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[Bostock, John]

HISTORY

OF

MEDICINE.

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The Writer of this Essay begs to remark that the references inserted at the foot of the page are to be regarded as the authorities for the facts and dates contained in the text; with respect to the opinions that are maintained, he is to be considered as alone answerable for them. Where he has conceived it necessary to dissent from, or to controvert, the doctrines of his predecessors, he has endeavoured to do it without acrimony or arrogance, and he trusts that his remarks will be received with the same spirit of candour in which they are offered. He thinks it necessary to state that wherever a reference is made to any book, the book so referred to has been examined by him.

HISTORY

OF

MEDICINE.

CHAPTER I.

Introduction—Division of the history of medicine into three great chronological periods—History of medicine previously to its introduction into Greece—Origin of medicine—State of medicine among the Egyptians—Among the Assyrians—Among the Jews—Introduction of medicine into Greece—Chiron—Æsculapius—Machaon—Podalirius—The Asclepiades—Records in the temples of Æsculapius—Ancient inscriptions—Pythagoras—Democritus—Heraclitus—Acron—Herodicus—Gymnastic medicine.

ALTHOUGH the primary object of this treatise is to present a view of the history and progress of practical medicine, yet it will be impossible to avoid entering occasionally into the consideration of the various theories and speculations which have so generally prevailed in the science. Medical theory and practice have been so intimately blended together, that it would be useless to attempt to separate them. The terms which are employed, in works of the most practical nature, are for the most part, derived from the theory which was current at the time of their publication, and even the narrative of facts and the direct details of experience are, with a few exceptions, deeply tinged with the prevailing doctrines of the day, or with the individual speculations of the writer. Those who are versed in medical science, and who are acquainted with the relation which it bears to the other physical sciences, with the mode in which it is acquired, and the nature of the evidence on which it rests, will easily perceive that, in this department, it is peculiarly difficult to separate facts from hypothesis. It may, however, be asserted, that until this be accomplished, medicine can never be placed upon the basis of induction, and that this alone can give it that stability, which may entitle it to be regarded as a correct science. In its present condition it will be impossible to do more than to approximate to so desirable a state, but it will be a special object of attention, in the following pages, to endeavour to point out the limits between practice and theory, between facts, and the opinions that have been deduced from them.

When we take an extended view of the progress of medicine, tracing it from its scanty sources, in the most remote periods of society, and observe its course, as gradually augmented by the stores of Grecian and Roman learning, obscured by the darkness of the middle ages, and again bursting forth in the copious and almost overwhelming streams of modern literature, we are naturally led to separate the narrative into three divisions, corresponding to the three great chronological periods. The first of these will comprehend the history of practical medicine, from the earliest records which we possess, to the decline of Roman literature; the second will contain an ac-

count of the state of the science, through what are termed the dark ages, until the revival of letters; the third will commence with the establishment of the inductive philosophy, and be continued to the present time.

In tracing the history of this science from its earliest records, it will not be necessary to devote much time to a subject, which was formerly discussed with great learning and acuteness, viz. the origin of medicine. It may be sufficient to remark that, in proportion to the progress of civilization or refinement, attempts would be made to remove or alleviate the diseases, and to repair the injuries, to which the body is constantly incident. Subject as it is, at all times, to the influence of various noxious agents, and to a consequent derangement of its functions, to painful affections of various kinds, and to the loss or depravation of its powers or actions, we must conceive that mankind would be anxious to remove or relieve these evils. The means that would be employed must have been, in the first instance, extremely imperfect, and frequently ill directed. They may have been suggested by the effects of certain kinds of food, or by the operation of certain external agents on the body: some analogies may have been derived from the spontaneous actions of the system, by observing the natural efforts of the constitution to remove certain causes of disease, or to relieve the patient when suffering from their effects. Thus, in the earliest periods of society, mankind must have been aware of the relief which was obtained, in the derangements of the alimentary canal, by an evacuation of its contents, and would probably have discovered, incidentally, that certain vegetable substances promoted this operation. In the external injuries to which the body is subject, more especially in a rude state of society, means would early be had recourse to for procuring present ease from pain, or for removing the obvious danger to life, which would so frequently follow from various causes. It would soon be found that the pain was diminished by excluding the wounded part from the air, or from other extraneous substances; that by certain modes of pressure, the flow of blood might be restricted; and that, in some cases an increased, and in others a diminished temperature, gave immediate ease to the patient, and tended to promote the ultimate cure. A rude species of medical and surgical practice of this description has been, in all cases, found to exist in newly-discovered countries, even when in the most barbarous state; while it has been observed generally, that the improvement in the healing art has been nearly in proportion to the advancement of the other arts of life, and to the gradual progress of knowledge on all subjects intimately connected with our existence or welfare.

The historical records which we possess respecting the progress of practical medicine are scanty and uncertain; but, so far as they extend, they coincide with the view of the subject taken above. The writers who have investigated this point with the greatest learning and assiduity inform us, that Egypt was the country in which the art of medicine, as well as the other arts of civilized life, was first cultivated with any degree of success, and that it had advanced so far as to have become a distinct profession. We are not, however, informed in what degree or to what extent that distinct appropriation was carried; whether medicine was made the exclusive business of certain individuals, who were regularly instructed for that purpose; whether it was attached to certain public functionaries, especially to the priests; or whether persons in different situations applied themselves to the practice of medicine, from a real or supposed superiority in their skill and in their knowledge of the treatment of diseases. The probability, however, is that the priests of the Egyptians were at the same time their physicians. This appears to have been the case among the Jews and the Greeks, who are supposed to have borrowed from the Egyptians many of their institutions; and indeed it seems to be the natural progress of society in its earlier periods, when the priests were generally the depositories of knowledge of all kinds, and when they confined it as much as possible to their own use, for the purpose of maintaining their influence over the rest of the community.

From some remarks which are made incidentally in the Mosaic writings respecting the learning of the Egyptian priests, it would appear that it consisted, in a great measure, of the employment of magical incantations, and, so far therefore as it effected the cure of disease, must have operated through the medium of the imagination. This has been, in all cases, the first step in the art of medicine, if it may be so called, and its efficacy must have been in exact proportion to the ignorance and superstition of the people on whom it was exercised.

A circumstance respecting the practice of medicine in Egypt is mentioned by Herodotus, as existing when he visited that country, and which, it may be presumed, was transmitted from a much earlier period, that certain individuals treated certain diseases only.* This division into separate branches might, at first view, seem to indicate a considerable progress in the practice of medicine, and it may undoubtedly have led to a degree of manual dexterity and of minute observation in certain departments. But, independent of any other consideration, we may rest assured, that the science must have remained in a state of complete degradation, when we bear in mind that it was the custom in Egypt, as it is in the present day among many of the nations of the east, to transmit the same occupations from father to son, through a number of successive generations. This practice, although it may be favorable to the perfection of an art, or even of a science, in some of its minute details, must furnish an almost insurmountable obstacle to its general improvement, or to the development of the powers and faculties of the human mind.

Although we are in the habit of considering Egypt as the parent of the arts and sciences, the empire of Assyria has been supposed, by many learned men, to possess a greater claim to this distinction. Perhaps the priority of invention may be justly awarded to the Assyrians, but the memorials which they have left behind them are so scanty, that the degree of excellence to which they arrived is almost entirely conjectural. The priests of this nation, as in all other cases, appear to have been the depositaries of all the learning of the times, and of that of medicine among the rest. We have reason to suppose that their practice consisted of little more than the dexterous application of magical arts, and such other means as tended to impress the minds of the people with a sense of their power over the operations of nature, while any actual information which they possessed was carefully concealed under the guise of mystery and superstition.†

In the writings of Moses there are various allusions to the practice of medicine among the Jews, and more especially with regard to the treatment of leprosy. The priests appear in this, as in other cases, to have been the practitioners; the treatment consisted principally in certain regulations for the purpose of promoting cleanliness and preventing contagion, together with various ceremonies, which, so far as they could affect the patient, must have acted entirely on the imagination.‡ So little is known respecting the state of the arts and sciences in the other countries of the east, at these remote periods, that it is scarcely necessary to allude to them in this place. We shall only remark that the imperfect and scanty notices which we possess on this subject would lead us to conclude, that the practice of medicine was even in a less advanced state than among the Egyptians, its progress being regulated by the greater or less degree of refinement or civilization of the respective countries, but in no case having advanced beyond the state of implicit credulity and gross superstition.§

After having given an account of the state of medicine among the ancient Egyptians and other contemporary nations, as far as can be gleaned from the scanty records that remain on this subject, we must follow it into Greece, and trace its progress from the period of its first introduction in the remote and semi-fabulous ages of their *demigods* and *heroes*, until it acquired the rank of a science under the genius of Hippocrates. It is generally admitted, that although Greece cultivated the arts and sciences with so much success, yet, in the first instance, she borrowed them from the neighbouring nations; principally, as it would appear, from Egypt, and in some cases from

* Euterpe, §. 81.

† *Herodotus*, Clio, passim; *Enfield's* History of Phil. v. 1. p. 25 et seq.

‡ Leviticus, chap. xiii.-xv.

§ For further information respecting the state of medicine among the Egyptians and the other nations of antiquity, previously to the Greeks and Romans, the reader is referred to the following works. *Herodotus*, Euterpe et Clio, passim. *Diodorus Siculus*, lib. i. sect. 25, 82. *Plinius*, lib. vii. cap. 56. lib. xxix. cap. 1. *Plutarchus*, De Iside et Osiride. *Josephus*, Antiq. Jud. lib. viii. cap. 2. §. 5. *Clemens Alexandrinus*, a Potter, Stromat. lib. vi. p. 758. *Conring*. Introd. Art. Med. cap. 3. §. 2. et De Hermet. Med. passim. *Barchusen*, Diss. no. 1. et 7. *Gruner*, Analecta, Diss. 1. De Ægyptiorum Veterum Anatome. *Schulz*, Hist. Med. p. 1. sect. 1. *Clerc*, Hist. de la Méd. par. 1. liv. i. chap. 1—8. *Sprengel*, Hist. de la Méd. par Jourdan, sect. 2. ch. 1—3. *Enfield's* Hist. of Phil. v. 1. p. 86, 7 et alibi. *Pauw*, on the Egyptians and Chinese, part 1. sect. 2. *Bryant's* Analysis, v. 2. p. 324 et seq. et in multis aliis locis. *Cabanis*, Révol. de la Méd. ch. 2. §. 1. *Ackermann*, Instit. Hist. Med. p. 1, c. 1, 2. *Lauth*, Hist. de l'Anatomie, liv. i. *Blumenbach*, Introd. in Historiam Medicinæ Litter. sect. 1—3.

Phœnicia.* To certain individuals who migrated from these countries, the Greeks themselves were in the habit of referring the introduction of many of the most useful inventions, and during a considerable space of time all those who were desirous of acquiring a larger share of knowledge, either theoretical or practical, than was possessed by their countrymen, visited Egypt, as the great storehouse of science and learning. It is from this cause that we find so much analogy between the divinities that were worshipped in the two countries, as inventors or patrons of the various arts and sciences. For although they acquired new names on their being transferred into Europe, yet their attributes, and even their forms, clearly demonstrate their origin. This is particularly the case with respect to medicine, so that in the Orus and Thouth of the Egyptians we may recognize the prototypes of the Apollo and Hermes of the Greeks.†

It is not until comparatively at a late period, approaching to that of the Trojan war, that we find the names of actual personages who practised medicine in Greece; and of these, it is probable that some were natives of either Africa or Asia, who brought with them the information which they had acquired in their respective countries. Of those whose history is better known, and who were acknowledged to be of Grecian origin, it was the general custom to travel into Egypt for the purpose of obtaining a knowledge of their art, and with this view they submitted to a system of rigid discipline, and to a variety of irksome and burdensome ceremonies; and after all this laborious process, so far as the science of medicine is concerned, the result seems to have been little more than the knowledge of magic and incantations, with some rude notions respecting the application of external remedies for the cure of wounds and of cutaneous diseases, with a very imperfect idea of the anatomy of the human body, and a very inadequate conception of its functions.‡

The first native of Greece who is more particularly singled out, as having introduced the art of medicine among his countrymen, is the centaur Chiron. There is much mystery attached to his character and to every thing connected with him, but what we may consider as the most probable conclusion is, that he was a prince of Thessaly, who lived about the thirteenth century before the Christian æra; that he was distinguished above his contemporaries for his knowledge of the arts of life, and that, after the manner of his countrymen, he was frequently seen on horseback, so as to give rise to the fabulous account of his compound form. He is particularly celebrated for his skill in medicine and in music, a combination, it may be remarked, that was said to have existed in many other individuals. We are not informed by what means he obtained his superior knowledge in medicine, but there are various circumstances, which lead us to conclude, that it was at that time regarded rather as a part of the education of all men of rank, than as attached to a particular profession. We accordingly find that he instructed the Argonauts in medicine, and the heroes who were engaged in the siege of Troy, and that all the kings and warriors of that period were more or less acquainted with the treatment of wounds, and even with the practices which were adopted for the cure of internal diseases.§

But although Chiron has the reputation of having introduced the art of medicine into Greece, it is to his pupil Æsculapius, that by the common consent of antiquity, is ascribed the merit of having first devoted himself to the cultivation of medicine as a science, and of having made it a distinct object of pursuit. The improvements which he made in the art were so considerable, as to have induced his countrymen, after his death, to pay him divine honours, to designate him as the God of physic, to erect temples to him in various parts of Greece,‖ and to derive his origin from Apollo himself. His history, when divested of all the fabulous appendages that were attached to it by his contemporaries, appears to be that he was a native of Epidaurus, that he was exposed in his infancy, probably in consequence of his illegitimate birth, that he was

* Vide *Bryant*, ubi supra, et v. 2. p. 426 et seq. et alibi.

† *Haller*, Bibl. Med. pract. lib. 1. §. 7, 8. *Hundertmark*, in Ackermann, Opuscula, Exerc. no. 1.

‡ *Herodotus*, Euterpe, passim. *Diodorus Siculus*, lib. 1. passim. *Josephus*, Antiq. Jud. lib. viii. cap. 2. §. 5. Odyss. xix. 656 et seq. Æneis, vii. 753 et seq.

§ Ilias, xi. 636 et seq. *Sprengel*, t. 1. p. 112, 13. *Ackermann*, per. 1, cap. 3. §. 25—40.

‖ *Pausanias*, lib. i. cap. 21; ii 10; ii. 13; iii. 22; iv. 31; vii. 21; vii. 23; vii. 27; viii. 25. *Strabo*, lib. viii. p. 592; ix. 668; xiii. 899; xvi. 1097, a Casaubon, Amst. 1707. *Clerc*, part 1, liv. i. ch. 20.

accidentally discovered by a shepherd, and placed under the care of Chiron. His death was said to have been caused by the jealousy of Pluto, in consequence of the number of individuals whom he rescued from the grave; from which tale we may at least conclude that his reputation as a successful practitioner must have been much higher than that of any of his contemporaries.*

According to the custom of that age, he transmitted his profession to his sons Machaon and Podalirius, who accompanied the Greeks in the Trojan expedition, and are celebrated in various passages of the Iliad for their medical skill.† From the incidental mention that is made by Homer and the early Greek writers of the nature of the remedies that were employed by these individuals or their contemporaries, it will appear that their practice was principally surgical, and nearly confined to the treatment of wounds, and that, with respect to internal diseases, they were for the most part conceived to be the immediate infliction of the Deity, and were therefore abandoned as incurable, or at least were to be obviated only by charms and incantations, and that the arts of magic formed no inconsiderable part even of their surgical practice.‡

The practice of medicine remained for a considerable time hereditary in the family of Æsculapius, and in a great measure confined to it. His descendants obtained the name of Asclepiades; they were the priests of his temples, and presided over and directed the rites and ceremonies.§ These temples, indeed, became a species of hospitals, to which patients resorted from all quarters for the relief of the diseases with which they were affected. Under the direction of the priests of these temples they underwent a variety of ceremonies, the immediate effect of which must have been principally upon the imagination. Some, however, of the practices which were enjoined were of a dietetic nature, and were directly conducive to temperance and cleanliness; such as frequent ablution, and the abstaining from certain kinds of food. To these if we add that the temples were generally erected in healthy situations, that the patients enjoyed rest and leisure, and that the mind was interested by a succession of new and pleasing impressions, we may suppose that they would be placed under circumstances, not a little resembling those which are found so conducive to health, by the invalids who frequent the medicinal springs and other analogous establishments of modern times.‖

Although the accounts that have been transmitted to us respecting Æsculapius would lead us to conclude that he was a real personage, who actually possessed a greater degree of medical skill than any of his contemporaries, yet his whole history is so involved in fable and mystery, that it is impossible to obtain any correct idea of the details of his practice. It has been observed above that it was probably, in a great measure, surgical, and even confined almost exclusively to the cure of wounds or recent injuries. The treatment of these may be considered so far judicious as it was simple; it consisted in removing all extraneous bodies, in placing the parts as much as possible in their natural position, in fomentations and ablutions, and in the application of certain vegetables which were supposed to be possessed of balsamic or styptic properties. Wine and other articles of a more stimulating nature were also used, while oleaginous substances were employed nearly with the same intention as in modern times, to defend the part from the air or other external agents, together with bandages and other means of mechanical support. We have no distinct evidence how far internal remedies were administered; for the most part they relied on magical arts and incantations, and although we have reason to believe that certain vegetable products were occasionally employed as internal remedies, we are scarcely able to discover what was the object of the practitioner, and we are frequently unable to ascertain what were the plants that were employed.¶

* *Diodorus Siculus*, lib. iv. §. 71. *Hyginus*, fab. 49 et alibi. *Clerc*, part i. liv. i. ch. 11—16. *Ortelius*, Capita Deor. lib. ii. in Gronovii Thes. Græc. t. 7. p. 278 et seq. *Montfaucon*, Antiq. v. i. book ii. ch. 1, 2. *Sprengel*, t. i. p. 119 et seq. *Ackermann*, per. 1. cap. 3. §. 41—59; and especially the second dissertation in his Opuscula, by Günzius and Richter.

† *Clerc*, part 1, liv. i. ch. 17. *Sprengel*, t. i. p. 127 et seq. *Goulin*, "Anciens Médecins," in Encyc. Méthod. "Médecine:" this article may be advantageously consulted on the subject of the Greek and Roman physicians.

‡ Ilias xi. 636 et seq. Odyss. xix. 456 et seq.

§ *Sprengel*, t. i. p. 168 et seq.

‖ *Clerc*, part i. liv. ii. ch. 2–6. *Schulz*, par. i. sect. 2, cap. 4. *Sprengel*, t. i. p. 153 et seq. *Cabanis*, p. 59, 60.

¶ *Celsus*, lib. i. præf.; *Plinius*, lib. xxix. cap. 1; *Clerc*, part 1, liv. i. ch. 15; *Schulz*, p. i. sect. 2, cap. 4; *Sprengel*, sect. 2, ch. 4, 5. *Cabanis*, ch. 2, §. 1.

But scanty and imperfect as is our knowledge of the state of medicine in the age of Æsculapius, after his death and that of his sons Machaon and Podalirius, we have a long period, extending even to several centuries, during which we have still less information respecting the history and progress of the science. We have not a single improvement of any importance recorded as having taken place during this long interval, nor have we the names of any individuals transmitted to us, who were of sufficient eminence to be distinguished above their contemporaries. We learn that the practice of medicine was entirely confined to the Asclepiades, who were the guardians or superintendents of the temples that were erected in honour of Æsculapius. It may be inferred from the very scanty materials which we possess on the subject, consisting entirely of allusions or indirect accounts, scattered through the works of the older poets and historians, that they sedulously kept up the system of rites and ceremonies, which had been handed down to them from still more ancient practitioners, that they carefully preserved to themselves the sole management of the art over which they presided, and we cannot doubt made use of the influence which they acquired over the minds of their contemporaries for the purposes both of gain and of ambition.* But although we regard the general system of the priests of Æsculapius to be nothing more than a tissue of mystery and delusion, it is very probable that the ample opportunities which they possessed of witnessing the phenomena of disease in all its forms, might enable them to obtain much valuable information respecting the nature and tendency of the morbid actions of the body, and of the effects of certain agents upon them. Men possessed of superior talents and sagacity would naturally profit by these advantages, and we accordingly find that some of these temples acquired a high degree of celebrity, in consequence of the supposed skill of the priests that were attached to them. These opportunities of acquiring experience were much facilitated by a practice, which generally prevailed among the patients, whenever they were cured of their diseases, of depositing in the temple a votive tablet, on which was inscribed a narrative of the case, including a statement of the symptoms of the disease, and the means adopted for its removal. The temples were thus converted, to a certain extent, into schools of medicine, and as these records were religiously preserved, they became the repositories of much important information, which must have gradually led to an improvement in the art. Of the numerous temples that were dedicated to Æsculapius, there were three which acquired peculiar celebrity, those of Cos, of Gnidos, and of Rhodes; we are informed that Hippocrates made great use of these records, and it has even been supposed that one of the treatises which is generally ascribed to him, "Coacæ Prænotiones," was composed from the records which he procured from the temple of Cos.

Some ancient inscriptions have been discovered by the researches of the learned antiquaries of the last century, which would appear to consist of memorials of this kind; and from these specimens we may form some idea of the nature of the information that would be conveyed by them. For the most part they state little more than the name of the disease, together with a very brief account of the means adopted for its relief, which in many cases depended entirely upon certain ceremonies, and in others upon the application of remedies which, we may venture to assert, could have no physical operation.† Still, however, some experience of the nature and treatment of disease might have been conveyed by their means, and of this we may presume that an individual of a sagacious mind would have availed himself for the improvement of his art.

Among the few circumstances that are transmitted to us respecting the principles and practice of the Asclepiades, we are informed that the priests connected with the two rival establishments of Cos and Gnidos, devoted their attention in some measure to different objects; those of the former assumed more of a philosophical cast, attempting to unite reasoning with experience, while the latter attached themselves solely to the observation and collection of mere matters of fact. Hence it would appear that a foundation was thus early laid for the two great sects of the Dogmatists and the Empirics, which long divided the medical world, and the influence of which is, even at this day, not altogether destroyed. We may remark, however, that the philosophy of the school of Cos, if it may be so called, was founded upon such totally incorrect principles, and

* *Lucian*, in his "Philopseudes," gives an account of various medical superstitions which prevailed at a later period, many of which were probably transmitted from the empirics of antiquity. See Tooke's Trans. v. i. p. 87. et seq.

† *Gruter*, Corp. Inscrip. a Grævio, pl. 17 et alibi. *Ackermann*, Opuscula, Diss. 3, sect. 3. by Hundertmark and Carpzov.

upon so fallacious a basis, that little immediate benefit was derived from it, and that it was only useful so far as it might lead them to exercise their intellectual powers, and enable them to reason more correctly on medical subjects. By the mode in which Hippocrates speaks of certain practices, such as bleeding and the administration of emetics, purgatives, and other analogous medicinal agents, we may infer that they were in common use among his contemporaries, and probably had been so for a long time before him. We may in some instances obtain a knowledge of the vegetable substances that were employed in these early ages, as well as of the individuals who introduced them into practice, by the names which were afterwards imposed upon them by the ancients. It must indeed be obvious that the indication derived from these names is far from being decisive as applied to any particular case, but we derive a general inference from it as to the nature of the articles employed, while they serve to point out the persons who were supposed to have been the most eminent for their skill or their science.

Some centuries had elapsed, during which the practice of medicine continued altogether in the hands of the priesthood, and under their control had remained nearly stationary. It had been exercised, for the most part, for the purpose either of direct emolument, or for the still more selfish purpose of maintaining their influence over the minds of the people, when it began to be cultivated by a different description of persons, much more likely to produce a spirit of improvement, and from whom in reality it derived its first impulse. It was during the sixth century before the Christian æra that the genuine principles of philosophy first made their appearance in Greece, and among the other topics which then became the subject of investigation, the powers and functions of the human body were examined with considerable attention. This led to an inquiry into the nature and cause of diseases, and to the means of their removal; and although a long period elapsed before much actual advance was made in the knowledge of pathology or of the practice of medicine, yet we observe the effect of a more correct mode of reasoning, and may perceive that the strong-holds of mystery and superstition, although not destroyed, were at least in some degree weakened.*

The celebrated name of Pythagoras may be mentioned as the first of this class respecting whom we have any accurate information, and even his history is enveloped in much obscurity. We may, however, conclude with certainty that he devoted the greatest portion of a long life to the pursuit of natural knowledge, that he made many considerable advances in various departments of science, and among others in the knowledge of the structure and actions of the human frame. It has been supposed that he dissected the bodies of animals, and hence acquired a certain acquaintance with anatomy, and that he publicly taught what he knew on this subject to a large assembly of students who came from all the civilized parts of Greece and Italy to Crotona, where he established his school. We are informed that, for the purpose of acquiring knowledge, he travelled into those countries which, previously to his time, were regarded as the depositaries of knowledge, particularly Egypt, where he is said to have passed no less than twenty-two years, and probably also Chaldæa and some parts of Eastern Asia. From what has been stated above, we may form some conception of the nature of the knowledge that he would obtain from these sources, and we may conclude that he must have been possessed of a very superior mind to have been capable of extricating himself from the trammels of superstition and bigotry in which every thing connected with those countries was involved.†

We are scarcely able to determine in what degree he directly improved the practice of medicine; it is probable, however, that, as he did not make it his profession, but studied it only in connexion with the other branches of natural philosophy, the actual additions which he made to it were not considerable.‡ This we may also conclude to have been the case with many of his pupils, who were among the most justly celebrated philosophers of that and the succeeding age. They may all of them be regarded as belonging to the school of Pythagoras, inasmuch as they cultivated natural knowledge by means of observation, and even occasionally of a rude kind of experiment; and

* *Sprengel*, sect. 3, ch. 1.

† *Diogenes Laertius*, lib. viii. cap. 1–50. *Cicero*, de Fin. v. 29. *Valer. Maximus*, viii. 7. *Ælianus*, Hist. Var. iv. 17. *Clemens Alexandrinus*, Stromat. lib. i. p. 354–7. *Fabricius*, Bibl. Græc. lib. ii. cap. 12. *Enfield*, vol. i. p. 422 et seq. *Ackermann*, Instit. Per. 2, cap. 4, 5; Opuscula, diss. 4, a Kühn.

‡ *Sprengel*, t. i. p. 337 et seq.

although none of them were exclusively devoted to the study of medicine, yet they gradually and indirectly contributed to its advancement, so as to prepare the way for one of those great and commanding geniuses who occasionally make their appearance, and by their intellectual ascendancy produce such important revolutions in the world of science; it is unnecessary to state that we here allude to Hippocrates.

During the interval from Pythagoras to Hippocrates there are few names that require any particular notice as improvers of medicine. Democritus* and Heraclitus† were among the most illustrious followers of Pythagoras, but they became famous rather from the ingenuity with which they supported their peculiar hypotheses than from the additions which they made to actual knowledge. They applied respectively their favourite doctrines of atoms and elements to explain the phenomena of disease, and even the operation of remedies; but, it is unnecessary to say, with little real advantage. The former of these philosophers, however, deserves honourable mention from the attention which he paid to the study of comparative anatomy; and it has been conjectured that he so far rose superior to the prejudices of his age as to venture upon the dissection of the human subject.

The name of Acron is mentioned by Pliny‡ as among the first who attempted, upon any general principles, to apply philosophical reasoning to the science of medicine, but we have scarcely any knowledge of his history or character, nor have we any memorials left of the principles which he adopted.§ We may also select the name of Herodicus as having been considered the inventor of what was styled gymnastic medicine,‖ which was regarded by the Greeks as a very important branch of the art. Schools for the practice of the gymnastic exercises were established in various parts of Greece, and were placed under the direction and superintendence of persons especially trained for the purpose, who took charge of the health of their pupils, and who appear to have undertaken the treatment both of the accidents which occasionally occurred in their establishments, and also, when necessary, of internal diseases. These gymnasiarchs, as they were styled, must in this way have acquired a certain degree of information respecting the nature of disease, and seem to have been considered as among the most skilful practitioners of the age in which they lived.¶

CHAP. II.

An account of the opinions and practice of Hippocrates and his contemporaries—Remarks on the history and education of Hippocrates—High estimation in which he was held—Remarks on his character and acquirements—On his works—Account of his principles and doctrines, his physiology, pathology, anatomy, and practice.

We now enter upon the history of an individual of very distinguished character and acquirements, who was destined to effect a complete revolution in his profession, and to introduce a system which may be considered as having laid a foundation for all its future improvements. The contemporaries and immediate successors of Hippocrates were so sensible of his merit that he acquired from them the title, which he has since retained, of Father of Medicine; and it may be confidently affirmed that the science is more indebted to his genius and ability than to that of any single individual. It is a little remarkable that, notwithstanding the great celebrity which he attained, we have no very correct knowledge of his history, of the mode of his education, or of the means by which he acquired his wonderful pre-eminence. All that we are able to learn on these points with any degree of certainty is, that he was brought up among the Asclepiades, who were attached to the temple of Cos, that he studied medicine under Herodicus, and that he embraced the philosophical hypothesis of Heraclitus; he is also reputed to have been a lineal descendant, in the eighteenth degree, from Æsculapius, and may therefore be supposed to have been devoted to the profession

* *Clerc*, p. 96–101. *Enfield*, vol. i. p. 422 et seq. *Barchusen*, diss. No. 1. *Sprengel*, t. i. p. 261–6.

† *Clerc*, p. 95, 6. *Sprengel*, t. i. p. 266–9. *Enfield*, vol. i. p. 436 et seq.

‡ Lib. xxix. cap. 1.

§ *Clerc*, part i. liv. ii. ch. 7.

‖ *Clerc*, part i. liv. ii. ch. 8. *Mercurialis*, De Arte Gymnastica. *Schulz*, p. 192 et seq. *Barbier*, in Dict. Scien. Méd. art. "Gymnastique." *Ackermann*, per. 2, cap. 6.

¶ *Plato*, De Repub. passim. et De Leg. lib. vii. Schulz has judiciously summed up in a series of general propositions the history and progress of medicine up to the period at which we are now arrived; p. 201. 2.

from an early period of life, and must have had access to all the records which were accumulated in the establishment to which he belonged. These circumstances may have had the effect of originally directing his mind to the pursuits in which he afterwards became so eminent; but we must suppose that he possessed from nature a genius singularly adapted to the advancement of medical science, by which he was enabled so far to surpass all those who were placed in situations equally advantageous. We are informed that he spent a considerable portion of his life in travelling through foreign countries, partly for the purpose of obtaining information, and partly from the circumstance of his assistance being required to undertake the cure of persons of rank, to arrest the progress of epidemics, or to check the ravages of endemic diseases. The works that he left behind him are very numerous, and considering their antiquity, they may be regarded as in a tolerably perfect state.

Unfortunately, however, to those which appear to have a just claim to be considered as his genuine productions, there are appended a number of others, which it may be concluded are spurious, either written by his pupils or successors, or fraudulently attached to his name in consequence of its great celebrity. Many eminent critics have exercised their ingenuity in endeavouring to separate the genuine from the spurious writings of Hippocrates; and in such estimation was he held, that for many ages a main object with all writers on medical topics was to comment on the works of Hippocrates, to elucidate his principles by subsequent observation, or to support their respective doctrines by his authority. He is mentioned with great respect by Plato, Celsus, and Pliny, and by others among the ancients; Galen speaks of him with a degree of almost enthusiastic admiration, and at the revival of letters the most learned men of the times devoted themselves to the elucidation of his works by glossaries, commentaries, and criticisms of all descriptions. In Italy, Germany, and France, where learning first began to revive, and where the earliest universities were established, we have, among other illustrious names, those of Alpinus, Cornarius, Hollerius, Ballonius, Mercurialis, Fernel, Heurnius, Sennert, Fœsius, Riolan, and Duret,* who, however they might differ in their opinions and practice, all coincided in regarding Hippocrates with equal respect, and considered him as having first placed the study of medicine on its correct basis.†

We are hence naturally led to inquire what were the circumstances, in the intellectual or literary character of Hippocrates, which produced this powerful impression, and perhaps we may assign the following as among the most influential. He appears to have had the sagacity to discover the great and fundamental truth, that in medicine, probably even more than in any other science, the basis of all our knowledge is the accurate observation of actual phenomena, and that the correct generalization of these phenomena should be the sole foundation of all our reasoning. Every page of Hippocrates proves that he was not without his speculations and hypotheses, but at the same time we perceive that, for the most part, they were kept in subjection to the result of observation, and that when they appeared to be in opposition to each other, he had the wisdom to prefer the latter. Hence his descriptions of particular diseases, after all the revolutions of customs and habits, both moral and physical, are still found to be correct representations of nature, while his indications of cure, and the treatment derived from them, are generally rational and practicable. When we reflect that at this period anatomy was scarcely practised,‡ that physiology was almost unknown, that the materia medica was nearly confined to vegetable substances, and of these to such as were indigenous to Greece and the neighbouring countries, our admiration of the skill and talents of Hippocrates will be still farther increased, and we are induced to regard him as one of those rare geniuses, who so far outstrip their contemporaries as to form an æra in the history of science.

With respect to the particular improvements which he introduced into the practice

* In designating the names of authors who flourished after the revival of letters, it is somewhat difficult to determine, whether we ought to employ their actual or their latinized names; we have adopted the former, where it could be done without ambiguity or the appearance of affectation.

