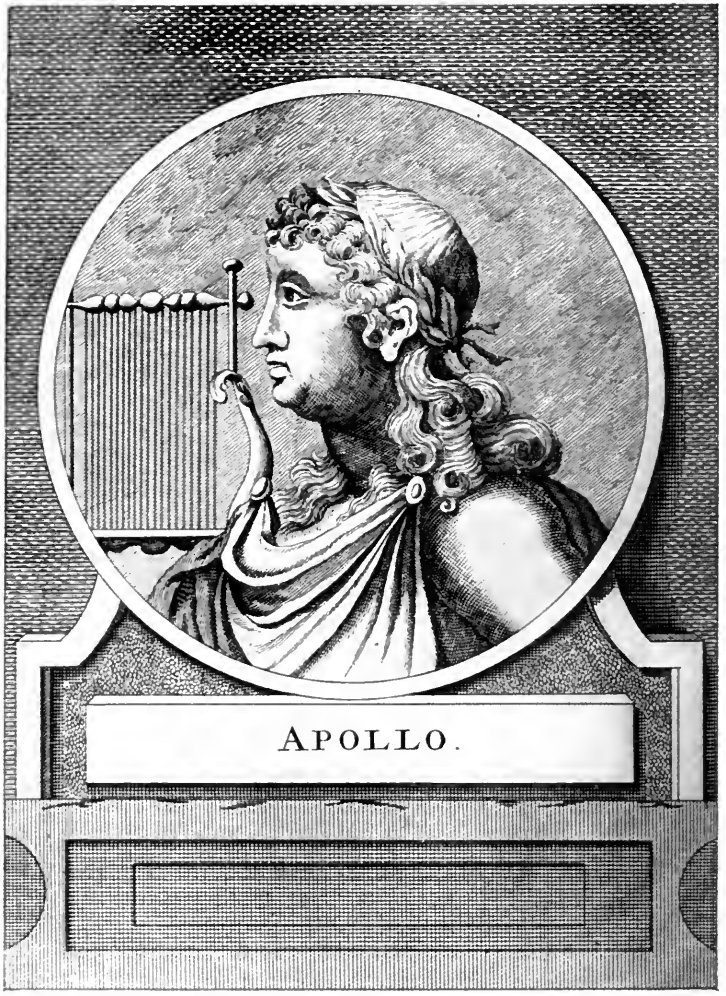
Harry W Forbes

Digitized by the Internet Archive
in 2007 with funding from
Microsoft Corporation

http://www.archive.org/details/historyofmedicin01gortiala



The God of Medicine.

From Le Clerc's *Histoire de la Médecine*.

The History of Medicine

Philosophical and Critical, from Its Origin to the Twentieth Century

By

David Allyn Gorton, M.D.

La philosophie est la mère de la médecine
Kurt Sprengel

In Two Volumes
Volume One

G. P. Putnam's Sons
New York and London
The Knickerbocker Press
1910

Copyright, 1910
by
DAVID ALLYN GORTON

The Knickerbocker Press, New York

To

THE PROFESSION OF MEDICINE
OF THE CIVILIZED WORLD

IN RECOGNITION OF HIS PERSONAL INDEBTEDNESS

THESE VOLUMES ARE DEDICATED WITH

GRATEFUL APPRECIATION

BY THE AUTHOR

40
G6
V.1
191

PREFACE

THE author has endeavored to give in this work a comprehensive view of the evolution of the art and science of Medicine from its origin, to set forth its Institutes, or the principles upon which it is founded, and at the same time to make mention of men who have more largely contributed to their development. To this end he has indulged in discussions of, and dissertations upon, medical theories and hypotheses, and criticised rather freely, but without malice or prejudice, medical sects and their votaries. While the critic may take exception to this latter feature of the work as being inconsistent with an impartial narrative of the progress of medical events, the author believes that the course he has pursued, while not impairing the judicial accuracy of the narrative, was indispensably necessary to a lucid illumination of his theme. He has written in the interest of the rising generation of medical students as well as the medical profession generally.

The author has spared no pains to be accurate. The facts of which he has availed himself are accessible for the most part to all students of history: the conclusions are his own; and if they differ from those of writers or thinkers on the

25472

same theme, we trust that the reader may attribute it to a difference of point of view.

The history of Medicine is largely the history of science and philosophy. It is not a narrative of events simply, but more a tracing of the evolution of the various branches of the sciences, the ensemble of which comprises Medicine. In this connection he has given brief sketches of physicians and surgeons who have been the most conspicuous in advancing that art and science.

The author trusts that the followers of medical schisms, sects, and cults may not feel aggrieved for any criticism in which he has indulged. He has treated them as amiably as was possible for one to do who possesses strong convictions of truth and duty and recognizes the claims of both upon his conscience. Neither friends nor foes can be considered when truth is in the balance. To paraphrase Aristotle's epigram concerning Plato, he can say: "Amicus Christus, sed magis amica veritas."

The author makes his grateful acknowledgment to all who have kindly offered him suggestions and made criticisms, sent him books, documents, excerpts, monographs, and illustrations, containing information in respect of subjects which otherwise might have escaped his notice. To the learned, painstaking, and scrupulously accurate "Pronouncing and Biographical Dictionary" of the late Dr. Joseph Thomas, of Philadelphia, published by the Messrs. Lippincott Company of that city,

and to the publications of the New Sydenham Society, London, the author feels under special obligation. He desires to acknowledge also the valuable assistance that Miss Bertha Rehbein has rendered in proof-reading, and in the preparation of the excellent index that accompanies the work.

D. A. G.

New York, 1910.

CONTENTS

ILLUSTRATIONS

The History of Medicine

THE HISTORY OF MEDICINE

PROLOGUE

PART I

The Predicate of Medicine

THE history of Medicine is not a biography of men who have distinguished themselves in the science and art of curing disease and the discovery of its natural history; nor is it an account of diseases and their remedies. It is rather a study of the progress of the science and art of caring for living beings in health and disease, and of ideas fundamental to them, and only incidentally of men who distinguished themselves in their advancement.

Medicine is founded upon the nature and constitution of man, physically and psychically, in all his phases of existence, and must necessarily be related to all the sciences, with scarcely an exception; since man is a microcosm of the universe, and science and philosophy are exponents of his relation thereto. This is the foundation of Aristotle's epigrammatic phrase: "The philosopher should

end with medicine; the physician commence with philosophy."

Philosophy, says the distinguished Sprengel, is the mother of medicine, and the perfection of the one is inseparable from that of the other. In connection with the history of the sciences, we undertake to inquire what was known of them in each siècle; to ascertain the knowledge, the prevailing opinions, and the genius of the medical art. Physicians have, as a rule, taken their theories from the philosophers. If partisan demonstrations were waged in the schools here, they were faithfully followed in the schools there, seeking by a show of great words and learned phrases to give to their statements an evidence of truth that they did not have, and that they could never acquire. When the philosophers began to introduce a critical spirit into human knowledge, physicians were also the first not to admit any principle which was not the result of accurate observation.[1] Nothing could be more natural,

[1] "La philosophie est à certains égards la mère de la médecine, et le perfectionnement de l'une est inséparable de celui de l'autre. En combinant l'histoire de ces deux sciences nous apprenons à connaître quelles furent, dans chaque siècle, l'étendue des connaissances, les opinions dominantes, et le génie de l'art. Les Médecins, en effet, ont presque toujours emprunté leurs théories aux philosophes. Si la fureur des démonstrations régnait dans les écoles de ceux-ci, ceux-là suivaient fidèlement la même marche, et cherchaient, par un étalage de grands mots et d'expressions fastueuses, à donner à leurs preuves une évidence qu'elles n'avaient pas, et qu'elles ne pouvaient jamais acquérir. Dès que les philosophes commencèrent à intro-

Æsculapius.

From the marble statue in the Louvre.

therefore, than that physicians, in their search for data that were demonstrable, should often find themselves unwittingly in conflict with deductions predicated upon imaginary, revealed, or supernatural sources; the more so, since, as we have said, the philosophy of man both in health and disease, physiologically and pathologically, and in his twofold nature—conscious and sub-conscious,—allies him with both systems of thought, the Physical and the Psychical.

We have been led to believe, by years of earnest study of science and philosophy, that not only the corporeal nature and relations of man, which comprise the smaller part of his being, but also his psychological nature, which constitutes the greater part of it, should be studied in this twofold aspect, if we would acquire a full, complete, and accurate knowledge of his nature. In no other way can we comprehend his nature and affiliations. Of a truth, no man can understand God, the divine Supremacy, except by a knowledge of man. He who knows man physically only, knows him imperfectly, and of God nothing at all, and is not properly qualified to understand and minister to his development or to treat his maladies; for few maladies there are which in their causes and effects do not comprehend his whole being, both

---

duire un scepticisme critique dans toutes les connaissances humaines les médecins furent aussi les premiers à n' admettre aucun principe qui ne fût le résultat d'observations fidèles."—*Histoire de la médecine, depuis son origine jusqu'au dix-neuvième siècle, par Kurt Sprengel. Tome premier. Introduction, p. 5.*

physically and spiritually. The same observation is true in respect of the theologian, or religious teacher; he is not properly qualified—though he may be ordained and pronounced so to be by the schools—if he possess not a thorough knowledge of man's whole nature in health and disease, and is able to approach the subject inductively and to minister to him understandingly. He might lose some of his mystic, reverent, and impressive character, to his advantage, we think, by being thus qualified; but ultimately his influence would be greatly augmented for good among all classes. "The truth is so lovable," said Plutarch, "that it has only to be known to be embraced." It needs no mannerisms to increase its attractions, nor appeals to the unknown and Unknowable.

The ancient leaders of opinion sought to unite these two functions, the physician and teacher, for of a truth they are one and should be so regarded. The priest-physicians of the temples and Asclepiadæ among the ancient Greeks, and the Egyptians, too, who were their seniors, possessed a knowledge of medicine—crude, of course, but such as was possible at those times, and cared for the sick; and if they made use of charms, amulets, prayers, and magic to effect their purpose upon the ignorant and credulous, it does not become us to criticise them for such superstitious indulgences, for they had the superstitious to deal with. The tabernacles, synagogues, and temples among the ancient Jews were devoted to the same

excellent purpose; the priests were the reservoirs of such medical knowledge as was known, and administered to the infirm and sick. It is evident that the great lawgiver of the Jews, during his career of forty years among the Egyptians, acquired a knowledge of their system of government and jurisprudence, and of their method of treating diseases. To the Jews he brought this knowledge, and ultimately instituted the Egyptian form of government among them; and it must be confessed that, so far as hygiene was concerned, the laws and regulations of Moses could not be improved upon to-day as far as they go, except in a few minor particulars.

Except in the practice of the art and the science of Surgery, which has been perfected in modern times, it is a question if the Mosaic system of caring for the sick is not the better one. It was a salutary check on the greed of gain since it was not a business. Under the present system, the love of money has infected the professors of medicine, with the effect of making the profession more a business than a high call of duty and humanity, regulated by the rules of trade with its arts and tricks for spoils and profits, rather than the love of doing good and serving the unfortunate, in the hope of emoluments. Under the impetus for spoils, Medicine has been split up into a variety of specialisms, in the practice of which great fortunes are often won. It is true that greater skill and proficiency are acquired by the specialist

in his department, but it is at the expense of the family physician, and the dignity and standing of the profession. Under the old régime, caring for the unfortunate, ill, and afflicted was in the hands of the priest-physician, who was removed by his position from the need or desire of gain. His profession was, therefore, no source of profit to him, and he did not batten on the woes of mankind and have an interest in extending them.

Moreover, under the modern method of caring for the ills of humanity, an illogical distinction is made between moral and physical ills, when, as a matter of fact, for the most part, they are intimately associated. This leads to a great waste of money and energy. The temples and churches as now conducted are places of luxury and edification, built and maintained at great cost to the people. The moral and religious pabulum which is dispensed by their pastors and teachers does not fully meet the requirements, as centuries of experience have shown, and it is not worth what it costs. It is well, of course, to keep before the people the fine precepts of Jesus and the laws of Moses; but every intelligent person knows that there are a thousand laws of God written on the tablet of every sensitive heart besides those of the Decalogue. One can keep every command in the Decalogue and yet be the greatest sinner in Christendom.

The institutions of old, the temples and Asclepiadæ of ancient Greece and Egypt, were conse-

crated—not to God, who had no need of them, but to the people: a larger polity would consecrate the churches of Christendom to humanity, and especially to the sick-poor, the weak and infirm, more especially to those who suffer disease, deformity, and death in service of the state and the industries of society. They could still remain places where pulpit oratory, essay dissertations, and music could be heard and enjoyed; but their function should be enlarged so as to embrace not only ministering to the sick, the oppressed, and afflicted, not with empty sympathy, the spoken word, the consolations of religion, prayers, laying-on-of-hands, but more by counsel and substantial helpfulness; also by instruction in the conditions of sanity of body and mind, to the end of prevention of disease and other ills due to ignorance and folly.

Far be it from us to discredit the value of the kind word fitly spoken, the open hand, and the encouraging smile of hope and cheer to the sick, the suffering, and despairing; or the helpfulness of religious exercises and prayer: not that they possess remedial virtues; but rather that they *furnish conditions for self-helpfulness*, the all-healing powers within us—leading the sanative and curative forces of the organism away from the trammel of depressing emotions, and diverting them into proper and higher channels of activity, channels more conducive to convalescence. All know how beneficent the effect of this procedure

is upon the sick or care-worn, and especially upon the needlessly helpless and depressed; but it would not be justified by the fact of convalescence in any of these numerous cases to conclude that a miracle had been wrought, or that any supernatural or supernormal agency had been interposed. The agent of cure was within, in the physis (φυσις) of Hippocrates. The conditions and directions of its activity were supplied; Nature did the rest. Nature in man, be it observed, has a great store of reserve forces posited in the cerebro-spinal and sympathetic systems, held in reserve, like the prudent general or superintendent that she is, on which to draw in emergency cases, as is so often shown in instances of so-called miraculous recoveries from apparent imminent death.

Primitive man, as will be seen in the following chapter, attributed all instinctive acts, and even the thoughts that came into consciousness, to God, or the gods. Hence the origin of the healing art was traced to them. When an animal was observed exercising the instinct of forethought or prevision, it was the inspiration of the gods. To them all intelligence below reason was of God or the gods. Hence they attributed the origin of Medicine to them, because all primitive creatures possessed the attribute of correcting or healing their wounds and maladies. Such powers were associated with the "All-Heal." Hippocrates called that principle physis (φυσις); and he also

used another term to express the same idea, namely dynamis (δυναμις). Galen recognized the subsistence of a like principle in Nature, and termed it pneuma (πνεῦμα) or the breath of life, and the curative agency, vis medicatrix naturæ. We conceive that Aristotle did not mean to ignore or exclude this principle from Nature, but to superpose on it another and higher principle, viz: conscious Mind or Soul, in the term psyché (ψυχή). Since these principles are fundamental to medicine, and are so regarded by all the masters of thought who have given their lives to that art, it seems to be worth one's while to inquire more deeply into the subject and to ascertain what the true scientific conception of those principles is, and what is the true meaning of the term God with which so many people profess to be so familiar.

