh, which then became water. Quotidians were owing, in his opinion, to the obstruction of the larger particles, tertians of the less, and quartans of the least. He denied the existence of critical days.

As for his practical principles, the branch of therapeutics is indebted to him for several important remarks. He rejected violent remedies, particularly emetics and purgatives, substituting for the latter injections. He had frequently recourse to blood-letting, especially in inflammations. He had but little confidence in cupping, which he used only when the fever had disappeared and the plethora was not very considerable. Obstructions were best removed, in his opinion, by friction, wine, gestation, and bathing. He plumed himself on having first recommended frictions, and is minute in his directions for their management. He first made use of the shower-bath, if we are to so translate his *balneæ pensiles*, and frequently directed cold baths and affusion with cold water. In violent angina, or sore throat, he bled the patient in both arms, and was the first that advised bronchotomy, or opening the windpipe, to prevent the fatal effects of that complaint.

Asclepiades was the founder of a school which enjoyed great celebrity amongst the ancients, and promulgated his principles with more or less modification. Amongst his disciples Stephanus of By-

zantium names Philonides of Dyrrachium, Aufidius of Sicily, and Nico of Agrigentum, who flourished about the middle of the century before Christ.

MARCUS ARTORIUS, the friend and physician of Augustus, was also one of the disciples of Asclepiades. Augustus said himself, in his memoirs, that he owed his life to Artorius, because he, inspired by a dream, persuaded him before the battle of Philippi to be present notwithstanding his indisposition, by which step he was prevented from falling into the hands of the enemy when Brutus became master of his camp. Artorius was lost at sea, a short time after the battle of Actium, which took place 31 years before Christ. Clodius and Niceratus, whom Cœlius Aurelianus also ranks amongst the disciples of Asclepiades, are less worthy of notice.

The most celebrated and the most important of all the pupils of the Bithynian physician was THEMISON of Laodicea, founder of the Methodic School, properly so called, who did much to rectify the principles of Asclepiades, and to introduce greater precision into his system. Themison has been highly extolled by his contemporaries and successors, and his name was long synonymous with that of an able physician. Juvenal, however, whether by way of sarcasm or as a simple narrator of facts, is very severe upon his medical powers: "*Quot Themison ægros autumnis occiderat uno;*" "How many sick did Themison destroy in one autumn?"

Asclepiades principally considered the causes of diseases, whilst Themison thought it only necessary to connect them by some common symptom, and

divided diseases into the *stricta*, *laxa*, and *mixta*. By these terms are not to be understood constricted and relaxed fibres, or a mixture of both, but diseases attended with impeded or increased secretions or too great discharges from one part, or too little from another. These principles formed a guide for physicians, and hence the sect (from *μεθοδος*, *via*) was styled the methodic. In the first case, the *stricta*, Themison directed evacuants; in the second, the *laxa*, astringents; and in the third or *mixta*, to oppose, by either class of remedies, the most dangerous symptoms as they may occur. Themison neglected the precepts of Asclepiades in many respects, particularly in giving aloes and scammony. What we know, however, of his curative methods does not impress us with a very high idea of his skill in the treatment of disease. He recommended bleeding in apoplexy, and also applied the trepan, probably with the view of more certainly disgorging the bloodvessels.

He appears to have been the first who made use of leeches; he regarded the plantain as a universal remedy, and wrote an *ex professo* treatise on the virtues of that plant. Cœlius Aurelianus relates a singular fact of Themison, that, having been bitten by a mad dog, or probably remaining too long with a friend laboring under hydrophobia, he contracted the same disease. He cured himself, but, when he attempted to explain the method, he relapsed. This, however, could only have been a high degree of hypochondriasis. He was the author of several works, from which Cœlius Aurelianus has preserved short

extracts; but there is nothing very important contained in them.

Amongst his numerous disciples were Eudemus, who advised the administration of clysters of cold water in inflammation of the bowels, Vettius Valens, and ANTONIUS MUSA. The latter, who lived a short time after Themison, was the freedman of Augustus, and is celebrated for a fortunate cure produced on that emperor. Augustus had been for a long time affected with a severe disease, respecting the nature of which historians do not give us any accurate information, and which the physicians had aggravated by the administration of healing remedies. Musa succeeded in curing him by the simple use of cold bathing. Augustus and the Senate, out of gratitude, not only accorded him a considerable sum, but also decreed to him the title of knight, and a statue of brass in the temple of *Æsculapius*. Dion Cassius asserts that, emboldened by this brilliant success, Musa also ordered cold bathing to Marcellus, but it occasioned the young prince's death. Musa introduced into medicine the flesh of the viper in cases of malignant ulcers, as well as the lettuce, chiccory, and endive.

The system of Themison seems to have had no very violent opponent or defendant; so far as we can collect the opinions of physicians, they were divided between the pores of *Asclepiades* and the strictum or laxum of Themison, and practitioners would seem to have reasoned with some freedom, though with no striking marks of genius or ability.

CHAPTER XV.

STATE OF MEDICINE DURING THE EARLY CENTURIES OF THE CHRISTIAN ERA.

Cornelius Celsus, the medical Cicero—His views on anatomy, surgery, etc.—Elegant Latinity of his works—Contempt of Pliny for the Roman practitioners of this age—Medical pretensions of Thessalus Trallianus—Symmachus and his clinics—The first medical lexicographer—The subdivisions of the methodic sect—Aretæus and his medical practice—Medical writings of Soranus—Claudius Galenus (Galen), his life and services, writings, etc.—The immediate successors of Galen—State of medical literature at this period—School of Alexandria—Study of medicine in Persia—Celebrated medical school at Edessa, and its professors—Establishment of the first institution for clinical instruction.

CORNELIUS CELSUS was one of the most distinguished ornaments of the methodic sect, who brought back, or greatly contributed to bring back, physicians to the patient study and observation recommended by Hippocrates. Respecting this elegant writer, this medical Cicero as he has been termed, we possess but few details; we know only that he received an excellent education, that he embraced the methodic sect when in its infancy, and that the work for which he is celebrated formed only a small part of a great encyclopedia. Although we have no substantial proofs that he was a physician, he has de-

scribed several operations too accurately not to have seen them practised.

Bianconi presumes that Celsus was secretary to Tiberius, and that he accompanied the emperor in his expedition to the East; an opinion which is probable, for Horace in his Epistle to Florus speaks of Celsus and of the compilation which he made from the library of the Palatine Mount:—

“Let Celsus be admonished o'er and o'er,
To search the treasures of his native store:
Nor touch what Phœbus consecrates to fame,
Lest, when the birds their various plumage claim,
Stripp'd of his stolen pride, the crow forlorn
Should stand the laughter of the public scorn.”

Hor. lib. 1, ep. 3.

Bianconi also endeavors to prove that he was intimately acquainted with Ovid.

In his work on agriculture, he treated of the veterinary art. His books entitled *De Re medicâ*, although almost exclusively devoted to surgery, contain several facts which permit us to form an idea of the state of anatomy, of medicine properly so called, and of the different other branches of the science at that period. Celsus defends anatomy against the empirics, who, as before observed, neglected it. The description which he gives of the structure of certain parts proves that he had himself dissected human bodies; whilst that of others, on the contrary,—of the liver, for example,—was evidently described from the organization of animals. He does not always distinguish arteries from veins, and had not a very correct

idea respecting the nerves, for he sometimes gives that name to tendons and even to muscles.

Several of his principles on semeiology, or symptomatology, and on clinical or bedside medicine, are derived from the writings of Hippocrates and of the ancient Greeks. Some resemble those of Asclepiades and Themison. He rejects the critical days, recommends and censures, as the case may be, in different places, the use of purgatives, particularly recommends friction, exercise, and bathing in chronic affections, and first speaks of the utility of analeptic, or nutritive, glysters. He was, however, tinctured with considerable superstition, and mentions with confidence several superstitious medicines for the cure of epilepsy, as the warm blood of a recently slain gladiator or a certain portion of human or horse flesh.

Some of his surgical precepts may be advantageously followed even at the present day. His method for performing the operation of lithotomy, the mode of extracting stone from the bladder by the smaller apparatus, has been strongly supported in modern times, and is more especially applicable to children. His rules relative to the application of the trepan merit great commendation, taking into account the time at which they were written. At that period obstetrics, or the art of midwifery, was in a very rude state; it was confined to the forcible extraction of the child, which was frequently pulled with such violence as to be taken away piecemeal.

Cataract was removed by depression. Celsus also speaks of some particular operations performed in his time at Rome, as, for example, the formation of

an artificial prepuce in cases where the original does not cover the glans, and of infibulating boys in order to preserve their voice for the purpose of singing, and gladiators to preserve their strength by keeping them from venereal excesses. "The skin that covers the glans," he observes, "is extended and marked on both sides with ink, where it may be perforated, and then it is let go. If these marks return upon the glans, too much has been taken up, and it ought to be marked nearer the extremity; if the glans is not reached by them, that part is proper for the fibula. Then where the marks are, the skin is pierced by a needle followed by a thread, and the two ends of this thread are tied together, and moved every day, till small cicatrices are formed about the orifice. When these are confined the thread is taken out, and a fibula or clasp put in; and the lighter it is, so much the better. But the operation," he wisely remarks, "is more frequently needless than necessary."

Celsus may be considered rather as an epitome of the maxims of his predecessors than himself an object of historical research; those, however, who are anxious to study the opinions and practice of the ancient physicians will find them correctly detailed in his works. They are worthy of perusal as a specimen of the most elegant Latinity with which medical literature has been enriched.

Pliny has been reproached with bearing an implacable hatred to the physicians, his contemporaries, and with painting them in the most odious colors. There is not the least reason, however, for

regarding as a calumny all that he has said of the Roman practitioners, and the contempt with which he speaks of them is not wholly unmerited. At the period of which we are now detailing the history, the capital of the world was inundated with physicians, whose principal aim appeared to be to acquire riches and honors, to elevate their own schools on the ruins of the ancient, and to blind the people by the establishment of new systems or by the invention of obsolete modes of treatment.

Amongst others, CRINAS, a physician of Marseilles (A.D. 54-68), introduced astrology into medicine, and was desirous of subjecting the regimen of the sick to the course of the stars; and, notwithstanding these absurdities, he acquired a sufficiently large fortune to fortify, at his own expense, several towns of his own country.

THESSALUS TRALLIANUS (A.D. 54-68), however, surpassed all his contemporaries, and perhaps all his predecessors, in the low manœuvres of charlatanry. His father was of the lowest rank, and Thessalus himself without the advantages of education. This is the account, indeed, of Galen, who, on every occasion, eagerly censures him; but Pliny as well accuses him of the most disgusting arrogance and the most consummate ignorance. A man, says Sprengel, who heaped the most gross epithets on the ancients, who cited them all before his tribunals, and was at once judge and party, who gave himself the title of chief of physicians, because he believed himself to excel all other practitioners; a man so little versed in the literature of the Greeks

that he accused Hippocrates of having killed his patients by overloading them with nourishment; a man who had the audacity to write to Nero that his predecessors had contributed nothing to the progress of science; a man, finally, who flattered the great, and boasted of being able to teach the healing art in six months; has such a man any right to pretend to the esteem of posterity? He had, in fact, attracted a great number of disciples, but they were all rope-makers, cooks, butchers, weavers, tanners, and, in a word, artisans, whom he took for six months to visit patients, and then accorded them the privilege of killing with impunity.

The custom followed by physicians of taking their students with them is satirized by Martial in the following epigram:—

“Languēbam ; sed tu comitatus protinus ad me
Venisti centum, Symmache, discipulis.
Centum me tetigere manus, aquilone gelatæ ;
Non habui febrem, Symmache, nunc habeo.”

Martial, lib. 5, ep. 9.

I send for Symmachus ; he 's here,
A hundred pupils following in his rear.
They feel my pulse, with hands as cold as snow ;
I had no fever then, I have it now.

The system of Thessalus differed but little from that of Asclepiades and Themison. It is, however, scarcely capable of being rendered intelligible. He made use of the ideas of Asclepiades relative to the relationship between the primary corpuscles and their pores, to establish a new indication which was to be followed up when the ordinary signs of *strictum* and *laxum* failed. This new indication he called

metasyncrisis, or the restoration of the relationship which, in a natural state, exists between the pores and the corpuscles.

Galen accuses him of not having the least idea of the action of medicines, although he had written upon the subject. The chief works of Thessalus, quoted by Cœlius Aurelianus, relate to diet; but Galen mentions his name connected with a subject of surgery, which leads us to suppose that he may have written some surgical tract. None of his practical opinions are worthy of notice.

About the period embraced by the methodic sect lived RUFUS EPHESIUS (A.D. 98–117), who was perhaps the first medical lexicographer, as well as EROTIAN, whose “Lexicon Hippocraticum” is still a work of great value. In this era also, from the age of Nero to that of Trajan, lived Dioscorides and Pliny.*

The sect of the methodists was, however, at no period very generally followed, and about this time it was subdivided into many others. One of these, the Episynthetics as it was termed by its founder, or Eclectic sect, endeavored to reconcile the various discordant opinions of different authors, and to select from each system what seemed the most philosophical. The chief of the eclectics was Agathinus of Sparta; and of its supporters, Archigenes of Apamea and Philip of Cæsarea.

* The extensive work of the latter on natural history has furnished several data for this medical history, and the department of materia medica is considerably indebted to both these authorities.

Another sect into which the methodists were subdivided was the Pneumatic. The chief of this sect was ATHENÆUS of Attaleia, a man whose system, according to Galen, was polished with greater skill than that of any of his contemporaries. Athenæus supposed that fire, air, water, and earth were not really elements, but that their qualities, heat, cold, dry, and moist, merited that title. Like the Stoics, he introduced a fifth principle, viz., a spirit or air governing and directing everything, and occasionally when offended inducing diseases. From this same principle it is that they were styled Pneumatists.

The fame, however, of all the followers of Athenæus was eclipsed by that of ARETÆUS. It is a singular circumstance that he never mentions Galen, nor did any person notice him prior to Aetius. He was educated in the principles of the pneumatic school, and subsequently embraced those of the eclectic and partly of the pneumatic. His language has always been esteemed for its luminous terseness. The nerves, he supposed, did not grow from their origin to their termination in straight lines, but crossed each other in the form of an X, passing in this way to opposite sides. He thus explains why, where the head has been injured on one side, the disease is felt on the side opposite.

His practice was without question the most judicious of the ancient physicians, and was infinitely more simple and rational than could be expected in one of that age. He employed few and almost always simple medicines, and was particularly fond of

giving emetics, especially the white hellebore. He used the most active purgatives, and bled frequently and freely from different parts, although he argued against the refinement of some practitioners, who preferred small veins, which are only the branches of those whence blood is usually taken. He employed arteriotomy, cupping-glasses, and leeches, but preferred curing acute diseases by diet. He gave wine more freely than former physicians, and employed opiates with little reserve. The castor was one of his most favorite remedies as a nervous and antispasmodic, thinking it also a promoter of digestion. He administered it in almost all chronic diseases. He recommended asses', mares', sheep's, and woman's milk, used frictions and the actual cautery, and advised the operation of lithotomy. Practitioners, in short, of any age will derive from Aretæus the most wise and useful medical observations. His practice was active, enlightened, and discriminating.

An author of the era of the methodic sect was SORANUS of Ephesus (A.D. 98-138); his works have been lost, which is a source of regret, as Galen, who omits no opportunity of criticizing the methodics, speaks respectfully of Soranus. They were translated in a barbarous style by Cœlius Aurélianus, but even in this dress they have reached us in an imperfect state. Yet, from Cœlius, we have the only systematic and connected views of the methodic doctrine, for by Soranus only was it brought to a perfect state. It has been, indeed, generally conceived that the writings published under the name of Cœlius Aurelianus were due to Soranus.

As the cycles of the methodists are often mentioned in medical works, a brief description of their meaning will not be inappropriate. The cycles were periods supposed to consist of three days each, or combinations of three, and during these the same plans of treatment were continued, but at the end of each cycle the exertions were increased so as at last to rise to the most active measures. The resumptive cycle consisted of common foods; the meta-syncritic of a more acrid and stimulating diet, with frictions, baths, rubefacients, sternutatories, &c. The *cyclus vomitorius* was distinguished into two, according as the vomits accompanied the sparer diet of the first, or the more stimulating diet of the second. Each cycle consisted of four diatritio, though sometimes prolonged to sixteen days; the additional diatritios containing four days.

Several other physicians and surgeons of the pneumatic and eclectic schools followed Aretæus or were his contemporaries, but it is only necessary to state the names of the chief of them, such as Cassius the Iathrosophist, Herodotus, a pupil of Agathinus, Magnus of Ephesus, Heliodorus, a celebrated surgeon under Trajan, Antyllus, Philagrias, and Leonides of Alexandria. The three last mentioned flourished, however, a century or two later. They all published works on different branches of the healing art, but we only know of them by the extracts given by Aetius and others.

Of all the physicians of antiquity, not one perhaps possessed a more brilliant genius or more ex-

tensive erudition than CLAUDIUS GALENUS of Pergamus, who was born during the reign of the Emperor Adrian, not, as Dr. Parr asserts, under that of Severus. At the time of his appearance the schools of medicine were a prey to the most pernicious dissensions; the partisans of the schools of Erasistratus, of Hippocrates, Herophilus, and of the empirical, methodical, eclectic, and pneumatic sects, divided in their opinions, agreed but in one point, that of converting medicine into a tissue of frivolous subtleties and useless discussions. In the midst of this disorder Galen appeared, and led back to the safer road of patient thinking and accurate observation which so much distinguished the Hippocratic school.

This extraordinary man was born at Pergamus in Asia Minor; in the 132d year of the vulgar era. In his writings he has suffered no opportunity to escape him of representing his father, whose name was Nico, and who followed the profession of an architect, as well informed, active, and of an excellent character, but he relates a multitude of scandalous anecdotes of his mother Xantippe. His father gave him an excellent education, and himself initiated him in the mysteries of the Aristotelian philosophy. He afterwards studied philosophy under a Platonist named Gaius, a stoic and an epicurean. When still young, he had made such progress in the stoical dialectics that he wrote commentaries on the dialectics of Chrysippus; but he himself thought but little of that production. He asserts also that but for the natural spirit with which he was endowed, and the

inclination which he felt for geometrical demonstrations, he would infallibly have sunk into the darkness of Pyrrhonism. A dream determined his father to educate him for the practice of medicine.

Satyrus, a skilful anatomist for the times, and a disciple of Quintus, then much celebrated; Stratonicus, a physician of the Hippocratic school, and *Æschrion*, attached to the sect of the empirics, taught him in turn the principles of their systems. After the death of his father, young Galen, aged twenty-one, went to Smyrna to hear the lectures of Pelops, a disciple of Numesianus, and those of the Platonist Albinus. Thence he returned to Corinth in order to study under Numesianus, a celebrated philosopher, and disciple of Quintus. Soon afterwards he travelled for the purpose of adding to his knowledge, and especially of acquiring novelties in natural history. Amongst others he journeyed over Lycia to seek for the black ashes, a species of bitumen, and subsequently passed into Palestine to collect the asphaltes of the Dead Sea.

At this period Alexandria was in some measure the centre of the learned world; and the best title of recommendation, as we have had occasion previously to observe, to a physician, was to have studied in that city. Galen therefore resolved to stay some time there and to improve himself in anatomy, which was nowhere cultivated with so much zeal. *Heraclianus*, respecting whom we know nothing more, is the one of all his masters of whom he speaks in the highest terms. At the age of twenty-eight he returned to his own country, where the priests of *Æs-*

culapius and the gymnasiarchs in the neighborhood of the temple placed the *athletæ*, or wrestlers, under his care.

A revolt which took place at Pergamus was the occasion of his quitting that city, and the advantages which offered themselves to the Greek physicians induced him to choose the capital of the world for his residence. He was then thirty-four years of age. Here his successful practices, his extreme sagacity in prognosis, and his great knowledge of anatomy were not long in giving him so much celebrity that he became an object of jealousy to all the physicians of Rome. Several of the *grandees* and philosophers of the empire persuaded him to open public lectures on anatomy, but he connected himself more especially with the Consul Boethius, the philosophers Eudemus and Alexander of Damas, and with Severus who subsequently wore the imperial purple.

It is presumable that his practice at Rome was never very extensive, as he mentions having gone twice a day into the country to visit one of his servants who was laboring under *ophthalmia*. According to his own account, observing the implacable hatred of the Roman physicians, who heaped upon him the most offensive epithets, he determined on the breaking out of a destructive epidemic to set off for Brinde, where he embarked for Greece.

Some have, however, narrated this event in a manner not quite so honorable to Galen, by asserting that his fear on the breaking out of the plague was the sole reason for his quitting the city and depriving it of his valuable assistance. He was at this period

in his thirty-fifth year, when he visited different parts of Palestine and the Isle of Cyprus, with a view of improving himself in natural history, and returned again to Rome, in spite of the hatred of his brethren, which he asserts had previously driven him away. In fact, about a year after he had left that city, the Emperors Marcus Aurelius and Lucius Verus being at Aquileia, where they were preparing for war against the Marcomanni and other Germanic nations, he was called in to attend upon them. At Aquileia he remained with them for some time, but a plague having broken out in the environs, and Lucius Verus having died of it, terror again possessed him, and he returned to Rome, where he was appointed physician to the young Emperor Commodus.

The year at which he returned to his country is not known, nor is the period of his death. One passage in his writings clearly proves that he was still living under the reigns of Pertinax and of Septimus Severus, who ascended the Imperial chair one hundred and ninety-seven years after Christ. Suidas asserts that he lived to the age of seventy.