† *Conring*, Intr. cap. 3. § 8. et alibi. *Haller*, Bibl. Med. Prac. lib. vi.; it is entitled "Schola Hippocratica," and is carried down to the beginning of the seventeenth century.

‡ *Gruner*, Analecta, diss. 2. "Hippocrates, corpora humana insecuerit necne?" He discusses the question with much learning and candour, and decides in the negative.

of medicine, we may remark that one of the first importance was the narration of individual cases of disease, a plan which may perhaps have been suggested to him by the votive tablets deposited in the temple of Æsculapius, but upon which he so far improved as to be entitled to the merit of an inventor. The second point on which we shall remark, was his method of endeavouring to remove particular symptoms by carefully noticing what have been termed the *juvantia* and the *lædentia*, watching the effect of his applications, and proceeding, by a cautious analogy, from individual facts to more general conclusions, and hence deducing his indications of cure from the operation of remedies, not from any preconceived or abstract principles, which were generally either fallacious or inapplicable. Hence his practice may be characterized as consisting in what has been termed a rational empiricism, where we first ascertain the fact, and afterwards reason upon its consequences.

In speaking of the writings of Hippocrates, it may be proper to remark that the most complete edition of them, in all respects, is that of Fœsius, in which every circumstance is attended to that can illustrate them or render them more easily intelligible. He has given a list of all the commentaries and criticisms that had been written upon them, which at the time of his publication, in the year 1595, would of themselves have formed an extensive library. It appears from this list that no less than one hundred and thirty-seven authors had published on the subject of the Aphorisms alone. It was remarked above that many of the writings which are commonly ascribed to Hippocrates, or at least are published in the collection of his works, are supposed not to have been his genuine productions, and hence it has been an object of interest with many eminent critics to distinguish the one from the other. It will not be necessary for us to enter into these discussions in this place; we shall only remark that the number of treatises which are admitted to be certainly genuine is very small compared to the whole number popularly ascribed to him. Of those which are printed in the ordinary editions of his works, which amount to more than sixty, Mercurialis, Haller, Gruner, and other critics conceive that there are a few only which were actually written by Hippocrates, while Ackermann has reduced the number of the genuine works to ten.*

In ascertaining what were the real opinions and practices of Hippocrates, besides the difficulty of discriminating the genuine from the spurious productions, we have a farther difficulty arising from the peculiarity of his style. This is admitted to be brief and abrupt, and to be full of ideas compared with the number of words employed to convey them, so that it appeared somewhat obscure even to his contemporaries and immediate successors. Erotianus, who lived in the first century of the Christian era, thought it necessary to write a glossary for the express purpose of elucidating his phraseology; and the immense number of commentaries which have appeared, and which continued to be published until the commencement of the eighteenth century, must be regarded, not only as a tribute to his extraordinary merit, but in some measure as an indirect censure of his style. But after making all due allowance for these peculiarities, after rejecting all the doubtful works and obscure passages, and resting more upon the general scope and tendency of the treatises than on particular words and phrases, we have sufficient evidence left us of the nature of his principles, both as regards theory and practice. Although it is principally in the latter capacity that we are now to regard Hippocrates, yet it will be proper to make a few remarks upon his acquirements in the analogous departments of science.

With respect to his philosophical tenets it appears that the father of medicine must be classed generally among the Pythagoreans, and in the particular sect or school of Heraclitus. The leading doctrine of this philosopher was, that fire is the prime origin of all matter, and that by the collision and peculiar combination of its particles, which are in perpetual motion, the four elements are produced.† From this doctrine Hippocrates derived his leading principles of pathology; it lies at the foundation of all his medical hypotheses, and is brought forward in various parts of his works. But

* *Conring*, cap. 3, § 8. *Clerc*, par. 1, liv. iii. ch. 30. *Mercurialis*, Censura et Dispositio Operum Hippocratis. *Gruner*, Analecta, No. 2. *Kühn*, Bib. Med. p. 167–171, for the editions of Hippocrates. *Haller*, Bibliotheca Med. Pract. lib. i. § 17–21. *Eloy*, Dict. hist. in loco. *Ackermann*, Inst. Hist. Med. per. 1, cap. 8, § 102. *Blumenbach*, Introd. § 34. *Goulin*, Enc. Méth. Médecine, "Hippocrate," p. 202–5.

† *Enfield*, b. 2, c. 14, v. 1. p. 436 et seq.

although, like all his contemporaries, and indeed nearly all his successors up to the present day, he assumed certain theoretical principles, yet, as we remarked above, he had the extraordinary sagacity to perceive the necessity of detaching medicine from what was then styled philosophy. He professed to examine the phenomena of disease in the first instance, to ascertain what were the natural powers and properties of the animal frame, how far these were affected by external circumstances and by morbid causes, and hence to derive his curative indications and his mode of treatment. It is in the writings of Hippocrates that we observe the first traces of what is properly styled physiology, i. e. an account of the functions and powers of the living body. Although some of his opinions were derived from the school of Pythagoras, and savour of its mysticism and obscurity, yet others appear to have been original, and founded upon a much more correct and philosophical view of the subject. We owe to him the invention of the hypothesis of a principle, to which he gives the appellation of nature (φυσις), which influences all parts of the corporeal frame, superintends and directs its motions, and which is possessed of a kind of intelligence, so as to promote all the actions which are beneficial, and repress those which have an injurious tendency. In addition to this general principle, he conceives of others of a subordinate nature, which he styles powers (δυναμεις), which are more particularly concerned in the action of the various functions of the body. The body itself is supposed to consist of the four elements, combined in different proportions in different individuals, so as to produce an original difference in the constitution of the body, giving rise to the four temperaments. These influence both the intellectual and the corporeal part of our frame, and lay a foundation for disease independent of external circumstances, and cause these circumstances to operate in different modes and in different degrees in different individuals.

One of the leading pathological doctrines of Hippocrates was, that the fluids are the primary seat of disease, a doctrine which, under the denomination of the Humoral Pathology, became the prevailing opinion of all sects and of all theorists, until the commencement of the eighteenth century. The combination of the four elements with the four states or qualities with which they were affected, of hot, cold, moist, and dry, gave rise to the four fluids or humours of the body; blood, phlegm, bile, and black bile, which originally tended to produce the four temperaments, and which in their turn contributed to the excess or defect of each of the humours.

Another of the most important doctrines of Hippocrates is that of crises, or the natural tendency of diseases to a cure at certain stated periods, depending upon a natural train of actions, which, when proceeding in their due course, terminate in the removal of the morbid action. These supposed crises were, for the most part, evacuations of various kinds, especially by the bowels or the skin, and hence the regulation of these evacuations led to his most important indications, and became a main part of his practice. There is no subject on which Hippocrates showed more sagacity and accurate observation than in watching the effect of external agents upon the system, such as temperature, the influence of the atmosphere, the effect of particular situations, of the seasons, and other analogous circumstances. In most of these cases the causes were obscure, and he frequently erred in his attempts to explain them, but his observations were correct, and contributed materially to the success of his practice.

The extent of knowledge which Hippocrates possessed on the subject of anatomy has given rise to much learned discussion. While his admirers were unwilling to admit that he was deficient in any of the departments of medical science, and attempted to prove that he had acquired a correct knowledge of the structure of the body, it has been contended, on the other hand, that on this point his information was very imperfect. This may be readily supposed to be the case from the abhorrence with which the dissection of the human subject was regarded at that period, and from the little attention which was paid even to comparative anatomy. There are likewise other considerations of an especial nature, which lead us to conclude that he had little knowledge of the internal structure of the body, or of the relation of its different parts to each other. Notwithstanding, therefore, the claim which has been set up for Hippocrates, by some of his devoted advocates, to a knowledge of the circulation of the blood, and other claims equally extravagant and unfounded, we may conclude, with the learned and candid

Le Clerc, that the knowledge which Hippocrates possessed of anatomy was little if at all superior to that of his contemporaries.*

After these brief observations on the theoretical doctrines of Hippocrates, and of the knowledge which he possessed in the various departments of medical science, we must conclude this chapter with a somewhat more minute account of his practice. Although he has published no regular treatise on practical medicine, nor laid down any specific rules on this subject, he has given us in several parts of his works a minute detail of his treatment of various diseases, so that we are enabled to ascertain, with considerable minuteness, the general principles on which he acted, as well as the mode in which he applied them. The great principle which directed all his indications was the supposed operation of "nature," to which we have referred above, in superintending and regulating all the actions of the system. The chief business of the physician is to watch these operations, to promote or suppress them according to circumstances, and perhaps in some rare cases to attempt to counteract them. The tendency of this mode of practice would be to produce extreme caution, or rather inertness, on the part of the practitioner, and we accordingly find that Hippocrates seldom attempted to cut short any morbid action, or to remove it by any decisive or vigorous treatment. Considering the state of knowledge on all subjects when he lived, it must be admitted that this plan of proceeding was much more salutary than the opposite extreme, and that it had likewise the good effect of enabling the practitioner to make himself better acquainted with the phenomena of disease, and by observing the unaided efforts of nature, to form his indications with more correctness, and to determine to what object he ought more particularly to direct his attention. It has been remarked that a man who is possessed of an acute and penetrating genius, however strongly he may be attached to a favourite hypothesis, contrives to adapt it to the information which he acquires, and this was in some measure the case with Hippocrates. For, notwithstanding the grand principle of the all-sufficient and unerring superintendence of nature, we have another general principle brought into view, which appears altogether of an opposite tendency, viz. that a disease is to be cured by inducing a contrary state of the system, or a contrary action in the morbid part. Thus, repletion is to be relieved by evacuation, and the effect of excessive evacuation to be removed by inducing repletion; the excess or defect of any of the humours or qualities is to be relieved by the employment of such means as may augment or diminish the contrary humour or quality. Perhaps it may be said that in these cases the practitioner is in fact only anticipating the operation of nature, or producing that change which would naturally ensue were there not some unusual counteracting cause which prevented or repressed it. But it is of comparatively little consequence in what way he reconciled this apparent discordance; we have every reason to feel assured that this mode of treatment is frequently correct, and Hippocrates evinces the superiority of his genius by not suffering his judgment to be warped, even by the influence of a favourite hypothesis.

A third principle which very materially affected the practice of Hippocrates was the doctrine of critical evacuations, to which we have alluded above. As diseases were supposed to originate in the prevalence of some morbid humour, so when they are suffered to run their course without interruption they are relieved by the discharge of the humour, and consequently the promotion of this discharge becomes an important indication which it is often easy to accomplish, and which proves very effectual. Hence an important part of his practice consisted in the employment of evacuations of various kinds, and especially of purgatives, of which he used a great variety and administered them with great freedom. This, indeed, was the only part of his practice which can be considered as decidedly active, but even here we do not perceive that he transgressed the limits of prudence, while in the selection of the remedy and its adaptation to each particular case, he manifested considerable judgment and sagacity. With the same intention he prescribed diuretics and sudorifics; he drew blood both by the lancet and the scarificator; he applied the cupping-glasses; he administered injections and inserted issues. He made very frequent use of external applications, such as ointments, plaisters, liniments, &c., and was familiarly acquainted with the effects of external

* *Clerc*, part 1, liv. iii. ch. 3. *Schulz*, per. 1, sec. 3, cap 2, § 1-8. *Sprengel*, t. i. p. 302 et seq. *Gruner*, Analecta, No. 2. *Lauth*, liv. iii. passim.

temperature. His materia medica was tolerably copious, and embraced many articles which still retain their place in our pharmacopœias. They were almost exclusively of vegetable origin, for the preparations which depend on chemical processes, such as metallic salts and oxides, the strong acids, with the spirituous compounds, were then totally unknown.

One important part of medical practice to which Hippocrates paid particular attention was the regulation of the diet; in this he displayed much sagacity and discernment, as well as on all points connected with the management of his patients, with regard both to the cure and prevention of disease. He appears to have been the first who noticed what has been called the epidemic constitution of the seasons, that inexplicable condition of the atmosphere, or of those influences to which the body is exposed, which appears to render it more or less obnoxious to certain morbid causes, and even to generate these causes at certain periods, without our being able to refer their production to any more general principle.

The tendency of the practice of Hippocrates to allow the operations of the system to pursue their course without interruption, united with his natural sagacity, enabled him to acquire great skill in prognostics, so that there is no part of his writings which exhibit more decisive marks of a superior understanding than those in which he treats on this topic. Upon a review of the character and writings of this celebrated individual, we conceive that we are warranted in the conclusion, that while there are few persons of any age or nation who attained to greater distinction among their contemporaries, or whose memory has been more cherished by posterity, there was perhaps no one whose fame was more merited or established upon a firmer foundation.*

CHAP. III.

History of medicine from the time of Hippocrates until its introduction into Rome—Establishment of the Dogmatic sect—Plato—Aristotle—School of Alexandria—Erasistratus—Herophilus—Division of medicine into different departments—Into the Dogmatic and Empiric sects—Their general principles.

We have not much to add respecting the state of medicine during the period which immediately succeeded to the death of Hippocrates. The advance which he made in the science, and the improvement which he introduced into the practice, were so considerable, that no one appeared for some centuries who was able to proceed, at least in any considerable degree, beyond the point of perfection to which it had been brought by the great father of medicine. In conformity with the custom of the times, Hippocrates transmitted his profession to his sons Thessalus and Draco, and we are informed that it continued to descend in the direct hereditary line for several successive generations. Polybus, his son-in-law, is singled out as having fully maintained the credit of his illustrious relative, and it is even said that many of the writings usually ascribed to Hippocrates are in reality the production of Polybus.†

The only other names which we meet with in the annals of medicine among the Asclepiades, that are in any considerable degree distinguished, are, Diocles of Carystus, and Praxagoras of Cos. The former of these obtained a high reputation for his learning and practical skill: he appears to have adopted for the most part the opinions and practice of Hippocrates.‡ Of the latter, although he is enumerated among the successful improvers of the art, we have only very imperfect and unsatisfactory accounts. We are, indeed, informed that he paid great attention to anatomy, that he particularly noticed the state of the pulse, and derived many of his indications from this source; but we have little except the general fact of the estimation in which his name was held by his contemporaries, which can enable us to form an estimate of his merit.§ The name of Chrysippus may be noticed in this place as one who appears to have been a kind of irregular practitioner, as we should style him, who did not belong to the family of the Asclepiades, and was principally remarkable for the innovations

* *Clerc*, part i. liv. iii. *Conring*, cap. 2, § 11, et alibi. *Schulz*, per. 1, § 3, cap. 1–4. *Douglas*, Bibliogr. Anat. p. 1 et seq. *Barchusen*, diss. No. 12. *Haller*, Bib. Med. lib. i. § 17–21. *Sprengel*, § 3, chap. 3. *Enfield*, vol. 1, p. 442–4. *Aikin's* Gen. Biog. in loco. *Goulin*, Enc. Méth. "Médecine," in loco. *Cabanis*, ch. 2, § 3. *Ackermann*, Inst. Hist. Med. p. 70–8. *Eloy*, Dict. in loco. Nouv. Dict. Hist. in loco. *Renauldin*, Biog. Univ. "Hippocrate."

† *Clerc*, part i. liv. iv. ch. 1.

‡ *Clerc*, part i. liv. iv. ch. 5. *Schulz*, p. ii. cap. 1, §. 10–22. *Sprengel*, t. i. p. 366–2.

§ *Clerc*, part i. liv. iv. ch. 6. *Schulz*, p. ii. cap. 1, §. 23–8. *Sprengel*, t. i. p. 372–4.

which he introduced into practice.* But like too many of those whose fame is principally founded on the novelty of their opinions, we do not find much to commend in them. We are told that he did not allow, in any case, of bleeding, and that he discountenanced the employment of all active purgatives; and, in short, that he rejected many of the most powerful and effective agents in the treatment of disease.†

Draco and Thessalus, in conjunction with their relative Polybus, are generally regarded as the founders of what has been considered as the first medical sect or school which was established upon rational principles. It obtained the name of the Hippocratean, or more generally the Dogmatic school or sect, because it professed to set out with certain theoretical principles which were derived from the generalization of facts and observations, and to make these principles the basis of practice.

Although we can have no hesitation in pronouncing this to be the correct and legitimate method of pursuing the study of medicine, yet it must be acknowledged at the same time that it is a method which, if not carefully watched and strictly guarded by prudence and sagacity, is exposed to the greatest danger of being corrupted by ignorance and presumption. Hence we may easily conceive that it would be liable to fall into the grossest errors, and to lie open to the most serious imputations, and that a fair plea would always be found for exclaiming against the introduction of what is termed theory into the practice of medicine. This abuse of the principles of the Dogmatists gave rise to the rival sect of the Empirics, who, perceiving the false reasoning of the former, and the injudicious practice consequent upon it, professed to be guided altogether by experience, and to discard all theory. For many centuries these two sects divided the medical world, and even at this day, after all the revolutions of opinion and the improvements of science, we may observe very distinct traces of their influence. It was not, however, until a considerably later period that the Empirics formed themselves into a distinct sect, and became the declared opposers of the Dogmatists.‡

Besides the individuals who belonged to the family of the Asclepiades, and who made medicine their particular profession or pursuit, most of the philosophers of Greece bestowed a certain degree of attention upon this science; for it appears that, among the ancients, a knowledge of medicine was regarded as one of the branches of philosophy which was included in a course of general education. The only two, however, of the Grecian philosophers whom it will be necessary to mention on the present occasion, are Plato and Aristotle, who, although they did not compose any treatises on medicine strictly so called, make frequent allusions to it in various parts of their writings. The former of these authors, in his dialogue styled Timæus, and in his treatise De Republica, has entered into various physiological discussions respecting the functions of the body, and the supposed effect of their derangement in producing the morbid conditions of the system, and has offered various incidental observations on the practice of his contemporaries. But it does not appear that either the theory or the practice of medicine received any improvement from this philosopher. He made little or no addition to the actual stock of our knowledge in any branch of natural science, while his peculiar genius rather led him to the formation of hypotheses and speculations derived from fanciful analogies, tinged with that air of mystery which pervades most of his writings.§

Both the original turn of mind and the pursuits of Aristotle were much better adapted to improve the science of medicine than those of Plato. He made very great advances in the knowledge of nature; he was peculiarly well situated for the acquisition of new information on all subjects connected with natural history, and he diligently availed himself of his advantages. He was the first writer who published any regular treatises on comparative anatomy and physiology, and his works on these subjects may be still read with much interest, after all the additions which have been made to them by the labours of the moderns.‖ But, notwithstanding all these favourable circum-

* Pliny remarks of him, "Horum (referring to previous physicians) placita Chrysippus ingenti garrulitate mutavit." Nat. Hist. lib. xxix. cap. 1.

† *Clerc*, part ii. liv. i. ch. 1. *Schulz*, p. i. sect. 3, ch. 5, 6. *Sprengel*, t. i. p. 365.

‡ *Sprengel*, sect. 4, ch. 1.

§ *Clerc*, part i. liv. iv. ch. 3. *Stanley's* Hist. of Phil. part v. ch. 22, p. 79 et alibi. *Sprengel*, t. i. p. 337 et seq.

‖ *Douglas*, Bibliogr. Anat. p. 9–11.

stances, it may be questioned whether the influence of Aristotle has not been ultimately somewhat unfavourable to the progress of knowledge. With his valuable facts and observations he mixed up a large portion of recondite and refined speculation, so that it is frequently not easy to separate the one from the other; and so great was the ascendency which his genius acquired over the minds of men for many centuries after his death, that all his opinions, the most unfounded as well as the most philosophical, were indiscriminately received as established truths, which no one ventured to oppose or to controvert.*

The next circumstance which we are called upon to notice in the history of medicine is the establishment of the school of Alexandria. This was effected by the munificence of the Ptolemies, who, about three hundred years before the Christian æra, laid the foundation of the celebrated Alexandrian library and of the school of philosophy, which is graced by so many illustrious names. The science of medicine was cultivated in this school with peculiar assiduity, and we owe some very essential improvements to its professors. Among the most famous of these are Erasistratus and Herophilus. We have not much accurate information respecting the personal history of these two individuals, nor have any of their works been transmitted to us; but we have a detailed account of their opinions and practice given us by Galen, Cœlius Aurelianus, and others, so as to enable us to form a tolerably correct estimate of their merits. They are particularly mentioned as being the first who dissected the human subject, for which purpose the bodies of criminals were allotted to them by the government; and it appears that they amply profited by the advantage which was thus given them, so as very considerably to advance our knowledge of the structure of the body, especially by pointing out those circumstances in which the human subject differed from that of the animals who most nearly resembled it, and in correcting the errors on this point into which their predecessors had fallen. Nearly every part of the great system of which the body is composed profited by their labours; they ascertained, with much more correctness than it had been previously done, the structure of the heart and the great vessels, and of the brain and nerves, and they even seem to have had some imperfect knowledge of the absorbents. We are informed that Erasistratus was the pupil of Chrysippus, and that he imbibed from him his prejudice against bleeding and against the use of active remedies, trusting more to the operations of diet or the natural efforts of the system: hence we are to regard him as having improved the practice of medicine only indirectly, by the addition which he made to our knowledge of anatomy.† The anatomical fame of Herophilus is so intimately blended with that of Erasistratus, that we are unable to assign to each his respective share of merit; but it would appear that the former was more correct and more skilful in the practical department. Of this we have one proof in the fact which is stated by Galen, that Herophilus was one of the first who paid very minute attention to the varieties of the pulse; and his name is handed down to us by the ancients as entitled to the highest respect, both from his character and his acquirements.‡

An important circumstance in the history of medicine, and more especially in that department to which our attention is particularly directed, occurred soon after the establishment of the Alexandrian school, viz. the division into distinct professions, which were exercised by different individuals. Previously to this period the practice of what is more especially styled medicine and of surgery was exercised by the same person; the ἰατρος of the Greeks corresponding nearly to what we should now term the general practitioner. But about this time the separation into the departments of dietetics, pharmacy, and surgery commenced, and was gradually admitted into all succeeding schools or sects. The terms did not, however, possess precisely the same signification as in modern times. Dietetics comprehended not the regulation of the diet alone, but every circumstance connected with the general health or management of the patient, and corresponded very nearly to the "medicus," or physician of modern

* *Clerc*, part i. liv. ii. ch. 4. *Schulz*, p. ii. cap. 1, §. 2 et seq. *Stanley*, part vi. passim. *Sprengel*, sect. 4, cap. 2.

† *Clerc*, part ii. liv. i. ch. 2–4. *Schulz*, p. ii. cap. 3, §. 35–66. *Sprengel*, t. i. p. 439 et seq. *Lauth*, p. 140, 1.

‡ *Clerc*, part ii. liv. i. ch. 6. *Schulz*, p. ii. cap. 3, §. 2–34. *Sprengel*, t. i. p. 433 et seq. *Lauth*, p. 139, 140.—For an account of the Alexandrian school generally, see *Sprengel*, sect. 4, ch. 3; and *Lauth*, liv. iv.

times. The second included not merely the department of the apothecary or the compounder of drugs, but the performance of many of the operations of surgery; while to the third was allotted the treatment of surgical diseases, many of the operations, however, being committed to the professors of the second branch. That this separation eventually tended to the improvement of the respective branches of the profession will scarcely be doubted, although it must at the same time be acknowledged that many of the distinctions which were introduced were frivolous and invidious, and are now rapidly yielding to the superior intelligence of modern times.*

It was about this period, i. e. shortly after the establishment of the Alexandrian school, that the great schism to which we have so often alluded took place. It was occasioned by the formation of the rival sects of the Dogmatists and the Empirics. Neither of these terms, in the first instance, bore exactly the same meaning which they convey to a modern ear. The controversy really consisted in the question, how far we are to suffer theory to influence our practice. While the Dogmatists, or, as they were sometimes styled, the Rationalists, asserted that before attempting to treat any disease we ought to make ourselves fully acquainted with the nature and functions of the part which is affected, or rather of the body generally, with the operation of medical agents upon it, and with the changes which it undergoes when under the operation of any morbid cause; the Empiric, on the contrary, contended that this knowledge is impossible to be obtained, and, if possible, is not necessary;—that the minute and internal changes of the system and of its different parts are beyond the reach of our most acute observation, that it is alone essential to watch the phenomena of disease, and to discover what remedies are best fitted to relieve the morbid symptoms;—that our sole guide must be experience; and that, if we step beyond this, either as derived from our own experience or observation, or that of others on whose testimony we can rely, we are always liable to fall into dangerous and often fatal errors. We may remark that this controversy, like so many others which have occupied the attention of mankind for a succession of ages, is partly verbal, and in so far as it is not verbal, that it is a question of degree. The boldest Dogmatist professes to build his theory upon facts, and the strictest Empiric cannot combine his facts without some aid from theory. The uniform experience of all the schools and sects from the days of Hippocrates to the present time, demonstrates that the undue extension of either of these systems is injurious, that they both originate from a partial view of the subject, and may generally be traced to some defect either in the acquired information or natural disposition of the practitioner. The controversy, however, forms so prominent a feature in the history of medicine, that it will be necessary to advert to it very frequently in the following pages; and we shall find that in estimating the value of the various opinions or modes of practice which will successively pass under our review, it will in most cases be necessary to inquire from which of these sects they emanated.†

Respecting the individuals to whom the origin of these sects should be referred, there is some degree of obscurity: the Dogmatists generally claim Hippocrates for their founder, and it is certain that he investigated with great care the functions of the animal body, the action of morbid causes upon it, and the operation of remedies, or, as we should style them, the general principles of pathology and therapeutics. But while in this respect he acted upon the principles of the Dogmatists, he was no less remarkable for the accuracy with which he observed the phenomena of disease, and the actual operation of remedies upon individual cases, or even upon particular symptoms; and it may be affirmed that, in most instances, when his preconceived hypotheses seemed to be in contradiction to the results of his experience, he wisely followed the latter. We may, however, easily imagine that his successors, not being possessed of his sagacity and industry, would prefer the easier method of indiscriminately adopting all his principles and speculations, to the more arduous task of correcting or extending them by their own observation, and that they would in this way bring all theoretical reasoning into disrepute. It is more probable that this feeling would be gradually induced in the minds of practitioners, than that it would be at once announced by any single individual; and as a matter of historical fact, the ancients themselves were divided in their opinion as

* *Celsus*, lib. i. præf. *Schulz*, p. ii. cap. 5. *Clerc*, part i. liv. ii. ch. 9. *Eloy*, "Partage de la Médecine."

† For an elegant summary of the arguments employed in this controversy, the reader is referred to *Percival's* Essays, nos. 1 and 2.

to the person to whom they should ascribe the origin of the empirical sect. Pliny attributes it to Acron, a physician of Sicily,* who was contemporary, if not prior to Hippocrates; while Celsus states that Serapion of Alexandria, who was said to be a pupil of Herophilus, was the first who distinctly professed the opinion that theory is to be totally discarded in medicine, and that direct experience should be our sole guide.† We have little correct information respecting either the history or the practice of Serapion; none of his writings have been transmitted to us, but from the scattered notices which we meet with concerning him, dispersed through the works of the ancients, it may be conjectured that he was a man of considerable acuteness and sagacity, and that he generally adopted the practice of Hippocrates and his school, although he discarded their theory.‡

All the medical men of the period at which we are now arrived, and for some centuries subsequent to it, were attached to one or other of these rival sects, and, it would appear, in nearly an equal proportion. Unfortunately, however, for the Empirics, it has happened that all their writings have perished, so that we are obliged to form our opinion of their merits principally from the representation of their antagonists. There is, indeed, one happy exception in the works of Celsus, who, in the commencement of his treatise, has given an account of the leading opinions of the two opposing sects in so candid and judicious a manner, as almost to supersede any more elaborate discussion. It has been thought by many that the view which Celsus gives of the controversy is too favourable to the Empirics; and we admit that we can scarcely read his account without being impressed with the opinion, that he advocates their side of the question. Yet the conclusion which he draws is perfectly candid, and is, indeed, not very remote from what the most enlightened practitioner would form at the present day;—that the perfect rule of practice is derived from a due combination of reason and experience; that without experience all preconceived theory would be vain and useless; and that by simple experience, without any attempt at generalization, we should frequently fall into gross errors, and be unable to profit even by the very experience which is so much extolled. And, indeed, whatever may have been the professed plan of the supporters of the two sects, we shall always find that the practice of the most eminent of either party actually proceeded upon a judicious combination of the two systems; and we are now persuaded that it is upon such a combination that all further improvements of the science and practice of medicine must essentially depend.§

CHAP. IV.

On the state of Medicine among the Romans from its first introduction into Rome until the time of Galen.—Roman superstitions—Archagathus—Cato—Asclepiades—Themison—Origin of the Methodic sect—Thessalus—Soranus—C. Aurelianus—Doctrines of the Methodics—Pneumatics and Eclectics—Aretæus—Archigenes—Celsus, his doctrines and practice—Condition of physicians in Rome—Pliny—Dioscorides.‖

For some centuries the school of Alexandria produced a succession of learned men, not only in medicine but in the other sciences, and contributed to the advancement of knowledge, or at least prevented the decay into which it was in danger of falling after the decline of the Grecian literature. It was during this period that the foundation was laid of the future grandeur of the Roman empire; but from the attention of this people being almost exclusively directed to warlike affairs, and perhaps also from other causes, science of all kinds, and medicine among the rest, was for a long time almost totally neglected. Rome had extended her empire far beyond the limits of Italy, and had subdued most of her rivals, before she condescended even to tolerate the pursuit of the arts and sciences. We are expressly told by Pliny, that for six hundred years she was without physicians. We cannot conceive it possible that during this long period no attempts were made to remove diseases; we can only understand by it that there were

* Lib. xxix. cap. 1. † In præf. sub initio. ‡ *Schulz*, per. ii. cap. iv. § 8 et seq.

§ *Galen*, de Subfigurat. Empir. et alibi. *Celsus*, in Præf. *Barchusen*, Diss. nos. 10 & 13. *Clerc*, pars ii. liv. ii. *Schulz*, per. ii. cap. iv. *Sprengel*, sect. 4, ch. 1, 4. *Ackermann*, p iii. cap. 10–13.

‖ For a concise, and at the same time a comprehensive view of this period of the history of medicine, the reader is referred to the fifth section of Blumenbach's Introduction. We may further remark that this work may be consulted with advantage, in connection with almost all the names that pass in succession under our review.

no individuals eminent for their knowledge or skill who were engaged in the profession, or perhaps that it was scarcely regarded as the object of distinct pursuit, or that individuals were not especially trained to the exercise of it. We have, indeed, abundant evidence of two circumstances; that in this, as in every other subject connected with the arts of life, the Romans servilely copied from the Greeks,* and that, as far as their medicine was concerned, wherever they deviated from them it was for the purpose of adopting various superstitious rites and ceremonies, indicating the most profound ignorance and the grossest superstition. Numerous instances of this kind are incidentally mentioned by Livy; and although he wrote in the refined age and splendid court of Augustus, they are introduced in the thread of his narrative as actual transactions, without any observation indicative of his disbelief of their efficacy.† One of these is the account which he gives us of the introduction of the worship of Æsculapius into Rome. In consequence of a fatal epidemic, the senate had recourse to the usual expedient of consulting the Sybilline books, where it was found to be enjoined upon them to transfer the worship of the god from Greece to their city. A formal deputation was accordingly despatched for the purpose, by whom the deity, unwilling to leave his native place, was seized by a stratagem, and was conveyed under the form of a serpent into Italy. He was received by the people of Rome with unbounded transport; a temple was erected to him on an island in the Tiber; the usual appendages of priests, with all their ceremonies, were appointed; and the plague was of course suspended.‡

Pliny further informs us that medicine was introduced into Rome at a later period than most of the other arts and sciences; that the practice of it had even been expressly prohibited by the citizens, and its professors banished. The account which he gives of so singular an occurrence is, that about two hundred years before Christ, Archagathus, a Peloponnesian, settled at Rome as a practitioner of medicine, and, as it may be inferred, was the first person who made it a distinct profession. He was received in the first instance with great respect, and was even maintained at the public expense; but his practice was observed to be so severe and unsuccessful, that he soon excited the dislike of the people at large, and produced a complete disgust to the profession generally, which led to the transaction mentioned above.§ His practice seems to have been almost exclusively surgical, and to have consisted, in a great measure, in the use of the knife and of powerful caustic applications. We hear little more of the state of medicine in Rome for the next century; but from certain incidental observations we may infer that it remained principally in the hands of the priests, and consisted as before in superstitious rites and ceremonies. It appears, indeed, that the few individuals who devoted themselves to the cultivation of natural science, among other subjects directed their attention to medicine; and it is particularly stated that Cato introduced various articles into the materia medica, and wrote several treatises on medical topics. We are not able to form any just conception of their merit from the account which is given of them; but it is worthy of remark that he was a professed opponent to Grecian literature in general, and we may therefore conclude, would not avail himself of the improvements that had been made by the Greek physicians.‖

We may presume that the prejudice which was excited against Archagathus would be gradually allayed, and that the improvement of the Romans in intellectual cultivation, although not considerable, would be at least sufficient to make them sensible of the necessity of attempting something beyond the mere power of charms and incantations for the removal of disease. Accordingly, about a century before the Christian æra, we find that another individual had acquired a very considerable degree of popularity at

* *Suetonius*, de Grammat. sub initio; the fact is admitted by Cicero and by Pliny, and is frequently alluded to in various parts of their writings.