A distinguished ancient poet asked: "Who by searching can find out God?" Many have risen to answer that question since the Psalmist's days, but without throwing much light upon the mystery until the advent and development of knowledge founded upon scientific studies and observation. Down to this period it was the substitution of one term for another to express the same thing, namely, a Supremacy outside ourselves, by which all things move and have their being. The appeal was always to consciousness, the testimony of which was but its own echo. Not until man began to study himself objectively—that is, to acquire pure knowledge, to trace his origin through count-

less ages, from germinal matter to complex organisms, could he begin to make any valid, substantial progress in the solution of this riddle of the universe, as Haeckel calls it, and fathoming its moving Principle.

Let us, for the sake of greater clearness on a point of vital importance in mental science and the healing art, further illustrate the subject:

In the pastime of horse-racing the question has been asked, Which wins the race, the driver's whip or the horse? It is clear that the driver furnishes the condition without which the horse wou d probably fail in the race; that the whip is of consequence, therefore, in bringing out the reserve energy of the horse. It possesses no force nor virtue in itself. The same is true with all curative measures or agents; for example: the surgeon sets the broken bone and applies the splint, but Nature knits the bone and heals the wound. There is no curative agency in the splints and bandages; they possess no inherent virtue; they supply the conditions of recovery; Nature does the rest.

Again, the husbandman prepares the soil and sows the seed, but sunshine and showers are needed for the sprouting of the seed and the fruitfulness thereof. The husbandman and the kindly influences of the atmosphere supply the condition of germination; they have no part in germination itself; that is due to the activity of *physis in the seed*. Should the normal conditions of germina-

tion be withheld, or be imperfect, the fruit will be diseased, imperfect, or fail altogether. Artificial aids may help somewhat: removing weeds, adding moisture, stirring the soil, the kindly hand, protection against ill winds, frosts, and the ravages of insects; all of these improve the environment, but they can do nothing other than that. The vital forces within the seed or organism, the *physis*, must win the race, grow the fruit, and save the soul, whichever it may be, if it be won, grown, or saved at all. The ancients were, therefore, not so far away from the truth in ascribing the origin of cures to the gods.

Saint Paul appears to have comprehended this matter, for he declared: "I have planted, Apollos watered; but God [*physis*] gave the increase." "So then," he continues, "neither is he that planteth anything, neither he that watereth, but God that giveth the increase."[1] This truth is fundamental to the medical art, and cannot be too strongly insisted upon.

Again, we are aware that it is a thankless task to undertake to define the limit or sphere of God in the world's affairs and that of his chief agent, man: to indicate the sphere of the unconscious Force, and that of the conscious Force—the human Mind. Yet every rational mind must admit that man is intrusted with a great work by his Creator, a work peculiarly his own, which can be done by no other agency, not even by God himself.

[1] I Cor. iii., 3–6.

It is one of the demonstrations of mental physiology that consciousness is located in the cortex of the cerebrum of all animals. Should this be destroyed, the animal may still live, but he is not conscious of the fact. He will eat food when it is put into his mouth, but he will not seek food, nor recognize it when placed before him. The seat of the subconscious or unconscious, on the other hand, is believed to be in the lower brain and the grand sympathetic nervous system.

Modern students of brain and mind are forced to this conclusion by unmistakable evidence. William B. Carpenter, in his excellent work on "Mental Physiology" (1874), gives his adhesion to it. M. Despine, in his great work, "Psychologie Naturelle" (1868), commits himself to it without reserve: "Les sensations physiques de plaisir et de douleur qui accompagnent les impressions de l'âme pendent les manifestations des sentiments et des passions, devaient donc avoir pour siège primitif un organ nerveux autre que le cerveau: c'est principalement aux nerfs du grand sympathetique qu' appartient cette fonction; et, comme tous les phénomènes auxquels préside ce système sont indépendants de la volonté, les phénomènes de l'emotion le sont aussi."[1]

In truth, the grand sympathetique system is the medium, the connecting link between the conscious life of the individual and his unconscious

[1] *Tome premier*, p. 439.

life; in other words, between the physical and the psychical.

This is one of the most important demonstrations that has been made in psychology through vivisection. Consciousness is the function of the cerebral cortex without which its possessor could not think or carry on processes of thought. Herein man is supreme over all nature. Outside of this supremacy he has no responsibility; within it he has all; and the sooner he recognizes this responsibility and acts upon it, the better it will be for humanity. Everything within the domain of reason, all the affairs of human life, industrial science and art, civic and religious constitutions, removing the disharmony of the social state, and establishing justice and righteousness in the earth, come within his sphere of responsibility exclusively. God has nothing to do with it.

On the other hand, the sphere of God, the great unconscious Force, is the vast domain of universal nature. In all his operations He is Inerrant, Divine, and Beneficent; He does not reason; He has not the function of thinking; He has no need of mental cogitation, because the law of his activities is from necessity, unerring, without beginning and without end. He is without personality. It is idolatry to paint, mould, carve, or conceive Him as possessing form and substance.

Matthew Arnold found great difficulty in treat-

ing of God as a Personality.[1] He used such phrases in defining God as the "Stream of tendency that makes for Righteousness"; the "Deus ex Machina"; the "Immanent God," etc.; and Dr. Paul Carus, a thinker of no mean order, and one of our best Sanscrit scholars, in his interesting volume on "The Nature of God," defines that Supremacy as "Super-Personal." God is certainly super-personal, as He is super-everything. We object, however, to the term *Personal* in such a connection as inconceivable. Whatever view one takes of the divine Supremacy, He is infinite in scope and power, without breadth and extension, proportion and substance, which, as a personality cannot be conceived.

At the risk of repetition, and for the sake of emphasis and of greater clearness, we feel justified in further elucidating, or trying to elucidate, the mystery of this subject. Primeval man, as has been observed, very generally referred the origin of medicine to the gods, an intelligence outside themselves which effected the cure of their wounds and diseases. With the growth of intelligence they perceived that the powers of therapeia subsisted within themselves. But even then it was God that worked in them and through them in effecting the desired results. The great Apostle Paul declared that man lived in God. *In Deo vivimus, movemur et sumus*, he said,—a conception which does not differ materially from

[1] See *Literature and Dogma.*

that entertained by men of science to-day. It only needs transposition.

All must concede the *nature* of God to be inscrutable, as inscrutable as that of matter. It is yet to be discovered that man has any faculties that enable him to probe the nature of either Matter or Mind. All that the ancients attempted was to clothe their conception of a divine Supremacy in terms such as Pan, Jehovah, Psyché, Physis, etc. The most that has been done, or that probably ever will be done, is to discover the laws and the relations that each sustains to the other. And as to God, the supreme Mind, one may without presumption try to show—not his nature, but his relation to *the universe of things*, and to point out the sphere of his supremacy in contradistinction to that of man. It would be idle to seek the origin of God, the divine Supremacy, because He never had a beginning. Man's power to do, to think, to feel, to plan, to purpose, to invent, and execute is superposed upon him by the functions of his organization; by the brain, the dome of thought, by virtue of his cerebral grey substance, the seat of his thinking attributes, and the functions of the grand sympathetic system, as has been observed. These powers are evolved from the great Fount of substance and purpose, of which man was and is and always will be a potential part, a unit of the measureless whole. Is he subordinate? Yes, as the molecule is subordinate to the planet—as a drop of the

Atlantic is subordinate to the volume of that ocean. Our study of man in his progress through the æons of the ages, from germ matter to his present august proportion, has served to exalt our conceptions of him, his dignity and character, and to broaden our knowledge of the great Inerrant One, his author, whom we reverently call God.

The scientific conception of God, then, comprehends all the activities of nature that are innate and spontaneous; that work without the aid of reason or conscious intellection. Herein lies the distinction, we repeat, between the forces ascribed to God, and those ascribed to man. The former are unconscious; the latter are conscious. One is unconscious Intelligence; the other is conscious Intelligence. One possesses reason to guide his activities; the other has no need of reason, or of such guidance, for He *comprehends every form of intelligence without consciousness.* This paradox it is well that we should understand. Let us try to illustrate: Man builds a house, the ant a nest. The former makes use of conscious mind, conscious intellection; the latter makes use of unconscious mind, instinct. The powers of one are rational; the powers of the other are instinctive as well as rational. One works by taking thought; the other by pure feeling. Each form of activity exhibits intelligence, but of a totally different order. Man *thinks* out his plan of procedure; God hath no need of thinking out his plan since *He knows without the necessity of thinking.*

Again, man builds a monument of stone; the coral builds a reef of itself. The latter is built by unconscious forces, being the accretion of myriads of corals under the direction of a blind, purposeful instinct, the great unconscious Force of the world, one of its lowest manifestations. Purpose is immanent in this formation, but the coral has no knowledge of it.

We look upon all the phenomena of Nature, such as the procession of the seasons, growth and decay, the development, maturation, and decline of vegetable and animal life as being under the dominance of the unconscious Mind of the world. Reason may make mistakes, calculations may err, knowledge may be at fault or fail of fulness and perfection, but the Unconscious never errs. It makes no mistakes. It is always at the helm of things; it is never weary; it never sleeps; it needs no day of rest. It is the correlative of what the Theosophists call God; the Hebrew, Jehovah; the ancient Egyptian, Pan; the Parsee, Mahat; the Chinese, Fo Hi; the Greek, Zeus. By whatever name we call this Principle, it is the supreme Intelligence, the great unconscious creating Force of the world.

It is the Unconscient that carries on the processes of digestion and nutrition. Would any one dare to say it is not intelligent? It is the Unconscient that heals our wounds, cures our diseases, guides the effects of medicines, and promotes conservation and repair of our bodies—all uncon-

sciously. Who could have the temerity to say that the genius of such processes is not intelligent, or that the processes themselves do not show the subsistence of the divinest intelligence? But we cannot ascribe to it a function of reason or conscious thought. The latter is, we repeat, exclusively man's possession and prerogative.

The coral builds its reefs without knowing it; the mollusk its shell oblivious of the shell; the bee constructs the honeycomb without foreknowledge of the end to which it works or serves, nor conscious of the mathematical genius it employs.[1]

Let us not confound intelligence with reason and thought. We repeat, that these powers are the at-

[1] See Maeterlinck's beautiful work, *The Life of the Bee.* According to Maeterlinck, the bee stands next to man in the scale of intelligence; the weight of its brain is as 1 to 174; the ant's brain in proportion to its body is as 1 to 296. The weight of the average man's brain is as 1 to 25 (about). Maeterlinck eloquently declares: "There is one masterpiece, the hexagonal cell, that touches absolute perfection, a perfection that all the geniuses of the world, were they to meet in conclave, could in no way enhance. No living creature, not even man, has achieved in the centre of his sphere, what the bee has achieved in her own; and were some one from another world to descend and ask of the earth the most perfect creation of the logic of life, we should needs have to offer the humble comb of honey." (Maeterlinck's *Life of the Bee*, p. 406.)

The phenomena of the bees is a typical illustration of Intelligence without knowledge, or consciousness of knowledge. Maeterlinck declares it to be "the spirit of the hive" that dominates its operations; the phrase "custom of the hive" would be equally expressive of the idea. Von Hartmann called it a manifestation of the great unconscient Force of the world. *Vide Philosophy of the Unconscious*, vol. ii.

tributes in their perfection of man. They have their source in the cerebrum, the dome of thought, the highest bud and blossom of the organic kingdom. They constitute the highest grade of mind of which we know, namely, conscious mind, which a few of the higher vertebrates possess in some degree in common with man. They are distinctively human attributes, and constitute man the lord and sovereign of the planet, in the sociological sphere.

We use the phrase, "Unconscious Mind," therefore, as synonymous with the theosophical word "God," to set forth and explain that unconscious stream of tendency which animates all things, from the molecule to the planet, and from the planet to the universe. And we maintain with a courage of profound conviction that the God whom so many ignorantly worship is this unconscious mental Force; that He is accordingly without intellection and reason, form or substance; that He is Impersonal.

When the author of these pages, therefore, uses the term divine objectively, he does not necessarily refer to the supreme Intelligence of the Kosmos, but to an excellence and a supremacy above that of the average man, such, for example, as the divine Nazarene, the divine Plato, the divine Plutarch, etc.

The *Art of Medicine* was originally regarded as of divine origin because it was the inspiration and expression of a curative and healing instinct of Nature, independent of reason. In the human,

it showed itself in the expression of a humane impulse, the exhibition of love and tenderness; the desire to relieve ills and sufferings; and he who aspired to do these things without thought of self or hope of reward was looked upon as divine. He was an expression of the divine principle of healing in Nature.

The *Science of Medicine* is, on the other hand, of human creation, the natural offspring of philosophy, or love of wisdom, founded upon experience and observation. Accordingly, we must look to ancient Egypt, the first nursery of science, for its beginning, since the first semblance of medicine and philosophy began there and was cultivated there.

The development of ancient Egypt antedates that of ancient Greece by many centuries. Chiron, the son of Saturn, is reputed to have taken the art of medicine from Egypt into Greece; but all know how impossible a fact that was. Art is not luggage, subject to transportation; nor is science—both are rather a growth, an evolution of knowledge. But little is known of that celebrated personage, Chiron. He is supposed to have been a prince of Thessaly, and, like others of his position, to have been more or less proficient in the art of medicine, especially in the treatment of wounds.

Chiron, however, is somewhat of a myth. He was said to be the son of Saturn and Philyra, and to have been born about the time of Hermes

Hygeia
Goddess of Health

and Abraham. He is pictured in Greek mythology as half man and half horse, and called Centaur. The upper half of his figure—including the chest, head, and arms—is man; the lower half being the body and legs of a horse. And a legend goes, among other legends, that Chiron took this form to symbolize that he was a physician of horses as well as of human beings.[1]

The Egyptian character, however, being set against innovations, precludes the idea of enterprise and progress. Her fossilized condition was well represented in her priestly institutions, pyramids, and mummies, and her rigid adherence to her sacred writings,—not unlike the Hebrews, Christians, and other religious sects of to-day.

The physician, usually the priest, was paid a salary by the State which, while it removed him from the incentives of cupidity, removed him also from the necessity of study and discovery, which is indispensable to activity and enterprise in any department of human endeavor. The learned Le Clerc, in his "Histoire de la Médecine," has pointed out the high position that the ancient physicians occupied among the Egyptians in public regard, and refers especially to an essay on the "History of Medicine" by the celebrated Juris-Consulte Tiraquean, who asks the question, "Si l' Art de la Médecine déroge à la Noblesse?" And he answers the question in the negative, showing that "persons of conditions the most

[1] Le Clerc's *Histoire de la Médecine.*

elevated have practised that art." "There have been," he says "a large number of physicians who have been numbered among the saints; several pontiffs, emperors, and kings have practised medicine; also queens and other women of quality, and even gods and goddesses. But more than all others, there have been philosophers and poets among the ancients who have professed the same art." And the author, Tiraquean, concludes his exhaustless essay by giving particulars of the standing of such persons as have been devoted to medicine, arranging the list in alphabetical order. Many of these distinguished persons have written brief essays on the art.[1]

The fact that man in his primitive state resorted to means and agencies of some sort for the relief of wounds, bruises, sprains, broken bones, etc., did not constitute him a physician. That was the function of the nurse. It is not unlikely that Adam knew enough for that; so do the ant, the bee, and other insects; the cat and dog and other animals; the savages of Borneo and Fiji; the aborigines of this continent, and other primitive tribes. But it would be a stretch of propriety to characterize such simple common-sense procedures as the art of medicine. Rather are they related to the art of nursing, which preceded the medical art, and was its initiative. To people of a very different sort, to ancient Greece, the land of life and light, of liberty, of heroism, of

[1] *Vide Histoire de la Médecine*, book 1, part 1.

creative art, industry, and literature, of lovers of truth and beauty, are we to look for the development of the art and science of Medicine as it is known to-day, even if we concede its origin to the Egyptians.