The differences of sentiment which reigned at that period had inspired Galen with a disgust for all sects, and the study which he had made of the different systems taught him the defects of each, but occasioned also that discordance in his opinions, which frequently degenerates into contradiction.

Although he asserts that the enemies of Hippocrates were either ignorant or punctilious dialecticians whose discussions are frequently repugnant to the most common sense, he is not himself entirely free

from that reproach. His works are not exempt from subtleties which ought to be attributed to the dialectic method generally adopted in all the medical schools. Although he declared that he had no wish to dispute about words, we cannot help observing several real disputes respecting words in more than one place of his writings. He endeavors to excuse his prolixity by the necessity for completely refuting his adversaries, whom he on all occasions loads with the most gross abuse; pretends to have always avoided repetition, although a perusal of his writings discovers them every instant, and in vain attempts to prove that he is devoid of pretension, that he attaches no value to the suffrages of men, that truth and the progress of science are the ends of his exertions, and that on this account he never put his name at the head of his works.

Notwithstanding all these assertions, he had an overweening idea of his own merit, and had the insufferable vanity to assert in the ninth book of the eighth chapter, "*de Methodo medendi ad Glauconem*," that if Hippocrates had rendered a service to medicine by opening the true road, it was he who had removed all difficulties: that he first had shown the true method of treating disease, and that he had produced in medicine, what Trajan had done for the Roman Empire, a considerable extension of its limits.

The following are the principal services rendered by Galen to each branch of the healing art, commencing with anatomy. Galen, as before observed, was instructed on this subject at Alexandria, the cradle of anatomy. Without devoting himself to

very minute researches, he properly regarded it as the foundation of the healing art. He appears, however, on very few occasions to have added to the discoveries of his predecessors by opening dead bodies, and nowhere mentions having drawn his descriptions from inspection of the human subject, speaking only of his numerous dissections of monkeys and other animals. He expresses his happiness at having been able to observe at Alexandria two human skeletons, one of which was that of a robber who had been deprived of sepulture, and he advises those who would study osteology to repair to that city. He recommended also those kinds of monkeys to be dissected whose structure approximated the nearest to that of man, in order that they might not be embarrassed when an opportunity presented itself for opening a dead body.

The inaccurate application of observations made on animals is particularly manifest in his osteology. The sacrum, he asserts, is formed only of three portions, and the coccyx in some measure constitutes a fourth. Seven distinct species, he asserts, compose the sternum or breast bone. In myology, or the knowledge of the muscles, he has made some important discoveries. He first observed the poplitæus muscle and the platysma myoides. He pretends also to have discovered, and has certainly described with accuracy, the origin of the tendo Achillis. His angeiology is not much more complete than that of Herophilus and Erasistratus. As a proof of this he asserts that the veins arise in the liver and the arteries from the heart, although both originate from the latter.

The pathology of Galen has made considerable noise in the medical world, and for a space of sixteen hundred years was almost implicitly followed. He gave to every change in the humors the name of putridity, which is said to take place whenever any humor in a state of stagnation is exposed to a high temperature without evaporating. Hence, the sediment in the urine was esteemed a proof of putridity. Previous to every fever, he asserts, there is a species of putridity which occasions preternatural heat; this becomes the cause of fever, because the heat and arterial system take part in it. All fevers proceed from a degenerate condition of the humors, with the exception of the ephemera or dry fever, which is owing to a particular state of the pneuma or spirit. Amongst intermittent fevers, Galen attributes the quotidian to derangement of the phlegm, the tertian to that of the bile, and the quartan to the putrescence of the atrabile or black bile; this latter humor, he conceives more difficult to put in motion, and requiring the longest time for the production of the paroxysms.

Galen accounts for inflammation by the introduction of the blood into a part which did not previously contain it. If the pneuma insinuates itself along with the blood, the inflammation is then pneumatoid; if the blood be alone, the inflammation is then pure or phlegmonoid; œdematoid if accompanied with phlegm; erysipelatoid when united with bile, and scirrhus if joined with atrabile. The terms phlegmonoid and erysipelatoid have since been used to designate different characters

of inflammation, although they are now accounted for more philosophically than in the absurd manner of Galen.

Galen professed to select from each of his predecessors what was most valuable, but he has almost exclusively confined himself to commenting on and illustrating the works of Hippocrates, which he thought succeeding physicians had either misunderstood or misrepresented. He seems, notwithstanding, to have taken the qualities of the four elements from Athenæus; and, though Hippocrates mentions somewhat obscurely the *pneuma* or spirit, Galen would seem to have borrowed his *pneuma* from the pneumatic sect of which we have previously spoken.

The life and opinions of Galen have been sketched at some length on account of the very extensive influence which the latter had on succeeding generations of physicians, and even still have in some parts of the world. In proof of this blind enthusiasm for his opinions, it may be remarked that Massaria, a professor of Pavia in the 16th century, absolutely declares that he would rather err with Galen than be right with any other physician. The doctrine of concoction, first broached by Hippocrates, but established in the school of Galen, was, as has been very properly observed, one of the most fatal that has ever been promulgated. By this term was understood such a change in the morbid matter, by the power of nature, generally with the assistance of art, as renders it fit for separation from the healthy parts of our fluids, and to be thrown out of our bodies.

His doctrine, as applied to fevers, exerted the most injurious agency. It prevented the administration of all-important means in the early stages of the disease, leaving the patients to its ravages, and when the idea was added that heat was the instrument by which the favorable change was effected, the miseries of the sufferers were considerably augmented. The curtains were drawn, the doors and windows shut, the fires large and kept up, and the food and medicines of the most heating kind; all diametrically opposite to the practice found to be so highly beneficial at the present day.

The theories of this writer, and the practice founded upon them, are now almost universally exploded, and they are principally referred to as chronicles of the state of medical science at this time. His book "*de Tuendâ Valetudine*," and another entitled "*de Temperamentis*," afford an example of his opinions, the former of his practical, the latter of his hypothetical and controversial.

Of the immediate successors of Galen during the third and fourth centuries, the most eminent were Marcellus of Side in Pamphilia, who wrote forty-two books on medicine in hexameter verses, Sammonicus Serenus, the father and son, Vindicianus, Theodorus Priscianus, and Sextus Placitus Papiensis, who recommended the heart of the hare to be placed upon the neck for the cure of a quartan fever, and a boiled new-born puppy to be eaten to preserve the patient from colic for the remainder of his life.

About this time medical literature had sunk to a very low pitch, and was principally occupied by the

effusions of certain monks, the absurdity of whose works is exemplified in those of MARCELLUS EMPIRICUS of Bourdeaux, who recommended in case of a styte seated on the right eyelid, that it should be touched with three fingers of the left hand, the patient spitting, and saying three times, "*Nec mula parit, nec lapis lanam fert; nec huic morbo caput crexat, aut si creverit, tabescat,*" and a number of similar ridiculous ceremonies.

During the first centuries, indeed, of the Christian era, theosophy had considerable influence over the schools in which medicine was taught. In the first century the opinion generally received was that the apostles had obtained the faculty of curing all diseases by means of the simple apposition of the hands or by inunction with holy oils and ointments; and it was believed that the disciples of Christ had transmitted the power which they had received from their master to the elders of each community. Thus, tradition unfolds to us the history of incredible cures performed by the shade of St. Peter, by St. Martin of Tours, &c.

These circumstances, which might be readily multiplied, are sufficient to exhibit the causes which arrested the progress of medicine and retarded the advancement of science. In the 4th century Christianity had extended through the Roman empire, and, for the reasons just mentioned, medical education in the public schools was everywhere totally neglected, if we except at Alexandria, where, even at that period, it was held in some account. Zeno of Cyprus attracted thither numbers of students,

and it was from this school that emanated the celebrated individual to be now mentioned.

About the latter end of the 4th century ORIBASIUS of Pergamus or of Sardis, who was physician to the Emperor Julian, lived. At that monarch's request he made extracts from all the works left by the ancients, arranged them in a methodical order, and divided them into seventy books, of which we at the present day possess only seventeen. He subsequently extracted from this collection the most important part of its contents, and composed a book of it, which he called a Synopsis.

In these compilations we seek in vain for any new idea, but they are of the highest value to the historian, and may be consulted with advantage by him who is anxious to learn the ideas of several great writers of antiquity. Distinct from these compilations, however, Oribasius published several works of his own, which, although they contain but little new, show that he was, for the times in which he lived, well informed in his profession.

About the same era lived NEMESIUS, first bishop of Emesa, who wrote a work entitled "*de Naturâ Humanâ.*" His physiology will be understood when it is stated that he believed the semen to be prepared in the brain, that it descended afterwards by the vessels which exist behind the ears, distributed itself over the whole body, and was finally deposited in the testicle. Between the time of Oribasius and that of Aetius of Amida not one name occurs which is worthy of mention, nor was any discovery made

with which we are acquainted in any one branch of medical science.

The school of Alexandria still continued to cultivate medicine, shedding at long intervals some faint glimmerings of light. The Greeks, oppressed by the superstitious and intolerant Christians of this period, gave up medical instruction. The school of Athens, once so celebrated, was trodden under foot by the orthodoxy of the Christian emperors of the East; and, in place of encouraging, they persecuted the pagan philosophers who taught medicine, Justinian ordering them to be deprived of benefices which they had possessed for ages, and directing them to be bestowed on orthodox Christians only. On the other hand, the dismemberment of the Roman empire and the destructive invasion of the barbarians of the North completed the annihilation of medical instruction.

The Persian empire was for a short period the only place where medicine could be cultivated under the protection of the laws. A sect of Christians, the Nestorians, flying from the persecutions of orthodoxy, established themselves at Edessa, in Mesopotamia, where they founded a school of medicine, which soon became celebrated for the number and knowledge of the professors, and for the excellence of their doctrines. Pupils hastened thither from all parts, where they studied practical medicine in a public hospital, probably the first institution for clinical instruction. One of the most celebrated professors of this school was Stephen of Edessa.

The Nestorians did not all, however, establish

themselves at Edessa; several of the most learned sought an asylum in the neighboring Mohammedan states. In the city of Dschondisabour they founded a school of medicine, where the Persians and Arabians studied the healing art, and it was from these Nestorians, from those at Edessa, and from the Athenian philosophers expelled from their country by Justinian, that the Arabians received the first elements of a science of which they were afterwards the restorers, through the foundation of the Academy of Bagdad by the Caliph Almanzor. From time to time, however, at the court of the Emperors of Constantinople were seen physicians distinguished for the extent of their erudition, such as Aetius and Alexander of Tralles.

CHAPTER XVI.

STATE OF MEDICINE IN EUROPE AND THE EAST FROM THE MIDDLE OF THE SIXTH CENTURY.

Epidemic of the sixth century—Aetius of Amida, and his use of charms—Alexander Trallian—Theophilus—Paulus Ægineta, the first obstetric physician—Medical writers and practitioners of the next centuries—Decay of medicine in the West and its rise in the East—Arabian physicians and schools—Spanish medical schools and libraries—Progress of Arabian practice of medicine and surgery—First writer on smallpox—First account of academic degrees conferred—Serapion the elder—Rhazes and his works—Avicenna—Albucasis—Avenzoar—Decline of science in Spain and the East in the eleventh, twelfth, and thirteenth centuries.

BEING more particularly interested with the history of the theories and progress of medicine, we need not give more than a passing allusion to the prevalence of the terrible epidemic which made the sixth century memorable. Although it attacked all without distinction of age or mode of life, and reigned in all seasons and in every climate, destroying, it is said, one-half of the population, causing all the arts to be abandoned, and whole towns to be deserted, medical science gained but little from the awful experience, and no information of value has been handed down to posterity for practical use in times of after-epidemics.

It was about the middle of the sixth century that AETIUS of Amida in Mesopotamia flourished. Like

all the practitioners of his time, he studied at Alexandria. Aetius pursued the same steps as Oribasius, and collected everything remarkable from the existing works on medicine. Like Oribasius, also, he has given us his own opinions respecting various points of medical science, from which he would seem to have been a man of somewhat extensive practice, but his ideas are mixed up with the grossest bigotry and superstition. In dropsies he advises punctures, but the observations on this subject are taken from his predecessors. His remarks on cauteries, both actual and potential, are more particularly his own. He advises them freely in many complaints, and directs numerous drains to be made.

Aetius also introduced much of Egyptian pharmacy, and was particularly fond of external applications, as well as of charms and amulets so common in the same country. In composing a certain ointment he required that there should be repeated in a loud voice, "*May the God of Abraham, the God of Isaac, and the God of Jacob deign to accord virtues to this medicine ;*" and when a foreign body had stuck in the gullet, he recommended that the neck of the patient should be touched by the surgeon, who was at the same time to exclaim, "Get thee out or descend, the martyr Blaise, servant of Jesus Christ, commands thee." One of the strangest of his recommendations, which is also repeated by Paulus Ægineta and Amatus Lusitanus, is that of coition for the cure of diarrhœa or relaxation of the bowels.

ALEXANDER TRALLIAN, so called from Tralles, a city of Lydia, flourished a short time after Aetius,

whom he mentions in his writings. This physician was one of the most original writers of antiquity, and his practice, with the exception of a few superstitious prejudices, such as the use of charms and amulets, perhaps the best of any of the older physicians. He not only compares the observations and principles of his predecessors with the results of his own experience, but always judges for himself, and does not hesitate to reject their theories and practice when he does not believe them to be well founded. His observations are principally confined to the signs of diseases and their remedies.

Alexander seems to have been impressed with a correct idea regarding the mode of practising medicine with the greatest advantage. One rule which he lays down is, that we ought never to determine the plan to be pursued in the treatment of any disease, without having attentively studied the specific and individual causes, and in a thousand places he recommends us never to suffer ourselves to be blinded or led into error by the spirit of system, but to always direct our attention to the age, strength, constitution, and mode of life of the patient, as well as to the season and atmospheric variations, and especially to observe carefully the efforts of nature in acute diseases. He is apparently the first author who mentions rhubarb. His practical precepts exhibit the most gross superstition.

We may next pass to the commencement of the seventh century, at which period lived THEOPHILUS, who was also called from his sanctity or his talents Philotheus or Philaretus. He was one of the first

monks that wrote upon medicine. He made a compilation from Galen and Rufus on the structure of the human body, which seems to have been dictated by piety, in order to demonstrate the wisdom of God in the organization of the human frame. He also published two other works, one on the urine and the other on the pulse, both of which are replete with absurdities. He and Stephen of Athens, one of his scholars, have also left some commentaries on the aphorisms of Hippocrates, which embrace only the theoretical part. John of Alexandria and Palladius the Iatrosophist probably also belong to the seventh century, but neither one nor the other merits especial notice.

The last Greek author who claims our particular attention is PAULUS ÆGINETA, who flourished about the middle of the seventh century. Paulus was a distinguished surgeon and accoucheur, and received his education at Alexandria. He was the first physician who seems to have been famous for his attention to female diseases and the obstetric art, and is by some considered to have been the first man that merited the appellation of man midwife. In medicine Paulus Ægineta does not merit much regard, but his surgical remarks are occasionally new and interesting. Like his predecessors Oribasius and Aetius, he was more a compiler than an original writer.

After this period the state of medicine in Greece remained stationary, and no person of eminence appeared who rendered himself so celebrated as those individuals of whose principles we have already

spoken. There were some few physicians, however, who shone dimly through the obscurity. NONUS, who lived near the end of the 10th century, compiled a work, frequently even literally from Aetius, Alexander Trallian, and Paulus, mixed up also with some original observations of his own. In these we find the first mention made of the distilled water of the rose as a remedy, which Le Clerc, Friend, and others erroneously ascribe to Johannes Actuarius. The first allusion, however, to rose-water as a perfume is in a work regarding the ceremonies of the Emperor Constantine VII., where, at a feast given in 946, the priest speaks of the rose-water as an agreeable scent.

Several works were composed about this era on the diseases of horses, &c., but SIMON SETH was, in chronological order, the next writer on human diseases. He held the office of keeper of the wardrobe in the palace of Antiochus at Constantinople, and wrote a "*Syntagma de Cibariorum Facultate*," in which he chiefly copied the work of Psellus, who was his contemporary. Neither of the treatises is, however, considered of any value. He speaks of asparagus as having been a long time introduced into the kitchens, and as possessing considerable medicinal properties. His work also contains the first description of camphor, which he affirms to be the resin of an extremely large Indian tree, and he speaks likewise of the musk.

The last but one of these writers to whom we shall at present allude was JOHN, the son of Zachariah, who was surnamed ACTUARIUS, a title accorded

by the court of Constantinople to a great number of physicians, and which merely answered to the modern physician in ordinary. All his works are in a great measure compilations from his predecessors, but they have been highly extolled by some practical authors. Stephens considered one of them worthy of a place amongst the "*Principes Artis Medicæ.*" They contain some original observations regarding palpitation of the heart, in which he would seem to have first recommended bleeding and purging. He is the only Greek physician who speaks of the milder purgatives, as senna, manna, cassia, and myrobalans; and these medicines were professedly borrowed from the Arabs, whom he calls barbarians.

DEMETRIUS PEPAGOMENUS, a contemporary of Actuarius, wrote a work on the gout, by order of the Emperor Michael VII. Palæologus. This small treatise has been highly spoken of, and esteemed worthy of a better place than the majority of the works of this period. The author continues in it faithful to the system of Galen, but his theory of the disease is more rational and conformable to the observation of the moderns than that of the major part of his immediate successors. He sets out with the principle, that the gout is a disease of the whole organism, produced by debility of the digestive organs, and by errors in diet; and on this account sobriety and temperance are considered to be the only means of prevention, but, he adds, although it is easy to prescribe a suitable regimen, patients are rarely found so tractable as to conform to it.

Nicolas of Alexandria, who sometimes styled

himself Myrepsus, lived also about this period; but, although he attained the title of Actuarius, he has left nothing behind him worthy of comment.

By the accounts thus given of the works published by the modern Christians of the Empire of the East, it will have been observed in what a state of decline were the sciences, especially that of medicine, under the reign of the emperors of Constantinople. Those princes themselves had afterwards so little confidence in their physicians, during the fourteenth century, that Andronicus III., being affected with a tumor of the spleen, sent for Arabian physicians from Persia to attend him.

When science decayed in the West it arose again in the East. We have already had frequent occasion to mention that Alexandria was, for a long period, the great medical school, at which the most eminent of the Greek physicians were educated, and although its rich library no longer existed, it remained the centre of the sciences, the Arabs from their vicinity possessing considerable facilities in the acquisition of knowledge. At the time of Mohammed there were at Mecca several physicians who had been educated in the Grecian schools.

History particularly mentions KHA-RETH-EBN-KALDAHT of Takif (A.D. 622), a contemporary of the prophet, who had studied also at Dschondisabour in the Chuzistan, where a medical school had been established, and who practised the healing art in Persia. Towards the end of the seventh century, Theodocus and Theodunus, two Greek physicians, established themselves in Irak, and had for pupils a number of

Arabs, who were afterwards distinguished for their knowledge of medicine. The principal works of the ancient writers of medicine in Greece had likewise been translated into the language of the country, and these translations formed the basis of Arabian knowledge.

Until the middle of the eighth century that nation showed but little zeal for the sciences; but, when the Caliph Almanzor had founded the city of Bagdad, it became the seat of a school more eminent than almost any of the other academies of the Mohammedan states. A college of medicine was there established, the directors of which were charged with the examination of those who were destined to exercise the healing art. From all countries of the world there were so many professors and pupils included in this city, that at one time they were estimated at six thousand. There also the Caliphs established the first hospitals and the first public pharmacies, to assist the progress of medicine. In the thirteenth century the Caliph Mostanser re-established the academy and medical school there; the number of Jewish schools between the time of their foundation and that century having almost wholly annihilated those of the Arabs. Mostanser gave salaries to the professors, collected a large library, and established a new school of pharmacy.

Of all the princes, the most renowned was Almamoun, who has made his name important by the services which he rendered to science. It is, properly speaking, in his reign, or about the year 812, that we should date the introduction of Greek lite-

rature into the Arabian schools. Until that period there were but few translations, but the Caliph had fresh ones made. Almamoun purchased far and wide the works of the ancients, and recommended this particularly to the care of the ambassadors of the Greek princes. He made to Leo the most advantageous offers to induce him to be near his person, but the philosopher refused the invitation.

Under the successors of Almamoun science was powerfully encouraged, and academies were formed in different states which were under the dominion of the Arabs. Spain, however, was the most happy of the Mohammedan states. The three Abdalrahmans and Alhakem, from the eighth to the tenth century, are celebrated for having raised to the highest point of splendor the countries subjected to the caliphate of Cordova. They protected science, and governed with so much mildness that, according to some historians, Spain could not boast of having been so happy under the reign of the Christian princes.

Alhakem established at Cordova an academy, which, for several centuries, was the most celebrated in the whole world. Already in the tenth century it had a library containing 224,000 volumes. Seville, Toledo, and Saragossa, Murcia and Coimbra had also schools, which preserved considerable reputation until the end of the domination of the Arabs, but none of them attained the celebrity of Cordova. Whilst their dominion continued in Spain medical instruction continued to make progress, so that in the twelfth century there were seventy public

libraries in that part of Spain which was subject to the Moors, whilst Cordova had produced 150 medical authors, Almenik 52, and Murcia 62.

The consequence of the encouragement given to science was the publication of several works on medicine, the principal of the authors of which may be noticed in chronological order, premising, however, that anatomy was rigorously forbidden by several dogmas of their religion; dogmas so influential that we are told by Toderini, that when he asked a Mufti if the dissection of human bodies were permitted, he received for answer that his question alone was a contravention of the law. Their anatomy was consequently wholly derived from the writings of the Greeks, especially from those of Galen. They studied it, however, also on human bones, when they were able to obtain them from the cemeteries. Abdollatif, a celebrated Arabian physician of this period, relates that having on one occasion examined some bones obtained from a burying-ground, he observed that the lower jaw is composed of but one bone, and that the os sacrum is sometimes formed of several, but more frequently of only one. These remarks he made for the purpose of refuting Galen, who asserted that those bones were not simple but composed of several pieces.