† The following references may be selected among many others of a similar kind :—Book i. ch. 31, Tullus consults the Sybilline books in order to stop the plague;—iv. 25, for the same purpose a temple was erected to Apollo;—v. 13, the books were again consulted;—vii. 2, a lectisternium was ordered for the same purpose, and afterwards the public games;—vii. 3, the plague was stopped by the dictator driving a nail.

‡ *Livius*, lib. x. cap. 47, et epitome ad lib. xi. *Val. Maximus*, lib. i. cap. 8, §. 2. *Schulz*, p. ii. cap. 6, § 4, et seq. *Montfaucon*, Antiq. Suppl., v. i. b. v. ch. 1. *Lucianus*, Tooke's Trans. v. i. p. 635, note.

§ Lib. xxix. cap. 1.

‖ *Clerc*, pars ii. liv. iii. ch. 1. *Schulz*, p. ii. cap. 6. *Ackermann*, p. iv. cap. 15.

Rome, which he maintained through life, and in a certain degree transmitted to his successors,—Asclepiades of Bythinia. It is said that he first came to Rome as a teacher of rhetoric, and that it was in consequence of his not being successful in this profession, that he turned his attention to the study of medicine. From what we learn of his history and of his practice, it would appear that he may be fairly characterized as a man of natural talents, acquainted with human nature, or rather with human weakness, and possessed of considerable shrewdness and address, but with little science or professional skill. He began upon the plan which is so generally found successful by those who are conscious of their own ignorance, by vilifying the principles and practice of his predecessors, and by asserting that he had discovered a more compendious and effective mode of treating diseases than had been before known to the world. As he was ignorant of anatomy and pathology, he decried the labours of those who sought to investigate the structure of the body, or to watch the phenomena of disease, and he is said to have directed his attacks more particularly against the writings of Hippocrates. It appears, however, that he had the discretion to refrain from the use of very active and powerful remedies, and to trust principally to the efficacy of diet, exercise, bathing, and other circumstances of this nature. A part of the great popularity which he enjoyed depended upon his prescribing the liberal use of wine to his patients, and upon his attending in all cases, with great assiduity, not only to every thing which contributed to their comfort, but that he flattered their prejudices and indulged their inclinations. By the due application of these means, and from the state of the people among whom he practised, we may, without much difficulty, account for the great eminence to which he arrived, and we cannot fail to recognise in Asclepiades the prototype of more than one popular physician of modern times.

Justice, however, obliges us to admit that he seems to have been possessed of a considerable share of acuteness and discernment, which on some occasions he employed with advantage. It is said that to him we are indebted, in the first instance, for the arrangement of diseases into the two great classes of acute and chronic, a division which has a real foundation in nature, and which still forms an important feature in the most improved modern nosology. In his philosophical principles Asclepiades is said to have been a follower of Epicurus, and to have adopted his doctrine of atoms and pores, on which he attempted to build a new theory of disease, by supposing that all morbid action might be reduced into obstruction of the pores and irregular distribution of the atoms. This theory he accommodated to his division of diseases, the acute being supposed to depend essentially upon a constriction of the pores, or an obstruction of them by a superfluity of atoms; the chronic, upon a relaxation of the pores or a deficiency of the atoms.*

Asclepiades was succeeded in his professional reputation by his pupil Themison of Laodicea, who had the honour of founding a new sect in medicine, which for some time almost eclipsed the former rivals; this was the Methodic sect. The great object of Themison seems to have been to adopt a middle course between the Dogmatists and the Empirics, and to take advantage of the excellencies of each of them. He was, however, strongly impressed with the great principle of Asclepiades, the importance of reducing the science to a few general laws, which by their simplicity might be universally intelligible and of easy application. He therefore rejected all the abstruse and recondite speculations of the Dogmatists, and substituted in their place a few positions derived from the tenets of his master, and founded upon the Epicurean doctrines. He remarks that it is an essential part of the business of the practitioner to make himself acquainted with the nature of the human frame, with its laws while in the state of health, and with the changes which they experience from disease. All these he referred to the respective states of constriction and relaxation, and to the undue preponderance of one of them over the other. To these two, however, he added a third, or mixed state as he styled it, the nature of which is not very easy to understand; while by classing all medical agents under the two great divisions of astringents and relaxants, we learn how to apply the appropriate remedy for every disease.

Themison's doctrine must be regarded as a refinement, and certainly an improvement

* *Plinius*, passim. *Celsus*, ubi supra et alibi. *Clerc*, pars ii. liv. iii. ch. 4-9. *Sprengel*, sect. 5, ch. 1. *Cabanis*, ch. 2, § 5. *Goulin*, Encyc. Méth., "Médecine," "Asclépiade." *Chaussier et Adelon*, in Biog. Univ., "Asclépiade."

of that of Asclepiades; for although we have the states of constriction and relaxation professedly copied from his master, it is disencumbered of the more objectionable speculation of the atoms and pores. The theory of the Methodics contemplates the solids as the seat and cause of disease, in which respect it is directly opposed to that of Hippocrates, who traced the primary cause of disease to an affection of the fluids, giving rise to what has been termed the Humoral Pathology. The humoral pathology was zealously defended by Galen, and was universally adopted by his successors until the seventeenth century, when the opposite doctrine of Solidism was revived, and has been gaining ground until the present day. It has been justly objected to Themison's theory, that even if we admit the correctness of his views respecting the states of constriction and relaxation of the system, there is a palpable absurdity in supposing that they can be co-existent in what he terms his middle state, as they are directly opposed to each other.

There is no work of Themison's extant, but we have an ample account of his practice in the writings of Cælius Aurelianus, who was a zealous defender of the tenets of the Methodic sect. They appear to have been diligent in the observation of the phenomena of disease, and sagacious in their employment of remedies: they seem, indeed, to have sustained their character of keeping a middle course between the Dogmatists and Empirics, avoiding the extremes of either, and combining the more useful parts of each system in a greater degree than had been done by their predecessors.*

For some time after the death of Themison the opinions of the Methodics were generally adopted in Rome, and almost superseded those of the professed Dogmatists and Empirics, so that we shall have little to detain us in our progress, except to notice certain individuals who became remarkable from their personal history or character, or from some peculiarity in their opinions or practice. The first of this description in point of time is Thessalus, who lived about half a century after Themison, and who ranks as one of his followers. He was, however, an individual very different, both in character and in acquirements, from his master. He is stated to have been of mean birth and of defective education, but by cunning and artifice to have acquired great wealth and a high reputation. He began his career, in the usual mode of ignorance and self-sufficiency, by endeavouring to throw contempt on all his predecessors and contemporaries, by pretending to expose their errors, and by claiming to himself the discovery of a new theory of medicine, which should lead to more correct practice, and should supersede all farther attempts of the kind; in fine, he assumed to himself the pompous title of the conqueror of physicians (ιατρονικες).†

We shall not have occasion to dwell long upon one who is so unworthy of a place in the records of science; it is only necessary to remark concerning him, that he appears to have united the speculations of Asclepiades with those of Themison, and to have admitted the atoms and pores of the one, with the constriction and relaxation of the other. The only addition which Thessalus made to medical theory which deserves our notice, is the introduction of what he terms metasyncrasis, or the method of producing an entire change in the state of the body. This he opposed to the practice of Hippocrates, who professed to watch over and regulate the actions of the system, as well to that of the Empirics, whose aim was to correct specific morbid actions, or to remove particular morbid symptoms. The term, as conveying a conceivable, if not an actual occurrence, was not without its value, and was generally adopted by medical writers; and even in the present day the principle implied in it serves as the foundation for some of our most important indications.‡

The name of Soranus next occurs among the celebrated Roman practitioners. There is, indeed, some reason for supposing that there were no less than three physicians of this name, but the one who is most eminent appears to have been a native of Ephesus, to have studied at Alexandria, and finally to have settled in Rome. He was a strict Methodic, and is said to have been highly respected for his character and

* *Celsus*, in præf. *Clerc*, p. ii. liv. iv. sect. 1, ch. 1. *Barchusen*, Diss. 11. *Sprengel*, t. ii. p. 20-3. *Ackermann*, per. iv. ch. 17.

† *Plinius*, lib. xxviii. cap. 1.—We have an amusing, and probably a correct account, given us by Lucian, of the successful knavery practised by an impostor of his age, named Alexander; see Tooke's Trans., v. i. p. 630 et seq. He appears to have been a worthy successor of Thessalus, so far as respects his arrogance and presumption.

‡ *Clerc*, p. ii. liv. iv. sect. 1, ch. 2, 3. *Sprengel*, t. ii. p. 28-31.

talents. His writings have not been transmitted to us, but probably the most valuable information which they contain is handed down to us by C. Aurelianus, whose work, if not, as some have supposed, a translation of Soranus's treatise, proceeds upon the same principles, and inculcates the same practice.*

There is considerable uncertainty respecting both the age and the country of C. Aurelianus. Some writers place him as early as the first century of the Christian æra, while others endeavour to prove that he was at least a century later. This opinion is principally founded upon the circumstance of his not mentioning or being mentioned by Galen, indicating that they were contemporaries or rivals. Numidia has been generally assigned as his native country, but perhaps without any direct evidence; it may, however, be concluded from the imperfection of his style and the incorrectness of some of the terms which he employs, that he was not a native either of Greece or of Italy. But whatever doubts may attach to his personal history, and whatever defects exist in his writings, they afford us much valuable information respecting the state of medical science. He was a professed and zealous Methodic, and it is principally from his work that we are able to obtain a correct view of the principles and practice of this sect. In his descriptions of the phenomena of disease he displays considerable accuracy of observation and diagnostic sagacity; and he describes some diseases which are not to be met with in any other ancient author. He gives us a very ample and minute detail of the practice which was adopted both by himself and his contemporaries; and it must be acknowledged that on these points his remarks display a competent knowledge of his subject, united to a clear and comprehensive judgment.

He divides diseases into the two great classes of acute and chronic, nearly corresponding to diseases of constriction and of relaxation, and upon these supposed states he founds his primary indications; but with respect to the intimate nature of these states of the system, as well as of all hidden or recondite causes generally, he thinks it unnecessary to inquire, provided we can recognize their existence, and can discover the means of removing them. Hence his writings are less theoretical and more decidedly practical than those of any other author of antiquity; and they consequently contributed more to the advancement of the knowledge and actual treatment of disease than any that had preceded them. They contributed in an especial manner to perfect the knowledge of therapeutics, by ascertaining with precision the proper indications of cure with the means best adapted for fulfilling them. The great defect of C. Aurelianus, a defect which was inherent in the sect to which he belonged, was that of placing too much dependence upon the two-fold division of diseases, and not sufficiently attending to the minute shades by which they gradually run into each other; a defect the more remarkable in one who shows so much attention to the phenomena of disease, and who for the most part allows himself to be so little warped by preconceived hypothesis. This view of the subject leads him not unfrequently to reject active and decisive remedies, when he could not reconcile their operation to his supposed indications; so that, although his practice is seldom what can be styled bad, it is occasionally defective.

There were two points in which C. Aurelianus, and the Methodics generally, decidedly opposed the doctrines and practice of the followers of Hippocrates, in trusting the removal of disease to the restorative powers of nature, and in attributing diseases to the excess or defect of particular humours. With respect to the former point, they conceived that it was as frequently necessary to oppose as to promote the natural actions of the system; and with respect to the latter, they did not admit the existence of the supposed four humours; and even, if their existence could be proved, they did not conceive that they were in possession of the means of acting upon them individually or specifically.

In the treatment of acute diseases, or those of constriction, the cure was effected by topical bleeding, (for general bleeding was rarely admitted,) and by narcotic and oleaginous applications, aided by a pure and sometimes by a moist air. Abstinence was strictly enjoined, and indeed often carried to an undue length; and in the administration of all remedies the practitioner was frequently guided by critical periods, generally of three, or in other cases of seven days. When the ordinary means of cure were found not to be successful, or when any circumstance occurred which appeared to contra-indicate their application, C. Aurelianus had recourse to a preparatory system. This

* *Clerc*, p. ii. liv. iv. sect. 1, ch. 4. *Sprengel*, t. ii. p. 33–5.

consisted principally in certain regulations regarding diet and exercise, in the use of the bath, frictions, and other external applications; when the system was thus prepared, the ordinary plan of treatment was had recourse to. Inflammatory diseases were supposed to depend upon constriction; abstinence, rest, and friction were enjoined in the first instance; bleeding general or local, baths, and certain vegetable preparations were then administered, while purgatives seem to have been seldom if ever employed. Little regard appears to have been paid to particular symptoms, and upon the whole we should be disposed to consider the practice as deficient in promptness and vigour, and not very unlike that which prevails at this day in many parts of the continent. We have mentioned above that C. Aurelianus seldom employed purgatives,—an unfortunate prejudice, by which he deprived himself of one of the most useful agents in the cure of disease; he also generally condemns the use of what are termed specifics, an error, if it be one, much more venial: he very sparingly employs diuretics, condemns narcotics, and rejects caustics and all similar applications.*

Although the Methodic sect continued to prevail among the Roman physicians during the greatest part of the two first centuries of the Christian æra, some alteration in the original tenets of Themison were gradually introduced, and it at length became subdivided into several minor sects or schools, which, although agreeing in certain fundamental principles, had each their peculiar views, which led to their separation from the main body, and to the adoption of specific appellations. Two of these were of sufficient notoriety to require being individually mentioned in this sketch,—the Pneumatics, and the Eclectics or Episynthetics.

The Pneumatics rose into notice about half a century after the death of Themison. They derive their appellation from the circumstance of their having introduced into their pathology the agency of what is termed the spirits (πνευμα), which, together with the solids and the fluids, compose the corporeal frame. It would be somewhat difficult to state, in a few words, to what supposed substance or power the term was applied; we may observe in it some traces of the pneumatic physiology of the modern chemists, while in some of its agencies it resembles the nervous influence. This sect has acquired considerable celebrity from the name of an eminent medical writer, which has been generally attached to it, that of Aretæus.

There is some uncertainty respecting both the age and the country of Aretæus; but it seems probable that he practised in the reign of Vespasian, and he is generally styled the Cappadocian. He wrote a general treatise on diseases, which is still extant, and is certainly one of the most valuable reliques of antiquity, displaying great accuracy in the detail of symptoms, and in seizing the diagnostic character of diseases. In his practice he follows for the most part the method of Hippocrates, but he paid less attention to what have been styled the natural actions of the system; and, contrary to the practice of the Father of medicine, he did not hesitate to attempt to counteract them when they appeared to him to be injurious. The account which he gives of his treatment of various diseases indicates a simple and sagacious system, and one of more energy than that of the professed Methodics. Thus he freely administered active purgatives; he did not object to narcotics; he was much less averse to bleeding; and upon the whole his materia medica was both ample and efficient. It may be asserted generally, that there are few of the ancient physicians, since the time of Hippocrates, who appear to have been less biassed by attachment to any peculiar set of opinions, and whose account of the phenomena and treatment of disease has better stood the test of subsequent experience. We have placed Aretæus among the Pneumatics, because he maintained the doctrines which are peculiar to this sect, and because he is generally considered as such by most systematic writers, although perhaps, strictly speaking, he is better entitled to be placed with the Eclectics.†

Of the sect of the Eclectics we know little except through the medium of the writings of their opponents. The most celebrated of them was Archigenes of Apamea, who

* Vide Opus, de Morb. Acut. et Chron. *Clerc*, p. ii. liv. iv. sect. 1, ch. 5–11; we have in this author a very ample account of the principles and practice of the Methodics. *Barchusen*, Diss. 11, § 5. *Haller*, Bib. Med. §. 72. *Sprengel*, t. ii. p. 37 et seq. *Eloy*, in loco. Biog. Univ. in loco.

† *Clerc*, p. ii. liv. iv. sect. 1, ch. 2, 3. *Barchusen*, Diss. 15, p. 232 et seq. *Haller*, Bib. Med. § 64. *Eloy*, in loco. *Goulin*, Encyc. Méthod. Médecine, t. iii. p. 385 et seq. *Sprengel*, t. ii. p. 82–7. *Chaussier et Adelon*, Biog. Univ. "Aretée."

practised at Rome in the time of Trajan, and enjoyed a very high reputation for his professional skill. He is, however, reprobated as having been fond of introducing new and obscure terms into the science, and having attempted to give to medical writings a dialectic form, which produced rather the appearance than the reality of accuracy. Archigenes published a treatise on the pulse, on which Galen has written a commentary; it appears to have contained a number of minute and subtile distinctions, many of which we may venture to affirm have no real existence, and to have been for the most part the result rather of a preconceived hypothesis than of actual observation; and the same remark may be applied to an arrangement which he proposed of fevers. He, however, not only enjoyed a considerable degree of the public confidence during his life-time, but left behind him a number of disciples, who for many years maintained a respectable rank in their profession.*

It may appear singular that we have so many instances of individuals who have risen to great eminence, both from their professional skill and general science, but of whose private history we possess so little information. This is very remarkably the case with Celsus. We know little either of his age, his origin, or even of his actual profession. There are some incidental expressions which lead to the conjecture that he lived under the reigns of Augustus and Tiberius, and particularly the mode in which he refers to Themison would indicate that they were either contemporaries, or that Themison preceded him by a short period only. With respect to the country of Celsus we have nothing on which to ground our opinion, except the purity of his style, which at most would prove no more than that he had been educated and passed a considerable part of his life at Rome.

With regard to his profession, there is some reason to doubt whether he was a practitioner of medicine, or whether he only studied it as a branch of general science, after the manner of some of the ancient Greek philosophers. This doubt has arisen principally from the mode in which he is referred to by Columella† and by Quintilian,‡ and by his not being enumerated by Pliny among the physicians of Rome in his sketch of the history of medicine. Yet, on the other hand, it appears to us that his work bears very strong evidence that he was an actual practitioner, that he was familiar with the phenomena of disease and the operation of remedies, and that he described and recommended what fell under his own observation, and was sanctioned by his own experience; so that we conceive it, upon the whole, most probable that he was a physician by profession, but who devoted part of his time and attention to the cultivation of literature and general science.

The treatise of Celsus "On Medicine" is divided into eight books. It commences by a judicious sketch of the history of medicine, terminating by the comparison of the two rival sects, the Dogmatists and the Empirics, which has been referred to above. The two next books are principally occupied by the consideration of diet, and the general principles of therapeutics and pathology: the remaining books are devoted to the consideration of particular diseases and their treatment, the third and fourth to internal diseases, the fifth and sixth to external diseases and to pharmaceutical preparations, and the two last to those diseases which more particularly belong to surgery. In the treatment of disease, he for the most part pursues the method of Asclepiades; he is not, however, servilely attached to him, and never hesitates to adopt any practice or opinion, however contrary to his, which he conceived to be sanctioned by direct experience. He adopted to a certain extent the Hippocratean method of observing and watching over the operations of nature, and rather regulating than opposing them, a method which, with respect to acute diseases, may frequently appear inert. But there are occasions on which he displays considerable decision and boldness, and particularly in the use of the lancet, which he employed with more freedom than any of his predecessors. His regulations for the employment of bloodletting and of purgatives are laid down with minuteness and precision; and although he was in some measure led astray by his hypothesis of the crudity and concoction of the humours, the rules which he prescribed were not very different from those which were generally adopted in the commencement of the present century. His description of the symptoms of fever,

* *Clerc*, p. ii. liv. iv. sect. 2, ch. 1. *Barchusen*, Diss. 15, p. 240 et seq. *Sprengel*, t. ii. p. 75–82.

† De Re Rust. lib. vi. cap. 5. ‡ Lib. xii. cap. 11.

and of the different varieties which it assumes, either from the nature of the epidemic, or from the circumstances under which it takes place, are correct and judicious; his practice was founded upon the principle so often referred to, of watching the operations of nature, conceiving that fever consists essentially in an effort of the constitution to throw off some morbid cause, and that, if not unduly interfered with, the process would terminate in a state of health. We here see the germ of the doctrine of the *vis medicatrix naturæ*, which has had so much influence over the practice of the most enlightened physicians of modern times, and which, although erroneous, has perhaps led to a less hazardous practice than the hypotheses which have been substituted in its room.

But perhaps the most curious and interesting parts of the work of Celsus are those which treat of surgery and surgical operations. It is very remarkable that he is almost the first writer who professedly treats on these topics, and yet his descriptions of the diseases and of their treatment prove that the art had attained to a very considerable degree of perfection. Many of what are termed the capital operations seem to have been well understood and frequently practised, and we may safely assert that the state of surgery at the time when Celsus wrote, was comparatively much more advanced than that of medicine. The Pharmacy of Celsus forms another curious and interesting part of his work, and, like his surgery, marks a state of considerable improvement in this branch of the art. Many of his formulæ are well arranged and efficacious, and on the whole they may be said to be more correct and even more scientific than the multifarious compounds which were afterwards introduced into practice, and which were not completely discarded until our own times.*

There is one circumstance respecting Celsus which requires to be noticed, that he is the first native Roman physician whose name has been transmitted to us. Before his time all those who arrived at any degree of eminence were either Greeks or Asiatics, and it would appear that the native practitioners were either slaves or persons from the lower ranks of life, who acted in the subordinate branches of the profession.† This circumstance may be attributed partly to the low state of science in Rome, even during the period when literature had advanced to considerable eminence, and still more to the idea of degradation or servility which seems to have been attached to the exercise of any art or profession for the sake of gain. All the trades and manufactures of Rome were therefore carried on by slaves, and medicine seems to have been placed in the same class. It must, however, be observed that many individuals who were brought to Rome as slaves, either by their natural talents or by some favourable conjuncture of circumstances, overcame the disadvantages of their situation, and made considerable acquirements in different departments of knowledge, and among others in that of medicine. One of the most celebrated of these is Antonius Musa, who was appointed physician to Augustus, and obtained great celebrity from his practical skill: we are told that he was a pupil of Themison, and it appears that he remained attached to the Methodic sect.‡

Before we close this part of our history, it will be necessary to take some notice of a class of writers, whose names or works are transmitted to us, who particularly devoted themselves to the improvement of pharmacy. The first of these was Scribonius Largus, who flourished in the reign of Claudius. He appears to have been, like Musa, originally a slave, and it may be conjectured from his work "On the Composition of Medicines," which has been transmitted to us, that he was never able to supply the deficiency of his education. It is a mere collection of nostrums and formulæ, without arrangement or discrimination, and is solely valuable as indicating the state of the art at the time of its publication.§

Andromachus, a native of Crete, who lived under the reign of Nero, is principally

* *Clerc*, par. 2, liv. iv. sect. 2, ch. 4, 5. *Barchusen*, diss. 15, p. 231, 2. *Morgagni*, Epistolæ in Celsum. *Haller*, Bib. Med. t. i. § 49. *Eloy*, in loco. Nouv. Dict. Hist. in loco. *Sprengel*, t. ii. p. 25–8. *Black's* Hist. of Medicine, p. 63–82. *Goulin*, Encyc. Méth. "Médecine," in loco. *Petit-Radel*, Biog. Univ. "Celse."

† *Clerc*, par. 3, liv. i. ch. 2. The condition of the practitioners of medicine in Rome was the subject of a learned controversy between Mead and Middleton; see Life of Mead, prefixed to his works, v. i. p. 13, Edin. 1765, and Aikin's Gen. Biog. art. "Middleton."

‡ *Haller*, Bib. Med. t. i. p. 150, 1. *Eloy*, in loco. *Aikin's* Gen. Biog. in loco.

§ *Haller*, Bib. Bot. t. i. p. 76, 7, and Bib. Med. lib. i. § 51, t. i. p. 166, 7. *Eloy*, in loco. *Sprengel*, t. ii. p. 55.

known to posterity as the inventor of certain compounded pharmaceutical preparations, one of which, the theriaca, obtained so much celebrity as to have been retained in our pharmacopœia until the close of the last century. It was composed of no less than sixty-one ingredients, which were combined together with much ceremony and no inconsiderable degree of labour and skill. Its essential ingredient, from which it derived its name, was the dried flesh of vipers, against the bites of which animals it was supposed to be an antidote. But its supposed medical virtues were equal to the number of articles of which it consisted, so that there was scarcely a disease for which the theriaca of Andromachus has not been proposed as a remedy. Andromachus is further remarkable as being the first individual on whom the title of Archiater, or principal physician, was bestowed by the emperors, a title which was continued for several centuries.*

We have next to notice an author of just celebrity, whose writings form one of the most valuable remains of antiquity,—Pliny the naturalist. Although not attached to the medical profession, and even, as appears from many of his remarks, by no means favourably disposed to it, in various parts of his great work he affords us much important information, both direct and indirect, respecting the history of medicine in all its branches, and more especially in all that concerns materia medica and pharmacy.† We meet with a great number of curious facts and remarks upon these subjects, so that we are enabled from them to form a tolerably complete conception of the state of medical science in the age in which he wrote. We learn from his works that the ordinary practice was in a considerable degree what may be termed empirical, consisting in the application of certain remedies for certain diseases, without any inquiry into their mode of operation. The materia medica, which was extensive, consisted principally of vegetable products, and these combined together in various forms, but without any regard to what we should now regard as scientific principles, either chemical or pharmaceutical. We find that they possessed various active remedies, adapted for the greatest part of the most important indications, so far as they could be obtained from vegetable or animal substances, but that in the application of them they frequently proceeded upon incorrect principles.

Another writer who lived about the same time with Pliny, and who, although less distinguished for general science, holds a conspicuous rank among the medical authors of this period, is Dioscorides. The same obscurity hangs over every thing which regards the personal history of Dioscorides as over that of so many individuals to whom we have had occasion to refer. It is generally supposed that he was a native of Asia Minor, and that he was a physician by profession. It appears pretty evident that he lived in the second century of the Christian era, and as he is not mentioned by Pliny, it has been supposed that he was a little posterior to him. The exact age of Dioscorides has, however, been a question of much critical discussion, and we have nothing but conjecture which can lead us to decide upon it. He has left behind him a treatise on the materia medica, a work of great labour and research, and which for many ages was received as a standard production. The greater correctness of modern science, and the new discoveries which have been made, cause it now to be regarded rather as a work of curiosity than of absolute utility; but in drawing up a history of the state and progress of medicine, it affords a most valuable document for our information. His treatise consists of a description of all the articles then used in medicine, with an account of their supposed virtues. The descriptions are brief, and not unfrequently so little characterized as not to enable us to ascertain with any degree of accuracy to what they refer, while to the practical part of his work the same remark nearly applies that was made above with respect to Pliny, that it is in a great measure empirical, although his general principles, so far as they can be detected, appear to be those of the Dogmatic sect. The great importance which was for so long a period attached to the works of Dioscorides has rendered them the subject of almost innumerable commentaries and criticisms, and even some of the most learned of our modern naturalists have not thought it an unworthy task to attempt the illustration of

* *Clerc*, par. 3, liv. ii. ch. 1. *Eloy*, in loco. *Haller*, Bib. Med. lib. i. § 56, t. i. p. 178, 9.

† The late illustrious naturalist Cuvier has formed what we conceive to be a very just and candid estimate of the literary and philosophical character of Pliny, Bibl. Univ. t. xxxv. in loco; the same inserted into the translation of Pliny by M. Aj. de Grandsagne, t. i. p. lxxxv. See *Eloy*, in loco, for a list of the various editions, &c. of Pliny; he enumerates one hundred and ten, of which it is worthy of notice that two only were printed in England. *Haller*, Bib. Bot. t. i. p. 91–8.

his Materia Medica. Upon the whole we must attribute to him the merit of great industry and patient research, and it seems but just to ascribe a large portion of the errors and inaccuracies into which he has fallen, more to the imperfect state of science when he wrote, than to any defect in the character and talents of the writer.*

CHAP. V.

Account of the opinions and practice of Galen—History and education of Galen—Remarks on his character and writings—His physiology, anatomy, pathology, and practice.

The course of our narrative brings us to one of those extraordinary characters who are destined to form an era in the history of science, both from the actual improvements which they have introduced into it, and from the ascendancy which their genius enabled them to acquire over the minds of their contemporaries. Of these, one of the most remarkable that ever appeared either in ancient or in modern times, is Galen. Galen enjoyed both from birth and from education every natural and acquired advantage; his father was a man of rank, and his education appears to have been conducted upon the most liberal and judicious plan. He studied philosophy in the various schools that were then in the highest estimation, and without exclusively attaching himself to any one of them, he is said to have taken from each what he conceived to be the most important parts of their systems, with the exception of the Epicurean, the tenets of which he entirely rejected. His professional studies were conducted upon an equally extensive plan; he attended the various schools and travelled through different countries for the express purpose of acquiring information, but it may be presumed that his knowledge of medicine was principally acquired at Alexandria, which still retained its character as the great depository of medical science. After passing a few years at his native city of Pergamus, spending some time at Rome, and again at Pergamus, he finally returned to Rome in consequence of the express request of the Emperor Aurelius, and made that city his residence for the remainder of his life.

The works which Galen left behind him are very numerous, amounting in the whole to about two hundred distinct treatises; they are all on subjects directly or indirectly connected with medicine, and exhibit a great extent of knowledge on the subjects of which he treats, and a degree of information, as far as we can judge, greater than that of any of his contemporaries. He appears also to have been a man of a superior mind and of a very decided character; confident in his own powers, and paying but little attention to the opinions of others. Hence he may be accused of arrogance and of want of candour, and he can only be defended upon the principle that he was so far in advance of his contemporaries as to be fully convinced of the futility of their reasoning and the deficiency of their information. The result was that he gained that superiority over his contemporaries which he assumed, and actually acquired a sway over public opinion on all points connected with medicine which has never been obtained by any individual either before or since his time. The rank which Galen held in the medical world has been compared not unaptly to that which Aristotle possessed in the world of general science. For centuries after his death his doctrines and tenets were regarded almost in the light of oracles, which few persons had the courage to oppose; and all the improvements in medicine which were even contemplated, consisted of little more than illustrations of his doctrines or commentaries on his writings. In numberless instances it was deemed a sufficient argument, not merely against an hypothesis, but even against an alleged matter of fact, that it was contrary to the opinion of Galen; and it may be stated without exaggeration that the authority of Galen alone was estimated at a much higher rate than that of all the medical writers combined who flourished during a period of more than twelve centuries.

Although such a brilliant reputation might in some measure depend upon accidental circumstances and upon the mere personal character of the individual, we may fairly presume that there must have been a foundation of a more solid nature; and upon an actual survey of the writings of Galen, we shall find ample reason to conclude that he was a man of great talents and of very extensive acquirements. In his general

* *Clerc*, par. 3, liv. ii. ch. 2. *Eloy*, in loco, where we have an account of the various editions, comments, translations, &c. *Sprengel*, t. ii. p. 58–64. *Ackermann*, p. 4, cap. 19. *Haller*, Bib. Bot. t. i. p. 79–87. *Goulin*, Encyc. Méth. Médecine, "Dioscoride." *Du-Petit-Thouars*, Biog. Univ. in loco.

principles he may be considered as belonging to the Dogmatic sect, for his method was to reduce all his knowledge, as acquired by the observation of facts, to general theoretical principles. These principles he indeed professed to deduce from experience and observation, and we have abundant proofs of his diligence in collecting experience, and his accuracy in making observations. But still, in a certain sense at least, he regards individual facts and the detail of experience as of little value, unconnected with the principles which he laid down as the basis of all medical reasoning. In this fundamental point, therefore, the method pursued by Galen appears to have been directly the reverse of that which we now consider as the correct method of scientific investigation, and yet such is the force of natural genius, that in most instances he attained the ultimate object in view, although by an indirect path. He was an admirer of Hippocrates, and always speaks of him with the most profound respect, professing to act upon his principles, and to do little more than to expound his doctrines and support them by new facts and observations. Yet in reality we have few writers whose works, both as to substance and manner, are more different from each other than those of Hippocrates and Galen, the simplicity of the former being strongly contrasted with the abstruseness and refinement of the latter. Those of his works which are the most truly valuable, and in which he actually rendered the greatest service to science, are his treatises on physiology. The knowledge which he possessed on this subject was much more considerable than that of any of his contemporaries; in all that regards the operations of the animal economy he was much better acquainted with the facts, and much more ingenious in the application of them. He appears to have been well practised in anatomy, and especially in what may be termed pathological anatomy he far surpassed any of the ancients. His knowledge of particular structures was in many respects correct, and in his mode of classifying them he made no inconsiderable approach to the philosophical views which have been taken of them by the anatomists of the present day. It appears upon the whole probable that he was not in the habit of dissecting the human subject, and, indeed, this may be fairly inferred from his own remarks; but there is reason to suppose that he omitted no opportunity of examining the structure of those animals which the most nearly resemble it, and that from them he has drawn up his descriptions. Considering this radical defect, it must be admitted that they possess great merit, and we may justly express our surprise at the few points in which they betray the imperfection of their origin.*

The pathology of Galen was much more imperfect than his physiology, for in this department he was left to follow the bent of his speculative genius almost without control. He adopts, as the foundation of his theory, the doctrine of the four elements, and, like Hippocrates, he supposes that the fluids are the primary seat of disease. But in his application of this doctrine he introduced so many minute subdivisions and so much refined speculation, that he may be regarded as the inventor of the theory of the Humoralists, which was so generally adopted in the schools of medicine, and which for so long a period entirely engrossed their attention. The four elements, the four humours, and the four qualities, connected in all the variety of combinations, presented a specious appearance of method and arrangement, which took such firm possession of the mind as to preclude all inquiry into the validity of the foundation, and to present us with one of the most remarkable examples of the complete prostration of the understanding in a physical science, where facts were daily obtruding themselves upon observation, but were either unnoticed or totally disregarded.