The subject may be divided conveniently into six epochs or periods, namely:

First: Period of Mythical Medicine.
Second: Period of Hippocratian Medicine.
Third: Period of Aristotle.
Fourth: Period of Mediæval Medicine.
Fifth: Period of the Renaissance.
Sixth: Period of the Twentieth Century.

PART II

The Legacy of Medicine to Civilization

Having set forth the predicate of the Art and Science of Medicine in the foregoing pages, it may not be without interest briefly to point out the part that the Sciences related to Medicine have played in promoting human progress, and the legacy that they have left to civilization.

The claims of Medicine to the gratitude of mankind have been recognized in words of appreciation by publicists the world over. Its professors and practitioners have been universally eulogized as types of moral heroism by no means second to those of saints and martyrs whom the world delights to honor. The altruistic life is noble;

moral heroism is grand; to die in defence of one's country, or for the cause of truth and righteousness, commands the reverent respect of the multitude. But surely the love of truth displayed by men of science and philosophy; the degree of self-denial and unselfish devotion to the service of mankind, without hope or thought of reward, that men of science exhibit, is second in grandeur to no class of heroic deeds in all history. There are Dalton, Cavendish, and Lavoisier, turning away from the world in their greater love of studies in chemistry; Harvey, withdrawing from the world and the allurements of society and giving up the honors, profits, and preferments of professional life that he might uncover the mystery of the circulation of the blood; Pinel and Esquirol, sacrificing ease and professional gain that they might ameliorate the condition of the insane; Bichat and Schwann, giving their days and nights in quest of the infinitely little, that man might approach the nearer to the infinitely Great; John Hunter, ignoring wife and children, his food and drink, and the claims of the goddess Hygeia upon him for rest and sleep, that he might advance the knowledge of anatomy and the art of surgery; Pasteur, forgetting all else, even his sweetheart and his wedding-day, in his ardor to prove that life can only beget life, and to give to mankind a true theory of toxic infection, and to lay the foundation of a science of morbific causation; Reed, risking his life and comfort, turning away from the love

of wife and children, the fascinations of affluence and of the éclat of a successful career of practice, that he might demonstrate to a skeptical world his belief in the non-contagiousness of yellow fever. These and an innumerable multitude have followed the examples of the masters in medicine in personal sacrifice to the cause of truth and duty from the beginning. Personal ease, health, comfort, or welfare has not entered into their calculation. Through their labors in medicine the plagues and epidemic diseases of the world have been well-nigh abolished from civilization; the infectious and contagious maladies largely shorn of their fatality; the virulence of all diseases modified; the horrors of war lessened. By the establishment of Boards of Health, Municipal, State, and National, initiated by the profession, to apply and enforce the discoveries in Preventive Medicine, the death-rate has been decreased and accordingly longevity increased. Through discoveries in the ætiology of malignant maladies, and the application of the law of isopathy, of like curing like, immune medication is an accomplished fact. But far more important than any of the foregoing gratuitous services that the profession has rendered the world, are discoveries in antisepsis and anæsthesia, which have banished the perils and terrors of the lying-in room and led to the marvellous advancement in the resources of the surgery of to-day.

The above are a few of the gratuitous contributions that the profession of medicine has made to

the human race to mollify its sufferings and to prolong its existence upon the earth. But this is on the physical and least important side of the subject. The other side of it comprises its contributions to the moral, intellectual, and philosophical advancement of the race; to the development of a science of mind and morals, of brain physiology and pathology, unveiling the source of thought and feeling, of the emotional and religious sentiments, the rationale of sin and of evil, and laying the foundation of a rational moral philosophy. These are benefactions which transcend in importance all others that medicine has conferred upon humanity.

The science of medicine is the most comprehensive of all the sciences because it comprehends them all, mathematics excepted. It has uncovered the fallacies of Ecclesiasticism and demonstrated the baselessness and futility of doctrinal Christianity. It has given us a foundation upon which to build a sound and enduring Theology, comprehending the relation of man to man and of God to all his creatures. It has unfolded the principles of a mental science; and is accordingly related to all the sciences of matter and of mind, the material and the spiritual, the physical and the psychical, the normal and the abnormal. This, then, is the incomparable legacy that the medical sciences have bequeathed to civilization.

The philosophic follower and professor of medicine has discovered clues to the Infinite which escaped the Oracularists, or such as depend upon

their intuitions for occult knowledge, and has been able to unfold in part the secret of the true relations of man to his Maker. This marks a stupendous advance in Theosophy, or the knowledge of the Infinite. Nowhere in his investigations and interrogations of Nature has the scientist found a principle of evil; nowhere any foundation for a belief in the existence of so monstrous a character as the Jehovah of the Jews, or his august antithesis, the Devil; nowhere any evidence of the "Fall of Man"; nowhere a Creator that required an atoning sacrifice in order to reconcile himself to his creatures. On the contrary, he has found everywhere evidence, not of a merciful Creator, for man does not need mercy, but of a divine Beneficence running through every kingdom of Nature, embracing every human haunted thing—

> "All things that live His goodness show,
> In heaven above and earth below."

Indeed, this Beneficence in Nature is the foundation of the physician's art. His success in curing the sick and the resolutions of surgical operations and procedures are predicated upon the divine law of *vis conservatrix naturæ*. Upon this law the physician and surgeon confidently rely, assured that it will never fail them, be the subject of a malady or a surgical operation a believer in God or an unbeliever in Him; a bad

man or a good man; a miserable reprobate or a religious devotee. God is no respecter of persons in the sick-chamber. There the wicked fare as well as the righteous; the poor as well as the rich. In the domain of the instinctive or unconscious world, the physicists have discovered no natural laws broken, but everywhere natural laws fulfilled; no mercy shown to the delinquent, so-called, but everywhere justice done; no penalties inflicted that are punitive, but only those which are remedial—that is, in the interest and for the well-being of the unhappy victim of ignorance, disease, and misfortune. The idea of mercy and forgiveness is a fiction of a paternal Governor and government; it is no part of the scheme of the Kosmos and the wisdom of the Creator. Mercy implies forgiveness of misdeeds, withholding the rod when it is deserved and indispensable, than which nothing could be worse for the erring. God's penalties for wrongdoing act automatically. They are not punitive, but sanative and salutary, and the soul that aspires for betterment could not afford to have them suspended or withheld for a moment.

It is to be regretted that Christians do not heed a deduction so logical, and obey Christ's injunctions to pray in secret, to forego public praying, to cease crying for mercy, and behave toward their Maker like self-respecting men and women, and not like craven sycophants. Let them confess their offences against good morals, of

course, but avoid begging for forgiveness of sins of which they are guilty, no doubt, and for which "punishment" should be administered. Let them give thanks for life and its felicities and cultivate a grateful spirit; let them beg that the chastening rod may be laid on and not withheld. Forgiveness of sins! They know not for what they ask. One such act on the part of the Creator would wreck the moral order of the world.

We repeat that on every hand physicists have found displayed Beneficence, Wisdom, Justice, and Goodness. Nowhere throughout the marvellous works of that creative Force called God have they found an exception.

We are not ignoring in this connection the apparent existence of evil, nor of that misnomer of the theologians, technically called sin. But we beg to maintain that evil is a misconception of the divine Economy. It should be clearly understood that, according to the demonstrations in anthropology and morphology, both being collateral sciences of medicine, man is in a state of evolution. He is on the way from savagery to the characteristically human plane, as typified in the divine Nazarene. During this progress he must needs pass through a variety of planes of development, each one of them having laws and customs (morals) peculiar to itself. In the order of moral progress, the idea of laws of nature being broken is a misconception. Man never breaks or violates a law of his being. He is never beyond the pale

of law. Disease has laws no less than health. Breaking a law of nature is just as impossible an act on man's part as it is for the molecule to disobey the laws of matter. It is the law *above his nature* that man fails to obey or conform to; the laws of other men, not those of his own; arbitrary rules of conduct to which his nature is foreign and rebellious, the disregard of which affords the basis of the conception of law broken, of evil and of sin—the latter term being a purely theological conception. That which is good law and moral on a lower plane of existence would naturally be bad law and unmoral on a higher plane, and so on through each succeeding plane of development. So long as an individual obeys the laws of his plane—and he has no wish or power to do otherwise—he is no sinner, nor even an offender. But when such an indvidual happens to be transplanted to, or projected on to, a higher plane of society, he is naturally in conflict with the laws and customs of that plane and becomes an offender, subject to such penalties as the social régime of that plane has prescribed for offences, whatever they may be.

In the police courts to-day one may find frequent illustrations of our contention. Civilization is permeated by types of men varying all the way from the lowest savage to the highest known type of the human species. It should be no surprise that the lower types do not conform to our laws and customs but insist upon acting in accordance

with their own. Some of them come from foreign countries; others are products of our own country, being the unfortunate victims of the disharmony of our own social conditions in the marital relations, such as faulty wedlock, selfish indulgence, and mal-environment, leading to freaks of heredity and causing a reversal of types, or atavism.

The medical sciences have accomplished a great work of far-reaching importance in the domain of abnormal moral causation, or morbid psychology, to which this subject is related. Further investigation is needed for the demonstration of the problems involved which lie within the province of the profession of medicine. The sins of Christendom are widespread, and the degenerate trend, wherever it exists, must be legitimate—that is to say, in accordance with the laws of morbid causation. The abnormal habits of one generation are aggravated in their effects upon the next. Such is the law of hereditary descent, from which there is no escape. The self-indulgent should reflect upon these things. It is worth his while to know that there is reason for the induction that the morphine habit, alcoholism, cocaine addiction, excessive indulgence in tobacco and other narcotics which disturb the healthy activities of the nervous system, are among the chief causes of moral degeneration. The baleful influences of these indulgences are especially felt upon the generative function, it is believed.

Let us not hold God responsible for these

"accidents" of the social state. God has nothing to do with them either in their production or cure. They belong to the sphere of human responsibility, to the science of Sociology, now in its infancy, so far as their generation or prevention is concerned, which it is incumbent upon man—society —to correct and control. We repeat that the responsibility is ours. Preaching Jesus Christ and him crucified is no sufficient remedy for these disharmonies of the social state. It has failed and must forever fail to remove them. We cannot but believe that the remedy prescribed by Christendom is a most mischievous soporific, and tends to increase rather than to correct existing mal-conditions. The situation calls for practice rather than precepts. Medical writers have again and again called the attention of moralists, jurists, and publicists to these truths, but in vain. Public opinion is slow to awake to the importance of a subject involving so radical a reorganization of existing beliefs and institutions.[1]

The study of the nature and constitution of man clearly shows the closest intimacy between him whom we call God and the being whom we know as man. The perfected man is a supreme being. We have invested God with his attributes. If there be a divine Supremacy—and no earnest student of medicine would presume to doubt it—

[1] See *Responsibility in Brain Disease*, by Henry Maudsley, M.D.; Benedict, on *Brains of Criminals;* Lombroso, on *The Female Offender;* Carpenter, on *Mental Physiology*, etc.

in the constitution of the world, he must be immanent, not only in man, his chiefest work. bad as he is, but in all things. There is no other place for him. He must also be impersonal, since the mind cannot conceive of an infinite Personality; and, for another reason, there is no other place for an infinite Supremacy in all the starry spaces. No, the inerrant, supreme Impersonality, on which all things depend, is immanent, not outside of things; and nothing ever did, nothing ever could, and nothing ever will separate Him from the creature, or the creature from Him. Each has a destiny absolutely and irrevocably inseparable. If this be not true, then our science of man's psychology is vain, and all the sciences of medicine upon which it rests are likewise vain, and our studies of the Kosmos are vain. Imperfect, erring, and ignorant as man is, barbarian as he is on his present plane, with the habits, customs, and morals of the barbarian, he is, nevertheless, his Creator's best work, and a creature of his divine Sponsor. We feel assured that his Maker has no just cause to be ashamed of him, when we consider whence he came and the difficulties that have beset his progress. Eternity is long; there is no hurry; the Creator can wait the complete evolution of his work, and so can man.

In our short sight, we are apt to underrate the greatness of God's work. The Psalmist ignorantly asks: "What is man, O God, that thou art mindful of him?" The evolution of man, even to the

plane of the anthropoidal ape, is a marvel beyond the conception of intellects the most trained. The trained anatomist contemplates the perfection of his mechanism with awe. Before a man he stands in the presence of a mystery which he is powerless to penetrate; and his wonder increases with each new type in the ascent from ape toward man, and culminates when the dome of the cerebral convolutions is reached, as in the highest type of organization, and the marvellous complexity of the mechanism of Reason is unfolded even to his unaided sight. But, when to that he brings the microscope to assist his vision, his wonder is magnified a thousand-fold beyond the least conception of the plodding man of affairs. His respect for man, even in the state of barbarism, before the thought of the well-being of his race has entered his head, or he has recognized his indebtedness to his fellows, and self—and self only—dominates his ambition, grows with each advance in the scientist's investigations. He feels like exclaiming, "How great is man, O God, and how great art thou, his Creator!" No one can have any adequate conception of God until he comprehends his chief work, man.

Our contention is, therefore, that science's chief and most valuable legacy to civilization is the discovery and establishment of a rational psychology of man and a rational theosophy of God. This is the work of the sciences of Medicine. The demonstration in this department of science and

philosophy revolutionizes, as has been intimated, all the moral cosmogonies of the ages, and lays the foundation for a system of ethics in the constitution of things, beyond cavil or conjecture, altogether removed from the hypotheses of imaginative system builders. It supersedes oracular philosophy, the "Thus saith the Lord" hypothesis, and substitutes truth as the sole arbiter in human relations. It turns down many of the myths, conceits, vagaries, and misconceptions of seers and prophets, and the vapid superstitions to which the human mind has been enslaved from the beginning. It long since relegated the Heaven of the Apocalypse to a place in the subconscious mind of its writer, with no objectivity, and abolished Hell with its horrors too dreadful for a sane mind to contemplate with complacency; relieved the Devil of a tangible existence and of inciting men to do evil, or to commit the "deviltries" to which underbred and distorted-minded men are by the laws of their nature addicted, and demonstrated that if he has a mundane existence at all it must be in human form and of the human type,—a sort of human tramp left over from savagery, or incidentally projected into a society in which he is out of place, and to whose laws and customs he finds it impossible to conform—or to obey.

Finally, it is a long step from a state of society in which most barbaric cruelties were inflicted upon men and women for offences against laws

and customs of which they could not see or feel the justice, and a state of society in which gross offences against the laws will be punished in a spirit of humanity and charity. Such is the distinction between the society of to-day and that of a few centuries since. But the mollifying change, such as it is, has been brought about by discoveries related to medical science by medical philosophers, especially by studies in morbid psychology.