Chemistry and pharmacy are the branches of medical science most indebted to the labors of the Arabs; and several of the modern names are derived from them, such as alcohol, jalap, syrup, looch, naphtha, camphor, bezoar, and a number of others

and in the eighth century Geber of Mesopotamia had prepared corrosive sublimate, red precipitate, nitric acid, nitro-muriatic acid, lapis infernalis, &c.

It would seem that formulæ or recipes for the preparation of medicines sanctioned by the government were composed by SABOR-EBN-SAHEL, the director of the school of Dschondisabour, and published in the latter half of the ninth century, under the title of Krabadin, which would seem to be the first information we possess respecting the publication of a dispensatory, or pharmacopœia. The dispensaries which were subsequently published were under the immediate *surveillance* of government, who directed a particular attention that the medicines should not be adulterated or sold at too high a price.

With respect to the mode of practice pursued by the Arabian physicians, it was most gross and superstitious. The event and even the previous history of the disease as well as of the individual were pretended to be discovered by the inspection of the urine, or the aspect of the stars. Observation was neglected in proportion as they delivered themselves up to the foolish minutiae of theory and the subtleties of the dialectic philosophy, of which they were considerably enamored. Fabulous histories passed from mouth to mouth, and from writing to writing, without any pains being taken to investigate their accuracy. Surgery made but little progress amongst the Arabians, owing to natural prejudices and misplaced modesty,—men never being permitted, under any circumstances, to expose the parts of generation of

the female, on whom lithotomy, the reduction of a prolapsed womb, &c., were practised by women.

A priest of Alexandria named AARON AHRAN published the oldest work which the Arabs possessed. Aaron was a contemporary of Paulus Ægineta, who, it will be remembered, lived about the year 630 of the Christian era. His work was entitled *Pandects of Medicine*, and consisted of thirty books; they were published in Greek, but were afterwards translated by a Jew of Bassora. They are not in existence at the present day, but we possess some fragments of them in the works of Rhazes. Aaron was the first writer who drew particular attention to the small-pox, of which he gave the first description, Paulus Ægineta, his contemporary, not having noticed the subject.

The next writer to Aaron on medicine was Jahiah-Ebn-Masawaih, or MESUE as he is usually called. He was a pensioner at the court of Haroun-al-Raschid, and taught medicine to the Arabs. Of all his writings we possess a few specimens only in the works of Rhazes. He lived about the year 845 of the Christian era. His scholar HHONAIN became still more celebrated than his master amongst the Arabs for his translation of Greek works. His history furnishes the first account of academical degrees conferred by learned societies. He translated into Arabic not only Hippocrates and Galen, but also Pliny, Alexander of Aphrodisia, Ptolemy, and Paulus Ægineta. His sons, Izhac-Ebn-Hhonain, and David-Ebn-Hhonian, are also known as translators. He first left an Arabic translation of the work of Aris-

tote on plants, and was a celebrated philosophical physician. David wrote some observations on medical subjects, the manuscript of which has remained undated. Isaac has been quoted by several later writers on medicine, but his observations are of little moment.

Jahiah-Ebn-Serapion, commonly called SERAPION THE ELDER, lived at the commencement of the ninth century. His works are principally compilations, and those, according to Hali-Ben-Abbas, not of the most accurate kind. Serapion first described a species of eruptive disorder, which he called echra; this was subsequently corrupted to essera, and denotes a species of chronic nettle-rash, which was common in Arabia.

The great luminary of this period was Moham-med-Ebn-Secharjah-Abou-Bekr-Arrasi, who is commonly known in medical literature by the name of RHAZES. He published twelve works on chemistry and on medicine. He is said to have lost his sight at a very advanced age; and it is asserted that he would not suffer himself to be operated on for the cataract, because the surgeon who was to perform the operation was unable to tell him in what manner the eye was covered by its membranes. He died in the year 923.

The two great works of Rhazes are the *Continent*, and the ten books denominated *Almanzor*, addressed to Mansor, king of the Corassini. It has been asserted by some authors that the latter work was not the production of Rhazes, but there seems to be every reason for believing from the superior testi-

mony of others that it was. What have most contributed to establish the reputation of Rhazes are his treatises on the smallpox and measles, the most valuable of the works of the older writers which we possess on those two diseases, and the first description of the latter of them, the measles. Amongst the list of new remedies used by Rhazes, we find orpiment, a sulphuret of arsenic, the sulphates of copper and iron, borax, &c. &c., all of which are extensively used in medicine at the present day.

A short time after this celebrated Arab, whose life and medical productions formed prominent features of the tenth century of the Christian era, lived ALI ABBAS (A.D. 994), or Ali the son of Abbas, who was surnamed the magician, and published a work entitled "*Almaleki; or, the whole Book of Medicine.*" The only one of his productions particularly worthy of comment is his practical directions regarding diet, which, for the time in which he lived, is very creditable. In the general views and treatment of disease he differs but very little from Rhazes and his other predecessors.

This century produced also Al-Hussain-Abou-Ali-Ben-Abdallah-Ebn-Sina, surnamed Scheikh-Reyes or prince of physicians, than whom it would be difficult to find any one after Aristotle and Galen who reigned for a longer period and more despotically over the empire of the sciences. He is commonly known under the name of AVICENNA (A.D. 978-1036). He was born at Bokhara in Chorassan, and was the last of the Arabian authors on medicine, his successors being born in Spain, where the Saracens

were then having sway; but little communication seeming to have been held between the Eastern and Western empires.

Although the doctrines of Avicenna were almost implicitly followed for nearly six hundred years, he does not seem to have had any pretensions to an extraordinary genius, but was unquestionably endowed with a strong mind. From the multitude of materials furnished by his predecessors it was not difficult to compose the immense work to which he gave the title of *Canon*. Notwithstanding the extensive influence which Avicenna possessed, his *Canon* forming the syllabus or foundation of the lectures in every university, he was a mere compiler, his works being chiefly collected from those of his predecessors both of Greece and Arabia.

In the twelfth century lived a celebrated Spanish physician, or, more particularly, surgeon, called Khalaf-Ebn-Abbas-Abu'l-Kasem, born at Zahera near Cordova, and more known under the names of ALBUCASIS, Abulcasis, or Alzaharavius, especially the first. He is said to have died about the year 1122. Albucasis wrote a celebrated work on the operations of surgery, which is one of the most valuable relics of the age. In this he first describes the mode of removing stones from the bladder of the female, but this operation was only to be performed by midwives, the surgeon, as we have before had occasion to observe, not being permitted to offend the modesty of the sex.

Amongst all the Arabian physicians, however, there is no one who is entitled to the merit of so much

originality or of correct observation as Abdel-Malek-Abou-Merwan-Ebn-Zohr, more known under the name of AVENZOAR, a native of Seville in Andalusia, and who flourished about the year 1169 of the Christian era. Avenzoar would seem to have first described the inflammation of the mediastinum and of the pericardium, as well as dropsy and empyema of the latter.

AVERRHOES was also a Spaniard who flourished early in the thirteenth century; but he was more distinguished for his philosophical than his medical works. He died about the year 1206.

The last Arabian of whom mention may be made was EBN-BEITHAS, a celebrated botanist and physician, who was born at Malaga, and published some works on the materia medica and veterinary medicine. He was their last remarkable writer; and with him terminates the history of the medicine of that nation.

In the eastern part of the empire they lost their taste for science much sooner than in Spain and the empire of Morocco; the Turks having in the eleventh century destroyed the greater part of the caliphates of Asia, and substituted their despotic government. Science could not flourish under the reign of individuals whose national education had for its sole object that of making warriors. In Spain, science was not encouraged longer than the thirteenth century; the physicians of that era not being deserving of mention. The conquests of the Christian Spaniards more and more constricted the territory of the Moors, and compelled them to neglect every-

thing to defend themselves against the common enemy, until at last Ferdinand totally expelled them from Spain in the fifteenth century.

If we cast a rapid glance over the exertions of the Saracens for the advancement of the healing art, we shall find that they confined themselves to keeping the knowledge which had been transmitted to them by the Greeks, and that a small number of discoveries in materia medica or isolated observations were the only advancements which they made in the science. Anatomy, particularly, continued in the same state in which the Greeks had left it. The theory of medicine was filled by them with numerous subtleties, but no important acquisition was gained. As for surgery, they had no learned author on the subject except Albucasis. Chemistry and materia medica, in short, were the only two branches of medicine which were much improved by them. Whilst medical instruction flourished in the countries subjected to the Moorish princes, and especially in Spain, ignorance possessed the Christian states of the West.

CHAPTER XVII.

STATE OF MEDICINE AMONG THE MONKS OF THE MIDDLE AGES.

Monk Physicians of the West—Cures by prayer, relics, &c.—English ecclesiastical physicians—Medical schools established by them in England and France—Schools of the cathedrals—Physicians first so called—Curious laws affecting physicians—Practice of medicine restricted to the lower clergy—Eminent medical ecclesiastics of the day—Medical celibacy—Practice of medicine by the nuns—The Abbess Hildegard—Laws in regard to pregnant women—Constantine the African—Influence of the Crusaders—Celebrated schools of Monte-Cassino and Salerno—Dietetical precepts of the latter—Chief physicians of this school—Degrees of bachelor, licentiate, &c. first granted to physicians in France—Doctors first so called.

AFTER the sixth century, the monks of the West almost exclusively exercised medicine as a work of piety and of charity, and as a duty attached to their divine calling. Retarded, however, by ignorance and prejudice, and by the aversion they entertained for reflection, or for profane acquirements, they neglected the study of the science, never investigating the causes which produce the phenomena of nature nor employing even ordinary remedies, but having recourse merely to prayers, relics of martyrs, holy water, and other ceremonials of the Romish church. They were consequently unworthy of the name of physicians; and, as Sprengel has observed, ought

rather to be esteemed pious and fanatical nurses. It would be impossible fully to describe all the cures which the monks performed or are said to have performed in the middle ages on the graves of the martyrs, or by the aid of their relics.

The cures performed at the tomb of St. Ida, the wife of Egbert, in the ninth century, at that of St. Martin of Tours, and of John, Bishop of Hagustald; the infallible aid afforded by the ashes of St. Deusedit at Benevento in all species of intermittents; the cures of Pope Stephen III. of the convent of St. Denys, produced by the intercession of the apostles St. Peter and St. Paul; of several emperors, amongst others of Otho the Great, by St. Guy, &c., are only a small number of examples amongst those which might be cited to prove the gross superstition and fanaticism of these dark ages.

During the seventh and eighth centuries, however, there were among the monks of the West a few traditionary remains of the science which had originated in the East. Some missionaries sent into England by Pope Gregory I. founded schools there in which medicine was taught, and whence Germany several times obtained professors. About this period there were some English ecclesiastics distinguished for their extensive acquirements, especially Theodore, Archbishop of Canterbury (A.D. 671), and to Colomb and Erigenes. According to Bede, that prelate himself gave practical instructions to the monks who exercised medicine, for it is related, amongst other things, that he forbade bleeding during the

first quarter of the moon. Tobias, Bishop of Rosa, also practised the healing art.

The schools established by these ecclesiastics were much frequented by strangers, and thus the English, principally during the reign of Charlemagne, first lit the sparks of science in France and Germany. The remarkable zeal with which Charlemagne endeavored to encourage learning amongst the nations under his government is well known. He was seconded in this noble undertaking by an English savant named Alenin, who taught philosophy, dialectics, astronomy, and arithmetic to the emperor himself, and who in concert with Theodulf, Bishop of Orleans, established schools in the cathedrals and monasteries. A learned society was formed at the court of Charlemagne, almost wholly composed of English, in which were discussed the various subjects of human knowledge, and it was possessed of a library presented by the emperor. The members of this academy also, it would appear, occupied themselves with medicine.

Amongst the schools established by order of Charlemagne, those of Lyons, Metz, Falda, Hirschau, Reichman, and Osnaburg were the most celebrated. At these schools were taught grammar, music, dialectics, rhetoric, geometry, and astronomy. These were the only branches which they particularly studied; but the emperor in the year 805 issued an ordinance for adding medicine to the other sciences taught in the schools of the convent, although he himself held physicians and their advice in but little estimation.

After that period the healing art was taught in

several schools of the cathedrals under the name of physic, and it would seem to be at this time that the name of physician was first applied to the followers of the healing art. The physicians, however, do not seem to have been deserving of more consideration than was accorded them in the barbarous times in which they lived, and we may judge how little that was by the laws promulgated by Theodoric, king of the Visigoths, which were followed until the eleventh century in a great part of the West. "No physician," it is said in that code, "shall bleed a noble woman or girl without a relation or domestic being present at the operation, and in case of contravention of this law he shall pay a fine of five pence, '*quia difficillimum non est, ut in tali occasione ludibrium interdum adhærescat.*'" When a physician is called upon to attend a patient or to dress a wound, he must, immediately after having seen him, give surety, and agree upon the price to be paid upon his cure; but he shall not demand anything should the patient die. For the cure of the cataract he shall receive five sous. If a physician shall wound a man of noble birth, he shall pay a fine of one hundred sous, and if the gentleman shall die of the effects of the operation, the physician shall be delivered up to the relations of the deceased, who may treat him as to them seemeth meet; but if it be a serf whom he has wounded or caused the death of, he shall be made to restore another to the lord. When a physician takes a pupil, the latter shall pay him twelve pence for his apprenticeship, &c." (*Lindenbrog, Cod. Leg. Antiq. Wisigoth. in Sprengel Arzneigesch.*)

The contempt in which the ecclesiastical physicians were held was necessarily obnoxious to the church, and this was the principal reason why, in the twelfth and thirteenth centuries, various councils expressly forbade the members of the superior clergy, such as the archdeacons and the prelates, to practise medicine, and declared those excommunicated who would not conform to the order. The lower clergy, however, as the deans, subdeans, and monks, still preserved the right of practising medicine and of studying mundane sciences; but they were interdicted from performing any surgical operation, and especially from the use of the actual cautery and of cutting instruments.

These steps were taken first of all in the synod of Rheims in 1131, and they were afterwards confirmed in the councils of Montpellier in 1162, of Tours in 1163, of Paris in 1212, and at Lateran in 1139 and 1215. The same law was also renewed in more severe terms in the years 1220, 1247, and 1298. From this frequent repetition of the same ordinance it is evident that it was frequently violated, and that the ecclesiastics had much trouble in detaching themselves from the practice of medicine.

Independently of the ecclesiastics of the school of Salernum, now Salerno, in Italy, which was a celebrated school of medicine in the eleventh and twelfth centuries, the most eminent practitioners of the healing art were Thieddeg, an ecclesiastic of Prague, who had studied medicine at Corbey, and flourished in 1017. He was physician to Boleslas, king of Bohemia. Hugues, Abbé of Saint Denis, who was, in

the same century, physician to the king of France; Didon, Abbé of Sens; Sigould, Abbé of Eperny; Jean de Ravenne, Abbé of Dijon; Milon, Archbishop of Benevento; Dominico, Abbé of Pescara; and Campo, monk of the convent of Farfa in Italy, and other ecclesiastics were distinguished for their reputed cures from the ninth to the eleventh century.

In England, however, the fashion with the clergy of studying and practising the medical art prevailed a long while after the latter century. The prior and convent of St. Swithins at Winchester granted to Thomas of Shaftesbury, clerk, a corody, consisting of two dishes daily from the prior's kitchen, bread, drink, robes, and a competent chamber in the monastery for the term of his life; in consideration of which the said Thomas paid them fifty marks, and was moreover obliged to attend upon them medically—"deservire nobis in arte medicinæ." In the romance of "Sir Guy," which appeared about the end of the thirteenth century, a monk heals the wound of the knight:—

"There was a monke beheld him well,
That could of leach crafte some dell."

So late as the middle of the fifteenth century, John Arundale, afterwards Bishop of Coichester, was captain and first physician to Henry VI. King John, whilst sick at Newark, made use of William de Wodestoke, Abbot of the neighboring monastery of Croxton, as his physician; and many other examples might be added. Even in 1452 the physicians of the University of Paris were not allowed to marry, and in the same school, anciently, at the

admission of the degree of doctor in physic, the graduate took an oath that he was not married.

The nuns likewise attended to medicine as an act of piety and charity. So late as the twelfth century Abelard permitted those of the convent of Paraclet to practise surgery. The most celebrated of those learned nuns was HILDEGARDE (A.D. 1098–1180), Abbess of the convent of Rupertsberg, near Bingen, whose revelations and miracles caused her to be placed in the number of the saints. Her correspondence, which is still in existence, instructs us that the higher clergy at that time consulted her on all occasions. She has left behind her a sort of materia medica, which certainly was not obtained from the writings of physicians who had preceded her, and comprises a variety of superstitious remedies. Thus, it advises the common fern in all kinds of witchcraft, the herring in the itch, the ashes of flies in all affections of the skin, the seed of the zedoary in salivation and in pain of the head, and water mint in the asthma, &c.

A law which existed in the decisions of several councils exhibits the care taken by the church for the preservation of the life of its proselytes. This law might have favored the study of anatomy, had not prejudices opposed insurmountable obstacles to those desirous of undertaking it. It directed that the bodies of those women who died during pregnancy or in their accouchement should be opened, in order that the infant might be saved. "*Mortuæ mulieres in partu scindantur, si infans vivere credatur* ;

tamen, si bene constitent de morte ipsarum.” It was a revival of the edict published by Numa Pompilius.

Medicine assumed a more imposing attitude when the Benedictine monks turned a more particular attention to it in the kingdom of Naples and established two celebrated schools—the one at Monte-Cassino, the other at Salernum. The former of these as early as the eleventh century enjoyed so much celebrity that the Emperor Henry II. went from Bavaria to the convent to be cured of the stone. During the eleventh century it also became much more celebrated by the stay there of Constantine the African. This individual was born in Africa, but desirous of information he visited the Arabian schools of Bagdad, travelled into India and Egypt, and passed thirty-nine years in journeying over remote regions. On his return to his own country he was regarded as a sorcerer, and ran the danger of losing his life. He took refuge at Salernum, and became secretary to Robert Guiscard, Duke of Apulia; but becoming soon tired of the bustle of court, he retired into the convent of Monte-Cassino, where he devoted the last years of his life to translating the works of the Arabs. These translations, we are told, were by no means faithful, and were written in a barbarous style. His works have been passed off as original, but they are scarcely anything more than extracts from books written by the Saracens. He died in 1087.

The Benedictines established convents at an early period in the states of Naples. The school of Salernum, amongst others, was already celebrated

in the eighth century, as regarded the healing art. It was beautifully situated in a locality extremely favorable to health. The first pilgrimages made by the sick for medical aid to Salernum are asserted to bear date about the year 984, a period at which Adalberon, Archbishop of Verona, undertook a journey to that city, but did not reap from it all the advantages he had anticipated. At that period they endeavored to cure the sick by prayer only; but towards the eleventh century the monks of Salernum began to unite some scientific acquirements to these superstitious modes of treatment. They studied the works of the Greek and Arabian physicians in translations, and thus advantageously distinguished themselves from all their contemporaries.

The Crusaders, however, acquired Salernum the reputation of being the first medical school of the West. It was conveniently situated for them, and the beauty of the sky also attracted strangers thither from all parts. But it was not the Crusaders who carried thither the knowledge they had acquired in the East, as has been believed by some. These enterprising individuals were too ignorant and superstitious to profit by what was going on in the scientific schools of the Arabians. In proof of their superstition it is known that the whole army commanded by the Emperor Otho suddenly dispersed on the appearance of an eclipse of the sun. This phenomenon, which was considered as a miracle, occasioned terror in every mind; it was believed to be the precursor of the end of the world, which, at this period, was imagined to be close at hand. Every

sign observed in the heavens, every meteor, occasioned the most ridiculous fears. The physicians even borrowed only from the Arabians their marvellous notions on astrology, uniting it still more intimately with medical science.

It was by this mixture of astrology and all the reveries of theosophy with medicine that Edward the Confessor imagined he possessed the miraculous gift of curing certain diseases by the simple touch and by pronouncing a few sacred words. After the example of Edward, the kings of France became celebrated for the skill with which, by following his process, they cured the scrofula, goitre, &c., the former of which was thence called the king's evil. Such a method of cure has been claimed to be the peculiar attribute of the sovereigns of England and France, but history does not sanction this, for it appears to have been not unfrequently employed in Scandinavia, and to have been derived from the mystical practices of the Druids in curing disease. The words used by the French kings were "*Le roi te touche, Dieu te guérisse.*"

In the first year of the twelfth century, Robert, Prince of England, son of William the Conqueror, disembarked at Salernum for the purpose of being cured of a wound in the arm which the surgeons had treated badly, and it was perhaps on this occasion that the physicians of Salernum, at the head of whom is placed JOHN of Milan (A.D. 1100), wrote in Leonine verse, at that time much used, some dietetical precepts, which have reached us, and give a good idea of the medicine of the age; but they re-

semble considerably the dietetical production of Izhah, to which reference has already been made. One of their dietetical precepts, which will give an idea of their mode of writing, and which it would be well to attend to in this as in every other climate where the autumnal heat is great, was:—

“Autumni fructus caveas ; ne sint tibi luctus.”*

And another, recommending the use of wines after pork to assist its digestion:—

“Est caro porcina sine vino pejor ovina :
Si tribuis vina, tunc est cibus et medicina.”†

The chief physicians of the school of Salernum were Gariopuntus, who lived about the middle of the eleventh century, Cophon, Nicolas Præpositus, who lived in the first half of the twelfth century, Romualdus, and Ægidius, Eros or Trotula, and Roger. During the twelfth century the school of Salernum, through the favor of the Emperor Frederic II., acquired a degree of celebrity which few similar establishments in ancient times had attained. That prince, who possessed extensive literary and scientific acquirements, founded the Universities of Naples and Messina, gave fixed salaries to the professors attached to them, and encouraged that of Bologna, which already existed. The kings of England, those of France, and the popes, imitating the example of Frederic, created some learned institutions, where public teaching was encouraged, and those

* Sir Alexander Croke's Edit. of the “Regimen Sanitatis Salernitanum ;” Oxford, 1830, p. 105, line 56.