The practice of Galen in its general character appears to have been similar to his pathology, and, indeed, to have been strictly deduced from it. His indications were in exact conformity to his theory, and the operation of medicines was reduced to their power of correcting the morbid states of the fluids, as depending upon their four primary qualities or the various modifications of them. Many parts of his writings prove that he was a diligent observer of the phenomena of disease, and he possessed an acuteness of mind which well adapted him for seizing the most prominent features of a case, and tracing out the origin of the morbid affection. But his predilection for theory too frequently warped and biassed his judgment, so that he appears more anxious to reconcile his practice to his hypothesis than to his facts, and bestows much more labour on subtile

* *Douglas*, Bibliog. p. 18–22.

and refined reasoning than on the investigation of morbid actions or the generalization of his actual experience.

The number of treatises which Galen left behind him is very considerable, amounting to nearly two hundred separate works, embracing every department of medical science. His style is generally elegant but diffuse, and as may be imagined from the multiplicity of his works, he frequently repeats and copies from himself. Considered under the two classes of anatomy and physiology, and of pathology and practice, the following may, perhaps, be selected as the most valuable, both with respect to the absolute addition which they made to the previous stock of knowledge, and as to the reasoniag employed in them. Under the first head we may select the treatise "On the Use of the Parts of the Body," in seventeen books, in which he describes the structure of the different organs, and assigns to each of them their use. This is a work of great anatomical research and physiological ingenuity, which contains many facts that were probably the result of his own investigation, and exhibits a very favourable specimen of his reasoning powers, when not too much under the influence of preconceived hypothesis. The same kind of merit, although less in degree, may be assigned to the treatise "On the Motion of the Muscles," and also to that "On the Formation of the Fœtus," making due allowance for the greater difficulty and obscurity of the subject.

Among the works of the second class the treatise "On Temperaments" has been greatly and justly celebrated, as well as that "On the Seat of Disease," while that "On the Varieties of the Pulse" affords a happy illustration of his peculiar turn of mind, of his acuteness and originality, and at the same time, of his devoted attachment to hypothesis. The two works, "On the Differences and the Causes of Diseases," and "The Method of Cure," are more especially interesting, as containing the most detailed view of his peculiar doctrines of the humoral pathology, of the indications of cure which he laid down, and the methods which he adopted for their accomplishment. These two latter works exhibit a very complete view of the practice of Galen and of that of his contemporaries, and enable us to form a correct opinion of the state of the science when he entered upon the study of it, and of the additions which he made to it. To attempt an analysis of the works themselves or of the details of Galen's practice, would carry us far beyond the limits of this treatise, and, indeed, it would be principally as a question of literary curiosity that such an examination could be sustained. Their general character may be understood from what has been stated above, and we fully coincide in the remark of a learned and impartial critic, the late Dr. Aikin, who, after giving full credit to Galen for talent and acquirements, thus concludes:—"His own mass and modern improvements have now in great measure consigned his writings to neglect, but his fame can only perish with the science itself." The remark which we formerly made with respect to Hippocrates applies equally to Galen, that the great superiority which he acquired over his contemporaries appeared to repress all attempts at farther improvement.*

CHAP. VI.

An account of the successors of Galen—Decline of medical science—Sextus Empiricus—Oribasius—Ætius—Alexander Trallianus—Paulus Eginetus—Account of the state of Medicine among the Arabians—Conquests of the Arabians—Their patronage of science—Invention of chemistry—Ahrun—Serapion—Alkhendi—Rhazes—Ali-Abbas—Avicenna—Mesue—Albucasis—Avenzoar—Averroes—Estimate of the merits of the Arabic school.

In investigating the state of medicine during the middle ages, it is apparent that mankind seemed to be satisfied with the progress which had been made in the science, or were conscious of their inability to surpass the limits which had been assigned to it; and the result was, that after the death of Galen we have few illustrious names to celebrate, and no discoveries to record. Literature in general was now, indeed, rapidly declining, and various causes both moral and political were coming into operation, which suspended the progress of science and learning for many centuries, and produced

* *Conring*, Introd. cap. 3, § 16; cap. 4, § 17, et alibi. *Clerc*, par. iii. liv. iii. ch. 1-8, contains a very ample account of all that regards the writings and opinions of Galen. At this period we lose the farther aid of this candid and judicious historian of medicine. *Barchusen*, diss. no. 16, Nouv. Dict. Hist. "Galien." *Haller*, Bib. Med. lib. i. § 80, 1. *Lauth*, liv. v. par. 1. *Sprengel*, sect. 5, ch. 6. *Ackermann*, cap. 21, 2. *Blumenbach*, Introd. sect. 75. *Goulin*, Encyc. Méth. Médecine, "Galien." *Renauldin*, Biog. Univ. "Galien."

what are justly and emphatically denominated the dark ages. Into these causes it is not our business to inquire; it may be sufficient to remark that they were of so universal a nature as to operate on the human mind generally, and therefore to affect every intellectual pursuit. Medicine, among others, felt their paralysing influence, although, from certain incidental circumstances to be hereafter noticed, it was not allowed to remain so completely stationary as most of the other branches of science.

About the period when Galen flourished, the Roman empire began to exhibit very decided symptoms of that decline which, proceeding with more or less rapidity, was never altogether suspended until it terminated in complete destruction. Even in the most splendid state of Rome, the cultivation of science was very limited, and we have had occasion to remark that almost all the physicians who acquired any considerable degree of celebrity were natives of Greece or Asia, and wrote in the Greek language. This was the case with Galen himself and with the few individuals who succeeded him, whose names are of sufficient importance to be introduced into this sketch. The medical writers of the third and fourth centuries have been characterized by Sprengel as "de froids compilateurs, ou d'aveugles empiriques, ou de foibles imitateurs du médecin de Pergame."*

The only exception to this remark is Sextus Empiricus, who appears to have been a contemporary of Galen, and probably derived his appellation from the sect to which he attached himself, as there are some treatises of his still extant in which he attacks the principles of the Dogmatists with considerable acuteness. We may conclude from his works that he was a man of learning and talents, well versed in the principles of the philosophers, and familiar with all the branches of literature and science which were cultivated in his time.† He is, however, the last medical writer to whom the character of Sprengel does not strictly apply. Oribasius, who lived in the fourth century, Ætius in the fifth, Alexander Trallianus in the sixth, and his contemporary Paulus, were all zealous Galenists, who professed to do little more than to illustrate or comment on the works of their great master. Their writings are principally compilations from their predecessors; they are, however, occasionally curious from the incidental facts which they contain, and by furnishing us with extracts or abstracts of treatises which are no longer extant; but this constitutes almost their sole value. The only additions to the practice of medicine which they afford are an account of certain surgical operations, which is given us by Ætius, and a treatise by Paulus on midwifery, which is more complete than any that had previously appeared, and was long held in high estimation. But even these, which form but a small portion of the whole of their works, are connected with so much credulity and superstition, as to indicate at least the most degraded state of the science, if not the defective judgment of the writer. Ætius expressly recommended the use of magical arts and incantations, and that, not, as has sometimes been done in a more enlightened age, from a knowledge of the effect they might produce on the imagination of the patient, but apparently from his own opinion of their physical operation on the system.‡ It must, however, be admitted that both in Alexander Trallianus and in Paulus we meet with various descriptions of disease, which indicate that they possessed the talent of accurate observation; and we may conclude that, although in what respects opinions they were the devoted followers of Galen, yet in the simple detail of facts their authority may be relied upon with considerable confidence.§

With the death of Paulus, which took place about the middle of the seventh century, we may date the termination of the Greek school of medicine, for after his time we have no work written in this language which is possessed of any degree of merit. Those which occasionally appeared were mere servile transcripts of Galen and his disciples, or compilations formed without judgment or discernment, devoid of original observation, or even of any attempt at generalization or arrangement. In this degraded state was the science of medicine reduced in the former seats of learning, when a new school arose in a different quarter of the world, which will require our attention, from the actual

* T. ii. p. 170. Jourdan's Transl.

† *Enfield*, v. ii. p. 136.

‡ *Conring*, cap. 3, sect. 18–20. *Sprengel*, sect. 6, ch. 1–3.

§ *Freind*, Hist. Med. p. 398 et seq, and p. 420 et seq., Opera a Wigan, Lond. 1733. *Eloy*, "Paul d'Egine." *Haller*, Bib. Med. t. i. p. 311–15.

additions which it made to our knowledge, as well as from the mode of its origin and the nature of its connexion with the Grecian and Roman schools.

The city of Alexandria still retained its reputation as the great school of medicine, partly resting its fame on the excellence of its former professors, and in some measure depending on the value of its extensive library and other institutions favourable to the cultivation of science, the forms of which at least were still preserved. But even these feeble remains were destroyed by the conquest of the Arabians in the seventh century, who in the genuine spirit of blind bigotry appeared to be actuated by the barbarous desire of totally eradicating science from the face of the earth. The catastrophe which befel the Alexandrian library is too well known to be repeated in this place; a calamity, the full extent of which can scarcely be appreciated by one who is in the habit of regarding literature only as it exists in modern times, when books of all descriptions are multiplied to an excessive degree, and when the loss occasioned by the most splendid collection would be nearly confined to a single nation or community. It appears, however, that notwithstanding the brutal violence of the Saracen invaders, some books escaped from the general wreck of literature and science, and that there were not wanting some individuals who were capable of estimating their value. Among these relics were the writings of Galen, and we are informed that at an early period of the Saracenic empire they began to be held in very high estimation; they were translated into the Arabic language, were commented upon and elucidated in various ways, and soon acquired a degree of celebrity scarcely short of what they had previously enjoyed among the Greeks themselves. The Arabians were also in possession of the works of Hippocrates, but the simplicity of this author was less adapted to their taste than were the metaphysical refinements and elaborate arrangements of Galen, so that, while the latter was regarded with a respect amounting almost to veneration, the former was little read or estimated.

After the immediate successors of Mahomet had completed their conquest of a considerable part of the civilized world, they rested from their warlike triumphs, and seemed disposed to add to the splendour of their empire by the cultivation of the arts of peace. The patronage of literature was an express object of many of their rulers, and even the works of the Greek philosophers were translated and studied with much assiduity. But the spirit of Mahomedanism was decidedly averse to intellectual improvement, and we accordingly find that no additions were made to general science, and that very little was accomplished even in the collection of facts and observations. To this remark, however, medicine forms an exception; for although the Arabian physicians adopted implicitly all the theories and speculations of Galen, and seldom ventured in the smallest degree to deviate from his practice, we are indebted to them for the description of some diseases, which either made their first appearance about this time, or had not been before specifically noticed.*

We have to notice, in this place, a curious occurrence in the history of science, and one which indirectly produced a very important effect upon the subject of this dissertation,—the invention of chemistry. The origin of chemistry, like that of all other sciences, is obscure and uncertain. Traces of what may be called chemical operations are to be found even among the Jews and Egyptians, but it is generally admitted that they are to be regarded as incidental occurrences, depending upon accidental observations, pursued no further than the object immediately in view, and not considered, even by those who practised them, as more than mere insulated facts, leading to no general principles nor to any farther investigations. The practice of chemistry as a distinct pursuit seems to have originated with the Arabians, and by them was made subservient to the purposes of medicine.† It is not our business to inquire into the mode in which this art took its first rise, or to trace its subsequent progress, except so far as may be connected with our present subject; and this will be the most conveniently accomplished by giving in succession a brief account of the most distinguished writers who belonged to the Arabian school of medicine.

* For an account of the Arabian school of medicine generally, the reader is referred to Freind, who treats upon every thing connected with it in the most ample manner. See also *Barchusen*, diss. 17, § 12 et seq. *Sprengel*, sect. 6, ch. 5. *Cabanis*, § 6.

† *Freind*, pars 2, sub init. *Sprengel*, t. 2, p. 246–266.

The earliest Arabian writer on medicine of whom we have any certain account, would appear to be Ahrun, who was a priest at Alexandria. He published a treatise entitled "Pandects;" it has not come down to us, but it deserves to be noticed as it is said to have contained the first description of the small-pox. He was contemporary with Paulus, and from the account of his works which has been transmitted to us by Rhazes, we may conclude that the science of medicine was cultivated at that time with at least as much success among the Arabians as among the Greeks. During the next three centuries, although we meet with the names of many individuals who acquired a certain degree of temporary celebrity, we have none who rendered themselves so far pre-eminent as to entitle them to particular notice in this brief sketch. The first author of whom it will be necessary to give any distinct account is Serapion; he lived in the ninth century, and is said to have been a native of Damascus. His treatise entitled, according to the fancy of the translators, "Aggregator," "Breviarium," or "Therapeutica Methodus," was written originally in Syriac; its professed object was to give a complete system of the Greek medicine, and to incorporate with it the principles and practice of the Arabians. Like those of the rest of his countrymen, the greatest part of Serapion's work is taken from those of his predecessors, and particularly from Galen; but it contains some few novelties with respect both to doctrine and to practice, and in one point, the preparation and composition of medicines, as well as in the articles employed, we may notice a decided improvement.*

At the same time with Serapion lived Alkhendi, a multifarious writer, who obtained a very high degree of celebrity among his contemporaries, perhaps more from the variety of his acquirements than from the excellence he attained in any particular department. He is said to have assiduously cultivated mathematics, and the various branches of natural philosophy as well as medicine; and among other subjects to which he particularly directed his attention, we find astrology expressly enumerated. In relation to his varied attainments, he was styled the subtile philosopher, the learned physician, and the Greek astrologer. As an example, both of the spirit of the age and of the genius of the individual, we may remark that Alkhendi applied the rules of geometrical proportion and of musical harmony to regulate the doses of medicines, and to explain the mode of their operation—a mistaken application of science, which, however gross it may now appear, we must reflect was not entirely exploded until long after the revival of letters.†

We now come to one of the most illustrious of the Arabian school, Rhazes. He was born at Irak in Persia, in the ninth century; is described as a person of varied acquirements, as being well versed in general science, and, as his writings demonstrate, of unwearied industry. There is some reason to doubt whether the principal work which has been transmitted to us under his name, entitled "Continens," is precisely in the form in which it was left by its author; but there appears to be sufficient proof of its general authenticity to enable us to deduce from it, as well as from his other acknowledged works, an ample and correct view of the opinions and practice both of Rhazes himself and of his contemporaries. For the most part, the writings of Rhazes are deficient in method and arrangement, and they consist principally of abstracts and comments on Galen and the Greek physicians; but they also contain observations that appear to be original, and we even meet with the description of some diseases which were either new, or at least were not noticed by the ancients. Rhazes gives us a correct and elaborate description of the small-pox and measles, detailing the theory which was formed of their nature and origin by the Arabians, and the treatment which they employed. The most curious and original work of Rhazes is his "Aphorisms," in one part of which he professedly gives the result of his own observation and experience. But even this treatise, which was long regarded as of the highest authority in the schools of medicine, contains little that is really new and valuable; and when we compare it with its celebrated prototype, we cannot but be impressed with the very small advance which had been made in the science and practice of medicine during a space of nearly thirteen centuries. The most important additions which Rhazes made were, perhaps, rather in surgery and in pharmacy than in medicine strictly so called; and it

* *Haller*, Bib. Bot. t. 1, p. 183–9.

† For an account of the earlier writers of the Arabian school, see *Freind*, Hist. Med. pars 2, sub init.

is worthy of notice, that in the latter department we have some of the earliest indications of the free employment of what were styled chemical remedies.*

A short time after Rhazes lived Ali-Abbas, a writer of considerable celebrity, who obtained the appellation of the magician. His principal work, entitled "Opus Regium," professes to contain a complete view of the state of medicine in all its branches; it consists chiefly of abstracts of the doctrines and opinions of the Greek physicians, but along with these are contained some original observations. At the time of its publication it was very highly estimated, and perhaps may be considered as possessing more real value than most of the works that proceeded from the Arabian school.†

The fame of Ali-Abbas was, however, almost entirely eclipsed by that of Avicenna,‡ who flourished about a century later, and who rose to the highest pitch of celebrity, so as to be regarded by his countrymen as superior to Rhazes, or even to Galen himself. Avicenna was born at Bochara in the year 980, and was carefully educated in all the learning of the times, consisting principally of the Aristotelian logic and dialectics, with the imperfect mathematical and physical science, that was then taught in the schools of Bagdat. He appears to have been possessed of an ardent desire for acquiring knowledge, and of great industry, but united to a portion of fanaticism, indicative of a defective judgement, and fostered by the spirit of the age, which induced him to conceive himself under the influence of supernatural revelation. After a foundation of general science he entered upon the study of medicine, which he prosecuted with the same diligence and with the same spirit of enthusiasm. His reputation became so high that he was early introduced to the court, and for some years was without a rival in his profession. His death, which took place in his fifty-sixth year, was probably hastened by some political intrigues, in which he unfortunately became entangled.

The works which Avicenna left behind him are numerous, and embrace both general science and medicine. The former long maintained a high character for extent of information and profundity of learning, and according to the standard of the age were probably entitled to this commendation. But his fame, both with his contemporaries and with posterity, principally rests upon his great medical work, entitled, "Canon Medicinæ," which may be regarded as a kind of encyclopædia of all that was then known of medicine, and of the sciences connected with it, anatomy, surgery, therapeutics, and botany. Its celebrity was so great as to have acquired for its author the title of prince of physicians; for some centuries it was the received text-book in most of the medical schools, both of the Arabians and the Europeans; until the revival of letters it superseded, in a great measure, the works even of Galen, it produced scarcely less numerous commentaries and epitomes, and had not entirely lost its authority two centuries ago. Yet the matured judgement of one of the most learned and candid of the modern critics has not hesitated to bestow upon this so much vaunted production the character of an ill-digested and servile compilation, containing little that is new either in the way of observation or of practice. Indeed, the sole aim of Avicenna seems to have been to collect matter from all quarters, without paying any regard to its value, or to the mode in which it was arranged. He was a devoted admirer of Aristotle and Galen, and seemed to imagine that the ultimate object either of the philosopher or the physician consisted in being intimately acquainted with their writings, and in defending them against all objections. Upon the whole, after making every allowance for the period in which he lived, it seems difficult to account for the very great credit which he acquired, not only during his life-time, but which was attached to his writings after his death; a credit so much greater than what they merit, either from the importance of the information which they contain, or the mode in which it is conveyed.§

There are two Arabian writers of the name of Mesue, whose celebrity entitles them to a brief notice in this place, although considerable uncertainty attaches both to their individual history and to their works. The elder of them is said to have lived in the

* *Freind*, p. 483–91. *Haller*, Bibl. Med. Prac., lib. ii. §. 135. *Eloy*, in loco. *Lauth*, p. 280–2. *Sprengel*, t. ii. p. 285–301.

† *Freind*, p. 481. *Haller*, Bib. Med., lib. ii. §. 137, t. i. p 380. *Sprengel*, t. ii. p. 301–5.

‡ The actual name of this individual is said to have been Al-Hussain-Abou-Ali-Ben-Abdallah-Ebn-Sina. *Sprengel*, t. ii. p. 305. In most cases it appears that the names by which the Arabians are generally known in Europe were not their real names.

§ *Freind*, lib. ii. p. 491–2. *Haller*, Bib. Med. lib. ii. §. 139. *Eloy*, in loco. *Lauth*, p. 282–5. *Enfield*, v. ii. p. 222, 3. *Sprengel*, t. ii. p. 305–22. *Hutton's* Math. Dict., in loco. *Goulin*, Encyc. Méth., Médecine, "*Avicenne.*" "*Avicenne,*" in Biog. Univ.

eighth, and the younger in the tenth century; and they are both represented as being Christians of the Nestorian sect, but to have exercised their profession at Bagdat. The elder Mesue is principally remarkable as having been among the first who made correct translations of the Greek physicians, and especially of Hippocrates and Galen, into Arabic; for although he appears to have composed many original works, we do not find that they rose into any high repute even among his contemporaries. To the younger Mesue is usually ascribed a treatise on materia medica and pharmacy, which for a long time was in great estimation, and was republished and commented upon even as late as the sixteenth century; it probably contained a full view of the state of the science when he wrote, and is interesting, as it indicates the introduction of several new remedies into medicine; but in other respects it is to be regarded merely as a literary curiosity.*

The last of the Arabians who acquired any considerable distinction as a writer on medical subjects, is Albucasis. So little is known of his personal history, that both his birth and the country in which he lived have been the subject of controversy, and appear to be entirely conjectural. His principal works are on surgery; and the reputation which he acquired in this department is almost as great as that of Avicenna in medicine. He seems to have been a man of learning and talents, to have made himself master of the writings and practices of his predecessors, and to have improved upon them. The description which he has left of his operations shows him to have possessed a degree of boldness and dexterity which could only exist in one who was well acquainted with his art, and had been habituated to the practice of it. His practice was what we should now consider as unnecessarily severe, making much more use of the knife and of the actual cautery than is done in modern times, and in all respects inflicting both more pain and more permanent injury on his patients. The works of Albucasis appear, however, to have afforded by far the most complete view of the practice of surgery which then existed; and from this circumstance, as well as from their real merit, they were, for many ages, considered as standard performances, and employed as the text-book in various schools and colleges.†

It remains for us to give an account of two individuals, who, although natives of Spain, and residing principally in that country, were of Saracenic origin, and wrote in the Arabic language—Avenzoar and Averroes. Avenzoar was born at Seville, in the end of the eleventh century, and is said to have lived to the unusual length of one hundred and thirty-five years; but probably some error may have crept into this statement in consequence of both his father and his son having been, like himself, engaged in the practice of medicine. His principal work, entitled "Thaissyr,"‡ which consists of a general compendium of medical practice, displays more originality and discrimination than the writings of any of the native Arabians; so that, although he was professedly a disciple of Galen, he does not hesitate, on certain occasions, to shake off his authority when his opinions or practice were not sanctioned by his own experience. We may collect, from certain parts of his works, that he practised both surgery and pharmacy, as well as medicine properly so called; and we have many valuable observations on each of these departments. Upon the whole, we may consider Avenzoar as respectable both from his general character and his professional skill, and entitled to our regard as one of the improvers of his art.§

Besides the reputation which Avenzoar derived from his own merits, he was perhaps still more known among his countrymen as being the preceptor of the celebrated Averroes. Averroes was a native of Corduba, and flourished in the twelfth century; he was of illustrious birth, and highly educated in all the branches both of literature and of science which were then taught in the Saracenic colleges of Spain. From certain political causes he was, in the early part of his life, the subject of religious persecution; but he succeeded in repelling the attacks that were made upon his faith, and was finally reinstated in all his former honours and in the public estimation. These circumstances, coinciding

* *Freind*, p. 481, 2. *Haller*, Bibl. Med. Prac. lib. ii. §. 126. *Eloy*, in loco. *Enfield*, v. ii. p. 213. *Sprengel*, t. ii. p. 325.

† *Freind*, p. 506-524. *Haller*, lib. ii. § 148. *Eloy*, in loco. *Lauth*, p. 285, 6. *Sprengel*, t. ii. p. 327-32.

‡ Freind designates the Thaissyr as "liber qui omnia victus et medicinæ præcepta in plerisque morbis contineret:" p. 493.

§ *Freind*, p. 492-503. *Haller*, lib. ii. § 141. *Eloy*, in loco. *Sprengel*, t. ii. p. 332-7.

probably with the peculiar temperament of his mind, gave to his character a degree of ascetic gloom and austerity; but he appears to have been a man of distinguished worth and of superior abilities. Averroes' professional occupations were principally in a civil capacity; he is therefore to be regarded, not as a practitioner, but as a scholar who pursued the study of medicine as a branch of physical science. But such was his ardour in the pursuit of general knowledge, and the fondness which he manifested for this particular department, that he made himself intimately acquainted with it in all its details; and in his great work entitled "The Universal," he shows that he was not deficient in any part of the science which could be acquired by the mere study of books. As a philosopher, he was a zealous and obsequious follower of the opinions of Aristotle, and as a physician, of those of Galen; he published many comments on both of them, which acquired the highest degree of reputation, and for many ages were considered as standard performances. Yet there is reason to suppose that he was ignorant of the Greek language, and, like his contemporaries, became acquainted with Aristotle and Galen only through the medium of Arabic translations. The great estimation in which the works of Averroes were held is proved by the number of editions of them which were published from time to time, one of which appeared at Venice so late as the commencement of the seventeenth century. With respect to his medical writings, as they do not profess to be the result of original observation, we cannot be surprised that their reputation is no longer supported. They are indeed entirely neglected; and it may be affirmed that, notwithstanding the celebrity which they once enjoyed, and which they so long maintained, they have not left a single permanent addition to the science.*

With Averroes terminated the Arabic or Saracenic school of medicine; after his time we have no writer whose name is sufficiently distinguished to deserve particular mention: even the study of the ancients began to be neglected, while no original observations were made, and no novel opinions or speculations were framed which might tend to exercise the mind or dissipate the darkness which now covered all parts of the world.

If we inquire into the causes of the great celebrity of the Arabian school of medicine, we shall be led to the conclusion that they were rather incidental and factitious than derived from its absolute merits. It has been justly observed that a considerable portion of this celebrity must be ascribed to the comparative condition of the neighbouring countries. From the eighth to the twelfth centuries was, perhaps, the period in which Europe was in the state of the most complete barbarism and superstition. The only remains of a taste for literature and science, or for the fine arts, were found among the Moors and Arabs; and it was from this source, by the intervention of the crusaders, and the intercourse which was thus effected between the Asiatics and the Europeans, that the philosophical and medical writings of the Greeks were first made known to the inhabitants of Italy and of France. And even after their introduction into Europe, it appears that they were for some time read only in Arabic translations, or in Latin versions made from these translations; so that it was not until a considerably later period that they were perused in their native language. Indeed so completely was the study of the Greek tongue suspended during the dark ages, that it may be doubted whether the writings of the ancient physicians might not have been entirely lost to posterity had they not been preserved in these translations.

There are, however, two points in which the Arabians conferred a real obligation upon their successors; the introduction of various new articles into the materia medica, and the original description of certain diseases. The additions which the Arabians made to pharmacy consisted partly in the vegetable products of the eastern or southern countries of Asia, which were only imperfectly known to the Greeks, and with which they had no intercourse. Among other substances we may enumerate rhubarb, tamarinds, cassia, manna, senna, camphor, various gums and resins, and a number of aromatics, which were brought from Persia, India, or the oriental isles. But a still more important addition which they made to the pharmacopœia consisted in what were styled chemical remedies, such as were produced by some chemical process, in opposition to those substances that were used nearly in their natural state. With respect to the origin of pharmaceutical chemistry, it may be sufficient to observe that

* *Freind*, p. 503–6. *Bayle's* Dict., in loco. *Moreri's* Dict., in loco. *Haller*, lib. ii. § 142. *Eloy*, in loco. Nouveau Dict. Hist., in loco. *Enfield*, t. ii. p. 226–231. *Sprengel*, t. ii. p. 337–41.

a rude species of chemical manipulation appears to have been practised in Arabia in the fifth century, that distillation was performed, and that the metals were subjected to various processes, by which some of their oxides and salts were produced. The immediate object of these processes was the transmutation of the metals; an operation which, for many centuries, formed a main subject of attention to almost all the individuals who were considered as cultivators of natural philosophy.

With respect to the second subject alluded to above, the description of new diseases, it is well known, that from causes which are now altogether inexplicable, diseases of the most marked and distinct nature, which are the least liable to be mistaken or confounded with other affections, and which, had they existed, are too violent to have been overlooked, are not mentioned by the Greek and Roman physicians, and are described for the first time by the Arabians. Of these the two most remarkable are the small-pox and the measles. There is some reason to suppose that the small-pox had been known in China and the more remote parts of India at a much earlier period, but it is generally admitted that it was first recognized in the western part of Asia, at the siege of Mecca, about the middle of the sixth century, when it raged with great violence in the army of the besiegers. We have remarked above, that the disease was alluded to by Ahrun shortly after its appearance, but it was Rhazes to whom we are indebted for the first clear and distinct account of its symptoms and treatment. There is no subject in the whole range of medical science of more difficult solution than that which respects the origin of diseases, especially such as, when produced, are propagated solely by contagion. Into this subject, however, it would be improper for us to enter in this place, as our readers will find it fully considered in the appropriate articles; it is here only alluded to as an historical fact, in connexion with the writings of the Arabians.*

We are indebted to them for the transmission of the works of the ancient Greek physicians, to which they made certain additions of insulated facts with respect to the description of diseases, but with respect to the general principles of therapeutics the additions, if any, were few and imperfect. In anatomy they made no advances, and we have reason to suppose that the examination of bodies, either in a sound or a morbid state, was scarcely practised by them. Medical theory was much attended to, but their theories consisted more in subtile refinements, formed upon the Aristotelian model, than in the study of pathology, or an accurate discrimination of the phenomena of disease. Some little advance appears to have been made in surgery by Albucasis, but he is the only individual who seems to have aimed at improving this branch of the profession; and it may be doubted whether the practice of surgery was not, upon the whole, in a retrograde state, during the period of which we are now treating. It is in the department of pharmacy alone that they made any additions of real value; and, although in this case it may be attributed more to accidental circumstances than to any enlightened spirit of improvement, yet it is incumbent upon us to acknowledge the obligation, which was both extensive and permanent.†

CHAP. VII.

State of medicine in Europe after the extinction of the Arabian school—Medical schools of Monte-Cassino and Salerno—Medicina Salernitana—Constantinus Africanus—Actuarius—Rise of the study of anatomy—Mondini—Gilbert—Effect of the crusades, of the reformation, and of the invention of printing, on the literature of Europe—On medical science—Alchemists—Establishment of universities—Linacre—Chemical physicians—Paracelsus—Appearance of new diseases.

During the flourishing period of the Saracenic school of medicine, which may be considered as extending from the eighth to the twelfth century, the science remained nearly

* On the origin of the small-pox, see *Freind*, p. 524-9; *Mead's* Discourse on Small-Pox and Measles, ch. i.; *Thompson's* Enquiry into the Origin of Small-Pox; *Plouquet*, Literatura Digesta, "Variola, Antiquitas, Historia," in loco: ample references may be found in this learned and laborious compilation on all analogous topics, but we may regret that the writer appears to have aimed rather at multiplying his authorities than estimating their value.

† We are indebted to Freind for a candid and judicious account of the Arabian medical school, p. 529-33. *Haller's* second book of his Bibl. Med. Prac. is devoted to the same subject. See also *Robertson's* Charles V. vol. i. note 28. *Berington's* Middle Ages, App. No. 2. *Gibbon's* History, vol. x. ch. lii. *Ackermann*, cap. xxvii-xxix. *Oelsner*, Des Effets de la Religion de Mahommed, p. 196-9: this is perhaps too much disposed to exalt the merits of the Arabian school. *Kühn*,

stationary, or was even retrograde among the successors of the Greeks and Romans. We have scarcely a single name of sufficient importance to arrest our attention, and we have no improvements to record, either in theory or in practice. The only attempts that were made in Greece or in Italy during this period, which deserve to be noticed, are connected with the Neapolitan schools of Monte-Cassino and of Salerno, which acquired some degree of reputation in the eleventh century. It was at this period that the physicians attached to the school of Salerno wrote the verses on dietetic medicine, entitled "Medicina Salernitana," a work which, as afterwards published with the commentary of Arnoldus de Villanova, acquired considerable celebrity, and may be regarded as a valuable document, by its affording, in a small compass, a correct idea of the state of Italian medicine at that early period.*

In connexion with this subject we may notice Constantinus Africanus, who is supposed to have flourished about the end of the eleventh century. He was, as his name imports, an African; he possessed an ardent desire to obtain knowledge, studied in the schools of Bagdat, and is said to have travelled even into India. At his return to his native country he was regarded as a sorcerer, and was compelled, in order to save his life, to take refuge in Italy, where he was finally attached to the university of Monte-Cassino. He principally employed himself in translating the works of the Greek and Latin physicians into Arabic, which was at that time the general language of science. His translations are, however, said to be incorrect, and his style barbarous; while his works, which are not professed translations, appear to be composed of transcripts from other authors, without any particular merit, either of selection or of arrangement.†

We must mention in this place a writer whose real name has not been transmitted to us, commonly called Actuarius, from the office which he bore in the court of Constantinople;‡ he is supposed to have lived in the twelfth century. The works which he left are numerous, and, although consisting principally of extracts from Galen and the Arabian physicians, with whose writings he appears to have been familiar, are not without some additions derived from his own observations and experience. He is considered as having been the first Greek physician by whom chemical medicines are mentioned, as well as various articles of the materia medica, which were originally introduced by the Arabians. We may regard Actuarius as a diligent collector of facts, acquainted with all the information of his age, and as more free from prejudice and bigotry than the generality of his contemporaries.§

After the extinction of the Saracenic school of Spain, we have an interval of about three hundred years, from the twelfth to the fifteenth century, during which what are termed the dark ages still remain enveloped in the deepest gloom; every department of science was neglected, and among others that of medicine fell into its lowest state of degradation. What remained, either of literature or of science, was in possession of the monks, who were themselves grossly ignorant, and whose interest it was to preserve mankind in the same state of ignorance. The exercise of the medical profession was principally in their hands, and they still adhered for the most part to the doctrines and practice of Galen, but with these they mixed up a large portion of superstition, and had not unfrequently recourse to magic and astrology. By these means they obtained an unbounded influence over the minds of the people, and operated so powerfully on the imagination of their patients, as in many cases to give an apparent sanction to their confident assumption of supernatural agency.‖ The only branch of science which was cultivated with any ardour or success, was chemistry. The chemistry of these times can indeed only be interesting to us, as having led indirectly to the discovery of various substances which have been found of great importance in medicine, to which we have already referred. Its immediate objects were two-

Bib. Med. Sec. 3, of what he styles "Fontes Medicinæ," is entitled, "Scriptores Medici inter Arabes præcipui," p. 180-6. *Portal*, Hist. Anat. ch. ix. "Des Anatomistes et des Chirurgiens Arabes, t. i. p. 143 et seq. *Blumenbach*, Introd. sect. 6. "Arabes."