If mankind are still floundering in the slough of ignorance and superstition, and suffering unnecessary ills of body and mind, it is through no fault of the medical sciences, nor the labors and discoveries of medical men. They have set beacons at every cross-road from barbarism to civilization, pointing the wayfarer the way to health and happiness, the truth, and the life. Surely, it is not their fault if they be not heeded.

Moses.

FIRST: THE MYTHICAL PERIOD

CHAPTER I

The Origin of Medicine

Part I.—From the Origin to Moses

M. LE CLERC, with extraordinary patience and erudition, has traced the origin of medicine to the gods and goddesses of every country and almost every race, without finding any people who possessed a monopoly of it. The conclusion at which he finally arrived was that "the first man was the first physician" (le premier homme a été le premier médecin), which in a certain sense must be true, of course, since instinct teaches all beings possessing sensibility the rudiments of caring for their wounds. This instinct is also possessed by plants.

Primitive peoples have very generally regarded medicine as coming from God, and the men who practised the art as divine. "The Pagans of all antiquity," says M. Le Clerc, in his learned "Histoire de la Médecine," "believed that the gods were the authors of medicine."[1] And the

[1] "Toute l'Antiquité Payenne a été dans la créance que les dieux étaient les auteurs de la médecine."

celebrated orator, Cicero, declared it to be an art "consecrated to the immortal gods." Galen declared a similar sentiment, namely, that the Greeks attributed the invention of the medical art to the sons of the gods, or to some one near to their parents who were instructed by the gods. Hippocrates held the same opinion. "Those who were the first to find the secret of curing maladies," said he, "have judged it to be an art meriting the distinction of having been instituted by God. Such is the common sentiment," he said. And among the Jews of antiquity, since to them all knowledge was derived direct from God, nothing was more natural than that the means of curing disease should have likewise come from Him.

It may not be uninteresting to pause here for a moment to inquire into the source of the reason for this widespread belief as to the divine origin of medicine, although a clue to it has been given in the prologue of this work. One may find in the erudite work of M. Le Clerc, whom I have already quoted, much light on the subject. As to the manner of discovering medicinal virtues of herbs, Le Clerc cites the fable of Glaucus, son of Minos, king of Crete. While at play, this young son of Minos fell into a barrel of honey and was suffocated. It so happened that a diviner, named Polyidus, discovered at a distance what had happened and came and found the boy. Minos, seeing from his dress the avocation of Polyidus, insisted upon his restoring to life his son. As the

diviner approached the place of the accident he saw a serpent and killed it. Presently another serpent approached, and seeing his dead companion, promptly retired and brought a certain herb, with the leaves of which he covered the body of the dead serpent, which soon revived. This circumstance suggested that the same herb should be tried on Glaucus, who had been suffocated in the honey. The experiment was successful with him likewise, to the great glory of Polyidus. The foreknowledge of the serpent in discovering the remedial virtues of the herb was imputed to God with the usual logic of the multitude.[1]

As to the discovery of the medicinal effects of hellebore, it was said to have been made by Mélampe and the daughters of Prætus. Mélampe was a shepherd, who, finding that his sheep were suffering from a diarrhœa, discovered that they had eaten of hellebore. His daughters, who had drank the milk of the sheep, were suddenly affected with delusions. They imagined that they were become cows of great beauty, etc. Mélampe was of the same country as Polyidus, and

[1] We must concede some justification in science for the custom of the ancients in regarding instinctive knowledge, such as the serpent exercised in selecting an herb by which to restore his companion to life, referred to in the text. Instinct, or the unconscious Mind of Nature, is surely closely related to the supreme unconscious Intelligence of the world. In this sense we are willing to admit that the use of remedial agencies prompted by instinct is from God.

the discovery of the specific effects of the herb, hellebore, was immediately imputed to the gods. Mélampe was of Argos, the son of Amithaon and Aglaide or Indomené, daughter of Ahas. He must have been more ancient than Homer. He was a shepherd, according to the custom of his country, but he was also known to Homer as a poet. By reason of his discovery of hellebore and its medicinal virtues the drug obtained the name of Melampodium, and so under that term it appears in the materia medica of Dioscorides.

All living beings—except man—whom God supposed would know enough to take care of himself, being endowed with reason—have been invested with, or have acquired in the course of their long experience, the instinct of self-preservation and some knowledge of treating their ailments, and of what to eat and when. Thus, horses eat earth and charcoal when affected with worms; dogs eat fat for constipation; and cats eat certain grasses for the same purpose. Both these animals apply saliva to their wounds; and the dog when wounded will take to running water, when possible. Certain of the lower species have the power to reproduce lost parts—the spider, for example, its legs. The female of the mammalia, below man, knows when her term is due and prepares for it. The physiologist attributes these powers and procedures to instinct; but instinct is an intelligence. Is God the direct author of them? Or are they the outcome of evolution—

of a long series of experience and the development of innate powers of intelligence—unconscious intelligence? It does not matter which it is. Everything is of God from one point of view; He is certainly the final cause of all things; but as to the divinity of the art of medicine, that depends on the character of the physician; if he cultivate it from a sentiment of sympathy, or for the purpose of relieving the suffering and wretchedness of mankind, he is divine and so is his art; on the other hand, if he cultivate it for gain or personal emolument, both must be stripped of divine character, and given a rank among the trades and other useful industries.

But, however the art of medicine was derived, whether by instinct or the sagacity of man, or by the gift of God, its origin is very remote. It is customary to call Hippocrates the "Father of Medicine"; but from him it is easily traced back about thirteen hundred years to Æsculapius; thence farther back into Egypt, the home of the arts and sciences, five hundred years or more at least before Æsculapius. The celebrated Le Clerc, writing early in the eighteenth century A.D., has traced the origin of medicine to Egypt and to races more remote. He finds that anatomy and physiology were studied there, and hygiene and botany also; and that some crude ideas of remedies for disease were prevalent there nearly two thousand years before Hippocrates wrote his famous works upon medicine. And centuries

before Egypt, medicine was cultivated by certain of the Chinese kings.

Among the Egyptians, Prométhée is perhaps the first to claim the discovery of medicaments to cure the sick. He was known also under the name of Magog, son of Japheth. Æschylus speaks of him with enthusiasm as having made great discoveries in the use of remedial agents, but with such vagueness as to facts and particulars as to give one the impression that it is more the fancy of the poet than reality.

The discoveries of the Papyrus of M. Ebers, the distinguished archæologist, in his excavations at Memphis in Egypt, go to show the great antiquity of the art of medicine and surgery. Even the art of dentistry was practised in ancient Egypt. Mummies have been uncovered in a cemetery at Thebes, where teeth showed gold fillings of excellent workmanship, dating back about 5000 years B.C., antedating the advent of Adam several centuries. It is within the bounds of reason to believe that surgery is of older date than medicine, since among a warlike people there must have been large opportunity for its practice and cultivation.

But there are good grounds for the belief that some of the Egyptian kings were learned in the art of medicine. Athotis, of the Thinites, who was king of Egypt in the First Dynasty, not only acquired knowledge of medicine, but wrote books on anatomy.

Again, in the Third Dynasty, about 4500 years B.C., Tosorthros, or Sesorthros, king of the Manphites, was as distinguished in the art as Athotis. So much eminence did he attain as to be confounded with Æsculapius of a later period. These kings are supposed to be very ancient. According to the Egyptian historian Manethon, they antedate Adam by several *siècles*, or ages, which renders their existence vague. Nevertheless, Osiris and Hermes, who still maintain the reputation of having had a flesh-and-blood reality, antedate Athotis by several hundred years; and Zoroaster, the great Chinese law-giver and philosopher, whose works are still preserved, existed still farther in the shaded past, antedating Christ about five thousand years. Many historians have regarded Zoroaster as a myth, but he was the founder of the Magian Empire, and must therefore have had a corporeal existence. These facts make Moses and Adam and Eve seem very near to us.

Regarding the connection of the Chinese celebrities with ancient medicine, there are records, it is said, in the archives of China which antedate the Deluge by several hundred years. One of her distinguished kings, the founder of her monarchy, whose name was Ciningo, or Xin num, made divers experiments to discover the medicinal virtues of plants, such as were poisonous and such as possessed useful qualities. Moreover, says M. Le Clerc, "his successor, Hohamti,

carried his investigations in medicine still further, he having written several books on medicine that are extant to-day, in which one finds observations particularly strong, or forcible and learned, regarding the significance of the signs of the pulse, in order to know and to discern maladies and the state or progress of disease."[1]

Nevertheless, M. Le Clerc expresses some degree of skepticism of Hohamti's discoveries as to the indications of the pulse. We quote him literally:

Pour ce qui est de la connaissance de l'état du pouls, en particulier, et de son usage dans la médecine, il est difficile de croire que l'on en sût, du temps du Roi Hoamti, tout ce que l'on prétend qu' il ait écrit sur ce sujet. On verra ci-après qu' Hippocrate, qui n'est venu que plus de deux mille ans après ce Roi, ne dit pas encore grand' chose du pouls, et que ce ne fut que du temps d'Hérophile, Médecin Grec, qui exerçait la Médecine en Egypte cent cinquante ans après Hippocrate, que l'on commença à raffiner sur cette matière.[2]

It is certainly a singular circumstance that so accurate and astute an observer as was Hippocrates should have failed to observe the pulse, which in Galen's time (second century A.D.) was so important an aid to that sage in diagnosis and prognosis. Hippocrates evidently had no acquaintance with the medical writings of king Hohamti.

[1] *Histoire de la Médecine, primière partie*, liv. i., c. viii.
[2] *Ibid.*

China has produced many great men, great thinkers, great mathematicians and philosophers, natural and psychological, moral and religious; it would seem to have been a misfortune to us, as well as to them, that association of the two peoples should not have been more intimate, especially between the learned of each country. The bar to intercourse is broken down now however.

M. Le Clerc is not disposed to credit the Chinese with medical discoveries, preferring to believe that they received what knowledge of medicine they possessed from the ancient Syrians, Phœnicians, and Egyptians, who possessed the seas and understood the art of navigation, and therefore enjoyed the advantages of inter-communication and the mutual exchange of ideas with their neighbors. In a way, he says that the Indes Orientales were known anciently by "les Grecs, les Egyptians, qui ont été les peuples les plus savants de l'antiquité, et particulièrement les Phéniciens, qui étaient de grands voyageurs, et qui entendaient même la navigation mieux que les autres, sont allez jusques à la Chine, et par conséquent ont pu communiquer à cette nation leurs connaissances et celles de leurs voisins."[1] The learned author is loath to concede to the Chinese the genius of spontaneous or original discovery; yet the compass was discovered by them.

The ancient Druids are said to have contributed

[1] *Ibid.*

much to the knowledge of medicine. They were the priests, the judges, the physicians, of the ancient Gauls. There was a college of Druids in the time of Hermion, king of the Germans, who is supposed to have been contemporary with Jacob, the grandson of Abraham, who was the remote forefather of Moses. The Druids, according to Strabo, were said to have discovered drugs having the property of producing fertility in women; and that by such means they could produce boys or girls as they pleased. One of these drugs was probably the mistletoe, a parasitic plant, Viscum album (*Loranthracea*). It was used in the festivities of ancient Gaul, and has descended to us for Christmas decorations. The Druids were the original gymnosophists, and were very ancient. Their descendants were known to the ancient Spartans; and the custom of celebrating victory in their wars by games in which both sexes joined in a state of nudity, was derived from the gymnosophists, as the term implies.

It is the habit of writers to underrate the influence of ancient Egypt upon the civilization of Europe. The learned Sprengel traces with great clearness and conclusiveness the debt that ancient Greece owed to Egypt for the arts and sciences; and as conclusively shows that Moses owed his learning to them, not only in philosophy, mathematics, hygiene, etc., but also in statecraft, government, and the organization of society. In Egypt the priest's position was second only to that of the

king. The priests held the keys of the treasury of knowledge; they were the judges, and held the issues of life and death over offenders; they administered the rites of worship and of the sacrifices; they had charge of the sick and wounded and treated them with anointing, sacrifices, magic, incantation, etc., most of which Israel, under their great leader, copied from the laws and customs of Egypt, and exploited them in the laws and customs of the Jews.

The practice of anointing was of Egyptian origin and adopted by the Jews and Christians. Embalming was an art carried to perfection by the Egyptians; and it was among that people that the first traces of specialism in medicine may be found, as has been observed.[1]

All the professions, as we have said, were in the hands, or under the control, either of the king or the priests, which latter constituted a caste class, perpetuated from father to son; and whoever presumed to usurp their function, at least in treating the sick, did so at the risk of his life, should the case die in his hands. As has been observed, the priestly orders, of which there were four among the Egyptians, had a monopoly of erudition, in which they were protected by the law, and from which the lower classes of society were excluded, also by the law. Under such a régime it is difficult to see how there could be any substantial advancement in the arts and sciences.

[1] Sprengel's *Histoire de la Médecine*, i., pp. 46–47.

There could have been none except by such a proceeding as Moses instituted and carried into effect—with the Jews.

Sprengel writes:

Des recherches plus précises sur l'état social des prêtres de l'Egypte nous apprennent, il est vrai, que leur caste était fort honorée, et que leur dignité n' était guère inférieure à celle du souverain. Mais il paraît cependant que cela ne doit s' entendre que des ordres supérieurs; car un passage des écrits de Moïse prouve que, sous le règne même des Pharaons, il y avait plusieurs classes de prêtres, dont deux entre autres sont désignées sous les noms de Hékamim, et de Hêremim. Du temps d' Hérodote, on distinguait des archiprêtres et des prêtres ordinaires, dignités dont la première se transmettait également de père en fils.[1]

They too had their sacred books, in which the laws and the prophets, the rites, the ceremonies, rules and regulations were written for all social, medical, and religious services, from which there was to be no deviation, or innovations introduced.

Scholars generally concede that Hermes introduced the art of medicine to Egypt, and that Hermes was contemporary with Joseph. Le Clerc, who went into this subject with great particularity, writes:

Cependant si Herme est l' auteur de la Médecine chez Egyptians, comme on le verra tout à l'heure, il faut qu' il ait été longtemps avant Moïse, puisque

[1] *Op. cit.*, p. 49. See authorities cited there.