† Ibid., p. 106, lines 73, 74.

attached to them recompensed. The schools which already existed at Paris and Montpellier obtained the title of universities, and numerous pupils flocked thither to attend the medical classes. It was about this period that the titles of bachelor, licentiate, and master were granted to the physician. Academical dignities, as already stated, were first conferred by the Nestorians and the Jews of the East, whence the custom extended to the Arabs in Spain, and the school of Salernum first introduced them among the Christians of the West. The professors only, at this epoch (the twelfth century), were denominated doctors. This title, however, soon acquired the same acceptation as master, and was ultimately substituted for it.

The custom of the school of Salernum, which was also for a long period that of the institutions successively established, was to study anatomy in the works of Galen or on pigs and dogs, animals which, at this era, were almost exclusively dissected.

CHAPTER XVIII.

STATE OF MEDICINE DURING THE THIRTEENTH AND FOURTEENTH CENTURIES.

Medical progress in France under St. Louis—Jean Pitard—Lanfranc of Milan—Progress of surgery in Italy—The school of Bologna and its followers—Encouragement of medical instruction in the fourteenth century—First dissection of the human body—Rough modes of dissection—Astrology and theosophy intermingled with medicine—The Arabists—Decay of the school of Salernum.

MEDICAL education made remarkable progress in France under Saint Louis. It was during the reign of this prince that the college of surgeons was separated from the faculty of medicine, through the influence of JEAN PITARD, a man of considerable talents, the surgeon and confidant of the king. Surgery was regularly taught in this college, but without any particular splendor until the appearance of an individual to whom the art is highly indebted. LANFRANC of Milan, *medicin chirurgique*, or surgical physician, as the lay physicians who practised surgery were then called, being compelled to leave his own country, went to Paris in 1295, where he commenced a course of surgery which procured him the greatest celebrity.

This branch of the healing art had for several years made considerable progress in Italy. ROGER of Parma, who afterwards established himself at

Montpellier, and became the chancellor of that university, had first made known in his country the operations of Albucasis, and after him his pupil ROLAND of Parma, professor at Bologna, acquired considerable renown for his improvement of surgical pathology. The most skilful of the surgeons of this school, however, GUILLAUME DE SALICET of Placentia, a learned pathologist for his time, was the master of Lanfranc. The latter surpassed all his predecessors in the extent of his knowledge and the extent of his imagination. He published at Paris his "*Grande Chirurgie*," which served as a guide to that school until the more modern works of Guy de Chauliac, at the end of the fourteenth century, were substituted for them. Medical instruction now became successively encouraged in the principal cities of Europe in which universities were erected by the reigning princes.

The history of medicine is henceforth chiefly interested in its progress in England, France, Germany, and Italy. The Moors, vanquished by the Christians in Spain, appear in proportion as they left that beautiful country to have delivered it up to fresh darkness. The period at which the Spaniards recovered their independence, instead of being the occasion of increase of knowledge, was the precursor of a state of ignorance of increasing magnitude. Again the Arabians, overcome in the East, and their caliphates destroyed by the Turks, lost their taste for science.

In the fourteenth century medical instruction experienced in European countries a revolution of the highest importance, and one to which medical science

is indebted for its subsequent progress. Until this period anatomy, whose utility had been acknowledged by physicians from the most remote period, was but a speculative science. The prejudices of every religious creed had interdicted physicians from the dissection of human subjects. After the time of Herophilus and his successor Erasistratus, if some studious individuals attended to practical anatomy, they could operate only on animals, and of course their information was of a character by no means satisfactory, owing to the difference between their structure and that of man. The anatomical courses of the schools consisted of the nomenclature of the parts of the body, according to the descriptions contained in the works of Galen, and, when any demonstrations were made, dogs and pigs were the subjects; but in 1315 MONDINI DE LUZZI, Professor of Anatomy at Bologna, dissected the human subject before his pupils, for the first time, it is asserted, for seventeen centuries, and he subsequently composed a treatise on anatomy, in which the different parts of the human body were described from nature. This work, imperfect as might be expected, was considered classical for more than two centuries.

The bold and successful experiment of Mondini was successfully repeated by others, and soon the greater number of the universities began to open, several times in each year, human bodies, whose structure they demonstrated to the pupils. The previous dissection of the subjects, however, which served for those demonstrations, was confided to a

barber's boy, who had no other instrument than a razor, which he of course used in an unskilful manner; then the professor, furnished with the treatise of Mondini, read the description of the parts thus clumsily prepared to his auditors.

After Mondini, and in the same century, Nicolas Betrucci, Peter de la Cerlata, better known under the name of Argelata, both professors at Bologna, Henry de Hermondaville, who taught at Paris, and several others distinguished themselves by their zeal and dexterity in anatomical demonstrations.

The progress which the healing art, aided by practical anatomy, made at this period was but trifling. An important obstacle existed to the advancement of the science in the prodigious and to-be-regretted success everywhere acquired by judiciary astrology, as well as by every other part of the theosophy with which the writings of the Arabians, and especially those of Averrhoes, had infested the schools.

One of the most dangerous propagators of these doctrines—of those physicians whom Haller has called Arabists—was ARNOLD of Villa Nova, a professor at Barcelona, a man of considerable talents, but more famed for his chemical than for his medical knowledge; to him we are indebted for the use of tinctures. His astrological instruction he received from the celebrated Raymond Lully.

Peter Julian the Spaniard, afterwards Pope John XX., was also the author of several works, both physiological and practical, compiled from the Greek and Arabian writers, but the most famous of the Arabists was BERNARD DE GORDON, whom certain

authors assert to have been born in Scotland. He was professor at Montpellier early in the fourteenth century, and his system of the practice of medicine, entitled *Lilium Medicinæ*, contains some remedies not yet wholly forgotten.

The doctrine, however, which he taught at Montpellier, and consigned in his works, is a sad example of the extent of degradation which the human mind is capable of attaining. At the end of this century lived GUY DE CHAULIAC, and although he was never a professor, his treatise on surgery was the basis of instruction over all Europe until Ambrose Paré published his celebrated work on the same subject.

The rebellion of the Neapolitans against Emperor Conrad IV., son of Frederic II., excited the anger of that prince, who inflicted a severe punishment on the city of Naples by issuing an edict dated 1252, in which he invited by the most seductive promises, all the literati to go to Salernum in order to strengthen that celebrated school, and to transform it into a great university; but he was not successful in his design of injuring Naples. Death surprised him in 1254, and Salernum remained a simple school of medicine, which at the middle of the fourteenth century had already lost its ancient splendor. The laws relative to the healing art were, it is true, confirmed in 1365, by Queen Jane, but the school appears to have been so much eclipsed after the fourteenth century by those of Bologna and of Paris, that it could never recover the eclat it had enjoyed. The words of Petrarch prove that in his time it had almost entirely lost its reputation.

CHAPTER XIX.

STATE OF MEDICINE DURING THE FIFTEENTH CENTURY.

Absurdities taught in the schools, and afterwards denounced by the faculty of Paris—Distinguished medical men of the day—Surgery in the hands of the barbers and bathers—Scarcity of operators in Europe—Operation for replacing the nose when lost—Basil Valentine, the monk, and his experiments with antimony, &c.—Lectures of Chrysolore, ambassador of the Emperor of the East—Invention of printing—Prevalence of scurvy, lues venerea, &c.

MEDICAL instruction made but little improvement in the fifteenth century. The false philosophy of the Arabians, as already stated, pervaded the majority of the schools and counteracted the development of reason. Thus, MARCELLUS FICINUS, a Florentine physician who was celebrated in those times, uniting with some wise precepts on hygiene the most absurd conceits of judiciary astrology, laid it down as a principle that the vital spirits of man are of a nature similar to that of the ether, which according to the theosophical philosophy fills the space in which the stars move, and he concluded that if we could procure this ether we might attain considerable longevity; an effect which, according to him, the preparations of gold taken internally would likewise produce. He attributed a particular virtue to

medicines prepared during the conjunction of Jupiter and Venus. Many similar absurdities which were taught at this period in the public schools might be quoted. There were, indeed, but few minds which resisted the admission of this mysterious science.

Amongst those, however, who most usefully attacked it were the chancellor GERSON and the learned PIC DE LA MIRANDOLE. The former condemned all the superstitious means defended by the astrologists, and was the author of a work full of good sense, in which the theosophical precepts of the time had their just value assigned to them. Lastly the faculty of Paris denounced it, holding it to be diabolical and dangerous.

Amongst the physicians whose works were advantageous to science during this century was BARTHOLOMEW MONTAGNANA (A.D. 1460), professor at Padua, who cultivated anatomy and boasted of having opened fourteen subjects, a thing remarkable for the time.

MICHAEL SAVONAROLA, professor at Ferrara, is also highly worthy of mention amongst the learned of those times, not only as being a judicious observer on several practical points, but because he strongly combated the erroneous doctrines of Averrhoes and strenuously opposed the false philosophy which at that time possessed the schools.

In this century some useful works on materia medica and pharmacy were published, one of the most remarkable of which was that of Saladin, a physician of Naples. Surgery, however, remained

stationary in the hands of the barbers and bathers, who could neither read nor write. Scarcely at this period was there in Europe a man who was able to perform operations. They who required an oculist had to seek him in Asia, where they found some possessed of at least dexterity of hand.

The king of Hungary, Matthew Corvin, being wounded in battle and unable to find a surgeon who could cure him, published through Europe that he would load with honors and riches any one who should be successful. Hans de Dockenbourg, an Alsatian, succeeded in restoring his majesty to health and received the rewards which he offered.

LEONARD BERTAPAGLIA, professor of surgery at Padua, and who published a commentary on the fourth book of Avicenna, may be separated from the barbers on account of his classical instruction only; his surgical theory being filled with absurdities.

It was in the fifteenth century that was devised the operation for replacing the nose when lost by accident or disease. The Italians, VINCENT VIANEO, BRANCA and BOJANI, were the first who attempted it. They cut from the arm a piece of flesh, leaving it adherent to the limb by a few fibres only; giving to this flap the shape of the nose, they applied it to the raw surface where the nose had existed, the arm being kept tied up to the countenance, and, when the adhesion was complete, they divided the parts connecting the artificial nose with the arm. This operation, as we shall presently learn, was afterwards improved by Tagliacozzi.

About the middle of the fifteenth century lived

BASIL VALENTINE, a German Benedictine monk, who led the way to the internal administration of metallic medicine by a variety of experiments on the nature of antimony, with which, if we may credit vague tradition, he was extremely unfortunate upon his brother monks, all of whom he injured by it, and hence the name of this drug has been supposed to be derived, ἀήρι-μοναχης. To Basil Valentine we are also indebted for the discovery of the volatile alkali and of its preparation from sal ammoniac. He also first used mineral acids as solvents, and noticed the production of ether from alcohol. He seems also to have understood the tonic virtues of the sulphate of iron.

Towards the end of this century lived ALEXANDER BENEDETTI, professor at Padua, who contributed greatly to the improvement of anatomy and surgery in Italy. At this period also a remarkable event occurred which prepared the way for the improvements of the following century. This was the arrival in Italy of EMMANUEL CHRYSOLORE, ambassador from Emmanuel Palæologus, Emperor of the East. This sovereign sent his ambassadors to the courts of the Christian princes to solicit aid from them against the Mussulmans, who continually threatened his states. As the negotiation, the result of which did not fulfil the expectation of the emperor, continued for a long time, Chrysolore during his residence at Venice taught there publicly the different branches of erudition which had been cultivated at Byzantium since the destruction of the Roman Empire of the West.

The Greek language was chiefly the subject of the lectures of Chrysolore, explaining the original works of the authors of antiquity, of which the defective translation of the Arabians gave but a feeble and erroneous idea. The Greek ambassador had some zealous and clever disciples; his lectures were carried into several cities of Italy, and the taste for proper subjects of study was extended over all Europe. The works of Plato and of Aristotle were read, and the errors foisted upon them by the Arabians rectified. These and these new acquirements ultimately tended to the civilization of Europe.

During the obscurity of this and the following century, Greece still retained her former treasures, and could boast of a few physicians to whom they were not unknown, and by whom they were not neglected. A warlike race whose martial spirit was aided by enthusiasm burst at once from its fastnesses and soon overwhelmed the Roman empire in the East. The Turkish Emperor Amurat, in the year 1430, took by storm Thessalonica, from whence Theodore Gaza, a man of considerable learning escaped with some of his literary treasures to Italy. When Constantinople was taken a few years afterwards, and the Byzantine kingdom wholly overturned, many others followed his example. All were warmly received by Lorenzo di Medicis, and the manuscripts thus rescued from oblivion soon disseminated the stores of Grecian poetry, history, philosophy, and medicine.

The human mind was roused from its lethargy by several other occurrences in this century. The in-

vention of printing of course tended very considerably to the communication of knowledge. Colon and De Gama discovered or facilitated the access to either India, from whence the *materia medica* gained new acquisitions. The scurvy, first observed in Germany in 1482, the *sudor Anglicanus*, first noticed about the same time, followed by *lues venerea* and the *morbus petechialis* in Italy, equally animated the spirit of inquiry to prevent or relieve the effects of such distressing scourges.

CHAPTER XX.

STATE OF MEDICINE DURING THE SIXTEENTH CENTURY.

Improved taste and knowledge of medicine—New translations of Hippocrates and Galen—The Royal College of Physicians founded—Multitude of editors, commentators, &c.—Distinguished writers on practical medicine—Medical controversies of this century—John Argentier and his principles of reform—Belief in demons as a cause of disease—Alchemy in medicine—Paracelsus, his life, opinions, and vagaries—Chemical medicines more generally employed—New pharmacopœias—Remarkable progress of anatomy and surgery—Improvement in surgical operations—Treatment of gunshot wounds—Study of special surgical diseases—Tagliacozzi and his rhinoplastic operation—Remarkable discoveries in anatomy—The days of Sylvius, Vesalius, Paré, Fallopius, Fabricius, and Eustachius.

THE knowledge possessed by the learned of this century of the Greek language procured them, as already remarked, the inappreciable advantage of reading the works of Hippocrates and others in their purity, and of being able to expound them to their pupils. At the end of the fifteenth century NICOLAS LEONICENUS, of Venice, professor at Padua and Ferrara, and who taught there for more than sixty years, employed his talents in the promulgation of Hippocratic medicine. He translated into Latin the works of the Father of Medicine, and explained them in his lectures. Leonicensus did not, however, confine himself to the teaching of the doctrines of

Hippocrates; he did justice to those parts of the theories and practice of the Arabians which merited it, and thus advanced the already improving medical taste which was being promulgated from the schools of Italy to those of France. He died in 1524.

After Leonicensus the renowned THOMAS LINACRE, of Canterbury, who had frequented the Italian schools, and was physician to Henry VIII. of England, published a faithful translation of the works of Hippocrates into Latin. He was the first person who in England employed the Latin language in his writings. Linacre rendered everlasting service to medical science by appropriating the fortune he had acquired at court to the founding at Oxford and Cambridge of a chair of Hippocratic and Galenical medicine. It was through him also that the establishment of the College of Physicians of London was brought about, prior to this period the right of licensing practitioners in London seeming to have been vested solely in the bishops. Leonicensus and Linacre soon had imitators. John Gonthier, of Andernach, professor of the Faculty of Paris, translated Galen and the chief of the Greek writers. In Germany, also, Cornarus published a good translation of Hippocrates, and refuted the false philosophy of the Arabians.

During this period Fracastorius and Massa were the chief luminaries of the Italian schools; Sylvius and Fernelius of the Parisian. The latter victoriously opposed the humoral pathology of Galen and sowed the first seeds of Solidism, a system subse-

quently embraced by Hoffmann and his school. Lommius, the excellent author of the *Observationes Medicinales*, was a disciple of Fernelius, and practised at Brussels. All these authors were zealous supporters of Hippocratic medicine, and with equal enthusiasm and perseverance endeavored to revive it.

Botal, a Piedmontese of this era, a disciple of Fernelius, chief physician to Charles IX. and Henry II. of France, chiefly distinguished himself by his recommendation of profuse bleeding. Duretus, N. Piso, and Hollerius were also French physicians, but with more correct views under the guidance of Hippocrates, whom they admired and illustrated. De Gorris (Gorræus) and Foesus of Dijon were equally able illustrators of the ancients in the *Definitiones Medicæ* and *Œconomia Hippocratis*. Forestius and C. Piso wrote several interesting observations on prognosis, with select observations and consultations.

An immense multitude of editors, commentators, scholiasts, &c., during this century were employed on the writings of Hippocrates and Galen, whom they quoted as so many oracles. The study, however, had a considerable effect in bringing them back to the patient reflection which distinguished Hippocrates and his school. Amongst the distinguished writers on practical medicine in addition to those previously mentioned, were Zwinger of Basle in Switzerland, Mercurialis (A.D. 1533), who published a classical work on the gymnastics of the ancients, Amatus Lusitanus and Prosper Alpinus (A.D.

1553), who wrote an excellent work on the medicine of the Egyptians.

We need not dwell on the disputes relative to the proper place for bleeding according to the nature or seat of diseases. These controversies respecting revulsion and derivation which went on during the whole course of the sixteenth century, and in which each party speculated according to the humoral notions of the time in vogue, could not fail to retard the progress of the art. The discussion, however, excited the researches of anatomists, researches which were not without their use in the subsequent discovery of the circulation of the blood.

The writings of the Greeks which were circulated amongst physicians liberated them during this century from the servitude in which they had been kept by the erroneous theories of the Arabians, and a spirit of criticism was introduced into the schools. JOHN ARGENTIER, a Piedmontese physician who taught successively at Pisa, Naples, and Turin, signalized himself by his principles of reformation in teaching. He taught that medicine ought to be considered as a science of observation and experience, and demonstrated, contrary to the opinions at the time generally received, that the nails, hair, and humors of the human body are integrant parts of its composition; that every part of the frame, in short, receives its nourishment from the blood: whilst Galen and his followers pointed out certain parts as being vivified by the semen. He refuted also a multitude of other erroneous physiological ideas of the ancients which were defended by the moderns, but frequently the

theories he substituted were as objectionable as those which he combated. The opinions of Argentier found partisans in different universities, and were taught at Montpellier by two celebrated professors—Laurent Joubert and Guillaume Rondelet.

Notwithstanding the taste for accurate observation exhibited by several intelligent professors, theosophy, and that of the most degrading character, became in some schools intimately connected with medicine. HENRY CORNEILLE AGRIPPA of Bologna, for example, in different cities of Europe, as London, Paris, &c., promulgated the most gross errors. The absurd reveries of this visionary, as contained in his works, cannot be perused without a feeling of contempt and pity. He considered, for instance, all the Hebrew letters to have a natural signification, founding his opinion on the idea that Hebrew is the most sacred and ancient language, and adding that when demons speak they always do so in Hebrew.

Demons he considered to exist over the whole of nature, some dwelling in fire or air, on the land or in water, others in the constitutions, man constraining all these to obey him by proper fumigations with certain appropriate ingredients. According to this absurd doctrine, all diseases are influenced by demons, a doctrine, which, strange to say, spread through all the schools. Astrology was taught in those of the greatest celebrity during this century, and the most distinguished minds could with difficulty prevent the reception of this deplorable contagion.

The alchemists also now came to unite themselves with the abettors of theosophy, but it was reserved

for Paracelsus and Van Helmont to inundate the whole science with the mysticism of alchemical doctrines and language.

PARACELSUS lived in the middle of the sixteenth century. He was an ignorant boaster, but he still had the merit of having first introduced chemical remedies into medicine, and of subduing the prejudices of the Galenical physicians against the productions of the laboratory. He declared that antimony was not to be equalled for medicinal virtue by any other substance in nature, and he also appears to have first used mercury internally. He employed lead internally in fevers, and gives directions for the preparation of red precipitate with mercury and aqua fortis.

His vanity was such as to lead him to assert that Hippocrates was produced by the genius of Greece, as *he* was by that of Germany, adding in his delirium that all the universities united had not as much knowledge as his beard, and that the hairs of his forehead had more instruction than all writers put together. Paracelsus maintained that the human body is composed of salt, sulphur, and mercury, and that in these "three first substances," as he calls them, health and disease consist; that the mercury in proportion to its volatility produces tremors, mortifications in the ligaments, madness, frenzy, and delirium, and that fevers, phlegmons, and the jaundice are the offspring of the sulphureous principle, while he supposed that the colic, stone, gravel, gout, and sciatica derive their origin from salt.

His real name was Philip Hochener, which he changed, on commencing his professional career, into Philippus Aureolus Theophrastus Bombastus Paracelsus, a name which is quite characteristic of the boasting quackery of the man. At an early age he visited the most renowned towns in Europe, and returning to his native country was made Professor of Medicine and Chemistry at Basle in Switzerland. He availed himself of this situation not to instruct the unlearned, but to vilify his contemporaries and predecessors.