* *Haller* ascribes the Latin verses of the Medicina Salernitana to John of Milan; he remarks that of this work there had been published "editiones ferè innumerabiles;" Bib. Med. lib. iii. sec. 140. See also *Eloy*, t. ii. p. 599; *Ackermann*, sec. 422, and *Blumenbach*, sec. 114.

† *Freind*, p. 533, 4. *Haller*, Bibl. Med. lib. iii. sec. 159. *Eloy*, in loco. *Sprengel*, t. ii. p. 355, 6.

‡ For the origin of the term, see *Adelung*, Gloss. Man., in loco.

§ *Freind*, p. 452–462. *Eloy*, in loco. *Sprengel*, t. ii. p. 241-4.

‖ *Sprengel*, sec. vii. ch. i.

fold, the transmutation of the baser metals into gold, and the discovery of what was termed a universal medicine, which should possess the property of removing all diseases, and preserve the constitution in a state of health and vigour; objects which it is unnecessary to observe were completely vain and illusory. Yet by promoting a spirit of research, and by making the experimentalist acquainted with the various forms and properties of the substances on which he operated, they gave him some insight into the physical laws of matter, and by a gradual although very slow process, laid the foundation of the splendid improvements of modern science. Many of the alchemists of the dark ages, we can have no doubt, were impostors of the lowest description, who were completely aware of the folly of their pretensions; but at the same time there were others who appear to have been the dupes of their own credulity, and who bestowed a large portion of their time and fortune upon these researches. Between these two extremes there were some rare cases of individuals who may be entitled to hold an intermediate rank, who were sincere and honourable in their views, and without giving full credit to the professions of the alchemists, conceived that the objects at which they aimed were at least not altogether impossible. To these we may add another class of individuals, consisting of that singular and unaccountable compound of knavery and folly, which is not confined to the subject now under consideration, where it is extremely difficult to draw the line between these two qualities, or to decide which of them forms the predominant characteristic.

The school of Salerno, to which we have referred above, obtained a degree of celebrity from its local situation, this city being one of the great outlets from which the crusaders passed over from Europe to Asia in their expeditions to Palestine; and it was probably from this circumstance that Robert of Normandy stopped at Salerno, in order to be cured of a wound which he had received in the holy wars. It was on this occasion that the verses mentioned above, and which were addressed to him, were written. Upon the decline of the Saracenic universities of Spain, the only medical knowledge which remained was in Italy, where a few individuals, who were not of the ecclesiastical profession, continued to comment on Galen and Avicenna, and occasionally to deliver lectures; but we have a long dreary interval, in which there is nothing to arrest our attention, or to relieve the dull monotony of ignorance and superstition.

During this period the school of Salerno still retained its reputation, and was even favoured with especial privileges by the emperors; but its merits were probably rather comparative than absolute, for we do not find any improvements that emanated from it, nor any authors whose writings maintained their celebrity after the age in which they were produced. It is, however, in one respect deserving of our notice, as it appears to have been the earliest establishment in which what may be styled regular medical diplomas were granted to candidates, after they had passed through a prescribed course of study, and been subjected to certain examinations. The regulations are upon the whole judicious, and display a more enlightened and liberal spirit than might have been expected in that age, when the human mind was in so degraded a state.* The school of Salerno maintained its celebrity until the thirteenth century, when it was eclipsed by the general diffusion of medical science through Europe, and more particularly by the rising reputation of the universities of Bologna and Paris.

It was about this period that we may date the commencement of a practice which has eventually proved of the greatest importance to medical science in all its departments—the study of human anatomy. We have already had occasion to remark that the ancients, even in their most enlightened ages, seldom if ever ventured to examine the human subject, but were content to derive their knowledge of it from the dissection of animals which were supposed the most nearly to resemble it, making up the deficiencies by the casual examinations which were afforded them by accidents or diseases, and perhaps more frequently by supposed analogies, or rather by the efforts of the imagination. The individual to whom the credit is ascribed of having so far overcome vulgar prejudice as to have introduced this most important improvement into his art, is Mondini, a professor in the university of Bologna, who is said to have publicly dissected two female subjects about the year 1315, and who published an anatomical description of the human body, which appears to have had the rare merit of being drawn immediately from nature. This work deservedly obtained a high reputation:

* *Freind*, p. 535–7. *Eloy*, art. "Salerne." *Lauth*, p. 291, 2. *Ackermann*, cap. xxxi.

for three hundred years it was considered as a standard performance, and was used as a text-book in the most celebrated of the Italian universities. Mondini is also entitled to the gratitude of posterity for having given a very early, if not the first example of anatomical plates; the figures were cut in wood, and although, as might be supposed, they were not executed with much elegance or delicacy, they are said to have been correct and expressive.*

About the same time with Mondini lived Gilbert, surnamed Anglicanus, a writer who must be considered as peculiarly interesting to us, from his being the earliest English physician whose name is sufficiently celebrated to entitle him to a place in the history of medicine. There has been much controversy respecting the date of his birth; but it appears the most probable that he flourished in the beginning of the fourteenth century. At this time medical science, as well as all other kinds of knowledge in this country, was in a state of the lowest degradation. There were no public means of instruction in any of the branches of natural philosophy. The light of science, which had dawned in the south of Europe, had not yet extended to the remote shores of Britain, and the learning of the age, which was confined to the monks, consisted entirely of scholastic disquisitions and the disputations of polemical theology. We are not therefore to expect, in the writings of Gilbert, much of genuine philosophy or of real science; his principal work, which is entitled "Medicinæ Compendium," consists chiefly of subtile distinctions, disquisitions respecting trifling and insignificant topics, with minute divisions of his subject, which lead to no useful purpose or general conclusion. His medical theories are principally taken from Galen, while his mode of reasoning proceeds upon the technical principles of the Aristotelian dialectics; he adopts the former without discrimination, and employs the latter without judgment. He frequently refers to the Arabian physicians, and there is some reason to suppose that it was through their means, *i. e.* through the medium of the Latin translations of their writings, that he made himself acquainted with the opinions of Galen.†

But although we are compelled to pass this general censure upon the works of Gilbert, justice demands it of us to admit that his defects may be fairly ascribed to the age and country in which he lived, and that he deserves great commendation for the attempt which he made, however imperfect it may have been. Nor are his works entirely without merit or originality; he has described some diseases in such a manner as to shew that, under more favourable circumstances, he might have excelled in the art of making observations; he occasionally gives us some particulars of his practice, which prove that he was capable of exercising a correct judgment in the treatment of the cases which were submitted to him, and we are indebted to him for some additions to the materia medica, and for some improvements in pharmacy.‡

About this period a grand political revolution was commencing in Europe, which eventually produced an entire change in the civil condition of its inhabitants, and indirectly affected, in an equal degree, its science and its literature. The feudal system, after being firmly established for some centuries, began to be shaken, perhaps in the first instance by the crusades. These expeditions, although undertaken from a spirit of gross superstition and bigotry, yet by giving a degree of excitement to the mind, and still more by making the crusaders in some degree acquainted with the literature of the Arabians, laid the foundation for subsequent improvements. There has been much controversy, not only respecting the absolute merit of the Arabian literature, but respecting the influence which it had on that of Europe. On the first of these points, so far at least as regards the medical sciences, we have already offered a few remarks; and on the latter we may observe that at the period of the crusades, whatever may be our estimate of the absolute merit of the Saracenic schools of learning, they were undoubtedly superior to those of the Christians, if indeed these latter can be entitled to the appellation. The armies of the crusaders were certainly not the best adapted either for appreciating the learning of the countries which they invaded, or for transferring any portion of it to their own; but still an intercourse of two or three centuries could not fail of having produced some effect, and in fact we know, not only that Arabian

* *Freind*, p. 546. *Haller*, Bibl. Anat. § 120, t. i. p. 146, 7. *Eloy*, in loco. *Portal*, Hist. Anat. t. i. 209–16. *Sprengel*, t. ii. p. 432–4. *Douglas*, Bibliogr. Anat. p. 36–9. *Blumenbach*, § 118.

† *Warton's* Hist. of Eng. Poet. v. i. p. 443.

‡ *Freind*, p. 547–50. *Eloy*, in loco. *Aikin's* Biog. Mem. of Med. in Gt. Brit. p. 8, 9. *Sprengel*, t. ii. p. 402–6.

books were read and studied in Italy and France, but that it was almost exclusively by the medium of these books that the knowledge of the Greek and Roman authors was kept alive.*

The advantages which were derived to the Europeans from their intercourse with Asia, were, however, of but little moment compared to the great events to which we alluded above. The first of these was the capture of Constantinople, in the middle of the fifteenth century, by Mahomet the Second. The Greek monasteries of this city had been for some time the refuge of the learned men who had been driven from Italy by the perpetual wars in which that country had been so long engaged. They had taken with them, what they considered as their most precious treasures, the manuscripts of the ancient classical writers, probably regarding them more as objects of curiosity than of real importance. These manuscripts had now been buried for a long time in their libraries, their existence being unknown to the rest of the world, when the monks were expelled from their retreats by the Turkish conqueror, and, flying into Italy, carried back with them their classical manuscripts. A spirit of improvement had already begun to manifest itself in this country, which was considerably incited by their guests, who in their turn, by their change of situation and by the new society into which they were introduced, became more aware of the value of their literary treasures; while their own acquirements, limited as they were, gave them a degree of respect with their new associates which tended to inspire them with a desire of further improvement.†

The other event to which we referred, and which occurred about thirty years after the destruction of the Byzantine empire, was one of infinitely more importance both in its immediate and its ultimate effects. Considered in all its bearings, both moral and political, it may probably be regarded as the most important which has ever occurred in the history of civilized society. Our readers will not need to be informed that the great event to which we refer is the Reformation. Into the causes of this event, the motives of Luther and his associates, the difficulties with which they had to struggle, and the means by which they succeeded in overcoming these difficulties, it is not our business to inquire. It only remains for us to notice its effect on science, and more particularly on medical science. We have remarked above that a certain degree of mental exertion had begun to manifest itself in the fourteenth century, that this was in some measure brought into action by the excitement produced in consequence of the crusades, and that the minds of men were thus prepared to receive the great truths which were so powerfully impressed upon them by the reformers. The first effect, however, of the Reformation was rather unfavorable to the progress of science and literature. The attention was entirely absorbed by the violence of theological controversy, and the civil feuds which succeeded put a stop to the peaceful labours of the scholar and the philosopher. But if a temporary pause was thus produced, the subsequent advance was proportionally rapid. No sooner were the minds of men delivered from the thraldom of theological bigotry, than they felt a strong impulse to free themselves from the tyranny of opinions on all other subjects in philosophy; and although it still required the lapse of some centuries to shake off the undue authority of Aristotle and Galen, and to form a fair estimate of their real merits, they were at least regarded as fair topics for discussion, while innovators were every day rising up who ventured to question their infallibility without the danger of being stigmatized as schismatics and heretics.‡

The happy invention of the art of printing, "an art which derides the havoc of time and barbarism," and which fortunately occurred about the same period, most powerfully tended to co-operate with the labours of the reformers, both in religion and in science, by affording them the means of more readily communicating the result of their inquiries, and of preserving the records of knowledge from the danger which they had lately experienced of being totally lost or destroyed.§ One of the first uses which was made of this important invention was not only the multiplication of the works of the ancient classics, which had been brought by the Byzantine monks into Europe,

* *Gibbon*, ch. lxi. *Sprengel*, sect. 7, ch. iii. We must remark that the opinion expressed in the text respecting the influence of the crusades on the literature and science of Europe, differs in some degree from that of Mr. Mills, as stated in his interesting work on the Crusades, v. ii. p. 354-68.

† *Ackermann*, ch. xxxii. *Cabanis*, § 7.

‡ *Enfield*, v. ii. book 8, ch. ii.

§ For remarks on the scarcity and value of books, see Robertson's Charles V., v. i. ch. v. note 10; Warton's Hist. of English Poetry, passim.; Berington's Middle Ages, book vi. p. 507, 8.

but, by making mankind sensible of their value, other works of a similar kind were eagerly sought after, and thus, in the course of a few years, manuscripts were discovered of almost all the classical writings of which we are now in possession.* The munificence, and even the voluptuous extravagance of Leo X. and the other Italian potentates, by the direct encouragement which they gave to literature and the fine arts, powerfully coincided with the current of public opinion. For although, by inciting the daring spirit of Luther to take those steps of open hostility against the papal authority which he probably little contemplated in the first instance, they produced effects very different from those originally intended, yet they must be considered as among the indirect causes which conspired to produce the great mental revolution of the fifteenth century.

The science of medicine in its various departments was not slow in partaking of the beneficial effects of the change which we have been describing. The writings of the Greek physicians, which had for some centuries been studied through the medium of Arabic translations, or even of Arabic commentaries, were now read in their original language or in correct Latin versions. It was found that Avicenna, Averroes, and the great luminaries of the Saracenic schools, had in many cases either misunderstood or perverted the doctrines and tenets of Galen, and his genuine writings now began to be substituted for the imperfect transcripts of them which had so long occupied their place. The works of Hippocrates were also printed in their orginal form; but it required a considerably longer period of mental education to enable the bulk of medical readers to appreciate his merits, so that, although various editions of his works were printed, and learned treatises written to explain them, Galen still retained the pre-eminence in public estimation.

A practice began to prevail about the fifteenth century which very materially contributed to advance the science of medicine, and especially the practical part of it,—the publication of monographs of particular diseases and of individual cases, with the reports of hospitals or other public institutions. This plan was not, indeed, altogether new, for we meet with narratives of cases even in Hippocrates; but it had been either misunderstood, or had been so much perverted from its original design and legitimate object as to have been rendered of little value. Many of these early collections, it must be acknowledged, were formed without judgment, and consisted rather of marvellous stories than of histories from which any practical inference could be deduced; but they served the purpose of inducing a habit of observation, and of directing the attention more to facts than to mere hypotheses. In each succeeding age we find this plan to have been more generally adopted, and at the same time to have been much improved in its method; so that we may undoubtedly consider it as one of the means by which medical knowledge has advanced so rapidly in modern times.

Before we close our second period of the history of medicine, it will be necessary to make a few observations on the progress of chemistry, and on the influence which it had on medical science. We have already made some remarks on the rise of this science, and on the progress which it made among the Arabians, and have stated that it originated in the futile and sordid desire of converting the baser metals into gold. In its primary object it of course totally failed; yet in the numerous and laboured efforts which the alchemists made to accomplish their object, it is admitted that they acquired considerable information about the nature and properties of the bodies on which they operated, and thus produced various compounds, principally of a metallic nature, which were eminently useful in the arts of life, and especially in pharmacy. We farther owe to the Arabian chemists the discovery of the process of distillation, the art of preparing extracts; they introduced the use of sugar into pharmacy instead of honey in the composition of syrups and conserves; they seem to have made some approach to the formation of the mineral acids, and to have procured several of the earthy and neutral salts.

The art of alchemy was early transferred into the different countries of Europe, and was pursued with as much ardour as by the Arabians, and perhaps with even more superstition and credulity. Some of the alchemists acquired, during their life-time, a high degree of popularity, and notwithstanding the unphilosophical nature of their occupation, are not altogether unworthy of notice in the history of science. Albertus

* *Gibbon*, v. x. ch. lxvi. *Warton*, passim. *Berington*, book vi. p. 478 et seq. *Shepherd's* Life of Poggio, passim. *Hallam's* Middle Ages, v. iii. p. 577 et seq.

Magnus, Bishop of Ratisbon; Raymond Lully, a Spanish ecclesiastic; and Arnoldus of Villanova, a professor in the university of Barcelona, all flourished in the thirteenth century, and left behind them writings which, although they are encumbered with a mass of folly and mysticism, exhibit, in a certain degree, the spirit of philosophical research, together with an ample share of industry and patient investigation.* In the same age lived Roger Bacon: he may be classed among the alchemists, inasmuch as he adopted some of their principles and practices; but in the turn of his mind, and in the spirit with which he entered upon his experimental researches, he exhibited a genius which far outstripped the age in which he lived.† The philosopher's stone, which was the object of so much painful research, besides its property of producing gold, was supposed also to possess the power of curing all diseases, and hence obtained the title of the universal medicine. This vain and fantastical notion was indirectly the cause of some pharmaceutical discoveries; for to this we may consider ourselves indebted for the mercurial preparations, and for the experiments of Basil Valentine on antimony, which led to their introduction into medicine about the end of the fourteenth century.

Among the distinguishing features of the period at which we are now arrived, we must not omit to mention the various universities which were established in most of the great cities in the southern parts of Europe, of which the medical chairs, in most cases, formed a very distinguished part. We have already had occasion to mention the university of Salerno, which was the first of these establishments after the destruction of the Roman empire. The next in order of time appears to have been that of Montpellier, which is said to have been established not long after that of Salerno, and which acquired a high degree of reputation, which it maintained for many centuries. We are informed that Bologna had acquired considerable celebrity as a school of medicine in the thirteenth century; that about half a century later medical lectures were delivered in the universities of Vienna and Paris; and that about the same time medical schools were established in Padua, Pavia, Milan, Rome, and Naples, and most of the other cities of Italy, which each of them acquired a certain degree of reputation, necessarily varying with the abilities and characters of their professors, but all contributing to advance medical science, both by the actual acquisition of knowledge, and by the influence which they exercised in removing the undue veneration that was still paid to the writers of antiquity.‡ In the north of Europe the progress of literature and science was much more tardy. The natural sciences were scarcely regarded as an object of attention, and medicine was still strictly confined to the study of the works of Galen, or even to those of his Arabic translators. The only exception of which our country can boast is Linacre, a native of Canterbury, who, after studying at Oxford, travelled into Italy, and spent some time at the court of Florence, where he acquired a portion of that love of literature which so eminently distinguished the family of the Medici. On his return to England he was appointed physician to the royal household, and employed his influence in establishing medical professorships in the universities of Oxford and Cambridge, and in forming the foundation of the London College of Physicians.§

From the various causes which we have mentioned, and probably from some others of less moment, a spirit of general improvement now began to manifest itself; the

* *Freind*, p. 543-5. *Bayle's* Dict., art. "Albert." *Eloy*, "Arnauld de Villeneuf." *Moreri*, art. "Albert," t. i. p. 269; and "Arnaud de Villeneuf," t. i. p. 346, 7. *Ackermann*, § 446, 7. *Berington*, book v. p. 370. *Sprengel*, t. ii. p. 437–443. *Blumenbach*, § 120–3. *Turner's* Modern History of England, book ii. ch. i. p. 7, 8.

† *Freind*, p. 537–543. *Campbell*, in Biog. Brit., in loco. *Bale*, Scrip. Illust. Brit. p. 342–4. *Cave*, Hist. Lit. t. ii. p. 324–6. *Bayle*, in loco. *Eloy*, in loco. *Berington*, book v. p. 373. *Hallam's* Middle Ages, vol. iii. p. 539, note. Nouv. Dict. Hist., in loco. *Sprengel*, t. ii. p. 397, 8. *Wood's* History of Oxford, by Gutch, vol. i. p. 332–344. *Enfield*, in Hist. Phil. vol. ii. p. 346–8; and in *Aikin's* Gen. Biog., in loco. *Suard*, in Biog. Univ., in loco.

‡ The dates of the establishment of the various universities may be found in *Eloy*, t. iii. p. 223. The learned work of Tiraboschi, "Storia della Literatura Italiana," contains the most ample information respecting the universities of that country. See also *Lauth*, Hist. d'Anatomie, liv. v. part 4, sect. 1. § 2.

§ *Freind*, p. 587–591. We here lose the assistance of this learned and judicious historian. *Eloy*, in loco. *Cabanis*, p. 144, 5. *Sprengel*, t. ii. p. 8. *Aikin's* Biog. Mem. of Med. p. 28–47. In connexion with Linacre we may mention the name of Key, Kays, or, as it was Latinized, according to the custom of the times, Caius, whose liberality to the university of Cambridge deserves honourable mention. *Aikin*, in Biog. Anec. p. 103–136; and in Gen. Biog., in loco. *Eloy*, in loco.

arts and sciences gradually revived; philosophy, in all its branches, was studied on a more correct plan and with a more enlightened object, and medicine was not slow in partaking of the beneficial influence. One of the first symptoms of this improvement was an increasing relish for the writings of Hippocrates, and the revival of his method of studying and practising medicine. The taste for complicated theory and refined speculation gradually declined, and in the same proportion the value of correct observation and an accurate detail of facts began to be duly estimated.

A circumstance which tended in a considerable degree to shake the authority of Galen, and to diminish the veneration in which his opinions had been held for so many ages, was the rise of the sect of the Chemical Physicians. After chemistry had been used with advantage for the purpose of improving the processes of pharmacy, it was applied to the explanation of the phenomena of vitality, and of the operation of morbid causes upon the living system. The theories of these chemical physicians we now regard as altogether false and inapplicable; but they were advanced with so much confidence that they obtained many adherents, and for some time the opinions of the medical world were divided between the rival doctrines of the Galenists and the Chemists.

Among the most noted supporters of the chemical theory was Paracelsus, an individual whose claim to our notice depends more upon his consummate vanity and presumption than upon his abilities or acquirements. His professed object was to undermine the authority of the Galenists; and for this purpose he did not hesitate to hold forth the most absurd claims, and to practise the basest arts of quackery. He boasted that he had discovered the elixir vitæ, the universal remedy, of which mankind had been so long in search; and he publicly burned the writings of Galen and Avicenna, because, in consequence of his discovery, they were of no further use. It is somewhat difficult to determine in what degree Paracelsus was actually the dupe of his own folly; but whatever may have been his real opinion as to the efficacy of his elixir, his own death, at the early age of forty-eight, served to humble the confidence of his followers, and to reduce his reputation to its real standard.

But although the personal character of Paracelsus received an irreparable shock by this event, his doctrines continued to attract a number of zealous advocates. With respect to the nature of these doctrines, it will be necessary for us to say but a few words in this place. The leading principle of the Chemists was, that the living body is subject to the same chemical laws with inanimate matter, and that all the phenomena of vitality may be explained by the operation of these laws. The proofs which they adduced in favour of this principle, and the illustrations which they gave of the nature of these laws, were completely futile and unsatisfactory; and it may be asserted that the strength of their reasoning was much more apparent in the mode by which they attempted to controvert the hypothesis of the Galenists than in the direct arguments which they brought forward in favour of their own doctrine. In truth the chemical elements of Paracelsus were at least as hypothetical as the physiological elements of Galen, and were even less applicable to the explanation of the vital actions of organized beings. The only obligation which we owe to the chemical physicians is the introduction into medicine of certain substances, chiefly metallic preparations, which, in the hands of the more enlightened practitioners of modern times, have proved very valuable additions to the materia medica.*

After the death of Paracelsus, his peculiar theories fell into disrepute and were little attended to; but the sect of the chemical physicians continued to flourish even as late as the seventeenth century, when we meet with many examples of men of learning and sagacity, who attempted to explain the phenomena of the animal economy by the laws of chemistry. To the visionary speculations of the Chemists there was united a large portion of superstition and mysticism; and so much did this feeling coincide with the spirit of the times, that even the men who were the most illustrious for their learning and science were either actually infected with these notions, or did not venture so far to oppose the prevailing opinions of their contemporaries as to avow their disbelief

* *Clerc*, p. 792 et seq. *Barchusen*, Diss. 19. *Conring*, cap. xi. § 16, 17. *Haller*, Bib. Med. t. ii. p. 2 et seq. *Eloy*, in loco. *Sprengel*, sect. ix. ch. 2. *Cabanis*, sect. ix. *Hutchinsen's* Biog. Med. vol. ii. p. 197–209. *Enfield*, vol. ii. p. 451–4. *Aikin's* Gen. Biog., in loco. *Blumenbach*, Introd. § 169. *Renauldin*, in Biog. Univ., "Paracelse."

of them. Astrology and magic were generally practised by the members of the medical profession, while various rites and ceremonies were observed, which implied the belief of supernatural agency, but which, by a singular inconsistency, was supposed to be a constant and necessary part of the process.

Before we conclude this portion of our subject, we must notice the remarkable circumstance, that about this period, during the fourteenth and fifteenth centuries, some very formidable diseases made their appearance in Europe, the origin of which is still very obscure, after all the discussion and investigation that has taken place respecting them. Among these, one of the most remarkable is what was termed the *sudor Anglicanus*, which is first mentioned about the end of the fifteenth century, and which, for about fifty years, raged at intervals with extreme violence in England and in some other countries in the west of Europe.* In the fifteenth century we have the first correct description of the hooping-cough; and from the manner in which it is spoken of by the contemporary writers, it would appear that it was considered by them as a new disease. The sea-scurvy, if not entirely unknown to the ancients, was at least not distinctly recognized until this period, so that, if it existed previously, we may conclude that it was less violent in its effects; a circumstance which has been ascribed, with great plausibility, to the spirit of naval enterprise which sprang up at this period, and which led to the undertaking of long voyages.†

The great number of establishments which were formed during the dark ages for the cure of leprosy, was at one time supposed to be a proof that it was a new disease in Europe, imported, as was imagined, from Asia by the crusaders. There has been much nosological discussion concerning the exact nature of the disease to which this term ought to be applied; whether there were actually two species of leprosy, one which was indigenous in the east, and another species in Europe. Some writers have conceived that a combination of the two was produced at this period, while others, again, have supposed that the disease had previously existed in Europe, but that, in consequence of the greater degree of communication between the different parts of it which was brought about by the crusades, the disease was either more extensively propagated, or at least was brought more into notice, and that more active means were therefore employed for its relief.‡

It was about the same period, when the western part of the old continent was in its lowest state of degradation, that we hear of the ravages of those varieties of fever emphatically styled the plague, which were described in the thirteenth, fourteenth, and fifteenth centuries as invading various parts of Europe and Asia, and sweeping away a large proportion of the inhabitants.‖ The accounts which we have of these epidemics would indicate that they were not an absolutely new disease, but that the symptoms were modified and aggravated by the peculiar condition of the great bulk of the people; a conclusion which is confirmed by the fact, that, as the physical and moral condition of nations has been ameliorated, the occurrence of these diseases has become proportionally rare, so that we conceive them to be almost incompatible with the improvements in civilization and in medical police which exist in the greatest part of Europe.

But whatever may be our opinion concerning the origin of the leprosy and the plague, there is another disease where, from the peculiarity of its symptoms, its decidedly contagious nature, the ordinary method of its propagation, and the universality of its occurrence, we are enabled to fix the date of its appearance in Europe with more certainty. It is now generally agreed that it was near the close of the fifteenth century that the symptoms of syphilis were first recognized in Italy, from which country the disease very rapidly extended over the whole of Europe. Concerning its primary origin much controversy has taken place; many writers have attempted to prove that it was brought into Europe from America by Columbus; but this opinion, which was at one time pretty generally received, is now abandoned, nor are we able to offer any plausible conjecture respecting its introduction from any other quarter.

The same difficulty indeed exists in this case as in that of all those diseases which are produced by no cause except by a specific contagion. Almost every individual is

* *Sennert*, De Feb. lib. iv. cap. 15. *Freind*, p. 567, 8. *Plouquet*, "Febris Sudatoria," t. ii. p. 162. *Cullen's* Synopsis, t. ii. p. 77, 8. *Sprengel*, t. ii. p. 491–4.

† *Freind*, p. 583. *Sprengel*, t. ii. p. 494–6.

‡ *Sprengel*, t. ii. p. 371–5.

‖ *Plouquet*, "Febris Maligna," and "Pestis," in loco. *Cullen*, t. ii. p. 74–7, 139–41.

obnoxious to them upon the application of this cause, and this liability appears to be little affected by constitution, age, habits of life, climate, and other external circumstances. The question is, how were they first produced? It is impossible to imagine that the first created individual was born with all these diseases upon him, yet we know of no distinct cause now in operation which could, in the first instance, have generated them. These remarks apply to the small-pox and the measles, which, as was stated above, were first known to the Europeans about the middle of the sixth century, and it applies perhaps still more remarkably to the case of syphilis. This point must be regarded as one of those mysteries of which at present we are unable to offer any solution. It is true that the manners of the age in which this disease is recorded to have first made its appearance were grossly licentious, and in many respects unfavorable to health; but still we see no satisfactory reason why the specific poison of this disease should have been generated; yet it appears impossible to conceive that, if it had previously existed, it could have remained for any length of time unknown or undescribed.*

We have now brought down our sketch of the history of medicine to the period when the light of improvement was bursting forth from various quarters, when men were engaged in the investigation of the different departments of science upon a plan which, although not free from error, was more correct than that of their predecessors, and which by a slow but steady process led to the establishment of those principles which eventually produced the complete triumph of truth and philosophy over error and superstition.

CHAP. VIII.

General view of the state of medicine during the sixteenth century—Revival of the Hippocratean school—Account of the Galenists—The Chemists—The Anatomists—Vesalius, Fallopius, Eustachius.

We have already given an account of the manner in which the taste for the classical writers of antiquity was gradually developed during the fifteenth century, and we stated that in medicine, as well as in the other departments of science, the Greek writers began to be studied in the original instead of their being read through the medium of translations and commentaries. As this taste was further matured, the works of Hippocrates continued to rise into estimation in preference to those of Galen, and a new school of medicine was formed, which obtained the name of Hippocratean, the professed object of which was to proceed upon the inductive principle, of first ascertaining facts, and by their generalization to form the theory. That in every instance they adhered to this plan we cannot affirm; indeed we have too many instances where they forgot or misapplied their own principles, but still the importance of accurate observation was generally admitted, and although mankind could not at once abandon their former errors, they became aware of their existence, and of the method by which they might be corrected.

The contest between the Galenists and the Chemists, which agitated the whole medical world during the fifteenth century, was indeed still maintained through the sixteenth; but it was conducted upon more rational principles, and by men of more enlarged and more enlightened views. The Galenists were for the most part more scientific and learned than their adversaries; they consisted of the professors in the universities, and what may be styled the regular practitioners; and although they were still strongly attached to the tenets of their master, they did not omit to collect facts and to watch the phenomena of disease. Their practice may be characterized as being at the same time complicated and inert; their materia medica was principally taken from the vegetable kingdom, while their prescriptions were long and multifarious, consisting of a prodigious number of articles, combined together in such a manner as to render it almost impossible to conceive the probable operation of the compound, their indications at the same time being derived from an incorrect hypothesis, and being often either unintelligible or impracticable.

* *Freind*, p. 568–583. *Astruc*, De Morbis Veneriis. *Hunter*, on the Ven. Dis. p. 9, 10. *Sprengel*, t. ii. p. 499 et seq. *Plouquet*, "Syphilis, Historia," &c. in loco. *Black's* Hist. of Medicine, p. 147–155.

The Chemists were the bold empirics of the day, without learning or experience; but they endeavoured to supply the deficiency by confidence and temerity, and by these formidable weapons they frequently triumphed over their adversaries. They discarded the long prescriptions of the Galenists, rejected many of the articles of their pharmacopœia, while they introduced the active metallic preparations, and made free use of the most powerful remedies of all kinds. The rival sects mutually upbraided each other with the injurious effect of their respective plans of treatment, and probably there was but too much foundation for their accusations; for if on the one hand the Chemists, by their rashness, committed many fatal blunders, the Galenists, by their feeble remedies, must have frequently failed in subduing disease or arresting its progress.

It appears that upon the whole the Chemists, like the analogous characters in the present day, acquired a greater share of popularity than their opponents. Their arrogant pretensions, the more decisive and intelligible nature of their indications, coupled with the artifices which they practised for the mere purpose of acquiring popularity, gave them a decided advantage over their more learned and more dignified rivals, who were both unable and unwilling to contend with them in the race of empiricism. By degrees, however, the chemical physicians rendered themselves more worthy of the public estimation, by making themselves better acquainted with the principles and practice of their art; the search after the philosopher's stone was gradually abandoned; and although many of the doctrines which they still professed were altogether unfounded, they were less palpably absurd than those of their predecessors.

Another circumstance occurred about the period of which we are now treating, which contributed to produce a most important reform in the science of medicine—we refer to the study of human anatomy. With a very few exceptions, which have been noticed above, during a space of more than a thousand years, since the death of Galen, very little advance had been made in our acquaintance with the structure of the body. The professors of the Arabian school, with their successors in Italy and France, for the most part contented themselves with copying the descriptions of the ancients, without ever calling in question their accuracy, or endeavouring to confirm or refute them by their own observations. Even after the examination of the human subject had been practised for some time, and its necessity generally acknowledged, it was long before mankind could so far free themselves from the tyranny of authority as to admit that any imperfection could exist in the works of Galen, or that his descriptions were not to be preferred even to the evidence of the senses.