Moïse lui-même nous apprend qu' il y avait deja des Médecins en Egypte quatre cents ans avant lui, c' est à dire du temps de Joseph, qui ordonna à ses Médecins d' embaumer le corps de son père, comme porte le texte sacré. Mais outre qu' Eusebe réconnait lui-même qu' Inache était plus ancien que Moïse de quelques siècles, l'Écriture est encore contraire au fait que pose Artapanus, en ce qu' elle nous dit que Moïse possédait toute la sagesse, ou la science des Egyptiens, ce qui marque qu' il avait oppris d' eux, et non pas eux de lui. Philon Juif particularisant les sciences que Moïse avait apprise des Egyptiens, ne fait mention que d'arithmétique, de la géometrie, de la poësie, de la musique, et de la philosophie symbolique, que était écrite en caractères sacré; et il ajoute que les Grecs enseignerent à Moïse les autres arts liberaux; qu' il fit venir des Assyriens qui l'instruisirent dans leurs lettres, et des Chaldéens de qui il apprit la science des astrés. Mais Clement Alexandrin dit expressément que Moïse avait été instruit dans la Médecine par les Egyptiens.[1]

From all the facts of ancient history, facts and fables so intermixed and woven together that one scarcely knows the one from the other, it is apparent that the science of medicine, such as we know it, was derived from the Egyptians, originating as far back as Abraham, at least—perhaps to Adam. In the age of Moses these people had acquired much advancement in civilization. The arts and sciences were cultivated by them. Such

[1] *L'Histoire de la Médecine*, liv. i., c. v., p. 11. See authorities cited there.

knowledge of medicine as they possessed, however, was held by the kings, who formulated rules of treating disease, which the practitioner was required scrupulously to follow. Those who had the temerity to deviate from these rules were subject to severe penalties, even death, should the result of the treatment be fatal, or should the case fail to recover, as has been observed. It was in Egypt that Moses was brought up from his birth; it was among these people that he was educated; it was here that he imbibed the wide knowledge of laws and customs, of society and government, of letters, jurisprudence, and medicine, which he exhibited when it became his duty to legislate and formulate precepts and laws for his race. In this preparation, Moses spent the first forty years of his life. His genius was so great, and his influence so far-reaching upon his people, that we may be justified in devoting a few pages to him.

Part II.—Hebrew Medicine

We doubt if the character of Moses has been sufficiently appreciated by men of science. When one reads the laws and ordinances which he gave to the Jews, the people of his lineage, one is profoundly impressed with the greatness of the man. That he indulged in mysticism and practised sorcery and the arts of the charlatan, and made claims to an intimacy with Jehovah which would rank him among the impostors to-

day, must be admitted. Such things are naturally repugnant to men of a scientific cast of mind, who, though living as close to the divine Excellence, yea, infinitely closer than the religious fanatic, or one clean shaven with reverent mien, interpret the relation differently, rationally, and lay no claim to powers and privileges which they know are mostly false pretences, and that no man can possess. This claim on the part of the great Hebrew naturally alienates him from the sympathy and appreciation of scientific men; and it seems to us sufficient allowance has not been made for the embarrassing circumstances in which the man was placed, and the nature of the work which he elected himself to do; the peculiarity of the people whom he undertook to lead out of Egypt, from slavery to civilization—or, rather, independence,—etc. When one studies with a fair judicial mind the situation in which Moses was placed, one cannot fail to justify the means he used to fill it, and to excuse the pretension which he made, and the deception which he practised upon an ignorant, credulous, and superstitious people, to the end that he might succeed in doing the work to which he had put his hand. It does not seem to have been quite the manly thing to do to turn away from and against his benefactors, who had so tenderly brought him up and educated him. But that aside: it seems to us quite apparent that he could not have accomplished his great purpose, or achieved his great cause by any other means.

Often had he to make a show of wonder-working in order to gain and keep the necessary authority over the people. It was necessary, also, for him to speak in the name of the Lord, and to enforce laws and impose customs, rites, and ordinances in His name, and to use the oracular "Thus saith the Lord" upon all occasions. Far be it from us to say that Moses was not sincere in believing that he was under divine guidance, or rather the guidance of God, and yet we must confess to a skepticism in making this concession. *He could not know that it was God whom he felt, heard, and saw.* No man can see or hear the Infinite. It is hardly consistent with the man's great intellect and deep perception to regard him ignorant as to the true source of his powers. Yet it may be so. No advance had been made in mental science—the relation of mind and brain, thought and feeling—in his day; and it was the habit of men to refer what they thought and felt to an agency outside themselves, rather than to the inspiration of their own faculties, which must have been marvellously great in Moses. We repeat, therefore, that it is fair to presume that this supremely wise man was sincere, and honestly believed that his leadings were from without and by no means the promptings of his own mind and heart from within, especially since it was indispensably necessary that the people should take that view of the matter.

Moses was not a physician by profession, yet he

was a great physician, the greatest of his day. He was carefully educated in Egypt, in the Royal family, and, according to Josephus, was a precocious youth. The laws of health and sanitation which he advanced were a great contribution to medicine, and are sound to-day; the rules as to what to eat and what not to eat, and the preparation of food, are precepts as true to-day as they were then, with few exceptions.

The care that Moses took to guard his people against disease by infection in food indicated that he must have had a very correct idea of the danger of infection from that source. He especially forbade the eating of blood of any animal, "for it is the life of all flesh; the blood of it is for the life thereof; therefore I said unto the children of Israel, Ye shall eat the blood of no manner of flesh; for the life of all flesh is the blood thereof; whosoever eateth it shall be cut off."[1]

With equal propriety he could have forbidden the eating of raw or imperfectly cooked flesh, for that contains more or less blood, which is unclean, not only according to Moses, but according to the revelations of the microscope. The discoveries made by that instrument more than confirm the sagacity of Moses. According to them, not only flesh, but fruits and vegetables in their raw and unwashed state are unclean and may be sources of infection.

The restrictions placed by Moses upon flesh-

[1] *Leviticus* xvii., 14.

food were almost prohibitive of that article of diet, and had much to do, it is believed, in promoting the stamina and longevity of the Jews. In Numbers, Moses makes God say to the Jews, with great emphasis: "Behold I have given to you every herb bearing seed which is upon the face of all the earth, and every tree bearing fruit, to you it shall be for meat."—Chapter i., verse 29.

The regulations of marriage which Moses made, both for the well-being of the unborn and the happiness of the married, are admirable, these being, with few exceptions, caused by the changed position of woman in modern times. His conception of the ideal marriage—monogamy—was true in principle, is true in principle now, however difficult it may be for the multitude to practise. The precepts of morality and the rites and ceremonies of religion which he formulated were wise and consistent in his day and for his people, and mostly so for our own. His conception of the oneness and supremacy of God was grand, is grand, and must always remain grand—incomparably grand. It is difficult to estimate the debt the world owes to Moses. He is entitled to the reverence the Jews bestow on him, and that all people ought to pay to him.

It does not appear that Moses prescribed remedies for the cure of diseases. His treatment was prevention in the first place, and sanitation in the second place, and trusting to Nature in the third. Nothing could be wiser than his regulations

and rules on these matters. Syphilis was known to him, and the victim of it was expelled from the camp, or the city, and was not allowed to return until he was clean. It was properly held in great abhorrence by the Jews. In cases of leprosy the same course was pursued. The victim was put under the strictest observation. Every seven days he was sent to the priest for examination; and when its well-known signs and symptoms were apparent, the victim was sent into exile, away from human habitation, that he might not infect others. Everything connected with either syphilis or leprosy was destroyed by fire. Nature did the rest.

The physician as a class or profession did not exist in the time of Moses, among the Jews and Egyptians. The priests were the physicians; and the rules of procedure which the priests were to observe, in cases of disease that were brought before them, were prescribed by Moses with great particularity, especially if they were infectious or contagious diseases. His diagnosis and prognosis of leprosy, together with its care and treatment, were clear and most wise, discerning and judicious. They could not have been improved upon in his day, nor can they be to-day, except in a few particulars. The same observation may be made likewise as to his discriminations of the varieties of the disease—between the malignant and the non-malignant—the clean and the unclean, the rules accurately to determine which

Moses prescribed with clearness and precision for the guidance of the priests. It would appear that he regarded certain eczemas of the scalp leprous, and kept them under observation awhile, finally pronouncing them clean or unclean as the case may be.[1]

Moses possessed what Élie Metchnikoff calls the "Instinct of death." It does not appear that he was ill when he began to prepare for taking final leave of the people. But his preparations being completed, and having bid a parting farewell to certain of them, he sought the place where he was to disappear, taking the Senate, Joshua, and the high priest Eleazar with him. "Now as soon as they were come to the mountain called Aharim," writes Josephus, "he dismissed the Senate, and as he was going to embrace Eleazar and Joshua, and was still discoursing with them, a cloud stood over him on the sudden, and he disappeared in a certain valley."[2]

Of the character and attainments of Moses, Josephus writes:

He was one that exceeded all men that were in understanding and made the best use *of what that understanding suggested to him.*[3] He had a very graceful way of speaking and addressing himself

[1] *History of the Jews*, by Flavius Josephus, translated by William Whinton, A. M.; *Antiquities*, book ii., c. xiii., sec. 1; also *Leviticus*, c. xiii. and xiv.

[2] Bk. iv., c. viii., sec. 48.

[3] The italics are ours.

to the multitude; as to his other qualifications, he had such a full command of his passions as if he had hardly any such in his soul, and only knew them by their names, as rather perceiving them in other men than himself. He was also such a general of an army as is seldom seen, as well as such a prophet as was never known, and this to such a degree that whatsoever he pronounced you would think you heard the voice of God Himself.[1]

Moses was the son of Amram, of the tribe of Levi, born about 1570 years B.C. Josephus traces his genealogy direct to Abraham the seventh remove. His name was derived from his origin, the Egyptian *Mo*, water, and such as are saved out of it, by the term *Uses;* hence his name *Mouses*, anglicised *Moses.*[2] Diviners had foretold the birth of the boy, and what calamities he would bring upon Egypt when he grew up, in consequence of which warning male babies of the Jews, by order of the king, were to be slain at birth. When, therefore, the wife of Amram gave birth to the boy, her love for him was so great that she immediately entrusted him to the Nile, hoping that he would find favor and succor from some source, in the providence of God. Thermuthis, the king's daughter, discovered him in the little wicker basket floating in the stream, and loved him. Having no children of her own, she adopted the child, having begged the king's consent to do so.

[1] Josephus, *Antiquities*, sec. 49.
[2] *Ibid.*, sec. 6, p. 69.

Josephus says that Moses' father was told in a dream of the career of his son; the calamities that he would bring upon Egypt; the blessings he would bestow upon the Hebrews, and the glory and renown he would bring upon himself, to be remembered so long as the earth should endure —a prophecy which seems likely to be fulfilled. No man in all history achieved a greater renown than Moses, the son of Amram, or is likely to retain it longer.

With singular self-abnegation Moses almost never spoke of himself. It was the Lord that spoke; the Lord commanded so and so; to speak this and that to the Jews; the Lord said unto me; thus and thus saith the Lord. In all his writings there is seldom an allusion to himself in the first person. He does not appear to have been conscious of himself as a personality, but rather as an agent of another. Surely, if there could be any excuse or justification in claiming supernatural guidance and illumination for any man, it must be conceded to him. Moses' writings form part of the Holy Scriptures, the Sacred Book, of both Jew and Gentile alike. He is said to have lived to be one hundred and twenty years old, and, having finished his work, suddenly to have disappeared from earth, enveloped in a white cloud, as has been said. And if Moses was thus inspired by an agency without, was Hippocrates, a prince among the wise, inspired likewise? Was Plato? Aristotle? Galen? or Socrates?—all divine men. If so, they

never knew it—certainly never claimed to have been. Their points of view were different. Was that all?

Part III.—Æsculapius

Many writers have been skeptical of the existence of this sage, or the living flesh-and-blood reality of Æsculapius. Says Russell: "Although it is probably as near a fiction of the Greek imagination as Jupiter or Neptune, yet the fact of his having had two regularly-born sons at the siege of Troy gives to him a certain flesh-and-blood reality." Æsculapius antedates Hippocrates nearly a thousand years; Mélampe, Æsculapius more than five hundred years, and he was no myth. The habit of the Greek mind, in the absence of knowledge, or demonstrable data, to make free use of imagination in the interpretation of phenomena, to deal in myths and genii, to substitute gods and goddesses for causes and effects in the government of the world, has had the effect of calling in question the reality of many of her most distinguished personages —and this with doubtful reason. In regard to the personality of Æsculapius, the weight of evidence goes to show that a personage of that name and character had an existence outside and independent of Greek imagination, about one thousand three hundred years B.C. Moses, who surely was no myth, antedates Æsculapius several hundred years. Bostock, a very learned and

judicious student of medical history, after sifting the evidence pro and con, concedes the reality of Æsculapius, and that he possessed a greater degree of medical skill than any of his contemporaries or predecessors; and that, "while his master, Chiron, has the reputation of introducing the art of medicine into Greece (from Egypt about 1300 years B. C.), it is to his pupil, Æsculapius, that, by the common consent of antiquity, is ascribed the merit of having devoted himself to the cultivation of medicine as a science, and of having made it a distinct object of pursuit." [1]

According to Greek fiction, the family of Æsculapius was derived from Apollo, the god of Music and Medicine. The Greeks had a fancy for giving the names of gods and goddesses to the name and genius of things. Thus Hygeia, or Salus, his daughter, was the goddess of Health; Epione, the wife of Æsculapius, signified Adoucir. This sage had several daughters, besides Hygeia, namely, Æglé, Panacea, the goddess of All-Heal; Iaso, Romé, Æso; and a sister, who was named by the celebrated Greek poet Pindar, Eriopis; all were goddesses whose father was Apollo. Hygeia was called Health or Salus, because health or *santé* depends upon the air one breathes, "more than upon any other thing." She was represented on the medallions as a woman demi-nude, offering food to a serpent; Æglé was the goddess of Light,

[1] *History of Medicine*, J. Bostock, M.D., LL.D.; Introduction to John Mason Good's *Study of Medicine*, 1843.

or Brightness; Iaso and Panacea had the same function, representing the principle of Convalescence (*la Guérison*) and Universal Medicine.[1] While there are myths and mythology, fact and fiction, in all these primitive legends, it is well to remember that there is a substratum of reality in them, for the great poets of Greece have recorded their deeds in song and story, and their solid achievements still live to invest them with a living personality.

The character and career of this great personage, Æsculapius, are given by tradition with much particularity. He was a native of Epidaurus, Greece, of illegitimate birth, and was exposed in infancy by his mother in consequence thereof, but was fortunately discovered by a shepherd, and placed under the care of the physician, Chiron, whose pupil he subsequently became. His career in the art of medicine was one of the most notable of his age, or of any age. He was said to have raised many persons from the dead, and to have instituted important improvements in the medical and surgical art. By reason of his wonder-workings he was supposed to possess miraculous powers, and to have been immaculately conceived and sired by the god Apollo,—a not unusual concession to greatness in those days of ignorance and superstition, or later. After his tragic death at the hand of Pluto, which was said to have been inspired by jealousy, in consequence of his marvellous

[1] Le Clerc, liv. i., c. xx.

influence over the sick and the dead, by keeping them out of the clutches of that Shade, the people paid him divine honors. He was designated the god of Physic, and was honored by having temples of great magnificence erected to his memory in various parts of Greece; that of Æsculapius, at Epidaurus, which was presided over by his daughter, the goddess Hygeia, being the most celebrated one. Others were reared and dedicated to his honor at Trikka, Cos, and Cnidos. These temples were the refuge of the sick and unfortunate—a kind of hospital. They were surrounded by sacred groves and cultivated grounds, and decorated with the offerings, not of windows and votive tablets of patrons, but by those whom Æsculapius had saved from death or suffering. They were the reverent testimonials of gratitude.