It is generally said that his dissolute manners and intractable temper obliged him to quit this occupation, but others have told a more plausible story. It is said that a rich canon fell sick, and, getting frightened, offered one hundred florins to any one who would cure him. Paracelsus administered three pills, and the canon got well; but, being so soon restored, and by such simple means, he refused to fulfil his promise. The matter was brought before a magistrate, who decreed that the doctor should only recover the customary fee. Irritated at the flimsy excuses and unpardonable ingratitude of the priest, and at the magistrate's partial decision, Paracelsus declared that he would leave the inhabitants of Basle to the eternal destruction which they deserved. He then retired to Strasburgh, and thence to Hungary, where he took to drinking, and, notwithstanding his boasting that he possessed a universal medicine to secure immortality, he died in a hospital in the forty-third year of his age.

Although, however, what is almost incredible,

the chemical sect, with Paracelsus at their head, were very successful, they were aware of the unpopularity of their means; people were frightened at the idea of mercury and antimony, which were accordingly exhibited under fantastic and assumed names.

In England chemical medicines began to be employed in the reign of Charles I. In 1644 Schröder published his *Chemico-Medical Pharmacopœia*, and shortly after, that of the London College made its appearance. The great modern improvements in chemistry would seem indeed to have sprung from its application to medicine, and the foundations of chemical science are principally to be found in the medical and pharmaceutical writers of the sixteenth century, who rescued it from the hands of the alchemical pretenders and gave it a place and character of its own.

Whilst the state of medicine, properly so called, had become corrupted and deteriorated by the success everywhere obtained by the introduction of theosophy, surgery and anatomy made remarkable progress in the majority of the schools of Europe. Prior to the sixteenth century the operation of trepanning and that of lithotomy were never undertaken by surgeons by profession. The professors in their lectures spoke of the diseases which needed those operations, but left them to the charlatans of Italy.

A French surgeon, Germain Colot, about the end of the fifteenth century, having seen the operation of lithotomy executed by an itinerant at Milan,

performed it in France, making his first trial on a criminal under sentence of death. In the sixteenth century this operation was repeatedly practised by John de Romain, a surgeon at Cremona, and by Mariano Santo de Barletta, surgeon at Naples, a pupil of Romain. From Italy these improved operations were practised in France, especially by Laurent Colot, who operated so successfully that his fame was celebrated over Europe. Still later in this century, Pétér Franco became renowned as a lithotomist and as the inventor of several improved instruments for that operation.

Gunshot wounds were at this period new diseases, regarding the cure of which no information could be acquired from the ancients. The surgeons were therefore compelled to draw upon their own resources, and the most incongruous theories were the consequence, as is strongly exhibited in the works of Vigo, the Genoese. This branch of the art was, however, much improved by the labors of Ambrose Paré (A.D. 1509–1590), Maggi, Leone, a professor at Pavia, Botal, a celebrated anatomist, Felix Wurz, a German surgeon, Guillemeau, a pupil of Paré, and others. Vigo gave also in his lectures rules for the operation of the trepan, pointing out the cases in which the operation is required.

The diseases of the urinary organs, which had become more common after the introduction of syphilis, were likewise the objects of surgical attention. At this time the introduction of bougies of wax or lead for the dilatation of the urethra was proposed and practised, but in a very clumsy and

imperfect manner. It was not until a later period that plaster bougies were invented, the first instance of success from their use with which we are acquainted being that of Henry III. of France. This prince, when returning from Poland, in passing through Venice, contracted a disease which by bad treatment degenerated into a stricture of the urethra, when an expert physician of the time, Mayerne, thought of introducing plaster bougies for the purpose of widening the canal, and by this means cured his patient.

It was in this century that Gaspard Tagliacozzi, professor at Bologna, improved the operation for forming a new nose at the expense of the biceps muscle of the individual, now known as the Talliacotian operation. The most skilful surgeons and anatomists of the time, as Fallopius, Vesalius, Paré, and Fabricius Hildanus, thought it necessary to apologize for this graft, as Tagliacozzi called it, but that surgeon in his enthusiasm asserted that the grafted nose possessed a more acute sense of smell than a natural one. On this occasion Tagliacozzi excited such an enthusiasm amongst his fellow-citizens, that they erected a statue to him, on which he was represented holding a nose in his hand.

Surgical education at Paris acquired fresh lustre during this century. The College of Surgery under the protection of Guillaume Vavasseur, first surgeon of Francis I., became a celebrated school. The art was much improved also by the labors of Paré, Fallopius, Berenger de Carpi, and others.

The greatest discoveries which signalized the sixteenth century were those which took place in

anatomy. Every part of the human frame was carefully studied, and important discoveries made. Those professors who contributed more especially to the knowledge of the structure of the human body were Berenger de Carpi, who dissected more than one hundred subjects, and to whom the art is indebted for numerous discoveries; James Dubois, who Latinized his name (Sylvius), and was the master of the great Vesalius and the true founder of anatomy in France, and also the first who injected the blood-vessels; Andreas Vesalius, the most accurate anatomist of the day, who was the author of the first anatomical plates executed after nature; Eustachius, who discovered the Eustachian tube; Gabriel Fallopius, who first described the Fallopian tube, so called after him; Fabricius ab Acquapendente, who first described the valves of the veins, a discovery which contributed to facilitate that of the circulation of the blood; and lastly, Michael Servetus, who also contributed to the same discovery which took place in the following century. The latter anatomist comprehended the lesser circulation, or that through the lungs, but the honor of establishing the accurate theory of the general circulation was reserved for Harvey.

CHAPTER XXI.

STATE OF MEDICINE DURING THE SEVENTEENTH CENTURY.

Harvey's discovery of the circulation of the blood—Advance of practical medicine—Rosicrucians—Eclectic conciliators—Van Helmont and his doctrines—Sympathetic powder of Sir Kenelm Digby—Mathematical sect—Borelli, Bellini, Willis, Keill, and other celebrated physicians and philosophers—Humoral pathology—Malpighi, Bartholin, Steno, Aselli, Wirsung, Pecquet, Wharton, and their discoveries in the glandular system, &c.—The days of Sydenham, Baglivi, and Boerhaave—Distinguished contributors to medical science.

THIS period is signalized by the discovery of the circulation of the blood, the most important which has ever been made in medicine, and the source of most of the subsequent improvements. The honor of it belongs to WILLIAM HARVEY, physician to James I. and Charles II. of England, and Professor of Anatomy to the College of Physicians in London, who in the year 1619 made known to his pupils the general mechanism of the circulation. This great discovery was for a long time contested and attacked from all sides with the greatest acrimony, and it was remarked by Hume, as an evidence of obstinate adherence to preconceived opinions, that no physician in Europe who had reached forty years of age ever to the end of his life adopted Harvey's doctrine of the circulation of the blood. It was a

great triumph for Harvey, however, when such an anatomist as John Riolan, of the Faculty of Paris, who had been one of the most violent opponents of the new theory, voluntarily succumbed, and became one of its warmest advocates, during the same century.

Malpighi of Bologna soon demonstrated microscopically the course of the corpuscles of the blood in the minute vessels, and also corroborated the fact of the communication between the veins and the arteries. The teachings of Harvey were also confirmed by the experiments on infusion of medical substances into the veins and on transfusion of the blood of one animal into the body of another, which were made in various parts of Europe, and England especially.

Whilst anatomy and physiology in this century made a philosophical progress and one calculated to extend the domain of the science, the advance of practical medicine was retarded by the false doctrines which infested the schools. A sect of fanatical physicians, known under the name of Rosicrucians, united their principles to those of Paracelsus, and for a long time diverted medicine from its true object by seeking after modes of curing diseases in the knowledge of the occult sciences. These dreamers pretended to cure all diseases by the aid of faith and the imagination, asserting that the most serious disorder might be suddenly cured by the sole glance of a true Rosicrucian.

Another school of medicine also appeared at this

time, known under the denomination of the Eclectic Conciliators. These physicians, more intelligent than the Rosicrucians, were acquainted with the medical theories of the ancients, but they had the folly to unite them with the absurd principles of Paracelsus. The physicians of this sect, along with considerable knowledge, possessed the most abject credulity. Thus, they believed in the transmutation of metals, in the power of witchcraft, the possibility of holding a correspondence with the devil, &c. Daniel Sennertus, a professor at Wittemberg, who possessed considerable erudition, was one of these eclectics.

VAN HELMONT, whose doctrines assimilated with those of Paracelsus, was a man of much superior talents, distinguished by sagacity and judgment, which render his works very interesting to the modern physician. His son was more mystical than the father, but acute and ingenious, and was the friend of Leibnitz. He was succeeded as a chemical pathologist by Sylvius de le Boe, professor at Leyden, whose doctrines of alkalies, acids, and effervescence long disgraced the science.

One of the most remarkable instances of superstition upon record occurred in this century, that of the Sympathetic Powder of Sir Kenelm Digby, knight of Montpellier. Whenever any wound had been inflicted, this powder was applied to the weapon that had inflicted it, which was, moreover, covered with ointment, and dressed two or three times a day. This practice is repeatedly alluded to by the

poets; thus, Sir Walter Scott, in the "Lay of the Last Minstrel":—

"But she has ta'en the broken lance,
 And wash'd it from the clotted gore,
 And salv'd the splinter o'er and o'er.
 William of Deloraine, in trance,
 Whene'er she turn'd it round and round,
 Twisted as if she gall'd his wound.
 Then to her maidens she did say,
 That he should be whole man and sound."

Long after this period the formularies contained an "armatory unguent," which was applied to the instrument. According to Lord Bacon, the wound was washed clean, "and then bound up close in fine linen, and no more dressing renewed till it was whole." Under such treatment it was of little importance what application was made to the instrument; binding up the wound, bringing the edges in apposition, defending it from extraneous irritants, and leaving it to the restorative power which is seated in almost every part of an organized body, is the approved mode of managing incised wounds at the present day.

Dryden alludes to the superstition just referred to more than once in his "Tempest; or, Enchanted Island." Thus, Miranda, when she enters with Hippolito's sword wrapt up:—

Hip. O, my wounds pain me!
(She unwraps the sword.)

Mir. I am come to ease you.

Hip. Alas! I feel the cold air come to me;
 My wound shoots worse than ever.
(She wipes and anoints the sword.)

Mir. Does it still grieve you ?

Hip. Now methinks there 's something laid just upon it.

Mir. Do you find no ease ?

Hip. Yes, yes ; upon the sudden all this pain

Is leaving me. Sweet Heaven, how I am eased !''

ACT. V. SCENE II.

The school of Paris most firmly rejected the theosophical and chemical pathology. John Riolan and Guy Patin were irreconcilable adversaries of those pernicious doctrines, which, however, after their death, met with a more favorable reception, and were soon professed almost exclusively not only at Paris but in all the other schools of France. England at first adopted the chemical doctrine, the celebrated Thomas Willis being one of the most zealous propagators of the erroneous propositions of Paracelsus. The physicians of Italy also soon received the contagion; but about the latter end of the seventeenth or commencement of the eighteenth century a mathematical sect may be said to have arisen. The application of mathematics to astronomy by Kepler and to the laws of motion, as well as to the system of the world by Newton, led to the opinion that its powers were irresistible, and that it might unfold every secret of nature.

Borelli, at the end of the seventeenth century, applied this science, where it properly admitted of application, to the motions of animals, and showed the advantages and disadvantages derived in these motions from the origin and insertion of the muscles. His scholar, Bellini, in the beginning of the following century, went farther, and from mathematical data endeavored to explain many functions of the

human body. Keill, a philosopher and mathematician rather than a physiologist, calculated from imaginary data the power of each organ, and gave the stomach, for instance, a force of compression so great that in order to overcome the resistance it must have destroyed its organization. The very discordant results, however, at which different mathematical physiologists have arrived in treating of the same function, show that very little useful service can be looked for from that quarter. One estimated the force of the heart as equal to 180,000 lbs.; another reduced it to 8 ounces, and both these conclusions are clad in all the imposing forms of the exact sciences. This doctrine soon extended into all the universities of Europe. In Italy, and especially in England and Germany, the mathematicians soon vanquished the chemists; but in France the strife was very active between the partisans of the two doctrines, and for a long time the chemical sect preserved the pre-eminence.

About the middle of the seventeenth century, when the circulation of the blood came to be generally known and admitted, and when the receptacle of the chyle and the thoracic duct were discovered, a considerable revolution also occurred in the system of natural philosophy. In the course of this century Galileo had introduced mathematical reasoning; and Lord Bacon, having proposed the method of induction, had thereby excited a disposition to observe facts and to make experiments. Until this period every physician, whether Galenist or chemist, had been so much accustomed to consider the state and

condition of the fluids both as the cause of disease and as the foundation for explaining the operation of medicine, that a humoral pathology formed a great part of every system.

Such were the opinions which in the seventeenth century prevailed in the schools of medicine, and consequently amongst physicians. There were some individuals, however, who still followed the route traced out by Hippocrates, and occupied themselves in elucidating his works, and amongst the chief of these were Stephen Roderic de Castro and Zacutus Lusitanus.

Whilst the medical doctrines were thus corrupted, surgery, and especially anatomy, made striking progress. The structure of the lungs and heart was carefully studied. Malpighi, Bartholin, Lower, and Steno threw considerable light on this part of anatomy. Different physiological theories regarding respiration and circulation originated in these researches, Swammerdam, John Mayow, Borelli, Bellini, Pitcairn, and Raymond Vieussens occupying themselves with this important function. Gaspard Aselli discovered the lacteal vessels in animals, a discovery which opened the path for others relative to the lymphatic vessels and glands. The excretory duct of the pancreas was detected in a guinea-fowl by Maurice Hoffman and by John George Wirsung. A short time afterwards the route followed by the chyle from the intestines through the mesentery was detected, and Pecquet found the common trunk of the lacteal and lymphatic vessels. This celebrated anatomist discovered that the latter vessels

do not empty themselves into the liver, as had been previously believed, and he made known the course followed by the chyle before it reaches the torrent of the circulation.

The history of the glandular system, in spite of the controversies which it excited, was pushed to a great extent. Thomas Wharton, especially, threw considerable light upon it, and first gave a general description of the glands, specifying those parts of the body which in their structure belong to that class of organs. Some of his observations on the nature and functions of the glands are not exempt from error; but, notwithstanding this, his work rendered considerable service to the science, and prepared the way for the farther discoveries of anatomists of his and our own times. A Swedish physician, named Olaus Rudbeck, published his observations on the lymphatics, but he is memorable mainly for his controversy with Bartholin as to priority of discovery of the lymphatics of the intestines.

Before Francis Sylvius the anatomists of the seventeenth century had not made any useful researches on the structure of the encephalon. Sylvius, however, threw fresh light on several points of the history of the brain and of that of the nerves. J. J. Wepfer traced the course of the vessels of the brain with more accuracy than had previously been done. Thomas Willis afterwards published a treatise on the brain, which described in a more complete and accurate manner the brain and the nerves connected with it. Gerard Blaes, Swammerdam, Steno, and Malpighi also studied the brain, and

especially its membranes. Blaes described with accuracy the spinal marrow, and Francis Joseph Burrhus, by subjecting the brain to chemical analysis, discovered it to be composed of 25 per cent. of a fatty matter analogous to spermaceti.

The organs of the sense of sight were successfully studied by the anatomists and philosophers of the seventeenth century. Newton, Kepler, Scheiner, Descartes, &c., determined the properties of the different parts of the eye relative to vision, and Scheiner demonstrated that the retina is the true organ of sight.

During this century, also, numerous researches were made on generation. Those of Harvey threw considerable light on this portion of physiology, and afforded ample materials for the works of a number of physiologists, as Hartsoeker, Leeuwenhoek, Charles Drelincourt, and Frederick Ruysch. John James Rau, Spigelius, Sanctorius, and others equally promoted physiology or disseminated the discoveries of other observers by their dissections, assisted by the newly discovered art of injecting the vessels and the use of lenses, microscopes in the complex state at present affixed to them being the invention of the following century.

The improvements in surgery, which had been so numerous in the previous century, were less remarkable at this era. There was no one who could boast, like Ambrose Paré, of the sixteenth century, that he had been the surgeon to four kings of France in succession; but the services which he rendered to the art in the treatment of gunshot wounds, the

employment of the ligature, &c., bore good fruits even in these days. Neither was there any author of a complete treatise on surgery whose work obtained equal popularity with that of Anthony Chaumette, of France, in the sixteenth century; syphilis and gunshot wounds were then surgical novelties, and much of the literature of those times was devoted to these two subjects, and William Clowes, an eminent English surgeon of Queen Elizabeth's time, had published "a short, profitable treatise" on the morbus Gallicus, or syphilis; and, early in the seventeenth century, "a right fruitful and profitable treatise" on the king's evil.

There seem to be periods in the progress of every department of science, when, instead of making new improvements, the energies of its cultivators are directed to the perfecting of previous inventions and discoveries. Such seems to have been mainly the case in the surgical history of the seventeenth century. Thus we find on record suggestions for operations for stone, hernia, gunshot wounds, amputations, &c., and several quaint and learned treatises in various languages on the principles and practice of surgery; but novelties were uncommon. Much of the tardy inactivity of the surgeons of this day is due to the fact that the art had not yet been elevated to the position it occupies at the present age. For several centuries they had been associated with the barbers; in other words, the barbers were at one time almost the only surgeons, and this, too, not only in England, but in the countries of continental Europe. Even Ambrose Paré had been a barber-surgeon, but

he soon rose far above that rank. In the royal warrants of monarchs to their surgeons, the words *capitis rasura* were frequently mentioned, and in that of Henry VI., in the fifteenth century, occurs the phrase *valettus et sirurgicus noster*. Surgery was thus debased until the eighteenth century.

The increase of anatomical knowledge gave a great impetus to the advance of surgery; but even in 1635, when demonstrations of anatomy and surgery were given in the Jardin Royal at Paris, the lecturer was a physician, not a surgeon, and this was the state of things as late as 1671, when the king decreed that the lectures should be read by a surgeon. To exhibit the still growing interest in this branch of medicine, it may be stated, that in the next century, about 1724, as many as five public professors were appointed there to conduct these demonstrations.

Many other distinguished names, of authors especially, might be mentioned in connection with the advance of medical science, such as Conrad Victor Schneider, a German anatomist and writer, whose name is associated with the mucous lining of the nose; Francis Glisson, especially memorable for his researches on the anatomy of the liver; Sanctorius, author of aphorisms on Italian medicine, &c.; John Scultetus, whose Latin work was translated under the name of the "Chirurgion's Storehouse," illustrated with forty tables cut in brass; the German physicians, Michael Etmuller, father and son, both of whom were writers in various departments of medicine; Francis Mauriceau, the eminent French

accoucheur, all of whose works were collected and printed in the next century; Régnier De Graaf, of Holland, whose reputation has been preserved to posterity by his researches on the sexual functions of woman, and its association especially with the follicles which bear his name; and a host of others.

Several familiar names are associated with the discoveries of the latter portions of this century. Meibomius published a work particularly referring to the anatomy of the eyelids; Peyer, one on the glands of the intestines; Bonetus, a treatise on morbid anatomy, deduced from actual post-mortem dissections; and De Graaf introduced the practice of performing injections for the purpose of discovering the motion of the blood in the vessels, a process which was also beneficial to anatomy. The merit of this, or a similar discovery, is also given to Frederick Ruysch, who is said to have first made anatomical preparations. Bidloo, professor at Leyden, published in 1685 his celebrated anatomical folio, with 105 magnificent plates. Hugh Chamberlen, or Chamberlain, about this time invented the obstetrical forceps, but instead of giving the world the benefit of his invention kept it a great mystery for many years, so that he might reap the pecuniary benefit of its practical use. About the same period, also, Julian Clement, a celebrated French accoucheur, by his great skill and influence, was the means of having men employed instead of women to officiate in cases of childbirth. It is said that the writers of midwifery of this century did but little more than copy the obstetrical work of Eucharius Rhodion,

which was "set foorth in Englishe by Thomas Raynalde, Phisition," entitled "The Byrthe of Mankynde," which is said to have been the first book published on that subject, in 1540, and generally known as Raynalde's work.

The conclusion of the seventeenth century was distinguished by some of the brightest luminaries that have illustrated medical science, such as Sydenham, Morton, Baglivi, and Boerhaave, although the fame of the latter was chiefly conspicuous in the next century. The first of these, Sydenham (1624-1689), was a most accurate reasoner and excellent practitioner. His remarks on diseases, which are equally learned and original, are extremely worthy of perusal; Baglivi and Morton, although with fewer titles to genius and the character of original authors, deserve great credit for their observations on several important subjects of the healing art. Sydenham has been sometimes called the English Hippocrates, and the term is not inapplicable when we consider the accuracy of the detailed descriptions of diseases in his various works, and his sagacity in observing the effects of remedies, never allowing his theoretical views on the nature and causes of diseases to affect his rational treatment of them. In an age when speculation and conjectural hypothesis pervaded every system, Sydenham certainly deserves great credit for not blindly adhering to any one theory.

CHAPTER XXII.

STATE OF MEDICINE DURING THE EIGHTEENTH CENTURY.

New systems of medicine—Doctrines of Stahl—Expectant medicine—Systems of Hoffmann and Boerhaave—Haller's physiological theory of irritability—The Cullenian system—Doctrines of Brown—Darwin and the laws of association—Brilliant progress of anatomy and physiology—Interesting researches on the circulation, respiration, nervous system, organs of the senses, generation, surgery, pathological anatomy, &c.—The concluding years of the century—Jenner and the discovery of vaccination—Xavier Bichat—John Hunter—Other contributors to medical science.