In reviewing the state of medical science during the sixteenth century, it will assist us in our progress if we arrange the principal authors under the three classes of the Physicians strictly so called, the Chemists, and the Anatomists. Under the first head we propose to include both the writers who still adhered implicitly to the tenets of Galen, and those who, paying less regard to mere authority, devoted themselves more to observing the phenomena of disease and the effects of remedies, and who may be considered as having laid the foundation of the modern Hippocratean school. Of these, some of the most distinguished by their character or writings were Cornarus and Mercurialis in Italy, Hollerius, Fernel, and Duret in France, Lommius and Forest in Holland, Sennert, Plater, and Foës in Germany, and Linacre in England.*

The limits to which we are confined will not permit us to enter into any detail of the individual merits of these authors, or into any analysis of their writings or opinions. For the most part they were possessed of a competent knowledge of ancient literature, and well acquainted with the works of the Greek physicians; many of them were professors in universities or teachers of medicine, and engaged in extensive practice. They were generally diligent collectors of facts, and many of them voluminous writers, either publishing their own observations, or commenting on the ancients. Their practice was in a great measure taken from Galen, with the additions that had been derived from the materia medica of the Arabians, and in a few instances from the Chemists; but these latter were regarded as dangerous and empirical, and it was not until they had been long sanctioned by popular use that they were received into the authorized pharmacopœias. The actual advance which the practice of medicine received from these authors was not very considerable; but by their learning and diligence and their general respectability they contributed to raise the character of the profession, and to

* *Sprengel*, t. ii. passim. *Cabanis*, ch. ii. § 10.

prepare the mind to receive the improvements in science which were gradually unfolded in the next century, and to apply them to the department of medicine.

With respect to the Chemists of this period, although they composed a numerous and active body, yet there is none of them whose name is sufficiently distinguished above his fellows to require being particularized in this place. As science and knowledge gradually advanced, the absurdity of their speculations was more generally perceived, and their pursuits were either abandoned, or were directed by a more philosophical spirit; and although the search after the universal medicine was not entirely discarded, they began to occupy themselves with inquiring into the chemical constitution of the body, and investigating the changes that were induced in it by disease. This investigation was indeed attended with little success; their experiments were crude and imperfect, and their modes of analysis altogether inefficient. But still some important observations were made, and new processes were invented, and the foundation began to be laid for the more enlightened views of their successors in the succeeding century.

But the benefit conferred upon the science of medicine by the labours of the Chemists was trifling and uncertain compared to the great and direct advance which was produced by the researches of the Anatomists. Some attention had been paid to the structure of the body by the earlier Italians, and they had even ventured, in a few instances, to dissect the human subject; yet scarcely any discovery or any improvement deserving of notice had been made for many ages, when Vesalius, about the middle of the sixteenth century, entered upon his career of inquiry. He was the first anatomist who threw off the yoke of authority which had been imposed by a blind veneration for the opinion of the ancients, and who ventured to conceive the possibility of error in the writings of Galen. Vesalius prosecuted his researches with unwearied diligence, and disregarding the obloquy which was heaped upon him, he succeeded in publishing an anatomical work, which at this day we behold with admiration, and which maintains its character as a faithful transcript of nature.*

But the reputation of Galen was too firmly established to be affected in any considerable degree by the observations of any single individual, however highly he might be entitled to the respect of his contemporaries. Long and acrimonious discussions occurred between the defenders and the opposers of Galen, some maintaining that his descriptions of the parts of the body were absolutely perfect, while others undertook to prove, by direct and palpable facts, that Galen's knowledge of the human form was not complete. It was asserted, on the one hand, that he had seldom examined the human subject, and that his descriptions were frequently taken from apes and monkeys; an imputation which was firmly denied by his zealous advocates. Eustachius, Fallopius, and others of great and deserved reputation for their anatomical skill, undertook the defence of Galen; and it was not until after a long and severe struggle that the truth was established, and that it was agreed that the anatomy of the ancients was in many parts imperfect, and that the errors which had been pointed out by Vesalius actually existed.† It would be foreign to our purpose to enter into a minute examination of the labours of the individual anatomists, or to mention in detail the successive improvements which were effected in their department. With respect to the practice of medicine, which is our more immediate object, it does not appear that they effected any direct improvement, but they contributed indirectly to its advancement in no small degree by completely establishing the important point that the opinions of the ancients were not to be considered as infallible, but were to be subjected to the ordeal of free inquiry.

CHAP. IX.

State of medicine during the seventeenth century—The chemical and mathematical sects—Progress of anatomy—Fanatics—Chemical physicians—Sylvius—Willis—Sydenham—Mathematical physicians.

All the changes of opinion which we have described as occurring in the sixteenth

* *Eloy*, " Vésale." *Haller*, Bib. Anat. lib. 4, § 163. t. i. p. 180 et seq. *Sprengel*, t. iv. p. 5–9; *Douglas*, Bibliogr. Anat. p. 64–73. *Renauldin*, in Biog. Univ. " Vésale."

† *Haller*, Bib. Chir. lib. 5, " Schola Italica;" and Bib. Anat. lib. 5. " Schola Italica." *Fallopius*, § 200, t. i. p. 218 et seq. *Eustachius*, § 205, t. i. p. 233 et seq. *Douglas*, Bibliogr. Anat. in Fallopio, p. 94–6, et in Eustachio, p. 98–100.

century continued to advance with an accelerated progress during the seventeenth. The preference which was given to Hippocrates over Galen was daily gaining ground, and, as the consequence of this, the habit of correct observation was confirmed, and the value of the observations was more justly appreciated.

In the mean time anatomy was making rapid strides. Being a science which depended more immediately upon the accumulation of matters of fact, which required for their attainment little more than industry and mere observation, errors were more readily discarded than on those subjects in which much reasoning was necessary, and in which it was rather an inference from facts than the facts themselves, which constituted the object of the investigation. The investigations of the anatomists extended to every part and structure of the body; the forms and texture of the bones, the muscles, the nerves, the vessels, and the various viscera were each in their turn made the subject of particular and minute examination by some of the eminent men of the age. These labours were amply rewarded by the splendid discovery of the circulation by the immortal Harvey, and of the absorbent system by Asselli, Rudbeck, and Bartholine; while the structure and office of the lungs, and the relation which it bears to the heart, were explained by Malpighi, Hooke, Mayow, and their associates.*

With respect to the chemists of this period, their opinions were gradually disengaged from the tissue of mystery and credulity in which they had been so long involved, when about the middle of the century the science was finally placed upon its correct philosophical basis by the genius of Boyle. He correctly regarded it as an investigation into the change of properties which bodies experience by their action upon each other, and he pursued the investigation, not by presupposing the existence of certain occult causes and hypothetical agencies, but by an accurate examination of the effects which bodies actually produce upon each other when placed within the sphere of their mutual action.†

It is, however, not a little remarkable that while the science of chemistry generally, and more especially the sect of the chemical physicians was purifying itself of its grosser errors, we meet with not unfrequent instances where it continued to be combined with a singular degree of fanaticism. There was indeed no period, since the time of Paracelsus, when there were more remarkable examples of the prevalence of this spirit, and in no country were they more notorious than in England. The writings of Fludd, who practised in London in the early part of the seventeenth century, afford a curious compound of learning and folly, of profound erudition, united to an implicit faith in astrology, and in all the cabalistic opinions of the Jewish doctors.‡ Perhaps a still more remarkable example of this combination is that of the celebrated Kenelm Digby, a man of rank and of refined education, who during his travels on the continent became initiated into this mysterious chemical philosophy, and on his return gave a specimen of his opinions by publishing an account of the virtues of the sympathetic powder.§ Another of these individuals who obtained great celebrity was Valentine Greatrix, who cured all diseases by the imposition of the hand, and who even ventured to oppose his power in this respect to the royal touch of Charles.‖ These circumstances are interesting, not merely as forming a part of the history of medicine, but as displaying a singular feature in the history of the human mind; demonstrating the difficulty which exists in eradicating from it errors and follies even the most gross and palpable, when they have once become deeply rooted.¶

While what may be more strictly termed chemistry was advancing into the state of a

* The fourth volume of Sprengel is principally occupied with a luminous view of the anatomical discoveries of this period.

† *Campbell*, in Biog. Brit. in loco. *Haller*, Bib. Med. lib. ix. § 702, t. iii. p. 109–13. *Nicholson*, in Aikin's Gen. Biog. in loco. *Morell*, in Brewster's Encyc. in loco. *Suard* et *Cuvier*, in Biog. Universelle, in loco.

‡ *Enfield*, v. ii. p. 454, 5. *Sprengel*, t. v. p. 6–9. *Eloy*, in loco; *Haller*, Bib. Med. t. ii. p. 469. *Aikin's* Biog. Mem. of Med. p. 271–5. *Hutchinson's* Biog. Med. v. i. p. 303–5.

§ *Sprengel*, t. v. p. 9; *Eloy*, in loco; *Campbell*, in Biog. Brit. in loco. *Aikin's* Gen. Biog. in loco. Nouv. Dict. Hist. in loco. *Aikin's* (Miss) Mem. of Charles I. v. i. p. 410–16. See "A late Discourse," &c. by Sir K. Digby, translated by R. White: a work which affords one of those embarrassing cases where it is so difficult to assign the exact limit between credulity and empiricism.

‖ Phil. Trans. for 1699, p. 332–4. *Lowthorp's* Abrid. of Phil. Trans. v. iii. p. 11, 12. *Sprengel*, t. v. p. 10. *Hutchinson's* Biog. Med. v. i. p. 373–80.

¶ *Sprengel*, sect. 13, ch. i.

science, a combination was formed between its principles and those of physiology, which gave rise to the new sect of the chemical physicians. Their leading doctrine was, that the operations of the living body are all guided by chemical actions, of which one of the most important and the most universal is fermentation. The states of health and of disease were supposed to be ultimately referable to certain fermentations, which took place in the blood or other fluids, while these fluids themselves were the result of specific fermentations, by which they were elaborated from the elements of which the body is composed. Again, certain humours were supposed to be naturally acid, and others naturally alkaline, and according as one or the other of these predominated, so certain specific diseases were the result, which were to be removed by the exhibition of remedies of an opposite nature to that of the disease in question. According to the theory of the chemical physicians, fever was supposed to originate in an acid condition of the humours, and was consequently to be cured by alkalies; and in conformity with what is so often found to take place in tracing the history of medicine, they discovered that alkalies were actually the most efficacious remedies for fever.

The individual who may be considered as having first given a connected and consistent view of the theory of the medical chemists is Sylvius. He was born at Hanau in Flanders in 1614; he graduated in the university of Basil, practised for some time at Amsterdam, and finally was appointed to fill the chair of practical medicine at Leyden, where by his genius and eloquence he acquired a high degree of popularity. From this circumstance his peculiar opinions obtained a very extensive circulation, and the hypothesis of fermentation, with the acid and alkaline states of the fluids, after some time became the fashionable doctrine of the French and the German physicians, and had many zealous defenders in our own country.*

One of the most respectable of the advocates of the chemical doctrines of medicine was our learned countryman Willis. He was only a few years younger than Sylvius, and was early in life attached to the science of chemistry, which he afterwards applied with much ingenuity to the explanation of the functions of the animal economy. In the year 1659 he published his celebrated treatise on fermentation and on fever, the object of which is to prove that every organ of the body has its peculiar and appropriate fermentation, and that a morbid state of these ferments is the cause of all diseases. The hypothesis is in itself totally false, but it is supported by considerable ingenuity, and his works are of real value, as containing an accurate account of the phenomena of disease. Willis was also the author of some treatises of very considerable merit on the nervous system, and on various physiological topics, by which his reputation is amply supported as one of the most eminent medical philosophers of the age.†

The reputation of Willis has, however, been somewhat obscured by the still higher reputation of Sydenham, a man scarcely inferior to any that has passed under our review. He has been frequently styled the English Hippocrates, and there are various points of analogy between them, both as to general character and as to their peculiar mode of viewing the operations of the animal frame. The writings of Sydenham, like those of his great predecessor, abound in theory, but they also resemble those of Hippocrates, in containing the most accurate detail of facts, indicative of a mind of great sagacity, which enabled him to seize upon the most essential features of a disease, and to direct his attention to those points alone which tended to illustrate the nature of the morbid changes that were produced. But the great merit of Sydenham, that which has raised his reputation to so high a pitch of celebrity, and which causes his works to be still read with admiration, is the same with that which was ascribed to Hippocrates, viz. not allowing his speculative opinions respecting the nature or cause of diseases to interfere with the treatment. He carefully observed the operation of remedies on the symptoms, and the action of the various external circumstances to which the patient is exposed, and from their effect he deduced his indications. He accommodated his theory to the facts, not, as is too frequently the case, the facts to the theory. He agreed generally with Willis, in ascribing the origin of disease to certain morbid fer-

* *Eloy*, "Dubois." *Haller*, Bib. Med. lib. ix. t. ii. p. 627 et seq. *Sprengel*, § 13. ch. v. Biog. Univ. in loco.

† *Barchusen*, Diss. 23. § 15 et seq. *Haller*, Bib. Med. § 685. *Eloy*, in loco. *Sprengel*, t. v. p. 73-6. *Aikin*, in loco. Biog. Univ. in loco.

mentations, and he conceived the primary changes to take place, not in the solids, but, according to the opinion almost universally adopted at that period, in the fluids; this, indeed, may be regarded as a necessary consequence of the assumed hypothesis.

In one important point he agreed very nearly with Hippocrates, that diseased action consists essentially in an effort of nature to remove some morbid or noxious cause, and that the great object of the practitioner is to assist in bringing about the proper crisis, and to regulate the actions of the system so as to prevent either their excess or their defect. The practice was necessarily of a kind which, in the present day, would be styled somewhat inert, consisting rather in attempts to palliate certain symptoms than in any attempt to counteract or remove their cause. But although we may conceive that the object in view was not always precisely what it would have been, had he not been somewhat biassed by his hypothesis, the mode in which he proceeded to effect his indications is in most cases very judicious. We may, perhaps, venture to affirm that there are few practitioners, even in the present day, who were better acquainted with the juvantia and lædentia, who were more successful in attaining a just medium between excessive caution and undue vigour, and whose proceedings were more guided by the dictates of a sound understanding, enlightened by an extensive range of observation and an ample store of well-digested experience.*

We have spoken of Sydenham in connexion with Willis and the chemical physicians, because in many parts of his writings he adopts the hypothesis, that fermentation and other chemical changes in the state of the fluids are the primary causes of disease. Yet we have been, at the same time, especially careful to point out that the distinguishing merit of Sydenham consisted in his not manifesting an undue attachment to any theory, but in devoting himself to the study of disease, and the effect of remedies upon it. This merit was not unperceived by his contemporaries, and we learn that he was held by them in great respect. Yet the general spirit of the age was so entirely devoted to hypothesis and speculation, that he can scarcely be said to have made any great impression upon the general state of medical opinion, or to have materially diverted the mind from an almost exclusive attention to the theories which were then so prevalent. Indeed, with every feeling of admiration for the character and acquirements of Sydenham, it must be admitted that he was not himself fully aware of the great principle, which is the foundation of true philosophy as well in medicine as in every other department of science, that all theory not derived from the generalization of facts is objectionable, and almost necessarily leads to erroneous conclusions. Sydenham's natural sagacity caused him to feel the value of the inductive method, but it was more from this circumstance than from any abstract conception of its importance, that he was induced to adopt it. The state of medical science was indeed scarcely ripe for that reform which had now commenced in many other departments of philosophy. It is more a science of observation than of experiment, and the observations are of peculiarly difficult execution, depending upon the combined operation of various causes, and involving much complication in the effects, the respective proportions of which it is often extremely difficult to ascertain and to appreciate. Hence it required a more matured state of medical knowledge before we could arrive at the great truths which had been promulgated by Bacon, and which were generally recognized in the other departments of science. Although mankind were aware of the importance of observation and experience, they were not sensible of their full value; and it required another century and various successive revolutions of theory before they could be detached from the hypotheses that had been transmitted to them from their predecessors, and had been sanctioned by the authority of so many illustrious names.†

One of these revolutions was produced by the rise of a new theory of medicine, perhaps more captivating than any which had yet appeared, from its scientific aspect and its high pretensions; we allude to the doctrines of the mathematical physicians, or, as they have been termed, the Iatro-mathematical School. The rapid advance which had taken place in mathematical science during the latter part of the sixteenth cen-

* *Haller*, Bib. Med. lib. 10. t. iv. p. 188 et seq. *Eloy*, in loco. *Sprengel*, t. v. p. 566–576. *Cabanis*, § 12. *Aikin*, in loco; *Renauldin*, in Biog. Univ.

† We have an ample account of the iatro-chemical sect in *Sprengel*, § 13. ch. vi.; its advocates were numerous and respectable, but few were of that distinction which entitles them to be noticed in this sketch.

tury, and the fortunate application of it to various branches of natural philosophy, induced some of the Italians to apply it to the explanation of the phenomena of the living system. Of these one of the first, both in order of time and of celebrity, was Borelli. He was a profound mathematician, and a man entirely devoted to scientific pursuits, and in his well-known treatise on muscular motion he illustrated, in a very happy manner, the mode in which certain functions of the body may be elucidated and explained on mechanical principles. Some of the data which he assumes are now admitted to be incorrect, and in some cases the deductions are not the fair results of the premises; but upon the whole it is allowed that he established many important points, and considerably advanced our knowledge of the animal economy. The new path of inquiry, which had been thus so successfully opened by Borelli, was soon occupied by many of his contemporaries and pupils, and according to the usual custom on such occasions, it was carried by them far beyond its legitimate limits, and was applied to various topics with which it had little connexion. One of the most active and ardent in this pursuit was Bellini, who was a professor at Pisa, and who exhibited such marks of early genius as to become a lecturer at the early age of twenty. His acquirements were varied, and his talents were splendid, but they may be pronounced to be rather showy than solid, and to be more adapted to excite applause than to advance true science. The mode of reasoning which had been employed by Borelli to explain the action of the muscles, which is essentially a mechanical function, and where such reasoning was therefore appropriate, was extended by Bellini to all the functions and actions of the body both in health and in disease. He maintained not only that every part of the body is under the influence of gravity and mechanical impulse, but that these are the sole agents, and that we may explain all the vital functions merely by the application of the principles of hydrostatics and hydraulics.

The imposing air of the new hypothesis instantly acquired for it a number of converts, embracing many of the most learned men of the age. The body was regarded simply as a machine composed of a certain system of tubes, and calculations were formed of their diameter, of the friction of the fluids in passing along them, of the size of the particles and the pores, the amount of retardation arising from friction and other mechanical causes, while the doctrines of derivation, revulsion, lentor, obstruction, and resolution, with others of an analogous kind, all founded upon mechanical principles, were the almost universal language of both physicians and physiologists towards the close of the seventeenth century. In proportion as the mathematical sect gained ground, that of the chemists declined, while between the two the old Galenists may be considered as nearly extinguished. In Italy and in England the mathematical doctrines had many learned and zealous adherents; it had also some followers in France, although in this country as well as in Holland and Germany, the chemical theory still continued to prevail.*

When we consider the very great influence which the iatro-mathematical sect exercised over the theories of their contemporaries, we may perhaps be surprised that it did not produce any very decided or immediate effect upon their practice. In fact their reasoning was more applicable to physiology than to medicine, for while it appeared to afford a satisfactory explanation of the phenomena of muscular contraction, of the circulation, and of the other functions in which motion was concerned, it was obviously less applicable to the explanation of the obscure and secret agencies by which diseased action is either produced or removed when present. It was, indeed, frequently employed by the pathologist to explain the proximate cause of disease and the operation of remedies, but, except in a few instances, it can scarcely be considered as having had much effect upon the actual treatment. For the most part the practice that was adopted by this sect was founded upon the principles of the humoral pathology, and may be said to have been fundamentally that of the Galenists, although with considerable additions, derived from the more energetic treatment and the enlarged materia medica of the chemists. The great advantage which the science of medicine derived from the mathematicians was of an indirect nature, depending upon the habit of close reasoning

* *Sprengel*, sect. 14. *Cabanis*, ch. 2, § 9. In Italy we may select, as among the most eminent of the iatro-mathematical sect, Borelli, Bellini, Castelli, and Guglielmini; in France we have the celebrated Sauvages, and in our own country Pitcairne, Charleton, Keill, Jurin, Mead, and Freind; we may remark, however, that some of these, although practitioners of medicine, are principally indebted for their reputation to their physiological writings.

and strict deduction, which is requisite in all mathematical inquiries, and which, although in this instance incorrect in the application, and sometimes even founded upon a fallacious basis, were detailed with much labour and ingenuity, and tended both to improve the intellectual powers of the individual, and to raise the character of the medical profession.

During this period, while the minds of men were engaged in these controversies, and while so much attention was paid to theoretical reasoning, the practical part of the science was apt to be regarded as of secondary importance. Certain individuals, indeed, among whom Sydenham may be mentioned as a most illustrious example, contributed in an eminent degree to improve our knowledge of the phenomena of disease and of the effect of remedies upon it; but it must be confessed that for the most part medical men were more anxious to establish their favourite doctrines than to investigate the truth, and we find that, in the account which they give of the details of their practice, they appeared to be much more influenced by the desire of assimilating their experience to the tenets of their sect, than of inquiring how far these tenets were themselves sanctioned by their experience. In some instances there is too much reason to suspect that the operation of the theoretical views of the practitioner was decidedly unfavourable. The opinion which was entertained by the chemical physicians of the nature of fever, that it depended upon an acrid state of the fluids, led to the indiscriminate use of alkalies in all cases which were considered as belonging to this class of diseases. Again, certain hypothetical opinions which were entertained by the mathematical physicians respecting the mechanical condition of the blood, caused them to employ the lancet in cases where we should now consider it as decidedly injurious. But it does not require the illustration of particular cases to prove the position, that where the theoretical views which were entertained of the nature of the disease were incorrect, and where the practitioner was guided by these views, the result must have been frequently unfavorable. Happily, however, for mankind, there were not wanting individuals who rose superior to the spirit of the age, who disregarded the controversies of the contending sects, and who followed the inductive method of studying medicine which had now been introduced into philosophy by the commanding genius of Bacon. Besides Sydenham, our own country may justly boast of the names of Morton, Mead, and Freind,* who, although not without their bias towards particular opinions, were men of superior minds, who were fully aware of the imperfection of medical science, and of the value of experience as the means of remedying this imperfection.

CHAP. X.

Account of the sect of the Vitalists—Van Helmont—Stahl, his system—Hoffmann, his system, pathology, influence of his doctrines—Solidism—Baglivi—Disciples of Stahl.

While the medical world was thus divided between the rival opinions of the chemists and the mathematicians, a new sect was gradually rising up, which, although in its commencement it was perhaps equally remote from the principles of true science, became by successive improvements freed from many of its exceptionable parts, and finally triumphed over both the contending parties. It originated with Van Helmont, who commenced his philosophical career as a disciple of the chemical school of Paracelsus. He was a man of a powerful mind, but with a considerable mixture of enthusiasm and even of fanaticism, who became disgusted with the Galenic mode of studying and practising medicine, and embraced the bolder and more efficacious system of the chemists. But he made this great and essential addition to their doctrine,—that the changes which are produced in the body by its own spontaneous actions, as well as by the operation of remedies, are under the influence of a specific agent, which resides in or is attached to the living system, and to which he gave the name of *archeus*.†

It would not be easy to give any exact definition of the term, or to assign the precise meaning which was attached to it. Sometimes he seems to consider it as an abstract principle or power distinct from the material part of the universe; sometimes as a species of element, and at other times as a certain modification of matter which acquires

* For the character and writings of these eminent physicians the reader is referred to the respective articles in Eloy and Haller, Bib. Med.

† He probably took the term from Paracelsus, who speaks of it as a new word which he had introduced into medicine; Chirurg. Mag. tract. 2, cap. 15.

peculiar qualities or agencies.* In consequence of his early training in the chemical school, he occasionally speaks of the archeus as a kind of ferment, and it would appear that he resolves all the operations of the living system and all the functions into certain fermentative processes effected by the action of the archeus. In short the archeus was the convenient and never-failing aid to which he had recourse for the purpose of explaining all the actions of the system either in health or in disease; it was equally the cause of digestion and of sanguification, of fever and of inflammation. Van Helmont, both from the peculiar turn of his mind and from the course of study to which he had devoted himself, was little qualified to watch over the phenomena of disease, or to discriminate between the nice shades which so frequently serve to characterize the different morbid affections. Accordingly it does not appear that he introduced any improvement into the practice of medicine, or indeed into any of the collateral departments; he is solely entitled to be noticed in this place as having laid the foundation for a new series of opinions, which were gradually moulded into one of the most important theories which had occupied the attention either of the physician or the physiologist.†

Although, strictly speaking, Van Helmont must be regarded as the individual who first stated, in express terms, the great and important principle that the living body possesses powers of a specific nature different from those which belong to inanimate matter, yet so much mysticism and error were mixed with it, that it produced little effect on the opinions of his contemporaries. Nearly half a century had elapsed after his death, during which time the physicians and physiologists were still defending the doctrines of the chemists and the mathematicians each against their respective antagonists, when a new impulse was given to medical theory by the appearance of the celebrated Stahl, who was born at Anspach in the year 1660. His education was almost exclusively occupied with the study of medicine. At the age of twenty-three he became a public lecturer, and from this time he bore a conspicuous rank in his profession, both as a teacher and a practitioner, during the remainder of his life. He was brought up in the principles of the chemical school, and hence his attention was early turned to the study of chemistry, in which science he effected a still greater revolution of opinion than in that of medicine. He possessed a character and disposition well adapted to become the founder of a new sect. He had great activity of mind united to great industry; he was zealous and enthusiastic, at the same time inclined to fanaticism and mystery; he was bold, confident, and arrogant, fully impressed with the importance of his own opinions, and disposed to place little reliance on those of others. His arrogance, however, probably induced him to enter upon investigations which he might not have attempted had he contented himself with following the track of his predecessors, and to his declared contempt for the learning of his contemporaries we may consider ourselves as in part at least indebted for his original speculations, and for the actual additions which he made to our knowledge. This contempt and arrogance were carried to such an extent that he professed to set little or no value upon any of those studies that are usually associated with medicine, even that of anatomy; and he appeared to pay no regard either to the assertions or the arguments of his contemporaries when they opposed any of his favourite doctrines. Besides his ardour in the pursuit of medical science, he appears to have had a decided turn for metaphysical reasoning, and in the formation of his theories he was probably influenced by the doctrines of Descartes, which were then embraced by many of the learned men of Europe.

Stahl saw the errors and deficiencies of both the prevailing theories; he therefore laid it down as a fundamental position, that neither chemical nor mechanical reasoning is applicable to the phenomena of life, and he consequently bestowed all his attention on the study of what he termed vital actions. These actions he refers to the operation of a principle which he styles *anima*, and which, in many respects, resembles the archeus of Van Helmont.‡ The basis of the Stahlian doctrine is similar to that of the

* See the section of his "Ortus Medicinæ," entitled "Archeus Faber;" also *Castelli's* Lexicon, "Archeus."

† *Eloy*, in loco. *Haller*, Bib. Med. lib. 8, t. ii. p. 518 et seq. *Enfield*, v. ii. p. 458-60. *Goulin*, in Enc. Méth. Médecine, in loco. *Sprengel*, sect. 13, ch. 3: this author gives us a very minute analysis of the writings and opinions of Van Helmont. Although his absurdities are not concealed, we conceive that the account is somewhat too favourable. *Hutchinson's* Biog. Med. v. i. p. 414-423. *Fournier*, in Biog. Univ. in loco.

‡ Physiol. sect. 1, numb. 3, sect. 13, et alibi.

Cartesian system, that matter is necessarily and essentially passive or inert, and that all its active properties or powers are derived from an immaterial animating principle, which is superinduced upon it or added to it. It is by the operation of this spiritual principle upon the material organs of the body that all the vital functions are produced, and it is on the absence or presence of this principle that the difference between living and dead matter essentially depends. Stahl observed with considerable acuteness the action which the mind exercises over the body, and he proved that these effects could not be referred either to a mere chemical or mechanical agent. This point, clear as it now appears to us, had not been distinctly recognized before his time, or rather, it may be said that the contrary opinion formed the basis of both the prevailing theories. But although he laid down this great truth, and established it by incontrovertible arguments, there is considerable obscurity respecting the nature of this immaterial or superintending agent; and when we enter upon the detail of his description, we become involved in a labyrinth of metaphysical subtlety. We are told that the anima superintends and directs every part of the animal economy from its first formation; that it prevents or repairs injuries, counteracts the effects of morbid causes, or tends to remove them when actually present, yet that we are unconscious of its existence; and that, while it manifests every attribute of reason and design, it is devoid of these qualities, and is in fact a necessary and unintelligent agent. He examined with much attention the nature of the different functions, their relation to the anima, and their dependence upon it; he endeavoured to explain the effect of organization, and the mode in which organization operates in producing these functions. In these investigations he displays considerable acuteness, and he contributed materially to advance our knowledge of the laws of vitality; but still his ideas are, in many respects, confused and indistinct, and he is more disposed to enter into subtile disquisitions respecting the nature of his supposed principle, than to examine the actual phenomena of the animal economy, and from them to deduce his general laws.*

Contrary to what is frequently the case, the hypothesis of Stahl had a considerable influence upon his practice. As all the actions of the system are under the control of the anima, and as the office of this principle is to preserve the system in its perfect state, the duty of the physician is reduced to the mere superintendence of its actions, generally to co-operate with its efforts, or if they should be irregular or injurious, which we are to suppose is seldom the case, to endeavour to restrain or counteract them. These views tended to repress the energy of the practitioner still more than the pathological doctrines of Hippocrates, inasmuch as the anima of Stahl was conceived to exercise a more direct influence over the operations of the economy than the φυσις of Hippocrates, which was simply a general expression of these actions, and which, according to circumstances, might be either beneficial or injurious to the system. As a specimen of the mode in which Stahl applied his theory to practice, we may select his doctrine respecting plethora. He supposed that the body had a general tendency to the plethoric state, because he observed that spontaneous evacuations of various kinds occasionally took place, and these he assumed were produced by the provident care of the anima, in order to remove a plethora which must have previously existed so as to render them necessary. An important office of the superintendent principle is therefore to produce the necessary evacuations in order to prevent or remove this plethora, and hence it becomes the duty of the practitioner to watch over the evacuations, to promote them if too scanty, or to repress them if too abundant.†

The theory of Stahl, so far as it tended to fix the attention upon the vital actions of the system, and to overthrow the mechanical hypotheses which had so long and so generally prevailed, may be considered as having performed an essential service to the science of medicine. The appearance of metaphysical acuteness which it presented, independent of its real merits, acquired for it a degree of popularity in an age when the attention had been particularly directed to subjects of this description. It certainly produced a considerable revolution both in medical language and in medical opinions; and although Stahl had but few followers who received his doctrines in their full extent, it was partially embraced by many of the most intelligent and learned men of that

* *Haller*, Bib. Med. lib. xi. t. iii. p. 575 et seq. *Eloy*, in loco. *Cullen*, Preface to his "First Lines," p. 12–18. *Sprengel*, sect. 15, ch. 1, t. v. p. 195–270. *Blumenbach*, § 420. *Thomson's* Cullen, v. i. p. 164–182. *Renauldin*, Biog. Univ. in loco.

† Pathol. pars. ii. sect. 1, mem. 2, § 3 et alibi.

period, and it has ultimately had a great and extensive influence on the state of the science. Independently of the defects inherent in the system itself, the spirit of inquiry was now so widely diffused, and the importance of patiently investigating the phenomena of the animal economy was so generally admitted, that the merits of all theories were more strictly canvassed and subjected to more severe examination. From the same combination of causes a variety of rival hypotheses were produced, which tended to prevent the exclusive adoption of any one of them in preference to the rest; and the same state of things was still farther promoted by the great number of medical schools which were established in all the great cities of Europe, each of which was anxious to advance its claim to the public attention.

We have given to Stahl the great merit of having clearly perceived and decisively established the important truth, that the operations of the animal economy cannot be explained by the laws either of chemistry or of mechanics, and that we must therefore have recourse to something of a specific nature, peculiar to the living system itself. Yet, although he succeeded in pointing out the insufficiency of the existing theories, the one which he substituted in their place, the action of the superintending anima, was no less difficult to comprehend, was equally hypothetical, and equally liable to objections. His genius was not of a kind which was adapted to slow and patient investigation, and we accordingly find that he either defends his system upon general grounds, or rests satisfied with merely pointing out the errors and deficiencies of his adversaries. A powerful and sagacious mind was still wanting, which might carefully examine into the nature and operations of the powers that exclusively belong to the living body, and after ascertaining the facts, might generalize them, and thus deduce the correct theory. This was a process of much labour and difficulty, one which could only be accomplished by slow degrees, and which it might be expected would require the co-operation of various individuals.