Æsculapius had two sons, Podalirius and Machaon, who followed their father's profession, as was the custom, and who likewise became celebrated in the medical art. They appear to have been the most noted surgeons as well as warriors in the Trojan War, one of whom, Machaon, was wounded by an arrow in the hands of Alexander. Homer immortalized their names in the "Iliad." To this end we cite a few lines from that immortal classic, as translated by F. W. Newman, book ii., lines 729 to 734:

All who in Trikka dwelt, and in Æchalia, the city
Of Eurytus the Æchalian and many-knoll'd Ithone;
Two sons of Æsculapius, Podalirius and Machaon,

Excelling in the healing art, were over these the leaders,
And thirty smoothly hollow'd ships were ranged beneath their guidance.

Elsewhere, in book iv., Homer pays further graceful tribute to Machaon for his skill in extracting an arrow from King Menelaüs, who was wounded in the same war, and refers to the celebrated Chiron as his sire.

It seems almost incredible that doubt should be entertained by distinguished scholars of the personal existence of a man of so great a character as to impress himself for all time indelibly upon the literature and institutions of his age and country. Unless Homer be a fiction, and the famous siege of Troy and the Trojan War, which were so graphically described by some master hand at hexagonal verse, be also a fiction, then must be admitted the personality of Æsculapius as real flesh and blood. But in an age of myths, magic, and fables, among a people ignorant and imaginative, unlettered, such characters, projected as they were so high above the plane of the multitude, were called gods and goddesses; and such they were, and such they are to-day, so elevated are they above the plane on which the average mortal lives.

That Æsculapius and his sons were skilled practitioners in the art of medicine as it existed in early Greece is quite evident. The celebrity that they acquired as physicians is sufficient proof

of it. Nevertheless, that any of them added materially to the advancement of their art—not to say science—is a matter of conjecture. From all that can be learned from sources accessible to us, their practice of medicine was confined to the use and application of cleansing lotions and emollients, soporifics in pain, evacuants in obstructions, a careful abstemious dietary, and the free use, internal and external, of water; magic and incantations, or a systematic appeal to blind, unreasoning faith, did the rest.

Homer declares that Machaon when called to attend upon Menelaüs, King of Thessaly, who was wounded in the Trojan War, to which we have already referred, skilfully extracted the arrow, and with his mouth sucked the blood and poison from the wound, which indicates that he possessed no knowledge of antiseptic remedies or agents other than his own saliva. Magic and incantation were freely and successfully employed by them in the treatment of maladies, especially maladies of nervous origin, which in a crude way corresponds to Expectation and Suggestion of the present-day practice, and, in a more refined way, the use of infinitesimals by the followers of Hahnemann and the prayerful intercessions of Christian Scientists in behalf of the sufferer, in connection with the strong assurance that God is able to restore him to health. These early and unlearned Greeks had no materia medica of consequence, but for clinical purposes they possessed something

that is sometimes more potent remedially than drugs. They were acquainted with the psychology of belief, and possessed knowledge of the *vis medicatrix naturæ*, and knew well the remedial influence of faith. To these they appealed with such means and methods as were at hand. Nor did they often appeal in vain. Great and intelligent attention was paid to regimen—diet, ablutions, and exercise—by these early physicians. Physical training was a prominent feature in the treatment of malady, as well as in preserving health. To that end gymnasiums were regularly fitted up in the temples, with gymnasiarchs in attendance to superintend the exercises and to adjust them to each case.

Let no one suppose that the psychologic procedures, which were a part of their art, appealed to the imagination of the patient. He who takes that view of the influence of the imagination shows a mistaken conception of the nature and function of imagination. We are aware that learned men in the practice of the medical art do take that view. We are persuaded, however, that they do so without giving the subject sufficient thought. It is an easy way to dismiss a subject about which few care to write or to think. But one with equal reason might attribute a cure to a comet, or to an eclipse. A moment's serious reflection would convince the physio-psychologist or psychiatrist that the imaginative faculty is in no way directly related to the instinctive life of an

individual, no more than is reason or mathematics, and therefore can have no influence over its functions either in health or disease. Imagination, be it observed, is a mental function of the highest order. It enlarges the conceptions of its possessor. It is creative in its prerogative, or pure intellection, having no direct relation to the unconscious life of the individual, wherein are posited the forces of the physical life, and upon which is predicated the *vis medicatrix naturæ*, or the healing power of nature. We repeat that it was to the unconscious or instinctive forces of nature that the early physicians appealed, whether they knew it or not, and to which all primitive "medicine men" appeal to-day, in seeking to give relief from physical or mental disorders, by the pretence of possessing occult powers. They are not persons of great intellect and powers of imagination that are susceptible of, or amenable to, hypnotic influence or suggestion; but rather the unlearned and credulous who are moved by such influences, and upon whom the marvels of great cures are effected. In this respect, the Fiji sorcerers, in pretending to suck small stones or other foreign substances from the body of a fever case, are not altogether unlike our forefather physicians of ancient Thessaly—more crude, it is true, but identical in principle. The sorcerer's arts and the rites and ceremonials of religion are practised in vain upon the man of science.

In the art of surgery, the early Greek was

probably more rational than in the practice of medicine, since surgery involves so largely the genius of the mechanic. It appears that the temples erected in commemoration of Greece's great "god of physic" were hospitals or sanatoriums, to which surgical cases were taken for treatment, and where the diseased and infirm were likewise cared for. These were under the care of priests and, together with other means, rites and ceremonies were resorted to. It also appears that fees were charged, in some instances, for services rendered there.

Æsculapius was the first to introduce gymnastics as a curative measure, of which Hippocrates made so prominent a use. He is accredited also with being the author of Cliniques, and of Clinical Medicine, from the Greek κλίνη, *bed.* He seems to have been the first physician to visit the sick at the bedside.[1]

The temple of Æsculapius at Epidaurus, remains of which still exist, was the refuge of the afflicted and unfortunate of all classes of people. Kept there were serpents, the emblem of wisdom in all Asia, under the charge of the beautiful goddess, Hygeia. And when epidemics invaded the land and the inhabitants were scourged by disease, it was to Hygeia they looked for relief. She had only to bring out the serpents and wave them in the presence of the people, uttering a few words of assurance meanwhile, to restore confidence and

[1] Le Clerc, p. 42.

banish the epidemics. Such was the force and supremacy of blind belief!

After the death of Æsculapius and his sons, medicine fell into the hands of their followers and successors, the Asclepiadæ, of whom still less is known than of their predecessors. Medicine gradually drifted into the exclusive hands of the priests and sorcerers. The priests performed the rites and ceremonies of religion and ministered unto the sick as well. They became a class that arrogated to itself the powers and privileges of an order. The priests were supposed to possess learning and wisdom, and were, of course, the repositories of such knowledge as was current at that time. It was to their interest to keep the people in ignorance, that thereby they might the better and more securely hold on to the power, privileges, and emoluments which their position gave them. These self-constituted guardians and conservators of the interests of the souls and bodies of the people were moved by motives and considerations characteristic of their class among all nations and people. It is not in their mental make-up voluntarily to give up or to renounce a good thing when once acquired. Medical progress was therefore at a standstill.

It is a singular phenomenon that in the evolution of science, as well as of man, the tracer of events comes suddenly upon breaks in the continuity of progress. Mr. Darwin traced man from a humble

beginning to the anthropoid ape, but at that point he halted. There was a link missing that was necessary to connect the Gibbon, of the Post-Glacial period, with the ape-man of the present epoch. The anthropologists are still hunting for it. In following the progress of science the same phenomenon is met with. We have traced Medicine, for example, from Egypt to Greece, where under the ægis of a great and exalted character, Æsculapius, it bade fair to enter upon an era of indefinite expansion; from him we found it in the hands of his sons, who were almost as distinguished in the art as their father; thence we traced it to the Asclepiadæ, or priests; thence to the temples which were erected after the death of Æsculapius, by idolatrous worshippers, to his honor. But there the continuity halts. For more than seven hundred years nothing more was heard of medicine or medical heroes. They slept in the temples and continued there to sleep for nearly one thousand years, when Hippocrates unearthed records, it is presumed, of a clinical character, from their vaults, which showed that the priests had not been wholly idle. Meantime, Greece had passed through many notable epochs,—immortalized by many illustrious names. There were the heroism of the Spartans, the culture of Athens, a Lycurgus, a Solon, a Homer, a Pindar, a Hesiod, a Thales, Diagonus, Empedocles, and Pythagoras, the philosopher, as he called himself, and who has the

distinction of being the first to use that term. The last, and his equally distinguished pupil, Empedocles, we must dwell upon for a moment.

Pythagoras was a philosopher, with small pretensions to medicine, yet it is customary to place him among medical men. Born at Samos, about 600 B.C., he developed a speculative cast of mind and a fondness for mathematics, and made some discoveries in geometry. His early life was devoted to travel, visiting Egypt and other centres of learning, during which he made some acquaintance with medicine; but it does not appear that he added anything of importance to it. In his day the philosopher and physician were closely allied. One could be a physician without being a philosopher; but no man could be a philosopher without being a physician. It is said of Pythagoras that during his travels he halted to witness some of the Grecian games, at Philius, in Achaia. On one of these occasions, he met Leon, the king, who, becoming interested in the man, inquired after his avocation, to which Pythagoras replied: "I am a philosopher." Being asked in what way philosophers differed from other men, he said: "As at the public games some were contending for glory, and others were buying and selling for the sake of gain, there was one class that came simply as spectators; so in human life there were those who, regarding as unworthy of a wise man the desire of fame or of gain, sought above all to become wise;

those he called wise, or lovers of wisdom."[1] To him, therefore, the term φιλόσοφος (philosopher) was first applied.

Pythagoras established a school, probably of philosophy, at Crotona, Greece, to which students went from all parts. He is said to have been the first to dissect the bodies of animals, and by that means to have acquired some knowledge of anatomy, and some acquaintance with the structure and physiology of man. His method was that of observation and experiment, which made him naturally the forerunner of Aristotle and Hippocrates.[2]

Pythagoras was of an independent speculative turn of mind. He denied the substantive reality of the Greek gods, and escaped the fate that befell Socrates at a later day for committing the same offence, only by running away.

His distinguished pupil, the philosopher Empedocles, was a physician by profession. Although of an original turn of mind, like his great master, it does not appear that he made any great or substantial contributions to medicine, except, perhaps, to aid in rescuing it from the superstitions with which it had been so long encumbered, and introducing rational conceptions of the cause and cure of malady, and of the interpretations of other phenomena. This fact will be seen in one parti-

[1] Cited from Thomas's *Pronouncing and Biographical Dictionary.*

[2] See *Diog. Laert.*, lib. viii., c. i., p. 30.

cular circumstance in his life. When a pestilence attacked the people of Selimus by reason of the bad smells arising from the adjacent river, so that the men died and the women bore dead children, Empedocles contrived a plan and brought into the same channel two other rivers at his own expense, and so by mixing their water with that of the other river he sweetened the stream, and stayed the epidemic.[1] And for this wise and generous deed the Selimuses adored him as a god.

[1] *Op. cit.*

Hippocrates.

SECOND: PERIOD OF HIPPOCRATES

CHAPTER II

The Rise of Greek Medicine

HIPPOCRATES, a man more conspicuous as a physician than any which the annals of history disclose, had no sudden inception in Greece. Preparation had been made for his coming by the general advance of culture and the labors of other men of ability and genius almost equal to his. Of the almost incomparable Pythagoras we have already made mention. But closely following in the wake of that great sage were Democritus, Epicurus, Lucretius, Leucippus, Metrodorus, Anaxarchus, Herodotus, Heraclitus, and others too numerous to mention here. Not all of these distinguished personages were devoted to medicine, it is to be observed, but they were thinkers, philosophers, and lovers of wisdom. There was never a great philosopher who was not a great physician; hence, they must have been physicians. Naturally the long array of great men who immediately preceded Hippocrates would be classed among such men as Huyghens, Young, Newton, Darwin, Haeckel, Tyndall, Huxley, and Sir Henry Thompson, etc. of modern times. The former were the fore-

runners of the "Father of Medicine." Their genius bore fruit in him.

The learned editor and translator of the works of Hippocrates, from the most authentic copy of the Greek MSS., that of Foës, Francis Adams, M.D., LL.D., has given a concise statement of the lineage of Hippocrates, from Tzetzes, which we transcribe:

Æsculapius was the father of Podalirius, who was the father of Hippolochus, who was the father of Sostratus, who was the father of Dardanus, who was the father of Crisamis, who was the father of Cleomytide, who was the father of Theodorus, who was the father of Sostratus II., who was the father of Theodorus II., who was the father of Sostratus III., who was the father of Nebrus, who was the father of Gnosidicus, who was the father of Hippocrates I., who was the father of Heraclides, who was the father of Hippocrates II., otherwise the Great Hippocrates.[1]

Alexander Galt, the author of "Hereditary Genius," could have found a striking example to support his contention in Hippocrates, whose grandfather was a priest in the Temple at Cos, and of so little reputation that history mentions his name only as grandfather of our hero. His grandfather Hippocrates was the great-grandson of the third Sostratus, whose ancestor, the first Sostratus, was the grandson of Podalirius, the distinguished son of Æsculapius—the "god of

[1] Chiliad vii., 155, *Works of Hippocrates*, vol. i., p. 23.

Physic"—and brother of Machaon, whose memory was immortalized in the Homeric poems.

As we have observed, it will thus be seen that the great Hippocrates had a distinguished lineage, reaching back about eighteen generations—to Æsculapius direct, the genius of which he was the possessor and exponent being accentuated with almost each successive generation. Not only was he a great physician; he was greater as a surgeon than a physician.

Of the early life of Hippocrates but little is known. His grandfather belonged to the priesthood and probably was a physician, since he had charge of the Asclepion at Cos, on the little island off the southeastern coast of Asia Minor, when the grandson was born, about 450 years B.C. The sacred temple referred to was one of the many erected to the memory of Æsculapius and bore his name. As already intimated, they were hospitals, or sanatoria, in which the rites and ceremonies of religion, together with hygienic treatment, were administered to the sick and infirm. It appears that Hippocrates when a boy was sent away to school to Selimbria, in Thrace, where he came under the tuition of Herodotus, a great celebrity in his day as a teacher of youth, whose system of training embraced alike the development of both mind and body. It is probable that here, under the stern and inflexible discipline of Herodotus, Hippocrates received principles in physical culture, and a knowledge

of the laws of hygiene which laid the foundation for the career in which he became so justly celebrated. It is known also that he had the advantages of travel, as did Pythagoras, and visited Egypt, Athens, Assyria, and Persia for the purpose of study and observation of institutions, manners and customs of people the more advanced in the arts of civilization. In these travels he is said to have visited the famous temples dedicated to his great sire, Æsculapius, in various points of Greece, and to have studied the records kept therein of diseases and their treatment. This is only supposition however. It is also supposed that he gained his introduction to medicine in these institutions, a supposition which receives strong support from the fact that Hippocrates' first treatise on the subject of medicine embraces clinical records which could have been obtained nowhere else. His ideas of diet and regimen, which form so great a part of his method of caring for the sick, which he formulated later in life, and which may be found in his medical treatises, were such as were instituted by Æsculapius in the temples erected to that sage, and which in fact were a prominent part of the system of physical training throughout all Greece in the days of her greatest heroism.