Sketch of American medical history in the eighteenth century—Colonial condition of the country—Practice of medicine by the clergy and others—Absence of all restrictions in its exercise—Practice of midwifery by women—Modes of practice—Inoculation for smallpox—Systems of medicine—Medical authorship—Medical education—Medical schools of this era—Conclusion.

ABOUT the beginning of the eighteenth century, when every part of science came to be on a more improved and correct footing, there appeared in the writings of Stahl, Hoffmann, and Boerhaave, three new and considerably different systems of physic, which have ever since had some influence in directing it, although they now exert a much less influence than prior to the publication of the Cullenian theory. That of Stahl appeared first, and was for a long time the prevailing system in Germany. The chief

and leading principle of this system is, that the rational soul of man governs the whole economy of his body.

At all times physicians must have observed that the animal economy has in itself a power or condition by which, in many instances, it resists the injuries which threaten it, and by which, on many occasions, it also corrects or removes the disorders induced or arising in it. This power physicians very anciently attributed under a vague idea to an agent in the system, which they called nature, and the language of a *vis conservatrix et medicatrix naturæ* has continued in the schools of medicine from the most ancient times to the present.

STAHL expressly founded his system on the supposition that the power of nature, so much talked of, is entirely in the rational soul. He supposed that on many occasions the soul acts independently of the state of the body, and that, without any physical necessity arising from that state, the soul purely in consequence of its intelligence perceiving the tendency of noxious powers threatening, or of disorders anywise arising in the system, immediately excites such motions in the body as are suited to obviate the hurtful or pernicious consequences which might otherwise take place.

This theory is of course so absurd as not to require comment. There is, however, as Dr. Cullen has very properly remarked, so much seeming appearance of intelligence and design in the operations of the animal economy, that many eminent individuals, as Perrault in France, Nichols and Mead in

England, Porterfield and Simson in Scotland, and others equally noted, have very much countenanced the same opinion, and it is therefore worthy of mention, though not of refutation. The consequence of Stahl's doctrine was that, trusting too much to the constant attention and wisdom of nature, he and his followers proposed the art of curing by expectation, the *Medicina expectans* of some writers, *La Médecine expectante* of the French, and have consequently suggested only for the most part inert and frivolous remedies, zealously opposing the use of some of the most efficacious, such as opium and the Peruvian bark, and being extremely reserved in the employment of general remedies, such as bleeding, emetics, &c.

In whatever way the operations of nature in curing disease may be explained, it has often had a baneful influence on the practice of physic, by leading physicians into, or continuing them in, a weak and feeble practice, and by superseding or discouraging all the attempts of art. Huxham has properly observed that even in the hands of Sydenham it had this effect, and, although it may sometimes prevent the mischiefs of bold and rash practitioners, it tends to the production of a degree of timidity which opposes the introduction of new and efficacious remedies.

The opposition to chemical remedies in the sixteenth and seventeenth centuries, and the noted prescription of antimony by the medical faculty of Paris, are chiefly attributable to those prejudices, which the majority of the physicians of France did

not get the better of for nearly one hundred years afterwards, and which a considerable number have possessed until even more recent times. To this, indeed, is owing the inert practice for which the French physicians have been celebrated.

With respect to the pathology of Stahl, it did not wholly depend upon the powers of nature, or *auto-crateia*, as it has been termed, but supposed a state of the body and diseases that admitted of remedies, which under the power and direction of the soul acted upon the organization and matter of the body so as cure its diseases. Upon this footing the Stahlian pathology turned entirely upon plethora, or fulness, and cacochymia, or depraved condition of the humors. With respect to the former, or plethora, they applied their doctrine in a very fantastic manner; and with regard to the latter, they involved themselves as much in the humoral pathology as the systematic physicians who had preceded them, and with a theory so absurd and incorrect as not to merit the smallest attention. It may be observed, however, that as the followers of the Stahlian system were very intent upon observing the method of nature, so were they attentive to the phenomena of diseases, and have hence given in their writings many facts not to be found elsewhere.

Whilst the doctrines of Stahl were prevailing in the University of Halle, FREDERICK HOFFMANN, a professor in the same university, proposed a system which was very different. Hoffmann was born at Halle, in the year 1660. He graduated in 1681; was made professor of physic there in the year

1693, and filled that chair till his death, in 1742. A very remarkable circumstance of his life is, that he never took fees from his patients, but was content with his stipend. He was in high repute as a practitioner, and curing the Emperor Charles VI. and Empress, and Frederick I. of Prussia, of inveterate diseases, greatly increased his reputation. His works are collected into six volumes folio, published at different times, from 1748 to 1754. They abound with many useful practical remarks, but at the same time, as Dr. Cullen has correctly observed, contain many frivolous observations and an abundance of conjectural theory.

The chief peculiarity of Hoffmann's system was the theory of the nervous influence in the production of disease, and it is to him we are indebted for the attention which has subsequently been paid to it. With it he has also everywhere mixed a humoral pathology as incorrect and hypothetical as any other, and, although he differed from Stahl in the fundamental doctrines of his system, it is evident that he was considerably infected with the Stahlian doctrines of plethora and cacochymia.

Another author to whose theories reference may be made at this period is the celebrated HERMANN BOERHAAVE (A.D. 1668-1738), the contemporary of Stahl and of Hoffmann, and who over all Europe, and especially in Great Britain, gained higher reputation than either of the others. He was a man of general erudition, and few physicians enjoyed for so long a period so unbounded and so unalloyed a reputation. "He first gave chemistry," says Dr.

Parr, "a philosophical systematic form, and reduced medicine to a science at least plausible, inert, and perspicuous. We have no reason to think that he expected to be the founder of a sect; yet he proceeded with the caution of a veteran, and culled from each the flower which was to adorn his own parterre. Though Paracelsus had burnt the writings of Hippocrates and Galen in solemn state, yet they were not forgotten, and the wise observations of the Grecian sages formed the groundwork of his system. The Galenic doctrine of humors he assimilated with wonderful address to his chemical doctrines, and gave them a specific character founded on their chemical relations. The mechanical philosophy then attracting universal attention added to the fabric; the vessels were cones or cylinders, the fluids consisting of various particles, adapted only to given apertures, were at times forcibly impelled and impacted in vessels to which they were not fitted, and consequently produced numerous complaints."

From his selection from the opinions of various sects Boerhaave has been generally styled an eclectic; he has also been called the modern Galen. In his doctrines, however, he placed too much stress upon the acrimony of the fluids as a cause of disease, and as he fancied that such acrimony was of a particular character, which could be neutralized by chemical remedies, his practice was frequently most inert and illogical. In treating also of the properties and functions of a living body, he overlooked the principle of life, and the laws of a living organized machine. This error he seems to have

subsequently discovered, and in his later works he speaks, but still in the language of a sectarian, of the *inertia liquidii nervosi*.

The pathological doctrines of Boerhaave long held unbounded sway in different parts of the European continent, under the denomination of the humoral pathology, which, however, formed only one portion of his system, but never gained much ground in the British dominion, nor among the practitioners of the American continent. The Cullenian system, however, forms an important era in the history of British and American medicine. One of the most celebrated pupils and expounders of the views of Boerhaave was Van Swieten, of Leyden, afterwards professor at Vienna, who published a vast collection of observations in a work entitled *Commentaries on the Aphorisms of Boerhaave*.

The physicians of the European continent had scarcely escaped from the trammels of Boerhaave when the doctrines of Brown caught their attention; and to him they erroneously ascribe that revolution of the science which taught that the functions of a living being were to be explained only by the laws of animation. As already stated, even Boerhaave in his later years did not reject the consideration of a nervous fluid, though, consistently with his humoral pathology, he considered it as inactive; and Gaubius, his successor, treats at some length of the diseases of the vital solid. His nephew, indeed, Kaauw Boerhaave, who practised with credit at St. Petersburg, considered the influence of the nervous system in his work entitled

Impetum faciens Hippocrati dictum. As an evidence of the imperfect state of the materia medica at this time, and of the credulity that even then existed, it is worthy of note that some of the repulsive and ridiculous agents which were employed in previous centuries, such as a certain portion of human or horse flesh for the cure of epilepsy, were actually exhibited with success in the treatment of epileptics in the poor-house at Haerlem, by this author and practitioner. Haller, though chiefly of the mechanical sect, assisted the new revolution by his experiments on irritability, and Dr. Cullen finally constructed on this ground the ingenious system to which his name has been given.

One of the most distinguished authors and physiologists of the eighteenth century was ALBRECHT VON HALLER (1708-1777). He was a pupil of Boerhaave, whom he resembled in the possession of numerous sterling intellectual and moral attributes, and was a most prolific writer, especially on physiology, and he has not been inaptly called the father of modern physiology. He was also a brilliant experimentalist, and as professor at Gottingen was specially noted for the physiological discoveries made by him, as well as for the principles deduced by him from patient observation and experiment. This led him to establish a theory of irritability and sensibility, which he applied to the muscular and nervous system, by the action of which the various phenomena of the body were explained. The views of Haller led to various controversies. Among those who prominently figured in them

may be mentioned Whytt, Porterfield, Sauvages of France, and Bianchi and Fontana of Italy. Fabre of the Faculty of Paris was the first person to apply Haller's doctrine of irritability to pathology.

Called by the duties of his office to review and examine the various systems of physic which were in vogue, CULLEN soon perceived the inconsistencies of the Boerhaavian theory, and accordingly resolved to abandon it. Stahl's doctrines, to which some of his contemporaries adhered, did not appear to him more satisfactory, and in particular he deemed them objectionable on account of the inert practice which they countenanced. Nor could he altogether assent to the system of Hoffmann, though he conceived it to approach nearest to the truth, and he was induced to adopt some of its fundamental principles.

Among others he took up the doctrine of spasm and debility, from which he deduced all the phenomena of febrile disorders. Rheumatism was referred by him to a spasm of the muscular fibres, arising from an increased afflux of blood, but gout he conceived to originate in atony, especially of the digestive organs. In these latter diseases he rejected the idea of a peculiar morbid matter; yet in his explanations of several other complaints, as for instance of scrofula, he had recourse to the supposition of an acrimony of the fluids.

He laid much stress on the efforts of the *vis medicatrix naturæ*, advocated the hypothesis of a nervous fluid and vital principle, and ascribed to the brain a peculiar faculty, by which it was enabled to excite the muscles to action independently of the

mind, and to which he gave the name of irritability of the sensorium. This principle in its various ramifications influenced every part of his theory of medicine. The circulation was no longer to be explained by mechanical laws; the angles at which the larger arteries divaricated were shown to have little influence; and lentor, viscidty, and acrimony, either acid or alkaline, were proved, if they existed, to have no influence in producing diseases. The whole was resolved into motions, regulated by the living principle, and chiefly influenced by the action or torpor of the extreme arteries.*

The speculative doctrines of Cullen afforded the first hint of the Brunonian theory of excitability. In a passage of his *Institutions of Medicine*, Cullen speaks of a state of excitement or collapse of the brain and nervous system, on which he supposes the strength or debility of the other parts of the body to depend; and in his other writings he is constantly laboring to prove in what manner these conditions may be occasioned by the agency of various causes. Brown, seizing upon this idea, set about the formation of a new theory, according to which all the actions of life were to be referred to the excitement of the body by stimuli, and all disease reduced to the two general heads of direct and indirect debility, or debility arising from a deficiency or a previous excess of excitement.

Dr. JOHN BROWN first started as a self-appointed

* His views are contained in his *First Lines of the Practice of Physic*, an excellent history of disease, seductively amalgamated with his own peculiar doctrines.

lecturer, and the avowed opponent of the Cullenian system. His doctrine, which was even more simple than that of any predecessor, admitted only of the sthenic and asthenic states, without allowing the union of each, and the simplicity exhibited in his doctrine attracted many proselytes. Brown seemed to consider man not as a being composed of an organized system, to which the principle of life was superadded, but as a machine, to which a certain series of actions and effects is allotted by means of an excitability differing in degree, but generally, though on the whole imperceptibly, exhausting.

Life, therefore, he considered a forced state; everything stimulating, some substances too violently, others not sufficiently, and thus there are two kinds of debility, indirect and direct. In the former case the strongest stimuli are necessary; in the second, the slightest destroy in consequence of too great irritability. In the gaol fever, for instance, we must give the strongest stimuli; to the man long pent up in darkness, with scanty food, the light, he considered, must be moderate, the aliment of the mildest kind, and stimuli of every sort most sparingly administered, as the flame long repressed would be roused by the slightest excitement.

The doctrines of Brown when applied to practice were excessively injurious. As all diseases in his view were either sthenic or asthenic, that is, diseases of excitement or debility, he made a nosological arrangement according to those divisions, in which the greatest errors were committed, exhibiting clearly that the author was more attached to

system than an accurate observer of the operations of nature, as well as his want of judgment and practical knowledge. The cure was as simple as the arrangement: bleeding, low diet, and purging for the sthenic diseases; stimuli of different kinds and degrees for the asthenic.

It is not at all astonishing that a system of this kind should have had its admirers. The labor of study was entirely done away with. When the observation of the practitioner had taught him to which class of Brown's system any disease under his care might belong, the remedies were obvious. If it were sthenic, he must bleed; if asthenic, stimulate. Fatal were the effects of this system in different diseases; but fortunately it has now nearly met with the oblivion which it merits, sounder views and experience having taken the place of visionary theory and absurd practice.

Previous to the time of Dr. ERASMUS DARWIN no one seems to have conceived the idea of applying the doctrine of association to the theory and treatment of disease. It is true that Hoffmann, and even some writers before his time, had remarked the sympathy or *consensus* which subsists between particular organs of the body, but their observations were mixed up with much erroneous hypothesis. Darwin saw that the chief errors of preceding theorists had arisen from the partial views which they had taken of the animal economy; from their considering the living system as a simple whole, and not paying due regard to the reciprocal influence which the different organs of which it is composed exert upon each

other. He saw too that it was only by the same organic powers by which the body is preserved and developed, that disease is generated, formed, and finally removed from the system.

Taking advantage of all the facts which had been accumulated by his predecessors, placing them sometimes in new lights, and at other times confirming and illustrating them by his own observations and experiments, he proceeded to the construction of a system of pathology and therapeutics founded on the general laws of animated nature. Unfortunately, however, as he advanced in his design, he fell into many incongruities, and the difficulties increasing upon him, he was led to assume positions which were unsupported by evidence or countenanced by the slightest analogy, added to which the language which he employed was inflated, vague, and inconsistent, and was severely satirized—especially that adopted in his *Botanic Garden*—by a celebrated British bard, who describes him as one—

“ Whose gilded cymbals, more adorned than clear,
The eye delighted but fatigued the ear,
In show the simple lyre could once surpass,
But now worn down, appear in native brass ;
While all his train of hovering sylphs around,
Evaporate in similes and sound.”*

Rejecting as illusive all the explanations which had been given of febrile disorders on chemical

* The best part of his work *Zoonomia; or, the Laws of Organic Life*, is considered to be his account of the Catenation of Animal Motion and of the Diseases of Association, especially his theory of fever.

and mechanical principles, Darwin traced the succession of the symptoms of fever to the irregular actions of the nervous, vascular, and absorbent systems; showing how the derangement of one part produces similar or opposite affections of others, in consequence of the intimate connection of the organs in question and the influence which they naturally possess.

Dr. Darwin is one of the last writers who, during the eighteenth century, attempted any material revolution in the opinions of medical practitioners. As at the present day, various theoretical and practical innovations were indulged in, but they were confined to some particular disease or subject.

The brilliant progress of anatomy and physiology during the previous century laid the foundation for a still further advance of medical science in the eighteenth century. The names of many anatomists and physiologists of these times are familiar to the student as associated with special descriptions of the various portions of the economy, the name of the discoverer still clinging to them in the nomenclature of modern anatomy.

Physiologists at the commencement of the 18th century were occupied in minute investigations upon the peculiarities of the foetal circulation, and the structure of the foetal heart. Winslow, Duverney, Thebesius, Ferrein, Sénac, and others made interesting experiments on the valvular and muscular arrangement of the heart, and Lancisi not only traced the nervous distribution of that organ, but also offered some unsubstantial theoretical views in

regard to the coronary arteries, and the movements of the heart. The views of Haller were, however, antagonistic to those of Lancisi, and soon supplanted them.

Several prominent men in various parts of Europe, Helvetius, Morgagni, Michelotti, and others, were also busy at this time in investigating the structure of the lungs, and the changes which the blood undergoes in its passage through those organs. In the glandular system, at the end of the previous century, Duverney had established the identity of the chyliferous and lymphatic vessels; Pacchioni had discovered the lymphatic glands of the dura mater, and Cowper the two glands which have since borne his name. These discoveries were not followed in the next century by many of equal importance; the labors of the physiologists, of its latter portion especially, seeming to be directed to the systematic generalization and collocation of all the facts and discoveries previously established.

The investigation of difficult points of the anatomy and physiology of the nervous system and of the organs of the senses was an important feature of the medical history of this period. Pacchioni and Baglivi, early in the century, studied the influence of the dura mater on the movements of the body, comparing this membrane in its structure to that of the heart, and giving a fanciful view of the effect it has on the nerves. Santorini of Venice adopted similar views, but afterwards abandoned them. The opinions of Pacchioni were defended by Lancisi, who, however, ascribed to the pineal gland the fabu-

lous quality of controlling the functions of the soul, the power of thought being in direct relation to the bulk of this little organ. It was reserved for Haller to expose the fallacies of his predecessors, among whom may be mentioned the celebrated Boerhaave, and all the feeble theories in regard to the *dura mater* were soon completely demolished. The names of Tarin, Le Cat, and Meckel are at this time associated with the anatomy of the cranial nerves.

It had already been established in the seventeenth century that the seat of cataract was the crystalline lens, and Morgagni now described the humor in the midst of which it is nourished. Experiments were also made by Petit in regard to the nerves of the eye, the effect of age in producing changes in the organ, &c.; and Albinus and Haller each claimed to have discovered the pupillary membrane. The two anatomists, however, who accomplished most at this time in perfecting the study of the anatomy of the eye were Porterfield of Edinburgh, and Zinn of Göttingen, each of whom ascribed important functions to the ciliary processes. The structure of the *membrana tympani* and the distribution of the auditory nerve had been accurately studied a few years before the commencement of the eighteenth century; but Valsalva now described much more precisely the minute portions of the ear, and of the labyrinth especially, the use of the fluid of which was afterwards discovered by Cotunnus and Meckel.

The physiology of generation attracted much attention about the same period. Naboth of Leipsic made interesting observations on the mucous glands

of the neck of the uterus. Morgagni and Santorini made experiments in regard to the ovaries, and Alexander Monro (father and son) investigated the development of the foetus and the seminal ducts. The illustrious Haller also embraced in his physiological researches the whole field of the generative functions, and especially the development of the ovum. The celebrated William Hunter, of London, was, with Haller and Monro, the first to inject portions of the delicate structure of these organs.

Of the microscopic anatomists of the eighteenth century, one of the most prominent is Lieberkuhn, professor at Berlin, whose skill in injecting and preparing various portions of the economy was remarkable. He is said to have been the inventor of the solar microscope, by which he was enabled to exhibit the circulation of the blood, and thus to pave the way for numerous valuable discoveries. The assistance of chemical reagents seems now for the first time to have been called into play, either alone or in combination with the microscope, in the examination of certain portions of the economy which were not within the range of optical investigation only.

Valuable researches were also made during this century on the lymphatic system, by Cruikshank, Hewson, and William and John Hunter, and in 1787 Paul Mascagni gave, in his *Vasorum lymphaticorum corporis humani historia et iconographia*, the first general description of the entire lymphatic apparatus.

The field of pathological anatomy was invaded by

numerous representatives of the profession in every country of Europe, but prominent among them may be mentioned the name of John Baptiste Morgagni, whose work on pathological anatomy contains numerous evidences of the great erudition of its author, and as a valuable contribution to the medical literature of that subject occupies a more elevated position than any of the works that had preceded it.

The progress of surgery was materially enhanced by European wars, which gave abundant opportunities for studying the phenomena and treatment of gunshot wounds. Surgical professorships were also appointed in Germany and Holland. The celebrated German surgeon and anatomist Laurence Heister, one of the most voluminous authors of this century, and professor at Altorf and Helmstadt, in addition to a score or two of medical monographs, published a valuable system of surgery; and William Cheselden, of London, made important improvements in capital operations. The degrading association of barbers and surgeons was abolished in 1743 at Paris by an edict, breaking the legal fetters which had for so many years bound together the surgeons of St. Cosme and the barbers, and the example was speedily followed in 1745 by a similar act of the English Parliament. Freed from this galling servitude, surgery became a separate and distinct branch, to be ever afterwards studied and cultivated by educated members of the profession.

About the middle of the eighteenth century a distinguished lithotomist appeared, in the person of a monk named Frère Côme, or St. Cosme,—although,

before his monastic retirement, a surgeon by profession,—who operated gratuitously with a *lithotome caché*, as he called it, and thus excited the hostility and envy of the regular surgeons. The tourniquet of Petit was also devised, and came into use about this time. The surgeons of this era were less partial to the use of the cautery than their predecessors, and all the methods of dressing wounds were much less cumbrous and elaborate than those previously employed. Many of the more refined and elegant modes of operating still in vogue trace their origin to the eighteenth century, such as those for the stone, the removal of cancerous and other tumors, amputations, &c.