Of those whom we should be disposed to regard as having mainly contributed to this gradual progression, the first in point of time as well as of celebrity is Hoffmann. He was the contemporary of Stahl, and his colleague in the university of Halle; he may be considered likewise as his rival, for although they both contributed so considerably to advance our knowledge of the animal economy, and, to a certain extent, by pursuing a similar mode of reasoning, yet they were persons of very different habits and dispositions, and attempted to attain the same object by very different means. Hoffmann was a prolix and discursive writer, whose collected works occupy many folio volumes, and the very titles of which, as detailed by Haller, extend to no less than thirty-eight quarto pages.* It must therefore be supposed that they contain much that is of little value, and exhibit many marks of the hasty manner in which they were composed. Yet he appears to have been a diligent observer and collector of facts, and therefore, notwithstanding the repulsive aspect of his works, they are highly estimated and frequently referred to. He attended much more to the details of practice than his colleague, and, indeed, the basis of his great work, "Systema Medicinæ Rationalis," is essentially practical, in which his physiological and pathological doctrines are, for the most part, introduced in an incidental manner, as supporting or elucidating his practical observations. Of the nature or details of his practice it will not be necessary to enter into any minute examination. It did not differ very materially from that of his contemporaries, although the circumstance of his being less exclusively attached to any single hypothesis has rendered him more disposed to take a candid and unprejudiced view of the various points which would necessarily fall under his observation. In his leading doctrines he must be classed with the mathematical physicians, but at the same time he adopts many of the opinions of the chemists, and indeed not unfrequently derives his indications from the supposed chemical condition of the fluids. But the great and important addition which Hoffmann made to theory, both medical and physiological, is the distinct manner in which he refers to the operations of the nervous system, and its influence on the phenomena of life. Many of the actions which Stahl ascribes to the action of his hypothetical principle, the anima, Hoffmann explained by referring them to the nervous influence, a physical power no less real than that of gravity or chemical affinity, but of a specific nature and operating by its own laws, the knowledge of which is to be acquired by observation and experiment.†

* *Haller*, Bib. Med. t. iii. p. 536-576. † *Thomson's* Cullen, p. 195, 6.

But whatever merit Hoffmann may have had as a practitioner, his reputation with posterity must principally rest upon his merits as a pathologist. Although, as we have stated above, he considered the fluids to be occasionally the primary seat of disease, yet in most cases he conceives it to originate in an affection of the solids. In order to explain this affection, he assumed that what he terms the moving fibre possesses a certain degree of action or tone, which constitutes its natural state, and is necessary for the performance of its functions. Various circumstances, as well external as internal, were supposed either to increase or diminish this tone; if it were increased beyond its due limit, the state of spasm is the result; if it were unduly diminished, the contrary state of atony was produced. This celebrated theory, which under various modifications entered so largely into the speculations of most of the pathologists of the seventeenth century, cannot be maintained in all its parts as it was detailed by Hoffmann; it must, however, be admitted that it made a considerable approach to a correct view of the subject, and that it may be regarded as the germ from which the more mature doctrines of his successors immediately emanated. It has been supposed that he borrowed it from the constricted and relaxed fibre of the ancients, but even if we admit that this may have furnished him with the first hint, it was so far new-modelled and extended by him as to deserve the merit of originality.*

This hypothesis of the nature of the moving fibre, together with the more extensive influence which the nervous system was imagined to exercise over the various operations of the animal economy, may be considered as forming the basis of both the physiology and the pathology of Hoffmann. Unfortunately for the fame of this writer, in consequence of the multiplicity of his works, and the hasty manner in which they were composed, it is very difficult to obtain a consistent or connected view of his theory; but, upon the whole, we conceive that he is entitled to the merit of having materially advanced our knowledge of the laws of the animal economy, and still more, of having pointed out the track which might be successfully pursued by others for the farther advancement of this knowledge. With respect to the works of Hoffmann it may be further remarked, that as in the course of his experience he gradually enlarged and corrected his pathological doctrines, and continued to publish them from time to time in detached portions, but without giving them in a condensed or abstracted form, we frequently meet with what appear to be inconsistencies and contradictions, and are obliged to collect his opinions rather from inferences and from indirect remarks, than from any clear and explicit statement of them.†

In giving an account of the pathology of Hoffmann, we have somewhat anticipated an important point of medical theory, to which we must now revert. We have had occasion in various parts of this history to notice, that through all the succession of opinions, from the time of Hippocrates to the period at which we are now arrived, with a very few exceptions, the hypotheses were all founded upon the humoral pathology. This opinion was maintained equally by the mathematicians, the chemists, and the metaphysicians. The changes that were produced in the system, whether mechanical or chemical, were equally supposed to take their origin from the fluids, while the metaphysician imagined that it was upon the fluids that his immaterial superintending principle exercised its action. We may regard the publication of Glisson's treatise, "De Ventriculo et Intestinis," which appeared in 1671, as having laid the foundation for the change of opinion which afterwards took place respecting this doctrine. It was in this work that the hypothesis of muscular irritability was originally brought forwards, a specific property, which is supposed to be attached to the living fibre, and from which is deduced its peculiar power of contraction.‡ But the first writer who systematically opposed the theory of the humoral pathology was Baglivi. He was born

* Cullen, in the preface to his "First Lines," bears ample testimony to the value and importance of Hoffmann's physiological speculations, and acknowledges the use which he had made of them in the formation of his own hypotheses.

† *Haller*, Bibl. Med. lib. x. § 877, t. iv. p. 536 et seq. Nouv. Dict. Hist. in loco. *Eloy*, in loco. *Cullen*, preface to his "First Lines," p. 18-25. *Sprengel*, sect. 15, ch. 2. *Blumenbach*, § 419. *Goulin*, in Enc. Méth. Médecine, in loco. *Thomson's* Life of Cullen, v. i. p. 182-200. Biog. Univ. in loco. Of his works the following may be selected as the most original and valuable:—Systema Medicinæ Rationalis; Medicina Consultatoria; Opuscula Med. Phys.; Consult. et Respons. Cent.; Pathologia Generalis; Therapia Generalis; Semeiologia; Philosophia Corporis hum. vivi.

‡ See especially the fifth chapter of the treatise entitled "De fibris in genere." *Eloy*, in loco.

near the conclusion of the seventeenth century, and after rising to early eminence in his profession, and acquiring a high reputation for his sagacity in the treatment of disease, and for the assiduity which he displayed in the acquisition of medical knowledge, was prematurely cut off at the age of thirty-four.* He proceeded upon the Hippocratean plan of watching attentively and accurately describing the phenomena of disease; but he differed from him as to their primary seat, rejecting the principles of the humoral pathology, and placing the causes of them in the altered condition of the solids. His account of the nature of the solids, and the actions of what he terms the moving fibres, is by no means conformable to our modern notions on the subject, and may be pronounced to be incorrect; but the opinion that the fluids are affected secondarily, in consequence of a previous affection of the solids, was a great and important point of theory, which has been gradually gaining ground since the time that it was first promulgated by Baglivi, and may be regarded, with certain modifications, as the current hypothesis of the present day. The doctrine of solidism had, indeed, no direct or immediate effect upon the practice of medicine, but by drawing the attention more to the state of the muscular and nervous systems than to that of the fluids, it tended to correct many of the erroneous opinions which had previously prevailed respecting the actual condition of the system when labouring under disease, and in this way powerfully contributed to improve our knowledge of the relative state of the different parts of the animal economy, and of the operation of remedies upon it. The gradual subversion of the humoral pathology may also be regarded as a remote cause of the favourable reception with which the doctrines of Hoffmann were received, while the attention which he paid to the action of the nervous system contributed, in its turn, still farther to favour the theory of solidism in opposition to that of the humoral pathology.

The theory of Stahl, notwithstanding its defects and inconsistencies, was calculated to make a considerable impression upon the public mind at the time when it was advanced, and it accordingly met with numerous supporters. It clearly pointed out the inadequacy of all the previous hypotheses, founded merely on mechanical principles, to explain the phenomena of vitality, while it was powerfully recommended by its simplicity; and perhaps even its metaphysical aspect might render it not the less acceptable to his countrymen, who were deeply interested in the speculations of Leibnitz, and the controversy to which they had given rise. It was not, indeed, generally embraced in its full extent; but with certain modifications it remained the favorite doctrine with many of the Germans, until it was gradually superseded by the more correct views of Hoffmann, and still further by the powerful and commanding genius of Haller.

Of the followers of Stahl, who adopted his opinions with the fewest alterations, we may select the names of Juncker and Alberti, who were both of them professors in the university of Halle, of which they contributed for many years to support the reputation which it had acquired under their illustrious predecessors. They were both of them voluminous writers, and they devoted a considerable part of their labours to expounding and illustrating the principles of the Stahlian system. But their works being more theoretical than practical, and being intended rather for the purpose of defending certain opinions than for the acquisition of knowledge, are now sunk into oblivion, or are merely referred to as historical records of an hypothesis which formerly engaged so much attention.

With these remarks on the theory of the vitalists we shall close the review of the state of medical science during the seventeenth century. Up to this period we have adopted the chronological arrangement, and by pursuing this method have been enabled without difficulty to trace the successive stages of the progress of our art. But, as we approach nearer to our own times, the number of subjects which claim our notice are so multiplied, that it will be necessary to continue the historical sketch upon a different plan. Disregarding therefore, to a certain extent, the mere order of time, we shall, in succession, give an account of those individuals who have acquired the greatest degree of celebrity, endeavouring at the same time to class them according to

* *Eloy*, in loco. *Haller*, Bibl. Med. lib. xii. § 954, t. iv. p. 197 et seq. *Goulin*, in Encyc. Méth., Médecine, in loco. *Chaussier et Adelon*, in Biog. Univ., in loco.

the opinions which they adopted, pointing out their connexion with each other, and with the general state of medical science.*

CHAP. XI.

Introductory remarks—General progress of medical science—Boerhaave, character of his writings, his pathology—Gaubius—Gorter—Haller, his character, pathological doctrines, his disciples, his opponents—Whytt—Semi-animists—Sauvages—Cullen, his pathology and practice, his pupils—Brown, his system—Darwin, his system.

From the revival of letters to the commencement of the eighteenth century, including a period of between two and three hundred years, the great aim and object had been to apply to medicine the same scientific principles which had been found successful in the advancement of the other departments of philosophy. The most distinguished medical writers of that period had therefore employed themselves rather in collecting opinions and in reasoning upon them, than in examining into the grounds on which these opinions had been formed, or inquiring in what degree they were applicable to the explanation of the phenomena of the animal economy. For the most part, as we have had occasion to remark, they failed in their direct object; at the same time, however, a considerable body of information was gradually acquired, and the views which now began to be unfolded in consequence of the pathological speculations of Hoffmann, and the practical observations of Sydenham and the modern Hippocrateans, led to the establishment of the same spirit of inductive investigation in medicine which had been for some time adopted in the other departments of natural science. We have passed over the age of mere learning, and we now enter upon that of observation and experiment. Scholastic disquisitions were completely disregarded, abstract theory was rapidly falling into disrepute, and hypotheses were no longer considered as deserving of attention unless they professed to be derived from the generalization of facts. The necessary result of this state of things has been to detach the mind from the arbitrary influence of theory, to diminish the authority of great names, and to induce the inquirers after truth to rest more upon their own exertions than upon the authority of others. We have, indeed, still to lament the errors and perversions of the human mind, to witness the attempts of ignorance and arrogance to usurp the place which is due to modest desert and patient research; but such attempts for the most part have obtained only temporary success, and after an ephemeral celebrity have been consigned to their merited contempt. In the mean time, notwithstanding these occasional interruptions, the progress of knowledge has been rapidly and steadily advancing. Experiments, well contrived and patiently conducted, have been performed in every department of physiological and medical science; observations have been made with more minuteness and recorded with more accuracy; our improved knowledge of chemistry has enabled us to introduce the most important reforms into pharmacy, while the discovery of various new articles of the materia medica has given us additional and powerful means of opposing the progress of disease.

While Stahl and Hoffmann were promulgating their doctrines in the university of Halle, the celebrated Boerhaave was teaching medicine with equal zeal, and we may venture to say with more success, at Leyden.† Boerhaave was originally educated for the profession of theology, but owing to some doctrinal scruples he fortunately relinquished his intention, and devoted himself to the study of medicine in all its branches. There are few examples, either in ancient or in modern times, of any individual who arrived at higher eminence, both in general knowledge and in the departments more immediately connected with his profession. His acquaintance with botany and with chemistry were such as to enable him to teach both these sciences with the greatest success; while his lectures and his writings on medicine, both theoretical and practical, were long considered as standards of excellence. He had a

* It may be necessary to observe that we have already somewhat deviated from the chronological arrangement in considering Hoffmann and Stahl as belonging to the seventeenth century, although it was not until near the close of it, in the years 1693 and 1694, that they entered upon their office as professors at Halle. But by admitting of this irregularity, we have made the division to correspond more nearly with the changes which took place in the state of medical science.

† Boerhaave was elected to the chair of medicine in 1709.

mind and character peculiarly well adapted for his situation and the age in which he lived, when a variety of new facts and new hypotheses were brought into view, and when it required a consummate degree of judgment to weigh the opposing evidence, and decide between the merits of the contending parties. His moral qualities were no less admirable than his intellectual acquirements; and if we add to these his elegance as a writer, his eloquence as a lecturer, and his entire devotedness to his profession, we shall be at no loss to account for the celebrity which he enjoyed during his life-time, and the reputation which he left behind him.

Boerhaave has been compared to Galen, and it may be asserted that he will not lose by the comparison. If Galen possessed more genius, Boerhaave possessed more judgment; while in their scientific acquirements, and in the extent of their information, it would not be easy to decide between them. They were both eminently skilled in the art of availing themselves of the knowledge of their contemporaries in all the branches of science, of applying it to the elucidation of their particular department, and of modelling and combining into a well-digested system all the scattered materials which they obtained from so great a variety of sources. In the stability of their systems, however, we observe a remarkable difference, for while Galen's doctrines were implicitly adopted for many centuries, the system of Boerhaave, notwithstanding its real merits and the applause which it obtained during the life of its inventor, shortly after his death was assailed from numerous quarters, and was unable to maintain its ground. The age in which Boerhaave lived was not one of authority but of investigation, and the enlightened spirit which pervades his own works tended in no small degree to foster that taste for inquiry which led his contemporaries not to rest satisfied with his theories, however beautiful might be their aspect, and however happily they might appear to explain the phenomena of life, if they were found to be based upon principles which were themselves conjectural and gratuitous.

The great object of Boerhaave in the formation of his system was to collect all that was valuable from preceding writers, and by means of these materials to erect a system which should be truly eclectic. The basis of his doctrines is in a great measure mechanical, derived from the hypothesis of Bellini and Pitcairne, but he unites with this certain parts of the humoral pathology, and adopts some of the opinions of Hoffmann. To these he added various original observations, by which he has given ample proof of his talents as a sagacious practitioner. His language is remarkably perspicuous, and his reasoning, if we admit his premises, is fair and conclusive. But the grand error of Boerhaave consisted in his depending more upon opinions than upon observations, in his endeavouring to form a system which should be composed of the united speculations of others, rather than to ascertain the correctness of the principles from which these speculations were deduced. His system accordingly met with the fate of all such as are built upon hypothesis; it could not stand the test of experiment and observation, and notwithstanding the efforts of some of Boerhaave's pupils, who were zealously attached to their master, it was generally discarded in no long period after the death of its inventor. But although the system of Boerhaave may have yielded to the more perfect and enlarged theories of his successors, he must ever be regarded as one to whom the science of medicine is deeply indebted. His Institutions and his Aphorisms would alone serve to immortalize his reputation as a correct observer and a sagacious practitioner, and if we compare them with any contemporary performance, which is the fair method of judging of the merits of works of science, we cannot fail to recognize their great superiority.*

In forming his system, Boerhaave was not unmindful of the doctrines of Hoffmann, and particularly of the influence which the brain and nerves exercise over the operations of the animal economy. But although he introduces it on certain occasions, and in some instances allows it to act a prominent part,† yet he was by no means fully aware of the extent of its power. This indeed may be considered as the radical defect of his pathological doctrines; he regards the solids too much in the light of mere mechanical

* *Haller*, Bib. Med. lib. xii. t. iv. p. 142 et seq. *Eloy*, in loco. *Cullen*, Preface to his "First Lines," p. 25–35. *Hutchinson's* Biog. Med. v. i. p. 82 et seq. Nouv. Dict. Hist. in loco. *Thomson's* Life of Cullen, v. i. p. 200–217. *Blumenbach*, Introd. § 418. *Goulin*, in Encyc. Méth. Médecine, in loco. Biographie Universelle in loco.

† See particularly his work entitled "Prælectiones de Morbis Nervorum."

agents, without sufficiently taking into account those properties which specifically distinguish them from inanimate bodies. This deficiency was to a certain extent supplied by his nephew Kauw Boerhaave,* and by his favourite pupil and successor Gaubius,† who introduced the agency of the nervous system in many cases where it had been omitted by Boerhaave himself. They were both of them men of considerable talents and acquirements, and the improvements which they made in medical theory were of real value. The writings of Gaubius, especially his Nosology and his Institutions of Pathology, were long held in high estimation, and were employed as text-books in the medical schools.‡ In the same connexion we may mention the name of Gorter, an eminent professor and practitioner at Harderwyc, who, while, like Boerhaave, he adopted the essential parts of the mechanical theories of his predecessors, made considerable use of the agency of what he termed the vital force in explaining many of the operations of the animal economy.§ The writings of Gorter are very numerous, and prove him to have been an industrious cultivator of medical science, while his great practical work, entitled "Compendium Medicinæ," indicates a talent for correct observation, and an accurate discrimination of morbid symptoms.

But the great support and ornament of the Boerhaavian school was Van Swieten. He was born at Leyden in the last year of the seventeenth century, and was one of the most favored and meritorious of the pupils of Boerhaave. In consequence of his theological opinions not coinciding with those of the state religion, he was expelled from the university of his native city, in which he held a professorship, and accepted an invitation from Maria Theresa to the court of Vienna. Here honours and distinctions of all kinds were heaped upon him; but these he amply repaid by the unremitting attention with which he devoted himself to the medical school of that metropolis. Of the high reputation which it has since enjoyed he may be said to have laid the foundation, while by the publication of his Commentaries on the Aphorisms of Boerhaave, he demonstrated at the same time the high respect which he retained for his preceptor, and the extent of his own information on all subjects connected with medical science. The Commentaries of Van Swieten contain a large and valuable collection of practical observations, partly the result of the author's own experience, and partly derived from his extensive knowledge of books. He adopted the theory of Boerhaave with little alteration, and in this respect the work must be regarded as fundamentally defective; but the great body of facts which it contains, detailed as they are in a clear and perspicuous style, will always ensure it a place in the library of the medical student.‖

The intimate connexion which subsists between the doctrines of pathology and an acquaintance with the laws of the animal economy in its healthy and perfect state, makes it necessary for us to give some account of an individual who, although not a practitioner of medicine, contributed perhaps more to our knowledge of the nature of disease than any one who has hitherto passed under our review. We refer to the great name of Haller, who has been not unaptly termed the father of modern physiology. He was the pupil of Boerhaave, and imbibed from him his thirst for knowledge, his correct judgment, his undeviating candour, his unblemished integrity, and in short all the intellectual and moral qualities which we have admired in the professor of Leyden. But to these qualities Haller added a more extensive and original genius, which led him never to rest upon the unexamined opinions of others, and a clearness of conception which taught him, both in his language and in his mode of reasoning, to avoid all ambiguous and undefined terms, and all irrelevant arguments. He possessed a mind at the same time comprehensive and correct, equally adapted for discovering new paths to knowledge, and for investigating those which had been previously entered upon by others. The innate powers of the components of the body, which had been imperfectly seen by Glisson and by Hoffmann, were examined by Haller with his characteristic

* *Thomson's* Cullen, v. i. p. 219.

† Ib. p. 220.

‡ *Haller*, Bibl. Anat. t. ii. p. 166, 7. *Eloy*, in loco. *Aikin's* Gen. Biog. in loco. *Thomson's* Cullen, v. i. p. 220, 1. *Desgenettes*, in Biog. Univ. in loco.

§ *Eloy*, in loco. *Haller*, Bibl. Anat. t. ii. p. 169, 70. *Sprengel*, t. v. p. 314–16. *Thomson's* Cullen, v. i. p. 218. *Renauldin*, in Biog. Univ. in loco.

‖ *Eloy*, in loco. *Nauche*, in Biog. Univ. in loco.

acuteness, and the result of his long and well-directed experimental research was rewarded by the establishment of his theory of irritability and sensibility as specific properties attached to the two great systems of the animal frame, the muscular and the nervous, to which, either separately or conjointly, may be referred all the phenomena of the living body. But perhaps a still more important service which Haller rendered to science was the example which he held out of carefully abstaining from all opinions founded merely upon speculative grounds, and of deducing his general principles exclusively from experiment and observation. He gave an impulse to science no less by the actual discoveries which he made, than by the spirit with which he conducted his researches, so that we may regard the publication of his Elements of Physiology as having introduced a new era into medical science.*

It would be incompatible both with the immediate subject of this essay, and with the limits to which it is necessarily restricted, to give a detailed account of the controversies and discussions to which the theory of Haller gave rise. Notwithstanding its merits, and the evidence by which it was supported, it was opposed, either in its full extent or in certain of its parts, by many individuals of high respectability; while on the contrary various experiments were instituted, by which his conclusions were confirmed and his principles extended. Among those who were the most successful in these researches we may select the names of Zimmermann,† Caldani,‡ Fontana,§ Tissot,‖ Zinn,¶ and Verschuir. The last of these physiologists particularly distinguished himself by his experiments on the contractility of the arteries,** a point which had been left undecided by Haller, but which formed a most important addition to the theory of the action of the vessels, and which had previously been rather assumed as what was probable than deduced from any ascertained facts.

Among the most powerful opponents of the doctrine of Haller we may select the names of Whytt and Porterfield. They were natives of Scotland, and during the earlier part of the last century were residents in the metropolis of that kingdom, and bore a conspicuous part in the scientific institutions for which it was so justly celebrated. The former of them was professor of medicine in the university of Edinburgh at the time when it was rapidly advancing to that high reputation which it afterwards more fully attained under the genius of his illustrious successor Cullen. They opposed that part of the theory of Haller which ascribes all the actions of the living system to certain powers necessarily connected with the material parts of the frame, as well as to the separation of these actions into the two distinct powers of irritability and sensibility.†† The controversy which Whytt carried on with Haller was conducted with acuteness and ability, but it manifests a degree of acrimony which it is impossible not to regret, particularly as occurring in an individual who was otherwise so much entitled to our respect. And this is more especially the case when we consider the nature of the objections which he urged against the Hallerian hypothesis, which were rather of a metaphysical nature than such as were either founded upon experiment or deduced from observation. His doctrine of the vital motions of the body, which formed the principal subject of the controversy, may be regarded as intermediate between that of Haller and Stahl, or rather compounded of the two. He attributes these vital motions to the operation of the sentient principle, which is supposed to be something distinct from the corporeal frame, at the same time that it is necessarily attached to it, and is under the influence of physical causes, not like the anima of Stahl, acting by a species of independent consciousness and volition. The great error which pervades the specu-

* *Elye*, in Mém. Acad. Scien. 1777. *Henry's* Life of Haller. *Sprengel*, sect. 15, ch. iii. *Aikin's* Gen. Biog. in loco. *Thomson's* Cullen, v. i. p. 221–240. *Cuvier*, in Biographie Universelle, in loco. *Dewar*, in Brewster's Encyc. art. "Haller." *Blumenbach*, Introd. § 468. *Goulin*, in Enc. Méth. Médecine, in loco.

† De Irritabilitate.

‡ Instit. Physiol.

§ In *Haller*, sur la Nature Sens. et Irrit. t. iii.

‖ Ibid. t. i. et iii.

¶ Exper. circa Corp. Cal. etc.

** De Arter. et Ven. Vi Irrit.

†† See particularly *Whytt* on Vital and Involuntary Motions, and Physiological Essays. *Porterfield* on the Eye, passim, and papers in Edinburgh Medical Essays. *Thomson's* Cullen, v. i. p. 241–258.

lations of Whytt and Porterfield consists in their reasoning more upon metaphysical than upon physical principles, and in their assuming certain powers, the proof of which rests more upon their supposed necessity to account for the actions of the system than upon any independent evidence that we have of their existence. They did not indeed, like the Stahlians, consider the sentient principle as something independent of the body, and only as it were appended to it, but as a principle or power necessarily belonging to the living body, and imparting to it its vitality, although essentially distinct in its nature from any of the properties of a mere material agent. Whytt may be regarded as the founder of the sect which obtained the name of the semi-animists, which, under various modifications, included some of the most distinguished physiologists both in this country and in France. Of the latter, one of the most eminent was Sauvages; he was a native of Languedoc, and received his education at Montpellier, which, during the early part of the eighteenth century, held a very high character as a school of medicine. In 1734 he was appointed one of the professors in the university of that city, and during the remainder of his life contributed materially to maintain its credit by his talents both as a writer and a teacher. His reputation with posterity will principally rest upon his methodical nosology, a work which contains an arrangement of diseases into classes, orders, genera, and species, on the same plan which had been employed in the arrangement of the subjects of natural history. The Nosology of Sauvages is a work of great and original merit, which, although now in some degree superseded by the improvements of later writers, mainly contributed to the advancement of medical knowledge by producing accuracy in the use of terms and in the discrimination of the characters of disease.*

The same kind of service which Haller rendered to the science of physiology was performed for that of the practice of medicine by his contemporary Cullen. Among those who have made the study of medicine their professed pursuit, no one, since the revival of letters, has risen to greater eminence during his life-time, nor has left behind him a higher reputation than this celebrated individual. During the greatest part of a long life he was engaged in the teaching of medicine or some of the collateral sciences, first in the university of Glasgow, and afterwards in that of Edinburgh, which latter he contributed, in no small degree, to raise to the rank, which it long held, of the first medical school in Europe. His peculiar excellence as a lecturer afforded him an ample opportunity of promulgating and enforcing his doctrines, while their real merit, no less than the mode in which they were announced, rendered them in the highest degree popular among his pupils and contemporaries. He possessed an acute and ardent mind; he was well skilled in the medical literature both of the ancients and the moderns, but he had no undue respect for the opinions of others on the mere ground of authority. He detected the defects of former hypotheses with shrewdness and sagacity, while he proposed his own views with a degree of candour and modesty which tended to render them the more acceptable, and disposed his audience to receive them in the same spirit with which they were proposed.

With respect to his physiological writings, they afford, in some respects, a remarkable contrast to those of Haller; for while the latter are extended to a great length, and are filled with the most minute and elaborate details, the former are no less remarkable for their compressed brevity, consisting principally in general views and abstracted deductions. Contrary, however, to what is so frequently the case with respect to works of this description, they are not to be regarded as mere speculative positions, but as the condensed result of patient research and extensive observation. Some of the leading doctrines of his pathology were professedly borrowed from Hoffmann; but to these he made many important additions by taking advantage of the various improvements that had been made in physiological knowledge, principally by means of Haller and his pupils. Still later discoveries in this science, and in that of chemistry, have indeed proved that certain parts of his system are not tenable, and that others require to be considerably altered and modified; but it may be asserted that no one produced a more powerful and lasting effect upon the state of medicine in all its branches, both theoretical and practical, than Cullen. But his great and appropriate merit, and which entitles him to the admiration and gratitude of posterity, is the saga-

* *Eloy*, in loco. *Haller*, Bibl. Anat. "Boissier," t. ii. p. 300–4, § 999.

city and diligence which he manifested in the description and discrimination of the phenomena of disease. In this talent he may be considered as rivalling Sydenham or any of his most distinguished predecessors, while the recent improvements in physiology and the other branches of medical science gave him an advantage which he did not fail duly to improve. In his treatment of disease he manifested no less judgment and sagacity than in the formation of his theories. He was prompt and decisive, without rashness; he estimated the powers of remedies by a cautious and accurate examination of their effects, with little bias from hypothesis, and with even somewhat of a sceptical disposition of mind, which prevented him from falling into those errors and inconsistencies to which the practice of medicine is so peculiarly obnoxious.

In giving an account of the system of Boerhaave we remarked that in its formation he proceeded upon the eclectic plan, founding it upon the opinions of others, which he endeavoured to connect together and to mould into a consistent and uniform theory. Cullen adopted the more philosophical mode of generalization and induction. He disclaims all hypotheses and theories not immediately derived from facts, and made it his great business to collect, by actual observation, the materials from which he might deduce his general principles. In this object he was eminently successful, and it is this which gives his writings their great value, a value which they must ever retain amidst all the revolutions of opinion, which attach to medicine more than to any other branch of science. But, although he was so sensible of the advantage of the inductive mode of investigation, he was not a mere empirical practitioner, who disregarded all theoretical reasoning, and never ventured to go beyond the simple result of experience. On the contrary, he inquires in all cases into the remote and primary causes of disease, and endeavours to deduce from them his indications of cure. Many of his individual speculations are indeed remarkable for their subtilty and refinement, and may be characterized as exhibiting more ingenuity than judgment. At the same time it is not a little remarkable that these speculations, however carefully they were elaborated, had but little influence on his practice; and it is gratifying to observe with what caution he applies his hypotheses to explain or direct his method of treating disease.

His great work, entitled "First Lines of the Practice of Physic," is the one on which his reputation will principally rest; but the merits of his Institutions, of his Nosology, and of his Lectures on the Materia Medica, are each of them sufficient to have entitled him to a distinguished rank among the improvers of medical science. The last of these works, in which he takes a more philosophical view of the operation of remedies than had been done by any of his predecessors, is one of peculiar value. It contains a great variety of important pathological observations, together with a complete theory of therapeutics, and being the latest of his publications, we find in it his more matured and corrected views on many topics which had been treated in his former works. In none of them do we find more of that spirit of rational scepticism to which we have alluded above, and which led him to be more confident in opposing the opinions of others than in maintaining his own. Like Haller, with whom we have already taken occasion both to compare and to contrast him, he contributed to introduce into medical reasoning a philosophical spirit, which has produced a permanent and highly salutary effect upon the healing art, and which associates the name of Cullen with those of the great benefactors of the human race.

It is not easy to give, in a short compass, an account of the pathological doctrines of Cullen, because they consisted rather of a number of individual parts, as applied to the explanation of particular phenomena, than of one comprehensive system, which constituted a general theory of diseased action. The foundation of the system is, however, sufficiently simple; that the living body consists of a number of organs, which are all of them possessed of powers of a specific and appropriate nature, distinct from those which are attached to inanimate matter. These powers are so ordered, that they have a tendency to preserve the whole machine in a perfect state, when its actions and functions proceed in their ordinary course. When any irregularity supervenes, either from internal or external causes, if it be not in an excessive degree, the self-regulating principle is sufficient to control the operation of the morbid cause, and to restore the system to its healthy condition. This regulating principle, or, as it was termed, the *vis medicatrix naturæ*, differs essentially from the archeus of Van Helmont or the anima

of Stahl, inasmuch as it is supposed not to be any thing superadded to the body, but one of the powers or properties necessary to its constitution as a living system, and the existence of which is recognized by its effects. Although the laws of gravity and of chemical affinity affect the animal body, so far as it is composed of material organs, yet its appropriate actions are under the immediate influence of the specific laws of vitality. Hence all explanations, depending upon mere mechanical or chemical reasoning, were abandoned, and in their place was substituted the vital action of the parts, and more especially that of the extreme branches of the arterial system, or, as they are styled, the capillary arteries. Although it may appear that both Stahl and Hoffmann had to a certain extent preoccupied the ground which was taken by Cullen, as to the foundation of his system, and although the system, as detailed by him, is defective in some of its subordinate parts, yet we must admit that the ample and explicit manner in which it was stated gave it the aspect and much of the merit of novelty, while the applications which he made of it were frequently just, and always ingenious. His physiology and his chemistry were not in all cases correct; he did not pay sufficient attention to the distinction between the powers of the muscles and the nerves, which had been so well discriminated by Haller, and he even confounds their physical structure. But with all these abatements we still regard the pathology of Cullen with much respect, and consider him as one of those who greatly contributed to improve the sciences no less than the practice of his art.*

What may be termed the Cullenean school of medicine, including both his numerous pupils and the writers who either embraced his peculiar opinions, or adopted his method of investigation, comprehends a large proportion of the most distinguished of the British physicians during the remainder of the eighteenth century. The rational empiricism, as it has been styled, which he so firmly established, both by precept and example, has, in this country at least, so far superseded the taste for mere speculation and hypothesis, that we are perhaps disposed to run into the opposite extreme, and to undervalue all attempts to investigate the abstract principles of pathology, and to employ ourselves solely in the accumulation of facts, without duly attending to the general conclusions that may be deduced from them.†

We have, however, to notice one singular exception to this remark, where an hypothesis was advanced, of the most bold and lofty pretensions, disdaining the support of facts and experience, and professing to explain all the phenomena of life and of disease by a few simple aphorisms. In tracing the history of science, although it is proper for the most part to estimate books and opinions solely by their intrinsic merit, without any regard to the personal character of the author, yet we find them on some occasions so intimately connected that it is impossible altogether to separate them. This is the case with the celebrated Brown, whose theory appears to have originated as much from spleen and disappointment, and a determination to oppose the doctrines of Cullen, as from a more legitimate motive.