Hippocrates did not have the advantages of a college course to fit him for the practice of medicine. No faculty conferred upon him the degree of Doctor in Medicine, nor gave him

license to practise medicine and surgery. It is as unlikely that he ever saw the inside of a college as of a human body, for it did not exist, or that he had accurate knowledge of the brain and nervous system. His knowledge was of the experimental sort and gained by observation and induction. He was a close student of nature—of phenomena, normal and abnormal, and the conclusions at which he arrived were based, not on demonstration, but on a series of observed facts, and inductions therefrom. His knowledge was, therefore, experimental, and his method of treating disease empirical. But even so, his powers of observation were so keen, and his skill in arranging and classifying data so patient and tireless, as to lead him to conclusions for the most part reliable and indisputable. He could not by such a method of investigation ascertain *the nature of the specific cause* of a malady, such, for example, as an epidemic of fever or of a plague; the specific cause of tuberculosis, anthrax, or cancer; but he could determine their natural history, so to say, and declare what means and methods had been found the most successful for their treatment. These powers were possessed by Hippocrates to a greater degree than by any other physician in all history; and it was the possession of them that made him the great character he was, and that enabled him to wield so great an influence over his contemporaries and the generations that followed. He did not

permit his judgment to be trammelled by theories and finely spun hypotheses of the nature of malady, or of the rationale of the action of medicaments, but confined himself to the known, the objective, the practical, the results which were more important to the sick than ingenious abstractions. Even to this day it may be said that with all our precise and specific knowledge of morbific causation, he is the most successful physician who the more closely adheres to the empirical and at the same time inductive method of Hippocrates. On this subject we shall have something further to say in the course of these pages.

Let no one conclude from the foregoing that Hippocrates was a mere delver in facts, oblivious of their significance, or that he was wanting in imagination or a taste for speculation. He lived in an age of speculative thought. Democritus had advanced his ideas of the philosophy of matter and force; and Hippocrates, having been a pupil of the philosopher Heraclitus, after leaving the school of Herodotus, must have imbibed the tenets of that prince of the materialistic school of philosophy. Nowhere in his writings does he avow the truth or falsity of this conclusion; but it is clearly justifiable from his devotion to demonstrable truths and his silence as to the superstitious myths, the influence of the gods and goddesses which held dominion over the minds of many of his distinguished contemporaries,

that he did not doubt the interposition of occult forces in mundane affairs; he did not avow it, however, but esteemed it more prudent to confine himself to the study of causes natural, and in the treatment of disease and infirmities to remedies and measures purely physical, as likewise do his orthodox followers to this day.

We cannot forbear to quote in this conjunction the judicious utterances of the learned Bostock to the same effect:

We are hence naturally led to inquire what were the circumstances in the intellectual or literary character of Hippocrates which produced this powerful impression (his supremacy over his great contemporaries), 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 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 treat-

ment derived from them (or based upon 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 neighboring countries, our admiration of the skill and talents of Hippocrates will be still further increased, and we are induced to regard him as one of those rare geniuses which so far outstrip their contemporaries as to form an era in the history of science.[1]

There is perhaps no more convincing evidence of Hippocrates' adherence to rational conceptions of maladies and their treatment than is found in connection with his views of epilepsy, of all diseases the one most likely to impress one as being caused by supernatural agencies.

It is thus [he writes] with regard to the disease called sacred (epilepsia). It appears to me to be in no wise more divine or more sacred than other diseases, but has a natural cause from which it originates like other affections. Men regard its nature and cause as divine from ignorance and wonder, because it is not at all like other diseases. But if it be reckoned divine because it is wonderful, instead of one there would be many diseases which would be called sacred.

[1] *History of Medicine*, pp. 17, 18. Pythagoras, in writing earlier than Hippocrates, is said to have dissected animals. We think it not unlikely, therefore, that Hippocrates did the same, though the learned Bruner declares otherwise. See his *Analecta*, *ibid.* See also *ut supra*.

And they who first referred this disease to the gods appear to me to be just such persons as the conjurers, mountebanks, and charlatans now are, who give themselves out for being excessively religious, and as knowing more than other people.[1]

The extent of his knowledge and the greatness of the character and attainments of Hippocrates, with such limited opportunities as he possessed to acquire knowledge, have been a subject of wonder to many commentators. The unlettered multitude invested him with godlike attributes, and even regarded him as an object of reverence as a god. His contemporaries very generally conceded his superiority; nor did they, as might have been expected from the weakness of human nature, indulge toward him a spirit of jealousy and rivalry, for, indeed, he had no rivals. The staid and prosaic Bostock, even, writes of his attainments with an admiration bordering on surprise. Hippocrates' English translator, the learned and reputable surgeon, Dr. Francis Adams, speaks of his descriptive powers in terms of the highest appreciation. Referring to his writings, Dr. Adams says:

Several sections of the work are perfect masterpieces, such, for example, as the parts which relate to dislocations of the shoulder and hip-joint; and more especially the latter, in which it appears to me Hippocrates has given a fuller and more complete

[1] *Works of Hippocrates*, ii., p. 843.

history of everything relating to the subject than is to be found in any single work, even to the present day.[1]

And Dr. J. Rutherford Russell concedes that his descriptions of disease have never been equalled. "They have the severity of naked truth," he declares.[2] And he cites as a conspicuous example the description of the "dying face"—the Facies Hippocratia, as it is called: a sharp nose, hollow eyes, collapsed temples; the ears cold, contracted, and their lobes turned out; the skin about the forehead being rough, distended, and parched; the color of the whole face being green, black, livid, or lead-colored.[3]

Dr. Russell intimates that Hippocrates and Apelles, the greatest of Greek painters in point of finish, having been born and bred in the same town, at Cos, the latter may have had some literary influence upon or over Hippocrates. He assumes that Apelles possessed literary genius, but on what authority we know not.

The view we are led to take of this subject is altogether different. It is better to believe that Hippocrates was his own teacher. While we concede that experience is the source of knowledge and acquirements, it is well to remember that some persons, owing to the supremacy of their

[1] *Works of Hippocrates*, p. 55.
[2] *History and Heroes of Medicine*, p. 30.
[3] *Works of Hippocrates*, p. 23.

mental powers, acquire experience faster than some others possessed of less mental calibre. One person may thus experience more in five minutes than another in five hours or in five days, or never at all. And if one admit that experience may be inherited, which is generally conceded to-day, the mystery surrounding Hippocrates' acquirements is far from being a mystery. It becomes easy of solution. He did not need the genius of any contemporary to light his. Many animals get upon their legs and walk as soon as they are born or hatched, and exhibit instinctive intelligence without training, and recognize their mother's call, and their enemies at first sight or sound, as if they were old-time acquaintances. This is a heritage of experience. If this is nothing to marvel at, surely there can be no cause of marvel when a genius springs forth into full brilliancy unheralded and without a university education, as did the "Father of Medicine," and a host of others in the world's history that have been invested by the multitude with divine attributes. Surely if experience were needed as the source of Hippocrates' excellence of attainments, he did not want for that. Was he not the eighteenth remove from Æsculapius, the son of Apollo, himself a god, according to the Greek figment?

Hippocrates brought to the practice of his profession the sternest habits of rectitude. It does not appear in his prescriptions that he appealed to the element of faith, or that he practised

the principle of Suggestion, or Expectation, or Mystery, as aids to convalescence, which the moderns find so effective in certain temperaments, and the use of which is manifestly justifiable in such cases. He looked upon such acts and devices as the agencies of the quack, charlatan, and mountebank, totally unworthy and unbecoming the dignity of a devotée of a learned profession. To use any of these agencies or measures on the sick with any result, one must needs do so under cover; that is, one must practise deceit and deceive the patient as to his method in order to effect any beneficial results. Such a procedure is repugnant, it must be confessed, to an honest man, especially when it is practised for gain. Nor would he countenance the practice of artifices to attract the attention of patients to him; nor indulge in other specious ways of advertising for cases, or for business ends, the tricks of the tradesman, as unworthy the physician. This class of practitioners was prevalent in his day, but it was mostly confined to the priesthood and professional magicians and sorcerers. All readers of his works know the terms of reproach and contumely with which he referred to them. Medicine was a gift from God, he declared.

In the oath, called the "Hippocratian Oath," which he administered to his medical pupils about to enter upon the practice of medicine, may be observed the lofty sentiments of piety and consecration which animated the kindly spirit

of this pagan physician. It reads, with slight omissions, as follows:

I swear by the physician Apollo, and Æsculapius and Hygeia and All-Heal, and the gods and goddesses, that according to my ability I will keep this oath and this stipulation, to reckon him who taught me this Art as equally dear to me as my parents, to share my substance with him, and relieve his necessities if required; to look upon his offspring in the same footing as my brothers, and to teach them this Art, if they shall wish to learn it, without fee or stipulation; and that by precept, lecture, and every other mode of instruction, I will impart a knowledge of the Art to my own sons and those of my teachers, and to disciples bound by stipulation and oath according to the law of medicine, but to no others. I will follow that system of regimen which, according to my ability and judgment, I consider for the benefit of my patients, and abstain from whatever is deleterious and mischievous. I will give no deadly medicine to any one if asked, or suggest any such counsel; and in like manner I will not give to a woman a pessary to produce abortion. With purity and holiness I will pass my life and practise my Art. Into whatever houses I enter I will go into them for the benefit of the sick, and will abstain from every voluntary act of mischief and corruption; and further, from the seduction of females or males, of freemen or slaves. Whatever in connection with my professional practice, or not in connection with it, I see or hear in the life of men which ought not to be spoken of abroad, I will not divulge, as reckoning that all such should be kept secret. While I continue to keep this oath inviolate, may it

be granted to me to enjoy life and the practice of the Art, respected by all men in all times; and should I trespass or violate this oath, may the reverse be my lot.[1]

Such was in brief the character of the man Hippocrates. It remains to give some account of the physician Hippocrates, his method of practice, and the system of practice which he bequeathed to posterity, and which is known to-day as "Orthodox Medicine."

To Aristotle, the Stagirite, is usually accorded the honor of first introducing the inductive method in the search for truth. But it was the method of interrogating nature pursued by Pythagoras more than two hundred years before the advent of Aristotle, and by Hippocrates more than one hundred years prior to that sage's birth. It is probable that Æsculapius pursued that method at Epidaurus, for in the state of the medical art at that time no other method was expedient or possible; nor was any other method wholly so in the days of the "Father of Medicine."

To the inductive method of arriving at truth —of interrogating nature as Bacon called it,— Hippocrates rigidly adhered—that is, he adhered to it as rigidly as possible in the crude state of the materia medica to which he had recourse, and the limitations of his knowledge of the medicinal virtues. That he often became amenable to the charge of empiricism, which at a later day was

[1] *Works of Hippocrates*, p. 779.

a term of reproach, may be frankly admitted. Often must he have guessed at the truth, so far as the medicinal virtues of drugs were concerned, which was, of course, an act of empiricism.

However that may be, his method of procedure was essentially inductive, not only in the examination of the sick, but also in ascertaining the specific virtues of medicine. In the phenomena of diseases, it was his habit to observe with great particularity, both objectively and subjectively. He grouped such abnormal phenomena into signs and symptoms, and taken together he made up the diagnosis, prognosis, and indications of treatment—by a purely inductive process. In these clinical details he was helped to conclusions by certain hypotheses as to the exciting and proximate causes of the malady,—working hypotheses, such as the four elements, heat, cold, dry and moist, in the constitution of nature, and the four humors of the body, in one or more of which was the seat of the disease, the abnormal disturbance of which determined the nature of the disease itself. These humors he designated black bile, yellow bile, blood, and phlegm. This hypothesis was the foundation of humoral pathology, which dominated medical opinion down to within living memory. These humors must be purged in disease, if elimination was the indication presented. The means to this end were determined by experience alone. These examinations of the patient's condition, and inquiry as to the cause

or causes thereof, presuppose a knowledge of physiology, or the functions of the organs of the human body; and likewise of pathology, or proximate effects of disease upon such organs and bodily tissues.

The doctrine of the humors being the seat of infection, as laid down by Hippocrates, has had various fortunes. No dissent to it was raised until Borelli proved in the 17th century that disease may arise in the solids; thence the doctrine of Solidism, as opposed to that of Humoralism. Medical opinion has been divided on the subject ever since, and the controversy has been waged with much acrimony. Not until the microscope began to be used in diagnosis was the subject laid to rest with the vindication of the humoral hypothesis, without, however, disproving the fact that disease may also originate in the organs and nervous system of the human body. The celebrated Paine, Professor of the Institutes of Medicine in the University of New York, supported the doctrine of solidism in his great work on "The Institutes of Medicine" as late as 1850.

A favorite hypothesis of Hippocrates was that of crises—we say hypothesis, for the want of a more appropriate term, for we do not regard it an hypothesis at all, but a well-known phenomenon in the course and termination of disease, which any observer may verify at the bedside if he will take the trouble to do so. Then he avowed the existence of critical days. These occurred on the third,

seventh, ninth, fourteenth, seventeenth, and twentieth days in continued fevers, and the third day in surgical operations. If the condition and symptoms of the patient are favorable on the third day after an operation, the probability is that he will recover; if they are unfavorable, the probability is that the patient will die or have a protracted recovery. In the course of fevers and inflammations, critical sweats are likely to occur on critical days; sometimes alvine evacuations. Alvine evacuations, however, are not a constant phenomenon; but changes in the pulse-rate and temperature may confidently be expected. All physicians know how marked these crises are in continued and intermittent fevers. These and a thousand other diagnostic and prognostic signs and symptoms, in the course and progress of malady, this august father of the medical art was in the habit of observing and annotating with infinite detail and precision. They formed the basis of his medical judgment, which was almost unerring, and gave him an advantage pre-eminent over his contemporaries.

But far more important than signs and symptoms was Hippocrates' perception of an underlying animate principle in nature, which he termed Physis (Φύσις), or Dynamis (Δύναμις). These are terms to express the forces which he conceived to be the primary cause of all the phenomena of health or disease, and of all life and mind upon the earth. In health it is an activity normal—

that is, a balance between normal and abnormal causation; in disease, an activity just as friendly and conservative, but modified by being directed against morbific causes that have gained entrance to the system. By the term dynamis, he appears to have meant what the moderns know as *vitality;* by physis we understand him to have meant the life or soul of nature, which constitutes the difference between a live man and a dead man, organic matter and inorganic or crude matter. In the conduct of malady it was the guiding force—the Φύσις of the organism to which it was due. It constituted the *vis medicatrix naturæ* to which his remedies appealed in disease, to which he always appealed, and on which he always relied. This principle or force he regarded as intelligent and beneficent, since it was the guarding, conserving principle in all vital phenomena, normal and abnormal. This conception of the master has held its own through all the perturbations of centuries of philosophic opinion; now and then disputed by the medical system-builders, who, above all, wished to magnify their powers in curing malady without the aid of nature and in spite of nature. The idea of Hippocrates gave force and significance to it. More recently the physis of Hippocrates has become associated with the Psyché (Ψυχή) of Aristotle. The former constitutes the unconscious mind of the modern psychologist, who recognizes its universality throughout the inorganic, as well as the organic

departments of nature. It is synonymous, in other words, with what Von Hartmann and others have termed the great Unconscient.[1]

On these fundamental conceptions of nature and natural forces Hippocrates was right, and those who differed from him—often ridiculed him—for recognizing occult and beneficent forces immanent in the world of things, were wrong. The use of such terms as "Physis" and "Dynamis" as substantives, shows that Hippocrates' conceptions of final causes were thoroughly emancipated from the Greek idea of gods and goddesses in the government of the world. We can but marvel at the insight which this ancient sage displayed without the light of scientific knowledge, or the aids to scientific research and demonstration which we possess to-day.