The concluding years of the eighteenth century were remarkable for the immense amount of labor and research which were brought to bear on every department of medical science. It could hardly be expected in the stormy days of the revolution, that any successful efforts would be made in France to advance the progress of medical learning, but the other enlightened countries of Europe were not pervaded with the same spirit. Chemistry now for the first time became a subject of more scientific study, and more systematic arrangement, and was more generally applied to the living body. Blumenbach, Soemmering, Vicq-d'Azyr, Scarpa, Monro, John Hunter, and Cruikshank, made new and important physiological observations, especially on the nervous system. The latter and also Mascagni interested themselves with the lymphatic vessels. The medical writers of this period limited their writings to the observations of

nature, making their opinions to accord with experience, and originating no new theories.

It was at this period also that animal magnetism, which a few years previously had agitated the scientific world, was critically examined and placed on its proper level, but has been since spasmodically revived. Although not strictly or directly connected with the progress of medicine proper, the discovery of galvanism also formed an interesting episode in the history of these times.

The history of medical progress during the eighteenth century would be incomplete without a passing allusion and tribute of respect to the immortal English physician, EDWARD JENNER (A.D. 1749–1828), the discoverer and active promulgator of vaccination. Inoculation of the smallpox virus had been practised through a long series of years in every part of the world, and the inquiries of all learned men had been turned through the whole of this century to some rational plan for the prevention of the spread of the pestilence; but it was not until the year 1798, that Jenner discovered the possibility of protecting mankind by virus obtained from the cow. The history of this inestimable discovery need not here be detailed.

Without advancing further into the medical history of the nineteenth century than the first year of this era, we may briefly allude to the researches of the celebrated XAVIER BICHAT (A.D. 1771–1802), as then published. Distinguished above all his contemporaries for the light which his observant and penetrating mind diffused over the different depart-

ments of medical science, of some of which—as of general anatomy—he may be regarded as the founder, it may well be said of him, as Corvisart expressed in a letter to the First Consul announcing his death, “*Bichat vient de mourir sur un champ de bataille qui compte aussi plus d’une victoire ; personne, en si peu de temps, n’a fait tant de choses et aussi bien.*”

Perhaps the most prominent name connected with medical and surgical science and natural history in England during the eighteenth century was that of JOHN HUNTER (A.D. 1728–1793), who was distinguished not only for his energy of mind and accuracy of observation, but for the valuable contributions with which he enriched medical literature. He was not only an excellent anatomist and physiologist, but he suggested also valuable improvements in surgical operations. It has been well said of him in an impartial review of his minute inquiries into all the various processes of the organism, his demonstrations of the functions of animals, and of changes of structure, and of his surgical reflections and practical precepts, that all his original facts, his principles and opinions, are entitled to the respect of the anatomist, the surgeon, and the naturalist.

Other names might be enumerated as included in the long list of those who during this century aided in enriching medical science, although it would be impossible to describe minutely the nature of their various contributions. Among these might be mentioned Martin Lister, who published, besides works on anatomy and natural history, an edition of the aphorisms of Hippocrates and Sanctorius; Stephen

Hales, the author of various works on statics, especially as applied to the blood and bloodvessels; John Freind, the author of commentaries on Hippocrates, and other works, and of a *History of Physic from the time of Galen to the beginning of the sixteenth century*; Richard Mead, one of the distinguished writers and practitioners of England, the author of numerous valuable works on medicine, which were translated into various European languages; James and John Douglass, authors of numerous medical and surgical monographs; William Cheselden, the eminent surgeon and anatomist; Percival Pott, a voluminous contributor to surgical literature, especially on the subject of spinal curvature; Sir James Earle, Surgeon to George III., and author of comprehensive works on hydrocele, stone in the bladder, cataract, &c.; Henry Francis Le Dran, a distinguished surgeon, whose works on surgery were so highly esteemed that almost all of them were translated into English; Peter Joseph Desault, Surgeon to the Hôtel Dieu of Paris, the distinguished author and practitioner; John Louis Baudelocque, the celebrated French obstetrician; John Huxham, an English writer on fevers and epidemic diseases, whose name is perpetuated in an excellent officinal tincture of bark, and many others.

[SKETCH OF THE STATE OF MEDICINE IN AMERICA DURING THE EIGHTEENTH CENTURY.—The colonial progress of the medical profession of this country offers but few attractive features to interest the student of history. Little else could be expected in the then

existing condition of things, when the intercommunication between various portions of the country was so limited, and when the profession was chiefly remarkable for the absence of all the facilities for education and improvement. The attractions offered for foreign medical visitors to our shores were almost null, and the American physician of that period could boast of neither journals, hospitals, nor medical schools to aid him in obtaining the elements of a practical professional education. Quite a number of those who afterwards became prominent laid the foundation of their medical acquirements abroad, and were the active agents here on their return in disseminating the seeds of medical learning in this country, and of inaugurating a thorough system of medical instruction.

As in the early history of medicine its practice was restricted to the priesthood, and exercised by them in connection with their religious duties, so also do we find that in the older settled parts of America, as in New England, the clergy were both physicians and religious instructors. This is probably due to the Puritanical spirit which pervaded every department of society, affecting equally all branches of business and education. Men high in office, such as governors of provinces, also devoted attention to the practice of medicine; but it may be reasonably inferred that but little progress could be made in the scientific acquirements of a proper medical education, when the practice of this art was unrestricted by any legal enactments, so that the member of any profession, or of any trade even, was at liberty

to devote himself to it, however unprepared he might be.

That this was the real condition of things at that time is proven by the fact that an old law of the previous century, and this probably the only one that had been passed in any of the colonies for the regulation of the practice of medicine, was still in force, a proviso of which expressly declares "that no churgeons, midwives, physicians, *or others,*" should be allowed to practice medicine except under certain restrictions, which were neither satisfactory nor permanently effective. With the exception of laws passed in New York and New Jersey a few years before the Declaration of National Independence, prescribing that every person proposing to practice medicine or surgery should pass an examination, and be approved by a board of non-medical officials, such as judges, attorney-general, and mayor, nothing else was done in any of the colonies to throw restrictions or safeguards around the indiscriminate exercise of medicine.

Early in the century the practice of midwifery was almost entirely followed by women, and it was not until the return from Europe of several well educated and learned physicians, who devoted themselves also to this branch of the art, that the prejudice against the employment of the other sex in cases of labor was effectually destroyed. The mode of practice adopted generally in the treatment of diseases was of course mainly borrowed from the mother country. Here and there some slight originality was visible, as in the partiality evinced for

special drugs, and it must be confessed that the opportunity offered for novelties in treatment was strikingly manifested in the presence of the yellow fever at various periods of this century, in an epidemic form of startling gravity. The agitation throughout Europe in relation to inoculation for smallpox was transferred at an early date to our own shores, and the controversial discussions of its merits were probably more bitter among the physicians of this country than abroad, and were even carried to the extent of personal violence. Within a few weeks of its successful introduction in Great Britain as a preventive of smallpox, and before the intelligence could have reached America, inoculation became a popular feature of practice in spite of all the preliminary opposition to it.

The systems of medicine followed were essentially those in vogue in Great Britain, and the theories of Boerhaave, Stahl, Hoffmann, and others must have unsettled the prevailing faith of the practitioners of the new world, according as they adopted the views of one or the other of these celebrities, and furnished them with new ideas in pathology and therapeutics. It is probable, however, that the great mass of medical practitioners of this country, or medical pretenders as a number of them must have been, during the first half of the eighteenth century, were influenced by their own views of treatment rather than by conscientious adherence to the theories of any one man, however elevated in the scale of professional excellence. We can hardly wonder, however, at this unsatisfactory condition of the profes-

sion at a time when there was but little regular instruction or precise information accessible to the inquiring medical minds of the country in regard to the popular European systems of the day.

The medical authors of this country had but little prospect of fame or fortune at this early period to encourage them to enrich the medical literature of their times. It has, indeed, been said of the colonial physicians, that they only "turned authors on some special emergency of public duty, or for the purpose of promulgating and enforcing some new and useful mode of practice. The capabilities of our early physicians, therefore, ought to be judged of, not so much by the quantity as by the quality of the productions which they have left us; and an impartial review of them will show us that they do not suffer by a comparison with the productions of their European brethren at the same period. Some of them were not thought unworthy of being published in the Transactions of the Royal Society, while others found a place in the publications of the learned medical associations of the day in their mother country."*

It is remarkable that so many years were allowed to elapse before efforts were instituted to provide systematic courses of instruction, especially when the fact was universally recognized that a complete

* Annual Address before the Medical Society of the State of New York, by Dr. J. B. Beck, 1842, in which is a detailed reference to all the prominent works issued during our colonial condition, and to many matters of general interest in the medical history of that period.

medical education was only attainable by a visit to foreign schools. The earliest example of medical teaching in this country is probably found in the anatomical demonstrations of Dr. Thomas Cadwalader, at Philadelphia, after his return from London, where he had studied under the celebrated Cheselden.* This was probably previous to the year 1750, at which date there is evidence that a body was dissected in the city of New York, by Drs. Bard and Middleton, and the bloodvessels were injected for the instruction of the young men engaged in the study of medicine. This, according to Dr. Hosack, was the first essay made in the United States to impart medical knowledge by dissection, of which there is any record; but it is believed that the demonstrations of Cadwalader were made at an earlier date.

In 1754-56 a course of lectures on anatomy and surgery, accompanied by dissections, was delivered at Newport, Rhode Island, by Dr. William Hunter, of Scotland; and in 1762, Dr. Shippen, in his anatomical lectures then inaugurated at Philadelphia, laid the foundation of a medical school (now the University of Pennsylvania), which, on the return of Dr. John Morgan from Europe, was with his co-operation fairly established, being engrafted on the College of Philadelphia. The appointment of Dr. Morgan thus created the first collegiate medical professorship. In 1767 steps were taken for the establishment of a medical school in the city of

* A History of the Medical Department of the University of Pennsylvania, by Joseph Carson, M.D. Philada., 1869, p. 39.

New York, which was fully organized in the following year. The medical institution of Harvard College was the next in succession, and was located at Cambridge, Massachusetts, in 1782. The fourth medical school instituted in this country was that of Dartmouth, at Hanover, New Hampshire, in 1797. These were all the medical colleges established prior to the commencement of the present century, the period to which this history of medicine has been brought.

The limits of a cursory sketch of American medical progress during the eighteenth century do not admit of a detailed reference to the literary or scientific labors of individuals. These have been already described by those who have had the opportunity afforded them to make more comprehensive biographical and historical sketches of the men of that period, or will hereafter interest the compilers of copious and voluminous records of the medical progress of this country. They need not, therefore, be referred to here, even although, as in the case of Dr. Benjamin Rush, a sketch of American medical history may seem to be incomplete which passes thus lightly over their labors.]

The history of the various revolutions narrated in this review of the progress and theories of medicine in many of the countries of the world, from the earliest ages to the end of the eighteenth century, leads to one important deduction,—that we ought

to be very tardy in embracing any sect or system. The true means for the improvement of medical science are observation and reflection, systems having too much the effect of distracting the practitioner from those important objects of study, and of reducing the practice to a set form which the ever-varying characters of disease must effectually prevent him from successfully pursuing. And yet there is not a system, professional or empirical, from which the philosophical inquirer may not cull something useful.

Although we may become somewhat more notorious by embracing an exclusive theory, and by endeavoring to make all natural phenomena bend to it, we must recollect that, by such a course, we are wandering from the true path, to which, as years roll away and time mellows the over-excitement of the imagination, we will surely return. With no other motive than the discovery of truth, let us choose from the various sects and systems that which is good, rejecting, without remorse, the crumbling materials of which the superstructure is too generally erected.

When we take a retrospective glance at the condition of medicine in former times, and reflect upon the amount of ignorance, credulity, and superstition that prevailed, we cannot fail to be struck with the immense improvement that has taken place in comparatively modern periods, and must be encouraged in the hope, that as the physical and moral sciences pursue their onward progress, and as the means of observation and experiment are augmented and facilitated,

our own noble science may attain a pitch of perfection, of which at the present time we can form no adequate conception, shedding light where all is now obscurity, and tending to dispel doubt and difficulty wherever existent.

INDEX.

- A** **BARIS**, the Hyperborean, 82
Abbé physicians. (See **MONK PHYSICIANS**.)
Abdel-Malek-Abou-Merwan-Ebn-Zohr, 198
Abdollatif, an Arabian physician, 192
Abulcasis, 197
Academical degrees first conferred by societies, 194
introduced at Salernum, 211
Accouchement, old laws in regard to, 206
Achilles, healing powers of, 36
Acron of Agrigentum, 101, 102
Actuarius, John, 187
Ægidius, 210
Æschrion, 171
Æsculapius, 36
death of, 38
descendants of, 50
fensts of, 49
history of, 36
remedies used by, 38
science of, 37
sons of, 39
temples of, 43
worship of, 42
Aetius of Amida, 180, 182, 183
Agathinus of Sparta, 166, 169
Agrippa, Henry Corneille, absurd views of, 227
Agrodicea, the obstetrician, 144
Ahran, Aaron, 194
Albinus on the eye, 262
Albucasis, 197
Alemæon, first comparative anatomist, 93
Aleiptai, 102, 103
Alexander Trallian, 184
Alexandria, library of, 135-137
lithotomists of, 143, 145
medical school of, 26, 138, 171, 179, 181
medical works of, 144
surgeons of, 143
Alexanor, son of Machaon, 40
Al-Hussain-Abou-Ali-Ben-Abdallah-Ebn-Sina, 196
Ali Abbas, Almaleki of, 196
Almaleki, or the whole book of medicine, 196
Almamoun, caliph, services to science, 190
Almanzor, caliph, encouragement of medicine by, 190
Almanzor of Rhazes, 195
Alraunes, Druid sorceresses, 85
Alzaharavius, 197
Amatus Lusitanus, 225
America, state of medicine in, in eighteenth century, 268
absence of restrictions to practice, 269
examinations of physicians in, 270
first anatomical demonstrations in, 273
inoculation for smallpox in, 271
laws in regard to practice, 269
medical authorship in, 272
education in, 272
schools in, 273
practice of medicine by clergy, 269
practice of midwifery in, 270
systems of medicine adopted in, 271
Anacharsis, 82

- Anathemata or offerings, 48
 Anatomist, comparative, the first, 93
 Anatomy, first demonstrations of, on the human subject, 214
 progress of, in Greece, 51, 52
 practical. (See DISSECTIONS, etc.)
 restrictions to study of, in Spain, 192
 Anaxagoras of Clazomenæ, 100
 Andreas of Carystus, 142
 Animal magnetism, 266
 Antimony, first so called, 220
 Antyllus, 169
 Aorta, first named, 130
 Apis, an Egyptian divinity, 26
 Apollo, healing powers of, 36
 mythological history of, 24
 Apollonius of Citium, 142
 of Memphis, 142
 of Tyre, 142
 Apollophanes, 142
 Apostles, cure of diseases by, 179
 Arab physicians, practice of, 193
 Arabia, decline of science in, 213
 Arabian medicine and medical schools, 189
 Arabists, 215, 217
 Archagathus, the executioner, 54
 Archigenes of Apamea, 166
 Aretæus, 167
 Argelata, 215
 Argentier, John, 226
 Aristæus, healing powers of, 36
 Aristides, heroic treatment of, 47
 Aristotle, 127
 comparative anatomy of, 131
 discovery of the nerves by, 129
 history of, 128
 physiology of, 129
 Arnold of Villa Nova, 215
 Artemidorus of Side, 143
 Artemisia as a moxa, 77
 Arteries, discovery of, 132
 Artorius, Marcus, 157
 Arundale, Bishop of Coichester, 205
 Asclepiadæ, 50
 Asclepiades, 154
 doctrines of, 154
 Asclepius. (See ÆSCULAPIUS.)
 Aselli, Gaspard, on the lacteals, 240
 Association applied to disease, 258
 Assyrians, practice of, 30
 Astrology in medicine, 209, 227
 Athenæus of Attaleia, 167
 Athens, school of, 181
 Attalus Philometor, medical skill of, 153
 Aufidius of Sicily, 157
 Augustus, physicians of, 157, 159
 Autopsy or empiricism, 149
 Avenzoar, 198
 Averrhoes or Averroes, 198
 Avicenna, 196
- B** **BABYLONIANS**, medicine of, 22
 Baccheius of Tanagra, 142, 152
 Bacis, medical mythology of, 36
 Bagdad, medical college of, 190
 Bagliivi, 246
 on the nervous system, 261
 Barbers, surgery of, 219, 243, 264
 Bard, Dr., dissection by, 273
 Bardi, 84
 Barletta, Mariana Santo de, 231
 Bartholin, Thomas, on lung-structure, 240
 physiological researches of, 241
 Basil Valentine, 220
 Bathers, surgery of, 219
 Bathing before entering the temple, 45
 Baths established in Rome, 53
 Baudelocque, John Louis, 268
 Beans, proscription of, 90
 Belgæ, medicine of, 84
 Bellini, views of, 240
 Benedetti, Alexander, 220
 Benedictine monks, medical schools of. (See MONKS.)
 Berenger de Carpi, 232, 233
 Bertapaglia, Leonard, 219
 Bertrucci, Nicolas, 215
 Bianchi, 255
 Bichat, Xavier, researches of, 266
 Bidloo, anatomical work of, 245
 Blaes, Gerard, 241, 242
 Bloodletting, first recorded operation of, 41
 controversies in regard to, 226
 heroic, on Aristides, 47
 Blumenbach, physiological views of, 265
 Boerhaave, Hermann, 247, 251, 262, physiological views of, 262
 system of, 247, 251, 262

- Boerhaave, Knauw, 253
 Bojani, operation of, 219
 Bologna, school of, 213
 Bonetus, morbid anatomy of, 245
 Borelli, views of, 238, 240
 Botal, 225, 231
 Bougies first employed, 231
 Brahmin medicines, 68
 physicians, 65
 Branca, operation of, 219
 Brown, John, system of, 256
 Bruchium, library and museum of, 138, 144
 Brunonian theory, 256
 Burrhus, F. J., 242
 Byrthe of mankynde, 246
- C**ADWALADER, Thomas, lectures by, 273
 Caliphs, medicine under the, 190
 Callianax, 142
 Callimachus, 142
 Campo, monk of Farfa, 205
 Canon of Avicenna, 197
 Cassius, the iatrosophist, 169
 Castro, Stephen Roderic de, 240
 Cathedrals, medical schools of, 203
 Cato, Porcius, censor and practitioner, 55
 Cautery, use of, in China, 77
 Celibacy of physicians of middle ages, 206
 Celsus, Cornelius, 152, 160
 surgery of, 162
 views and works of, 161
 Celts, medicine of, 84
 Cerlata, Peter de la, 215
 Chaldeans, medicine of, 22
 Chamberlen, or Chamberlain, forceps of, 245
 Charidemus, 143
 Charlatans, in Greece, 103
 Charlemagne, medicine at the court of, 202
 Charms, cures by, at Rome, 55
 Chauliac, Guy de, 213, 216
 Chaumette, Anthony, surgery of, 243
 Chemical medicines, first used, 230
 opposition to, 249
 sect, 230
 Chemistry applied to physiology, 263
 Cheselden, William, 264, 268
- Chinese, medical absurdities of, 80
 medical schools of, 72
 medicine of, 22, 71
 physicians, code of, 72
 physiology of, 73
 Chiron, healing powers of, 36, 37
 Chirurgeon's storehouse, 244
 Christianity, effect of, on medicine, 179
 Chrysolore, Emmanuel, lectures of, 220
 Chrysermus, 142
 Circulation of the blood, discovery of, 234
 Chinese notions of, 74
 Clergy practitioners. (See MONK PRACTITIONERS)
 Clinical teaching, Martial's satire on, 165
 Clodius, 157
 Clowes, William, works of, 243
 Coan sage. (See HIPPOCRATES.)
 Code affecting physicians, 203
 Coimbra, school of, 191
 College of Physicians of London founded, 224
 of Surgery of Paris, advance of, 232
 Colomb, 201
 Colot, Germain, 230
 Laurent, 231
 Côme, Frère, lithotome of, 264
 Conciliators, eclectic, 236
 Constantine the African, 207
 Continent of Rhazes, 195
 Convents, medical schools of, 202
 Cophon, 210
 Cordova, academy and library of, 191
 Cornarus, translation of Hippocrates by, 224
 Cotunnus on the ear, 262
 Cowper, discovery of glands of, 261
 Crinas of Marseilles, 164
 Critical days of Hippocrates, 116
 Cruikshank on the lymphatics, 263
 physiological views of, 265
 Crusaders, influence of, on medical science, 208
 Cullen, system of, 247, 255
 Cullenian theory, 247, 255
 Cycle, resumtive, 169
 metasyncritic, 169
 Cycles of the methodists, 169

Cyclus vomitorius, 169
Cydias, 142

DARTMOUTH medical school established, 274

Darwin, Erasmus, doctrine of association of, 258

Dead bodies, burning of, 52
burial of, 52
respect for, 51

Death of patients attributed to disobedience, &c., 47

Definitiones Medicæ, 225

DeGraaf. (See GRAAF.)