Neither the education of Brown nor his natural character were of the kind the best adapted for the prosecution of medical science. He was originally destined for the

* For a minute detail of the opinions of Cullen and those of his immediate predecessors and contemporaries, the reader is referred to the learned and ample work of Dr. Thomson, which may be characterized as containing a philosophical history of medicine and pathology during the beginning and middle of the eighteenth century. The account which is given of Cullen's pupils must be perused with much interest, an interest which, in the case of the writer of this article, is exalted by the sacred sentiment of filial piety: p. 461, 644-6. See also *Sprengel*, t. v. p. 359-366. We think that this writer, in criticising the doctrines of Cullen, is somewhat deficient in that candour for which he is in most cases so conspicuous; Encyc. Brit. in loco; *Aikin's* Gen. Biog. in loco; *Kerr*, in Brewster's Encyc. art. "Cullen."

† In this brief sketch we can do no more than merely mention the names of some of our countrymen, who, either by the publication of single cases or of monographs on certain diseases, have contributed to the advancement of pathological or practical knowledge. Among others we may select those of Gregory, the able successor of Cullen, Pringle, M'Bride, Huxham, Fothergill, Cleghorn, Brocklesby, Lind, and Russel. In our own times we have had the no less illustrious names of the Hunters, of Percival, Withering, Johnstone, Falconer, Heberden, Baillie, Haygarth, Ferriar, Currie, Willan, Bateman, Marcet, and Parry. In mentioning the name of Gregory, the writer must be allowed to express the feelings of respect and regard which he has always felt for his preceptor. The elegance of his literary taste, his clear and comprehensive judgment, and more especially the interesting mode in which he conveyed his instruction all contributed to render him one of the most distinguished ornaments of his profession.

ecclesiastical profession; and when he afterwards entered upon that of medicine, he never devoted himself to those elementary studies which are indispensably necessary to a correct knowledge either of theory or of practice. But what he wanted in knowledge he endeavoured to supply by the force of his own genius, and by meditating upon a few general or abstract principles, he ventured to form a new system of pathology, which he announced with a degree of confidence that, while it exhibited the strong powers of his understanding, proved no less the deficiency of his information. Medicine, which had hitherto been a conjectural art, was now to be built upon a few certain and fixed principles, which, by superseding all that had been previously written upon the subject, and by being independent both of observation and of experience, required for its attainment little previous study or learning. The novelty of the attempt, the easy access which it promised to a science which before appeared of difficult approach, and the plausibility of some of its leading positions, acquired for the new theory a prodigious degree of popularity in the university of Edinburgh, where it was first promulgated. Brown had been, in the first instance, patronized by Cullen; but from some causes, both of a personal and a professional nature, which it is not difficult to comprehend, he forfeited the good opinion, and became the bitter antagonist of the doctrines of his former friend. The controversy to which this schism gave rise was carried on for some years with great vehemence, and was by no means confined to the place where it originated. In this country the Brunonian system obtained many adherents when it was first proposed, principally indeed among the students or younger members of the profession; while in some parts of the continent, more especially in Italy, it was adopted by men of learning and science, and became the prevailing hypothesis in some of the most respectable medical schools.

The general principles of the theory are few and simple. He assumed that the living body possesses a specific property or power, termed excitability; that every thing which in any way affects the living body acts upon this power as an excitant or stimulant; that the effect of this operation, or excitement, when in its ordinary state, is to produce the natural and healthy condition of the functions; when excessive, it causes exhaustion, termed direct debility; when defective, it produces an accumulation of excitement, or what is termed indirect debility. All morbid action is conceived to depend upon one or other of these states of direct or indirect debility, and diseases are accordingly arranged in two great corresponding classes of sthenic or asthenic; while the treatment is solely directed to the general means for increasing or diminishing the excitement, without any regard to specific symptoms, or any consideration but that of degree, or any measure but that of quantity. Such general views and sweeping doctrines, however alluring to the uninformed or the mere theorist, are altogether inapplicable to practice; and it is a subject for our admiration how they could be for a moment entertained by any one who had studied the phenomena of disease, or who was acquainted with the intricate and complicated relations of the different functions and actions of the living system. Accordingly in this country, where, in consequence of the prevalence of the Cullenean school, the attention was more directed to practical than to theoretical details, the professed adherents of Brown were neither numerous nor influential; and even in Italy, where for some time it enjoyed considerable popularity, it has long ceased to be maintained. Yet it must always occupy a distinguished place in the history of medical science, as exhibiting a remarkable example of the force of original and unaided genius in erecting a system plausible and captivating in its aspect, but devoid of the essential support of facts and observations, and therefore fated to share the lot of all systems built on so unstable a basis.*

In connexion with Brown we must notice a medical theorist whose general principles bore a considerable resemblance to those of the "Elementa Medicinæ," but whose character, talents, and acquirements were of a totally opposite kind. The "Zoonomia" of Darwin exhibits genius and originality; but in no other respect does it bear any

* *Beddoes's* Observations, prefixed to his edition of Brown's Elements; a writer possessed of originality and genius, but perhaps not unaptly characterised by Rothe as "a blind adherent of the new chemists and of Brown." *M'Kenzie*, in Brewster's Enc., art. "Brown." *Parr's* Dict., art. "Brunonian system." *Aikin's* Gen. Biog., in loco. *Sprengel*, t. vi. p. 155–158, 315–334. *Suard*, in Biographie Universelle, in loco.

resemblance to its prototype. Darwin possessed a knowledge of medicine and all the collateral sciences in their full extent; he was familiar with practice, and had a taste for minute detail and experimental research which, while it appeared to qualify him for a medical theorist, enabled him to give to his system an imposing aspect of induction and generalization. His speculations, although highly refined, profess to be founded upon facts; and his arrangement and classification, although complicated, seems consistent in all its parts. No theory which had ever been offered to the public was more highly elaborated, and appeared to be more firmly supported by experience and observation, while every adventitious aid was given to it from the cultivated taste and extensive information of the writer. Yet the Zoonomia made little impression on public opinion; its leading doctrines rested rather upon metaphysical than upon physical considerations, its fundamental positions were found to be gratuitous, and many of the illustrations, although ingenious, were conceived to be inapplicable and inconclusive. It is now seldom referred to, except as a splendid monument of fruitless labour and misapplied learning.*

CHAP. XII.

Remarks on the state of practical medicine at the conclusion of the eighteenth century—State of medicine in France, Lieutaud—State of medicine in Germany, De Haen—State of medicine in Italy, Morgagni, Burserius, Rasori—Epidemics—Improvements in pharmacy.

While the British physicians were principally occupied in collecting facts and recording their observations, and, with the exception of the temporary suspension which was occasioned by the Brunonian controversy, were more intent in adding to the stock of knowledge than in forming systems, the continental physicians were more disposed to pursue the eclectic plan of Boerhaave. In France this was accomplished with the most success by Lieutaud. He was a native of Provence, and was for some years a professor at Aix; in 1749 he was appointed physician to the royal hospital at Versailles, and finally to the court of France. He was eminent both as a practitioner and an anatomist; his great work, the "Synopsis universæ Praxeos Medicæ," published in 1765, contains much information on all topics connected with medicine, and is valuable from its real merits in this respect, while it is interesting as affording a correct view of the state of medical science in France at that period. With respect to his general principles, he was an eclectic, uniting certain parts of the old doctrines of the mathematicians and the humoralists with those of Hoffmann and the vitalists.† Upon the whole, however, we conceive that we shall not be accused of partiality or want of candour if we give it as our opinion, that the views of Lieutaud and his countrymen are less matured than those of his contemporaries in this island or in Holland. We may remark, in speaking of France, that for many years the great seat of medical science in that country was Montpellier. Its university was established in the thirteenth century, and was one of the earliest of those which rose to any considerable eminence; a distinction which it maintained until it was rivalled by that of Paris, which gradually acquired its splendid reputation during the course of the seventeenth century. To the name of Sauvages, who was mentioned above as distinguished for his learned work on nosology, we may add those of Bordeu, Barthez, and Astruc as among the most eminent members of the school of Montpellier.‡

Of the medical schools of Germany, the most celebrated during the seventeenth and eighteenth centuries was Vienna. We have already mentioned the exertions that were so successfully made for its advancement by Van Swieten, who was appointed one of its professors in the year 1734. After he had occupied this situation for about twenty years, he associated with himself his countryman De Haën, who materially contributed to support the reputation of the university, particularly by his talents as a practitioner. His great work, entitled "Ratio Medendi," is a valuable repository of facts and observations; upon which we may make the same remark that we offered above respecting Lieutaud's "Synopsis." De Haën has been characterized as a man of great learning united with much practical skill, and a talent for correct observation; but, on the

* *Brewster's* Enc., in loco. *Sprengel*, vol. vi. p. 269–70, 278–9. *Young's* Med. Lit., p. 54–5. *Brown's* Remarks on the Zoonomia, an acute, but rather severe critique. *Suard*, Biographie Universelle, in loco.

† *Hutchinson's* Biog. Med., vol. ii. p. 63 et seq.

‡ *Moreau de la Sarthe*, Encyc. Méth. Médecine, in loco.

other hand, he appears to have been unreasonably prejudiced against new opinions, and even improvements, in his art; for not only was he one of the most zealous opponents of Haller's theory, but he was no less decided in his opposition to the practice of inoculation, and to the use of various new remedies, which were at that period introduced into medicine, the value of which is now generally recognized. The state of medical theory then prevailing in Vienna was nearly the same with that which was taught in the universities of Leyden and Paris; the doctrines of the humoral pathology may be considered as forming the basis of their hypotheses, but upon these was engrafted a certain portion of the new views respecting the actions of the nervous system and the contractibility of the muscular fibre.

In Italy, which so early acquired a high degree of celebrity for its medical schools, and which still retains a considerable portion of its former reputation, the sciences of anatomy and physiology were cultivated with success, while they were but little attended to in the other parts of Europe. What may be styled anatomical pathology took its rise in Italy in the seventeenth century. The individual to whom the merit of having opened this new road to the improvement of medical knowledge is principally due is Bonet,* who was born at Geneva in 1620, and at an advanced period of his life published his great work entitled, "Sepulchretum," which was afterwards enlarged by his learned and industrious countryman Manget.† The Sepulchretum has been styled "the Library of true Pathology;" it consists of a great collection of cases, in which we have a history of the disease with the appearances found upon dissection. The plan which had been commenced by Bonet and Manget was followed up by Valsalva, an eminent professor of Bologna, and was still farther perfected by the illustrious Morgagni. This eminent anatomist was a pupil of Valsalva's, and afterwards became professor in the University of Padua, where for nearly sixty years, until his death, which took place in 1771, he devoted himself without intermission to the study of his favourite pursuit. The principal works of Morgagni are his "Adversaria Anatomica," his "Epistolæ Anatomicæ," and more especially his great pathological collection entitled "De Sedibus et Causis Morborum per Anatomiam indagatis." It proceeds upon the plan of Bonet's Sepulchretum, and contains the observations which were made both by himself and by Valsalva, and has always been regarded as a repository of facts and observations on anatomy and pathology unequalled in extent and in accuracy.‡

The Institutions of Burserius afford a favourable view of the state of medical science in Italy at this period. He was born at Trent in 1724, studied first at Padua and afterwards at Bologna; he was for some years a professor in the university of Pavia, and finally removed to Milan, where he died in 1785.§ Burserius was rather an eclectic than an original theorist, but his work is much valued for the information which it contains, and much admired for the elegant manner in which the information is conveyed. Like his contemporaries in Holland, France, and Germany, his doctrines are essentially founded upon those of the humoralists, but to these he unites various parts of those of the solidists and vitalists, and has proved himself deserving of the praise, not only of learning, but of candour and judgment.

We have already had occasion to remark upon the effect which was produced in Italy by the theory of Brown; it was embraced by many of the learned men of that country, and for some time acquired a considerably greater ascendancy over public opinion than it possessed even in its native city. It was not only defended in their publications, but its doctrines were applied to practice, and it was not until their insufficiency had been detected by fatal experience that the delusion was removed.‖ At the conclusion of the

* *Haller*, Bibl. Med. lib. 10, § 750, t. iii. p. 236 et seq. *Eloy*, in loco. *Dezcimeris*, Arch. Gén. de Méd. xx. 158, 9.

† *Haller*, Bibl. Anat. lib. 7, § 749, t. i. p. 103 et seq. *Haller*, Bibl. Med. lib. 11, § 889, t. iii. p. 603 et seq. *Eloy*, in loco.

‡ *Eloy*, in loco. *Haller*, Bibl. Anat. lib. 8, § 797, t. ii. p. 34 et seq. *Haller*, Bibl. Med. lib. 12, § 1029, t. iv. p. 424 et seq. *Renauldin*, Biog. Univ. in loco.

§ Vide Præf. ad Instit. Med. Prac. ed. Lips. 1787.

‖ Rasori of Genoa appears to have been the first who made his countrymen acquainted with the doctrines of Brown, of which he was a zealous adherent; subsequently, however, he found reason, from the result of experience, to change his opinions, and very candidly and honestly expressed his conviction of their erroneous tendency. An ample account of the pathological doctrines which are at present the most generally received in Italy, under the title of "Nuova Dottrina Italiana," may be found in the various publications of Tommasini, the learned professor of Bologna.

eighteenth century it would seem that the medical theories of the Italians were considerably similar to those of the Cullenean school, and that the Italians, like the English physicians, were little disposed to form systems of medicine, but devoted themselves principally to the cultivation of anatomy and physiology, in addition to the more immediate studies of their profession.

In tracing the additions and improvements which the science of medicine received during the eighteenth century, we must not omit to notice the descriptions of new diseases, either those which were conceived to have actually originated during this period, if there were any such, or those which had not been previously discriminated with sufficient accuracy from others that in many respects resembled them. The various epidemics which, from some unascertained and unexplained causes, have at different times passed over large portions of the surface of the earth; the endemic diseases attached to particular situations, originating in some circumstance connected with the atmosphere, soil, or climate of certain districts, or in the occupation or mode of life of its inhabitants; and lastly, the contagious or infectious diseases, which have invaded entire cities or communities, from unknown or at least obscure causes, and after spreading destruction on all sides, have disappeared from causes equally unascertained.

The first of these classes, the epidemic diseases, were made an especial object of attention, in the latter part of the seventeenth century, by Sydenham, whose remarks on them are among the most interesting of his works; also by Morton and by Ramazzini: at a somewhat later period we have the valuable observations of Huxham, of Lancisi and Torti in Italy, and of Stoll at Vienna. The science has been much enriched by various descriptions of the diseases incident to the army and navy, among which we may particularly notice those of Pringle, Brocklesby, D. Monro, Hunter, Lind, Hillary, Blane, Trotter, Larrey, and Desgenettes.* The formidable disease which has been emphatically termed the plague, as it appeared in London, the Low Countries, Marseilles, Moscow, and other parts of Europe, in the latter part of the seventeenth and the beginning of the eighteenth century, and as it still exists in Turkey, Egypt, and the adjoining countries,† as well as the less formidable, although more extensive visitations of the influenza, have each had their historians; and it is truly gratifying to observe that in most cases the writers have been more anxious to collect facts and to obtain correct information than to support any particular theoretical views.‡

In reviewing the state of medical science during the eighteenth century, and tracing its gradual advancement, we are naturally led to remark upon the great additions which have been made to pharmacy, both in regard to the introduction of new articles into the materia medica, and the improvement that has taken place in the preparation of various substances, and the mode of their administration. It has been remarked that in proportion as our knowledge of the virtues and qualities of medicines has been matured, our pharmacopœia has been simplified, both as to the number of articles employed and the mode of compounding them. Accordingly, if we compare the successive editions of the British pharmacopœias and dispensatories, we shall find that a number of superfluous and inert substances have been from time to time rejected, and that the complex formulæ of the older physicians have been reduced in the same proportion. At the same time some substances of real efficiency have been added, while the improvement in chemical science has enabled us to obtain the active principles of these substances in much more condensed and commodious forms. This remark may be illustrated by Peruvian bark, a remedy which for a long period afforded a fertile field for controversy both as to its power over disease, the nature of its operation, and the mode of its administration. Practitioners have long been aware of the futility of most of the points which were the subject of so much warm and even acrimonious discussion, and are satisfied with recognizing its value as a powerful curative agent in certain diseases, without endeavour-

* For a very complete list of works on these subjects the reader is referred to the valuable work of *Professor Ballingall* on Military Surgery, p. 227 et seq.

† Hecker's account of the "Black Death," which ravaged so large a portion of the globe in the fourteenth century, may be mentioned as a work worthy of our notice, both as containing many interesting details of this tremendous pestilence, and as exhibiting a curious specimen of medical hypothesis

‡ For the names of the authors who have treated on these topics, we refer to the respective articles of this work. Copious lists of authors may also be found in *Young's* Medical Literature, a work no less remarkable for its learning than for the condensed form in which it is communicated. Much valuable information on this subject will be found in *Sprengel*, sect. 16, ch. 3, art. 2.

ing to discover the nature of the occult qualities on which its operation depends; while the chemist has lent his aid in pointing out a mode by which its active proximate principle may be procured, detached from the inert matter with which it is naturally combined. The skill of the modern chemist has likewise been most beneficially exercised on the metallic preparations; giving them more fixed and definite combinations, pointing out the modes by which they may be produced with more ease and certainty, and ascertaining the chemical relation which they bear to other substances, so as to indicate how they may be combined with them without decomposition, or even with an increase of their activity.

CHAP. XIII.

Cursory remarks on the state of practical medicine since the commencement of the present century—Difficulty of acquiring medical experience—State of medicine in Great Britain—Pathologists of France—Physiologists of Germany—Medical journals—Medical societies—Schools of medicine—Suggestions for the improvement of medical science.

As the historian of medicine approaches nearer to his own times, he finds his path encumbered with almost insurmountable difficulties. The subject on which he has to treat differs, perhaps, from every other branch of science in this circumstance, that our actual information does not increase, in any degree, in proportion to our experience. Hence it follows that the accumulation of materials frequently rather retards than promotes its progress. In other sciences, although truth is not to be attained without a certain degree of laborious research, yet to those who are willing to bestow on it the requisite attention, it is for the most part attainable, or, if it still eludes our grasp, we are at least sensible of the deficiency, and can generally ascertain the precise nature of the obstacles which impede our progress. In other sciences, when we enter upon an inquiry, or propose to ourselves any definite object for experiment or observation, we are able to say whether the result of our inquiry has been satisfactory, and whether the object in view has or has not been accomplished.

But this is unfortunately not the case in medicine. There are certain peculiarities necessarily connected with the subject, which render it extremely difficult to appreciate the value of experiment and observation. In our experiments we are seldom able to ascertain with accuracy the previous state of the body on which we operate, and in our observations we are seldom able to ascertain what is the exact cause of the effect which we witness. The history of medicine in all its parts, and especially that of the materia medica, affords ample testimony to the truth of these remarks. In modern times, and more remarkably in Great Britain, no one thinks of proposing a new mode of practice without supporting it by the results of practical experience. The disease exists, the remedy is prescribed, and the disease is removed; we have no reason to doubt the veracity or the ability of the narrator; his favourable report induces his contemporaries to pursue the same means of cure, the same favourable result is obtained, and it appears impossible for any fact to be supported by more decisive testimony. Yet in the space of a few short years the boasted remedy has lost its virtue, the disease no longer yields to its power, while its place is supplied by some new remedy, which, like its predecessors, runs through the same career of expectation, success, and disappointment.

Let us apply these remarks to the case of fever, the disease which has been styled the touchstone of medical theory, and which may be pronounced to be its opprobrium. At the termination of the last century, while the doctrine of Cullen was generally embraced, typhous fever was called a disease of debility, and was of course to be cured by tonics and stimulants. No sooner was it ascertained to exist, than bark and wine were administered in as large doses as the patient could be induced or was found able to take. No doubt was entertained of their power over the disease; the only question that caused any doubt in the mind of the practitioner was, whether the patient could bear the quantity that would be necessary for the cure.

To this treatment succeeded that of cold affusion. The high character and literary reputation of the individual who proposed this remedy, its simplicity, and easy application, the candid spirit which was manifested, and the strong testimonials which were adduced by his contemporaries, bore down all opposition, and we flattered ourselves that we had at length subdued the formidable monster. But we were doomed to experience the ordinary process of disappointment; the practice, as usual, was found inefficient or injurious, and it was after a short time supplanted by the use of the lancet. But this

practice was even more short-lived than either of its predecessors; and thus, in a space of less than forty years, we have gone through three revolutions of opinion with respect to our treatment of a disease of very frequent occurrence, and of the most decisive and urgent symptoms.

Are we, then, to conclude that all medical treatment is of no avail? that it is all imaginary or deceptive? We should feel most unwilling to be compelled to form such a conclusion, nor do we conceive that it necessarily follows from the premises; but we think that the facts prove the importance of extreme caution in forming our conclusions, and still more that mere experience, without the due combination of well regulated theory, is a most fallacious guide. What objection can the man of mere experience, the rejector of all theoretical deductions, urge against the multiplied testimony that is now presented to us in favour of the Homoiopathic doctrine?—what answer can be made to the Report that has been recently brought forwards by the medical commissioners of Paris on the subject of Animal Magnetism? The conclusion that forces itself irresistibly on the mind is, that no medical testimony is sufficient to establish a fact which is in itself incredible, and that this previous incredibility can only be ascertained by an extensive and accurate knowledge of the functions and properties of the living body, both mental and corporeal, in all its modifications and under all circumstances, and by a correct and careful generalization of the knowledge thus obtained. These considerations, as well as others which will present themselves to the mind of the reader, may be deemed a sufficient reason for our attempting no more than to offer a few general remarks on the state of medical science during the period at which we are now arrived. We shall therefore devote this chapter to some cursory remarks on the practice of medicine as it now exists in the different countries of Europe, as well as on the state of some of the collateral or auxiliary departments, and shall conclude by some suggestions for the best means for promoting its future progress.

The prevailing and predominant feeling of the most enlightened and the most judicious of the British practitioners during the period referred to, has been to place little value upon theory, and to devote their minds almost exclusively to the observation and collection of facts. There can be no doubt that this is a less injurious extreme than the opposite; but if the statement which has been made above be correct, it will probably be admitted that this system may be carried too far. And the same exclusiveness has also induced them to pay too little attention to some of the collateral departments of science. In pathology and in pharmaceutical chemistry they have been far outstripped by the French, and in physiology by the Germans. But at the same time that we feel it necessary to pass this judgment on our countrymen, we most fully admit that the spirit of rational empiricism, to which we have referred above as the characteristic feature of the Cullenean school, has produced a most beneficial influence on the general state of medical practice. If it has, on some occasions, produced fluctuation of opinion, and in others indecision or inertness, it has tended to sweep away much error, and to purify the science from many of the antiquated doctrines and practices that still maintain their ground among our continental brethren. This is more especially the case with our pharmacopœias, where, if we compare those of London and Paris, we shall be struck with the number of what we conceive to be useless articles that are still retained in the latter, sanctioned by the authority of the scientific and enlightened body of men who compose the medical faculty of the French metropolis. We are, however, indebted to France for the most important improvements which have taken place in pharmaceutical chemistry: by their method of obtaining the proximate principles of various vegetable substances, and the greater precision which they have introduced into the formation of the metallic preparations, they have conferred a great and lasting benefit on the art, which, among all the revolutions of opinions and practices, can never be contravailed.*

But the glory of French medical science is its pathology. We are justly proud of our Hunters, our Monros, and our Baillie; and there are certain individuals among our contemporaries who are emulously treading in their footsteps. But any feeling of

* We have a very learned review of the state of medicine during the earlier part of the present century from the pen of the celebrated Sprengel. It is peculiarly valuable, from the numerous references which it contains to the writers of Germany, and from the view that it presents of the opinions which prevail in that country. The German physiologists afford a singular admixture of profound investigation and fanciful mysticism.—Ed. Med. Journ. v. xii. p. 385 et seq.

national vanity which we might be disposed to indulge, must be effectually repressed when we look at the illustrious band of French pathologists, when we review the labours of Pinel, Andral, Breschet, Broussais, Corvisart, Cruveilhier, Dupuytren, Laennec, Bayle, Louis, Gendrin, Foville, Chaussier,* and others, who have directed their attention more exclusively to pathology; and when we add to these the names of those who are to be regarded more in the light of physiologists, Bichat, Vic-d'Azyr, Cuvier, Richerand, Majendie, Edwards, Dumas, Legallois, Adelon, Demoulins, Serres, Blainville, Flourens, St. Hilaire, Dutrochet, and others, we must admit that France exhibits an unrivalled assemblage of medical philosophers. From the united labours of such eminent men it is impossible not to anticipate the most important results; but we believe that we are justified in asserting that, so far as the practice of medicine is concerned, the benefit is still rather in anticipation than in existence. With certain exceptions, but these no doubt very important ones, we should characterize the French practice as decidedly less effective than that of our country; dependence is placed on remedies which we conceive to be inert, and much of the dietetic regimen which enters so largely into the treatment can produce no effect in the removal of disease. In short, their "médecine expectante," although it may be a less dangerous weapon in the hands of ignorance or presumption, is, in the same proportion, less powerful and beneficial when under the direction of skill and judgment.

If France is pre-eminent for its pathology, Germany is no less so for its physiology and its anatomy. The names of Camper, Blumenbach, Ludwig, Soëmmering, Meckel, Wrisberg, Reil, Tiedemann, Wenzel, Sprengel, Jacobsen, Carus, Pfaff, Oken, Osiander, Ackermann, Rosenmüller, Gmelin, Walter, and Treviranus, may be selected from many others as among the most celebrated throughout Europe, and as having made most important additions to our knowledge on the subjects to which they have particularly directed their attention. Yet in Germany as in France, the effect of this scientific cooperation on the practice of medicine is not yet fully experienced. The treatment of disease is perhaps not more effective than in France, while it is still more encumbered with complicated formulæ and with antiquated practices, which in this country have been discarded because they have been found useless or even injurious.† Italy, which so long took the lead in all scientific pursuits, now offers the prospect of a splendid ruin, where we occasionally meet with an illustrious name, such for example as those of Scarpa, Caldani, Mascagni, Rolando, Bellingeri, and Tommasini, but where medical science, if it has not retrograded, has at least remained stationary. The practice of medicine has, however, had some zealous cultivators; we have already remarked on the activity with which the Brunonian controversy was pursued, and the excitement which was then produced seems to have had a beneficial effect in rousing the dormant energy of the mind, of which some traces are still visible.

A circumstance which has materially contributed to the improvement of the knowledge of practical medicine is the publication of periodical works, whether in the form of journals or of the transactions of societies. They have brought before the public the daily occurrences and passing events in a commodious and interesting form, and thus by exciting attention to them have tended both to diffuse and to increase our knowledge on these subjects. It is, however, very much to be regretted that so valuable a mode of communication should, in too many instances, be used as the medium of personal animosity, and that what ought to be employed for the promotion of the welfare of mankind should become a vehicle of the basest and the most malignant passions. On this point, as well as on the one referred to above, justice compels us to state that the French metropolis offers us an example by which we might profit, in the number, extent, and general character of its medical periodicals, and the same sentiment leads us to remark that the medical periodicals of London are decidedly excelled by those of Edinburgh and Dublin. Among the published transactions of medical societies, the Medico-Chirurgical may fairly be selected for our approbation; these, in the short space of

* We may refer our readers for an interesting account of the progress of pathology since the commencement of the present century, to a series of papers in the Archives Générales de Médecine, by *M. Dezeimeris*, t. xxix. et seq.

† In speaking of the practical writers of Germany, it would be unjust to omit the name of Frank, and not to acknowledge the obligation which he has conferred upon medical science. Among the pathologists, Hartmann of Vienna and Conradi of Gottingen are perhaps the best known in this country.

about twenty-four years, have amounted to eighteen volumes, and have acquired a character which is too well established to require recommendation or sanction.

In connexion with their transactions we may mention the effect of the societies themselves, which, when they are confined to subjectsof medical science, must be highly beneficial. Perhaps no single institution has contributed more to the improvement of our profession than the Edinburgh Medical Society, which for so long a period has maintained a reputation that reflects the greatest credit, not merely on its members, but even on the university to which it is attached. It is, indeed, a remarkable and an honourable circumstance that an association, principally composed of students and entirely conducted by them, should have proceeded for above half a century in so uniform a course of respectability; that during this period they should have admitted of free discussion without deviating into licentiousness, and that amidst the fluctuations to which such an association must necessarily be subject, successors have at all times been found able to direct its progress and qualified to support its reputation.

Another circumstance to which we must briefly advert, which is both the cause and the consequence of the progress of our art, is the improved state of medical schools of all descriptions, both those attached to universities or to public hospitals, and those conducted by private individuals. By a very singular anomaly it has happened that in this country the highest medical honours have been hitherto conferred by those bodies who did not profess to give the requisite means for their attainment. This circumstance may, indeed, in one point of view be regarded as paying the highest compliment to the English universities; but we believe that a very general sentiment now prevails among their most respectable members that this anomaly ought no longer to be suffered to exist, and that medical honours ought to be bestowed upon those, and those only, who have gone through what may be considered a sufficient course of preparatory studies, and who are able to give satisfactory proof that they have taken the due advantage of the means of improvement presented to them. But whatever may have been wanting in the English universities has been long supplied by that of Edinburgh, and, at a later period, by those of Glasgow and Dublin. The great London hospitals and some of the private schools, especially those of anatomy, have for a number of years possessed teachers of the highest talents and most admirably qualified for their office; but our metropolis could not be said to hold out the means of a complete medical education previous to the establishment of the London University and the King's College. These rival schools, rivals as we trust they will always be only in the talents of their professors and the excellence of their arrangements, have each of them laid down an academical course of medical instruction which appears to be complete in all its parts, and which must have the most salutary influence on the character and qualifications of the future members of the profession.

The perusal of the foregoing pages will, we trust, enable our readers to form a tolerably accurate conception of the progress of practical medicine, of the obstacles which it has had to encounter, of the degree in which it has overcome these obstacles, and of its present state of improvement. This we are not disposed to underrate; but at the same time we must acknowledge, that when we reflect upon the immense mass which has been written on the subject, the result seems scarcely adequate to the labour that has been bestowed. We may, therefore, be pardoned if we offer a very few remarks on the means by which, as it appears to us, the object in view might be more effectually attained.

This, we think, should be attempted precisely upon the same plan as in other departments of science:—in the first place, by a more careful exposition of facts; and, secondly, by a more careful generalization of them. In medicine there are various circumstances which render it less easy to ascertain the facts than in most other cases. These depend partly on the nature of the subject, and partly on the situation and character of the observer. It was the shrewd remark of a learned professor that in medicine there are more false facts than false opinions. On all topics, either historical, scientific, or literary, mankind possess a strong avidity for the marvellous. From the constitution of the human mind, the love of novelty is one great principle by which the attention is excited and the intellectual powers are called into action. Hence, in a rude state of society, nearly the whole art of medicine consists in the dexterous employment of this agent, and hence it is still found the most effectual method of attracting the notice of the multitude, who are incapable of close reasoning or calm investigation.

Perhaps one of the most easy and at the same time the most effective means of counteracting this mischievous influence, would be never to receive the evidence for any medical facts upon the authority of a single individual. They should, if possible, emanate from associated bodies, either from public hospitals, medical schools, or societies, the officers of which may afford their united testimony to the alleged facts. Another point which appears to us of vital importance, and which bears essentially upon every department of medicine, is that nothing should be received without the name of the author. The custom of anonymous writing, which has of late increased to so great an extent, has produced the most unhappy effects, both on the state of medical science and on the character of its professors; it has given rise to a degraded and depraved taste, no less at variance with honour and honesty than with the spirit of scientific research. We will venture to assert that no man ought to publish any statement or any opinion to which he would scruple to attach his name. It may occasionally happen that an individual of a timid or a modest disposition may, by this restriction, be deterred from detecting an error or controverting a train of false reasoning, but the loss which might by this means be incurred would be amply repaid by the greater authenticity and the greater correctness of our medical publications.

With respect to the second suggestion, the more accurate generalization of facts, when the facts themselves are fully substantiated,—this must be accomplished by the due exercise of judgment and sagacity, and can scarcely be directed by any general rules. We may remark, however, that one obvious mode of attaining this end is to arrange our insulated facts as much as possible in the form of statistical tables, by which we may readily observe their connexion with or relation to each other, and may thus be prevented from forming a hasty or unauthorized conclusion, derived merely from single cases or individual observations.

Another important means of obtaining the object in view is to preserve great precision in the use of technical and scientific terms. How many controversies have occupied the mind for ages, and have filled almost innumerable volumes, which have essentially turned upon the definition of a word? How frequently have remedies been prescribed, not for the symptoms, but for the name of a disease? How frequently has an article of the materia medica been employed, not from an experience of its actual effects, but from some nominal property assigned to it by an imperfect analogy or imaginary quality? The means that have been proposed to check these aberrations, to rectify the above-mentioned errors, and to reduce medical science to its appropriate and correct limits, are indeed few and simple, and not of difficult application. But there is one essential requisite, without which they can be of no avail,—a mind disposed to the reception of truth, determined to follow it wherever it may lead the inquirer, united to a high sense of moral obligation, which may induce the medical practitioner to bear in mind that his profession is a deposit placed in his hands for the benefit of mankind, and that he incurs an awful degree of moral responsibility who abuses this sacred trust, or diverts it to a base or selfish purpose.

(J. Bostock.)