Demetrius of Apamea, 142

Pepagomenus, work of, on gout, 188

Democedes of Crotona, cures of, 101

Democritus of Abdera, 101, 107, 109

Demons, influence of, in disease, 227

Derivation, controversies on, 226

Desault, Peter Joseph, 268

Diana, healing powers of, 36

Diatritoi, 169

Didon, Abbé of Sens, 205

Digby, Sir K., sympathetic powder of, 236

Dioscorides, 142, 166

Dispensatory, first publication of, 193

Dissection of human bodies, first, 214

Egyptian aversion for, 34

Dockenbourg, Hans de, 219

Doctor, title first used, 211

Dogmatic school, 126

Dominico, Abbé of Pescara, 205

Douglass, James, works of, 268

John, works of, 268

Dracon, son of Hippocrates, 111, 126

Dreincourt, Charles, 242

Druid physicians, 84

Dschondisabour, medical school in, 182, 193

Dubois, James, 233

Duodenum first named, 139

Duretus, 225

Duverney, experiments on the heart, 260

on the lymphatics, 261

EARLE, Sir James, works of, 268

Ebn-Beithas, 198

Eclectic conciliators, 236

Eclectics, 166

Edessa, medical school of, 181

Egyptians, aversion to dissection, 34

chemistry of, 34

imperfection of medical knowledge of, 35

medical works of, 27

medicines used by, 31

metallurgy of, 34

pharmacy of, 35

state of medicine among, 23

Embalming, Egyptian process of, 31

Embre, book so called, 24

Empedocles of Agrigentum, 94

medical services of, 95

physiological views of, 97

public services of, 95

Empire of the East, progress of medicine in, 189

of the West, progress of medicine in, 189

Empirical school, 146

Empiricism, 146

Empirics, doctrines of, 146-152

Epicharmus, medical works of, 99

Epidemic of sixth century, 193

Epididymus, discovery of, 139

Epilepsy, superstitious cures of, 254

Episynthetics, 166

Erasistratus, 138, 141

Erigenes, 201

Eros, 210

Erotian, Lexicon Hippocraticum of, 166

Esmun, worship of, 26

Etmuller, Michael, 244

Eubages, 84

Eucharis Rhodion, obstetric work of, 245

Eudemus, 142, 159

Euryphon, theories of, 101

Eurypylus, surgical treatment of, 40

Eustachius, 233

Excitability, Brown's theory of, 257

Expectant medicine, 249

Eye, nomenclature of, by Herophilus, 139

FABRE, 255

Fabricius ab Acquapendente, 233

Fabricius Hildanus, 232
 Fallopius, Gabriel, 232, 233
 Feasts of Æsculapius, 49
 Fees of physicians in the middle ages, 203
 Fernelius, 224, 225
 Ferrein on the heart, 260
 Foesius of Dijon, works of, 225
 Fontana, 255
 Forceps, obstetrical, invented, 245
 Forestius on prognosis, 225
 Fracastorius, 224
 Franco, Peter, lithotomist, 231
 Freedmen, sale of medicines by, at Rome, 53
 Freind, John, works of, 268

GAIUS, 142

Galen, 170
 Galen, biographical sketch of, 170
 comments of, on Hippocrates, 177
 modern, 252
 pathology, &c., of, 176
 services to medicine, 174
 views of, 173
 writings of, 224, 225
 Galenus, Claudius. (See GALEN.)
 Galvanism, discovery of, 266
 Gariopuntus, 210
 Gaubius, 253
 Gauls, medicine of, 84
 Gaza, Theodore, 221
 Geber of Mesopotamia, chemical remedies of, 193
 Gerson, Chancellor, work of, 218
 Glaucias, 152
 Glisson, Francis, 244
 Gonthier, John, of Andernach, writings of, 224
 Gordon, Bernard de, 215
 Lilium Medicinæ of, 216
 Gorgasus, son of Machaon, 40
 Gorgias Leontinus, 107
 Gorræus, writings of, 225
 Gorris, De, writings of, 225
 Graaff, Reginald de, 245
 Grande Chirurgie of Salicet, 213
 Greece, charlatans in, 103
 early study of anatomy in, 52
 medicine of, 86
 military surgeons of, 103
 physicians of, laws affecting, 102

Greek physicians at Rome, 53
 Greeks, ancient, medicine of, 36, 38
 writings of, 226
 Guillemeau, 231
 Gumnasoi, 102
 Gunshot wounds a surgical novelty, 231
 literature of, 243
 modern treatment of, 243
 Gymnasia of ancient Greece, 48, 102
 Gymnasiarch, 102
 Gymnastic physicians, 102

HALES, Stephen, works of, 268

Haller, Albrecht von, 254
 Haller, on generation, 263
 physiological views of, 262, 263
 theory of irritability of, 254
 views on the eye, 262
 Hartsoecker, 242
 Harvard college, medical school of, instituted, 274
 Harvey, William, 234
 discovery of circulation by, 234
 views on generation, 242
 Heister, Laurence, surgery of, 264
 Heliodorus, 169
 Helmont, Van, doctrines of, 228, 236
 Helvetius on the lungs, 261
 Hemelitus of Ephesus, 101
 Henry III. of France, case of, 232
 Heraclides of Erythræa, 142
 father of Hippocrates, 107
 of Tarentum, 152
 Hercules, worship of, 42
 Hermes, books of, 25
 Hermogenes of Tricea, 143
 Hermondaville, Henry de, anatomical demonstrations of, 215
 Hero, 143
 Herodicus of Selybria, 51, 101, 102, 107
 Herodotus, 169
 Herophilus, 138, 144
 anatomical discoveries of, 138
 Hewson on the lymphatics, 263
 Hochener, Philip, 229. (See PARACELSUS.)
 Hhonnain, 194
 David-Ebn, 194
 Isaac-Ebn, 194
 Hieroglyphica of Horapelle, 25

- Hildegarde, Abbess of Rupertsberg,
practice of medicine by, 206
- Hindoo laws on poisons, 66
- Hindoos, medicine of, 65
pathology of, 67
- Hippocrates, age of, 104
anatomical views of, 114
aphorisms of, 267
biography of, 107
commentaries on, 267
comments of Galen on, 177
cures by, 108, 109
dietetics of, 117
pathology of, 115
physiological views of, 114
practice of, 117
public services of, 109
surgery of, 123
travels of, 108
views of, 104-125
works of, 49, 110, 223, 224, 225
- Hippocrates, English, 246
- Hoffmann, Frederick, 225
system of, 247, 250
Maurice, 240
- Hollerius, 225
- Horus, Egyptian king, 24
- Hospital, public, in Persia, 181
- Hugues, physician to French king,
204
- Humoral pathology, 250, 252
- Hunter, John, on the lymphatics,
263
physiological views of, 265
services of, 267
William, on the generative or-
gans, 263
on the lymphatics, 263
William, lectures by, in Ame-
rica, 273
- Hygeia, worship of, 42
- I**CCUS of Tarentum, 101
Icesias, 143
- Ilithia, healing powers of, 36
- Indians, medicine of, 22
- Inoculation for smallpox, 266
- Instruments, surgical, early history
of, 20
- Irritability, Haller's doctrine of,
254
- Isis, medical powers of, 23
- Israelites, medical history of, 58-
64
- J**AHIAH-Ebn-Masawaih, 194
-Ebn-Serapion, 195
- Japanese, medical absurdities of, 80
medicine of, 22, 77
- Jardin Royal, surgical lectures in,
244
- Jenner, Edward, discovery of vac-
cination, 266
- Jews, medicine of, 57
resemblance to the Egyptian,
58
- John of Alexandria, 186
of Milan, 209
- Joubert, Laurent, 227
- Julian, Clement, accoucheur, 245
- K**EILL, mathematical views of,
239
- Khalaf-Ebn-Abbas-Abu'l-Kasem,
197
- Kha-Reth-Ebn-Kaldah of Takif, 189
- King's evil, cure of, by the touch,
209
- Krabadin, Arabic pharmacopœia,
193
- L**ACTEALS, discovery of, 240
Lancisi on the heart, 260, 261
Lancisi on the nervous system, 261
- Lanfranc of Milan, 212
- Laws affecting physicians in middle
ages, 203
- Laxum, a division of diseases, 158,
165
- Leach crafts, monk practitioners of,
205
- Le Cat, on the nervous system, 262
- Le Dran, Henry Francis, works of,
268
- Leeches, first use of, 158
- Leeuwenhoek, 242
- Leibnitz, 236
- Leone, 231
- Leoniceus, Nicholas, 222
- Leonides of Alexandria, 169
- Lepra, cure of, by the Israelites, 59
- Levites, cure of diseases by, 58, 60
- Lexicographer, medical, first, 166
- Libraries, celebrated ancient, 135-
137
- Lieberkuhn, microscopic discoveries
of, 263
- Ligature, use of, by Paré, 243

- Lilium Medicinæ of De Gordon, 216
- Linaere, Thomas, 224
- Lister, Martin, works of, 267
- Lithotome caché of Côme, 265
- Lithotomists, distinguished, 231
of Alexandria, 143, 145
- Lithotomy first performed by surgeons, 230
- Lommius, 225
- Lues Venerea in Italy, 222
- Lully, Raymond, 215
- Lycou of Troas, 142
- Lymphatics of intestines, discoveries in, 241
- M**ACHAON, son of Æsculapius, 39
death of, 40
history of, 39
treatment of wound of, 39
- Maggi, 231
- Magnetism, animal, 266
- Magnus of Ephesus, 169
- Malpighi, discoveries of, 235, 240, 241
- Mantias, 142
- Marcellus Empiricus, 179
Ficinus, 217
of Side, 178
- Mascagni, work of, on lymphatics, 263, 265
- Massa, 224
- Massaria, professor at Pavia, 177
- Mathematical physiologists, 239
sect, 238
- Mauriceau, Francis, 244
- Mayerne, treatment of Henry III. by, 232
- Mayow, John, on respiration, 240
- Mead, Richard, works of, 248, 268
- Meckel on the ear, 262
on the nervous system, 262
- Medical schools of cathedrals and convents, 203
of the monks, 201, 203, 207.
(See also COLLEGES, UNIVERSITY, &c.)
- Medicin chirurgique, 212
- Medicina expectans, 249
- Medicinæ established at Rome, 54
- Medicine of Chinese, &c. (See CHINESE, &c.)
origin of, 17
- Meibomius, anatomical work of, 245
- Melampus, medical mythology of, 36
- Menodorus, 143
- Menodotus of Nicomedeia, 152
- Mercurialis, works of, 225
- Mesue, Arab medical teacher, 194
- Metasyncrisis, 166
- Methodic school, foundation of, 157
- Methodists, cycles of, 169
- Michelotti on the lungs, &c., 261
- Microscope applied to physiology, 263
- Middle ages, monk physicians of, 200
- Middleton, Dr., dissection by, 273
- Midwifery, male practitioners of, in United States, 270
- Midwives at Rome, Greek origin of, 54
- Military surgeons of Greece, 103
- Milon, archbishop of Benevento, 205
- Mithridates Eupator, medical skill of, 153
- Mohammed-Ebn-Secharjah-Abou-Bekr-Arrasi, 195
- Mondini de Luzzi, 214
- Monk physicians, origin of, 63
of middle ages, 200
- Monks, cures by, 201
origin of, 63
- Monro, Alexander, on the fœtus, &c., 263
physiological views of, 263
- Montagnana, Bartholomew, 218
- Monte-Cassino, medical school of, 207
- Morbus petechialis in Italy, 222
- Morgagni, on the eye, 262
on the lungs, &c., 261
on the ovaries, 263
pathological anatomy of, 264
- Morgan, John, lectures by, 273
- Morton, Richard, 246
- Moses, medical knowledge of, 58, 59
- Mostanzer, Caliph, medical school established by, 190
- Moxa, use of in China and Japan, 77
- Murcia, school of, 191
- Musa, Antonius, freedman physician, 159
- Musæus, medical mythology of, 36
- Myrepsus, 189
- N**ABOTH, on the uterus, 262
Nemesius and his work, 180

- Nerves, discovery of, by Aristotle, 129
- Nestor, treatment of Machaon by, 39
- Nestorians, schools established by, 181
- New York, first medical school in, 273
- Nicander of Colophon, 152
- Niceratus, 157
- Nichols, Frank, 248
- Nicias of Miletus, 142
- Nico of Agrigentum, 157
- Nicolas of Alexandria, 188
Leoniceus, 223
Præpositus, 210
- Nonus, 187
- Nose, operation for restoration of, 219, 232
- Nuns, practice of medicine by, 206
- O**BSERVATIONES medicinales of Lommius, 225
- Oculists, scarcity of, in the fifteenth century, 219
- Œconomia Hippocratis, 225
- Oribasius and his works, 180, 183
- Orpheus, medical mythology of, 36
- Orus, Egyptian king, 24
restoration of, 23
- Osiris, 23, 24
- Osteology, early Greek notions of, 52
- P**ACCHIONI on the dura mater, 261
on the nervous system, 261
- Palæostrophylax, 102
- Palladius the Iatrosophist, 186
- Panaceus, Chinese, 76
- Pancreas, duct of, discovered, 240
- Pandects of medicine, 194
- Paracelsus, 228
chemical remedies of, 228
theories of, 228
- Paraschistes or operators, 33
- Paré, Ambrose, surgery of, 216, 231, 232, 242, 243
- Pastophori, medical practice of, 27
- Patroclus, surgery of, 40
- Patin, Guy, 238
- Paulus Ægineta, 186, 194
- Pecquet, discovery of course of chyle by, 240
- Pelops, 171
- Perdiccas, cure of, 108
- Periœdeutai or wandering practitioners, 102
- Perrault, 248
- Persia, medicine in, 181
- Petit, on the eye, 262
tourniquet of, 265
- Peter Julian, the Spaniard, 215
- Peyer on the intestinal glands, 245
- Phacas, 142
- Pharmacopœia, chemico-medical of Schröder, 230
of the London College, 230
first publication of, 193
- Philagrias, 169
- Philaretus, 185
- Philinus of Cos, 147, 151
- Philip of Cæsarea, 166
- Philonides of Dyrachium, 157
- Philoxenus of Cos, 143
- Physician in ordinary, 188
surgical, 212
- Physicians, ecclesiastical, 200
exempted from proscription, 54
fees of, in middle ages, 203
laws affecting, 203
punishment of, 25
- Pic de la Mirandole, 218
- Piso, C., 225
N., 225
- Pitard, Jean, 212
- Pitcairn, on respiration, 240
- Plato, views of, 126
- Pliny, 166
- Pneuma, theory of, 177
- Pneumatic sect, 167
- Podalirius, son of Æsculapius, 39
history of, 41
- Poisons, Hindoo laws on, 66
- Poleocrates, son of Machaon, 40
- Polybus, son-in-law of Hippocrates, 111, 126
- Porterfield, views of, 249, 255
on the eye, 262
- Pott, Percival, on the spine, 268
- Powder, sympathetic, of Digby, 236
- Prænotiones Coacæ of Hippocrates, 49
- Praxagoras of Cos, discoveries of, 132
- Prayer, cure by. (See MONKS, PRIEST, &c.)
- Pregnant women, old laws in regard to, 206

- Priest-practitioners of Egypt, 24,
26
 diet of, 28
Priests, Grecian, cures by, 44
 medicines of, 46
Printing, effect of invention of,
222
Prophets, miraculous cures by, 62
Prosper Alpinus, 225
Ptolemies, era of, 134
Pulse, Chinese exploration of, 75
Pyrrho, 147
Pyrrhonism, 147
Pythagoras, 87
 dietetics of, 88
 disciples of, 88
 medical practice of, 92
 views of, 87
Pythagoreans, views of, 89
- Q**UINTUS, 171
- R**AU, John James, 242
Ravenne, Jean de, Abbé of
Dijon, 205
Raynalde, Thomas, obstetrical work
of, 246
Remedies, new, publication of, 49
Revulsion, controversies on, 226
Rhazes and his works, 194, 195
Rhinoplasty first resorted to, 219,
232
Rhodion, Eucharius, 245
Riolan, John, 236, 238
Robert of England, cure of at Sa-
lernum, 209
Roger of Parma, 210, 212
Roland of Parma, 213
Romain, John de, 231
Roman practitioners, Pliny's opin-
ion of, 163
Romans, medicine of, 53
 Greek origin of, 53
Rome, Greek physicians in, 53
Romualdus, 210
Rondelet, Guillaume, 227
Rosicrucians, principles of, 235
Rudbeck, Olaus, 241
Rufus Ephesius, first medical lexi-
cographer, 166
Rush, Benjamin, 274
Ruysch, Frederick, 242
- S**ABOR-EBN-SAHÉL, 193
Saladin, materia medica of, 218
Salerno. (See SALERNUM.)
Salernum, school of, 204, 207-211,
216
 chief physicians of, 210
 decline of, 216
 dietetic precepts of, 209
 dissection of animals by,
211
Salicet of Placentia, 213
Sammonicus Serenus, 178
Santorini on the nervous system,
261
 on the ovaries, 263
Sanctorius, 242,
 aphorisms of, 267
Saracens, medical progress of,
199
Saragossa, school of, 191
Satyrus, the anatomist, 171
Sauvages, 255
Savonarola, Michael, 218
Scarpa, physiological views of, 265
Scheikh-Reyes, 196
Schemin, worship of, 26
Schneider, Conrad Victor, 244
School of Salerno, Seville, &c.
(See SALERNUM, SEVILLE, &c.)
Schröder, pharmacopœia of, 230
Scientia Causalitatis, 24
Scultetus, John, 244
Scurvy, first appearance of, 222
Scythians, medicine of, 81
Sénac, on the heart, 260
Sennertus, Daniel, 236
Serapion of Alexandria, 150, 152
 the elder, 195
Serapis, a medical divinity, 26
Serpent bites, Hindoo treatment of,
67
Servetus, Michael, 233
Seth, Simon, work of, 187
Seville, school of, 191
Sextus Placitus Papiensis, 178
Shippen, Dr. William, lectures by,
273
Sigould, Abbé of Eperny, 205
Simson, views of, 249
Slave practitioners, prohibitions to,
103
Smallpox, first description of, 194
Soemmering, physiological views of,
265
Solidism, foundation of, 224

- Soranus of Ephesus, 168
 Spain, decline of science in, 213
 medical schools and libraries
 of, 191
 medical science in, 198
 Specialties, earliest practitioners
 of, 30
 Sphyrus, son of Machaon, 40
 Spigelius, 242
 Stahl, system of, 248
 St. Cosme, Frère, 264
 Steno on lung structure, 240
 Stephen of Athens, 186
 of Edessa, 181
 Straton of Berytus, 142
 of Lampsacus, 142
 Stratonicus, 171
 Strictum, a division of diseases,
 158, 165
 Sudor Anglicanus, first appearance
 of, 222
 Surgeon-barbers. (See BARBERS.)
 Surgeons of Alexandria, 143
 scarcity of, in 15th century, 219
 young, prohibitions to, 145
 Surgery, origin of, 20
 Surgical apparatus of Alexandria,
 144
 instruments, origin of, 20
 presented to the temples,
 49
 Swammerdam on respiration, 240
 Sydenham, 246
 Sylvius, Francis, 241
 Jacobus, 224, 233
 de le Boe, 236
 Symmachus and his pupils, 165
 Sympathetic powder of Sir K.
 Digby, 236
 Syndesmology, early Greek notions
 of, 52
 Syphilis, literature of, 243
 Syrna, cure of, by Podalirius, 41
 Systems of medicine of Hoffmann,
 Cullen, &c. (See HOFFMANN, CUL-
 LEN, &c.)
- TAAUT**, worship of, 24
 Tablets, votive, 48, 107
 Tagliacozzi, Gaspard, rhinoplastic
 operation of, 219, 232
 Taliocotian operation, 219, 232
 Tarin, on the nervous system, 262
 Temples of Æsculapius, 43, 107
- Temples—**
 Grecian, practice of medicine
 in, 43
 guardians of, 47
 practice of medicine in, 24,
 87
 Thales, theories of, 101
 Theath or Thouth, worship of, 24
 Thebesius on the heart, 260
 Themison of Laodicea, 157
 pathology and practice of, 158,
 159
 Theodocus, 189
 Theodore of Canterbury, medical
 teachings of, 201
 Theodorus Priscianus, 178
 Theodunus, 189
 Theophrastus of Eresus, 131
 Theophilus Philotheus, 185
 Theosophy mingled with medicine,
 209, 227
 Thessalus, son of Hippocrates, 111,
 126
 Thessalus Trallianus, and his char-
 latantry, 164
 Thieddeg of Prague, 204
 Tobias, bishop of Rosa, 202
 Toledo, school of, 191
 Touch, cure by, 209
 Tourniquet of Petit, 265
 Toxaris, 82
 Toxicologists, royal, 153
 Trallian, Alexander, 184
 practice of, 185
 Trepanning first performed by sur-
 geons, 230
 Trotula, 210
- UNITED STATES**, medical pro-
 gress of. (See AMERICA.)
 University of Naples founded, 210
 of Messina founded, 210
 of Pennsylvania, foundation of,
 273. (See also SCHOOL, COL-
 LEGE, &c.)
 Urinary diseases, treatment of, in
 16th century, 231
- VACCINATION**, discovery of, 266
 Valentine, Basil, chemical dis-
 coveries of, 220

- Valsalva, on the ear, 262
 Van Helmont, 228, 236
 Van Swieten, commentaries of, 253
 Vavasseur, Guillaume, 232
 Veins, valves of, discovered, 233
 Vena cava, valves of, first observed, 142
 Vesalius, Andreas, 232, 233
 Veterinary art, works on, 187
 Vettius Valens, 159
 Vianeo, Vincent, 219
 Vicq d'Azyr, physiological views of, 265
 Vigo the Genoese, works of, 231
 Vieussens, Raymond, 240
 Vindicianus, 178
 Vision, study of organs of, 242
 Votive tablets, 48, 107
- W**EPFER, J. J., 241
 Wharton, Thomas, 241
 Whytt, 253
 Willis, Thomas, views of, 238, 241
 Wine, Pramnian, prescribed, 39
 Winslow, experiments on the heart, 260
 Wirsung, John George, 240
 Wodestoke, William de, Abbot of Croxton, 205
 Wurz, Felix, 231
- Z**ACUTUS Lusitanus, writings of, 240
 Zamolxis, 82
 Zeno of Cyprus, 179
 Zenon of Laodicea, 142
 Zinn on the eye, 262
 Zwinger of Basle, 225

THE END.