Hippocrates' conception of the healing and conservative powers of nature is fully justified by the studies of the modern physicists and naturalists. There is an intelligence, which the physiologists term Instinct, and which they define as "Purposive action without knowledge of its purpose," but which Hippocrates termed Physis, in all nature. Even the jelly-fish knows enough to select its food and to reject what is not food. The mollusk builds its shell unconscious of its goal. Certain insects renew lost parts—as the spider. Even plants possess sensibility—some of

[1] See Von Hartmann, *Philosophy of the Unconscious*, vol. ii.; see also the Prologue of this work.

them sagacity, as the *Drosera rotundifolia* in catching insects for food. Certain trees, the willow especially, will send rootlets many rods away in search of water in dry seasons. The common potato vine, confined in dark places, will do likewise in search of light. The vine of the grape will exhibit great ingenuity to get into sunshine, etc.[1]

Such facts as these could be adduced indefinitely in support of Hippocrates' conceptions of the intelligent powers of nature. They would be out of place here. Enough has been advanced in support of the views of this medical sage, to show that he was right in regarding this world animated by an Intelligence, not gods, except in human form, not disembodied spirits, ghosts and spectres, but beyond and above all these fanciful things, of an Intelligence which is unconscious, working through all to wise and definite ends. In the treatment of disease the physician is an adjuvant; it is his function to aid Nature, to work with, not against her. Such, at least, was the Hippocratian doctrine.

Of the writings of Hippocrates many editions have been made from time to time, but that of Foësius, or Foës, as the French have it, translated into Latin in 1595, is said by Bostock to be the most complete and reliable. An excellent English translation of his complete works by Dr. Francis

[1] See on this subject Von Hartmann's *Philosophy of the Unconscious*, vol. ii.

Adams was published, under the auspices of the New Sydenham Society, London, early in the nineteenth century. To the translator and publishers the profession of medicine owes a debt of gratitude for this inestimable service. We cannot but feel that an earlier translation of these remarkable writings of the veritable Father of Medicine would have materially hastened the progress of medical thought among English-speaking peoples. His writings being thus easily accessible to the profession, only brief extracts and comments will be made on them in this place.

Painstaking labor is apparent on every page of Hippocrates' books. As might naturally be supposed, in Hippocrates' therapeutics much of his treatment could not be commended to-day, as the virulence of maladies since his time has been greatly modified, and improved methods and remedies have been introduced. Many irrational conceits and notions as to remedies and means of treating maladies, such as were prevalent in his day, found a place in his practice. With these exceptions his suggestions are clear, precise, and abound with wisdom from which the student of to-day could not fail to profit. He is a master of detail. His descriptions of disease are pen-pictures. One does not see how they could be improved upon. He shows great discernment in noting down signs and symptoms, and wonderful sagacity in pointing out such as are favorable and such as are not. For an example

we select a paragraph from his book on Prognostics:

It is well when the patient is found by his physician reclining upon either his right or on his left side, having his hands, neck, and legs slightly bent, and the whole body in a relaxed state, for thus most persons in health recline, and these are the best of postures which most resemble healthy persons. But to lie upon one's back, with the hands, neck, and legs extended, is far less favorable. And if the patient incline forward and sink down to the foot of the bed, it is a still more dangerous symptom; but if he be found with his feet naked and not sufficiently warm, and the hands, neck, and legs tossed about in a disorderly manner and naked, it is bad, for it indicates aberration of intellect. It is a deadly symptom also, when the patient sleeps constantly with his mouth open, having his legs strongly bent and plaited together, while he lies upon his back; and to lie upon one's belly, when not habitual for the patient to sleep thus while in good health, indicates delirium or pain in the abdominal regions. And for a patient to wish to sit erect at the acme of disease is a bad symptom in all acute cases, but particularly so in pneumonia. Respecting the movement of the hands, I have these observations to make: When in acute fevers, pneumonia, phrenitis, or headache, the hands are waved before the face, hunting through empty space, as if gathering bits of straw, picking the nap from the coverlid, or tearing chaff from the wall, all such symptoms are bad and deadly.[1]

[1] *Works.*

One is forcibly impressed, in reading the cases of disease reported by Hippocrates, at the full and precise manner in which the symptoms are set down. As an example, of which it is no exception among many, we cite Case II. He does not give the disease a name, but in our modern nosologies it would be called Typhus Exanthematica. He writes:

Silenus lived in a house on Broad-way near the house of Evaleidas. From fatigue, drinking, and unreasonable exercise, he was seized with fever. He began with having pains in his loins; he had heaviness in the head, and there was stiffness of the neck. On the first day the alvine discharges were bilious, unmixed, frothy, high-colored, and copious; urine black, having a black sediment; he was thirsty, tongue dry; no sleep at night. On the second day, acute fever; stools more copious, thinner, frothy; urine black; an uncomfortable slight delirium. On the third day, all the symptoms exacerbated; an oblong distension of a softish nature from both sides of the hypochondrium to the navel; stools thin and darkish; urine muddy and darkish; no sleep at night; much talking, laughing, singing; he could not restrain himself. On the fourth day, in the same state. On the fifth, stools bilious, unmixed, smooth, greasy; urine thin, transparent; slight absence of delirium. On the sixth, slight perspiration about the head, extremities cold and livid; much tossing about; no passage from the bowels; urine suppressed, acute fever. On the seventh, loss of speech; extremities could no longer be kept warm;

no discharge of urine. On the eighth, a cold sweat all over; red rashes with sweat, of a round figure, small, like *vari*, persistent, not subsiding; by means of a slight stimulus a copious discharge from the bowels, of a thin and undigested character with pain; urine acrid and passed with pain; extremities slightly heated; sleep slight and comatose; speechless; urine thin and transparent. On the ninth, in the same state. On the tenth, no drink taken; comatose, sleep slight; alvine discharges the same, urine abundant and thickish; when allowed to stand the sediment farinaceous and white; extremities cold. On the eleventh, he died. At the commencement and throughout, the respiration was slow and large; there was a constant throbbing in the hypochondrium; his age was about twenty.[1]

The above is a perfect and concise picture of typhus fever such as was met with a few years since, before the formation of sanitary health-boards to look after the milk and water supply, sewage and house-draining of cities. It lacks only urinalysis, the pulse rate, respirations per minute, and variations of temperature to make the report a model.

It has already been remarked—the studious attention Hippocrates gave to the dietary of both sick and well people. He had no chemistry to guide him and to perfect his vocabulary; he did not know of what the simpler and more familiar elements were constituted, such as water and air; and of physiological chemistry he had abso-

[1] *Op. cit.*, i., pp. 371–372.

lutely no knowledge whatever. If he had had, instead of the term "concoction," which he used so much, in speaking of the interactions of the humors of the body, fermentation, a knowledge of the enzymes of digestion, etc., he would have used the terms toxic and toxæmia, ptomaine and ptomaine poisoning, etc., in describing ailments of digestion and of the digestive tract, which he does with such admirable clearness. In the absence of a knowledge of physiological chemistry and bacteriology to guide him, he shows an acumen of judgment in dietetics much of which could be followed to-day with advantage. And it was derived solely from observation and experience. One can but wonder that a man could draw so many wise inductions from the experience and observations of a single lifetime. It is this fact that has led his learned and critical commentators to believe that he must have had help from some source; to imagine that he must have had recourse to records of cases kept by the priest-physicians in the temples to which he had had access, as he was connected by heredity with the Asclepiadæ. A still greater wonder arises here, how men of ability so distinguished as this would imply could have managed to conceal their identity through so many centuries as elapsed from Æsculapius to Hippocrates.

The foregoing will be sufficient to show and illustrate Hippocrates' habit of close observation of signs and symptoms of the sick, their significance,

and make inductions from them. His aphorisms, of which there are several hundred, abound in epigrammatic sentences of singular precision and terseness, and display a degree of learning and an amount of acumen which it seems impossible for any one to acquire in an ordinary lifetime. It is this reflection, doubtless, that has led many commentators to believe that Hippocrates must have had access to writings and records of malady that were kept, or supposed to be kept, in the sacred temples or sanatoria throughout Greece, and presided over by the Asclepiadæ, or priests, from whom Hippocrates was descended. This is conjecture, as has been said; there is no absolute authority for the statement.

On this point the very able historian and commentator, Dr. Bostock, in his "History of Medicine," from which I have already quoted, suggests that the method of practice which Hippocrates pursued, that of trusting to nature and giving precise attention to the natural course and culmination of disease, enabled him the better to observe and to note its progress from one crisis to another. This he thinks may have "enabled him to acquire great skill in prognostics, so that there are no parts of his writings which exhibit more decisive marks of a superior understanding than those in which he treats on this topic."[1] There may be something in this; but he who examines the records of treatment,

[1] *Op. cit.*, p. 21.

especially the doses administered and prescribed in his writings, will certainly come to the conclusion that Hippocrates did not always allow nature to pursue its own uninterrupted course. He often made use of Alteratives and powerful Revulsives.

The fame of Hippocrates spread throughout all the Grecian states, and, we may say, throughout the then known world. Athens, the focus of learning and culture, of art and beauty, invited him there; but he preferred the simple, unostentatious life at Cos. The great Darius, king of Persia, offered him inducements to go with him; but he declined the intended honor. His celebrity could not have been due to his writings, for they were not extant or accessible in his day; besides, he had not literary art, and knew little and cared less about poesy, or rhetoric, or fine writing. He clearly was not a cacoëthes scribendi. He had not riches. He made no display. His dietary was of the simplest, consisting probably largely of barley water, of which he prescribed so much to the sick. He cared nothing for the luxuries of the table, or the pleasures which most men seek in existence. Although he had a wife and at least two sons and a daughter, one easily imagines him a bachelor and wedded only to his profession, absorbed in his records and cases, and closing the declining years of his life still plodding as he began. What, then, was the secret of his world-wide fame? Naught, but his wisdom

and skill in relieving suffering and curing disease. He was the type of a physician. His services were at the command of rich and poor, for money and without money, large fees, small fees, or no fees. He had no tricks of trade, nor of the profession, and had no time to trouble himself about profit and loss. And yet his fame spread, and continued to spread, and to grow in splendor to the end of his days, solely on account of his rare judgment and skill as a physician. His fame to-day is greater than at any previous epoch in history, not on account of the mastery of his art of which he stands to-day the world's greatest pioneer and exponent, but more for the qualities of the man, morally and intellectually, as revealed in his writings and by those who write about him. He is the model physician, the great exemplar for every sincere student of medicine to emulate. The more one reads his simple unadorned writings—adorned the more by being unadorned—the greater he appears to one's expanding vision.

In concluding a brief account of Hippocrates, the excellent Bostock modestly observes:

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.[1]

Such is the judgment of scores of biographers whose history we have had the privilege to consult.

Again, while the fame of Hippocrates among his contemporaries rested upon his character as a man and his success as a physician, upon what does it rest to-day, near twenty-four hundred years after his death among the class to which he belonged—the profession of Medicine? We do not hesitate to answer, Upon his contribution to Medical Science. He rescued it from the superstitious myths of his day and laid the foundation of medicine as a science, and laid it upon principles sound and demonstrable, upon which to rear the lofty and stable superstructure it is to-day. And if we were asked to name the substratum of that foundation we would say, without a moment's hesitation, that it is the recognition of a supremacy in nature (Φυσις), on which he predicated the *vis medicatrix naturæ* as the curative principle in man, upon which all cure and all healing depend. That is the great panacea, the All-Heal, a discovery pre-eminently his. On its practical recognition at the bedside his success was due. It was his legacy in chief to the profession for all the ages to come; the foundation of the science of medicine as distinguished from its art. The art of medicine might exist, does exist,

[1] *Op. cit.*

in a way, without the recognition of "physis"; but the science of medicine, never. To him, therefore, is the profession of medicine indebted more than to any other man in the history of the art, though, strange to say, the rank and file of the profession very frequently ignore it.

It may not be amiss to transcribe a few of the aphorisms of Hippocrates on diet and prognostics, in concluding this brief and imperfect sketch of a god-man of incomparable proportions. They may be found in the second volume of Hippocrates' "Works," to which we have so frequently referred with admiration.

Samples of Hippocratian Aphorisms

SECTION I

1. Life is short and the art long; the occasion fleeting. The physician must not only be prepared to do what is right himself, but also to make the patient, the attendants, and externals co-operate.

2. In disorders of the bowels and vomitings, occurring spontaneously, if the matters purged be such as ought to be purged, they do good, and are well-borne.

4. A slender and restricted diet is always dangerous in chronic diseases, and also in acute diseases where it is not requisite. And again, a diet brought to the extreme point of attenuation is dangerous; and repletion, when in the extreme, is dangerous.

8. When the disease is at its height, it will then be necessary to use the most slender diet.

11. We must retrench during paroxysms, for to

exhibit food would be injurious. And in all diseases having periodical paroxysms, we must restrict during the paroxysms.

13. Old persons endure fasting most easily; next adults; young persons not nearly so well; and most especially infants; and of those such as are of a particularly lively spirit.

16. A humid diet (diluent, doubtless) is befitting in all febrile diseases and particularly in children and others accustomed to live on such a diet.

SECTION II

1. In whatsoever disease sleep is laborious, it is a deadly symptom; but if sleep does good, it is not deadly.

2. When sleep puts an end to delirium, it is a good symptom.

3. Both sleep and insomnolency, when immoderate, are bad.

5. Spontaneous lassitude indicates disease.

6. Persons who have a painful affection in any part of the body, and are in great measure insensible of the pain, are disordered in intellect.

10. Bodies not properly cleansed, the more you nourish the more you injure.

17. When more food than is proper has been taken, it occasions disease; this is shown by the treatment.

21. Drinking strong wine causes hunger.

22. Diseases which arise from repletion are cured by depletion; and those that arise from depletion are cured by repletion; and in general diseases are cured by their contraries.

23. Acute diseases come to their crises in fourteen days.

25. It is better that a fever succeed to a convulsion, than a convulsion to a fever.

31. When a person who has recovered from a disease has a good appetite, but his body does not improve in condition, it is a bad symptom.

44. Persons who are naturally very fat are apt to die earlier than those who are slender.

52. When doing everything according to indication, although things do not turn out agreeably to indication, we should not turn to another course while the original appearances remain.

SECTION III

9. In autumn, diseases are most acute, and most mortal on the whole. The spring is the most healthy, and the least mortal.

10. Autumn is a bad season for persons in consumption.

SECTION VII

43. A woman does not become ambidextrous.

60. Fasting should be prescribed for those persons who have humid flesh; for fasting dries bodies.

66. If one gives to a person in fever the same food which is given to a person in good health, what is strength to the one is disease to the other.

82. Persons above forty years of age who are afflicted with frenzy do not readily recover; the danger is less when the disease is cognate to the constitution and age.

The foregoing observations are taken here and there throughout the seven sections in the "Book of Aphorisms," of which there are several hundred, and which we submit without comment.

THIRD: PERIOD OF ARISTOTLE

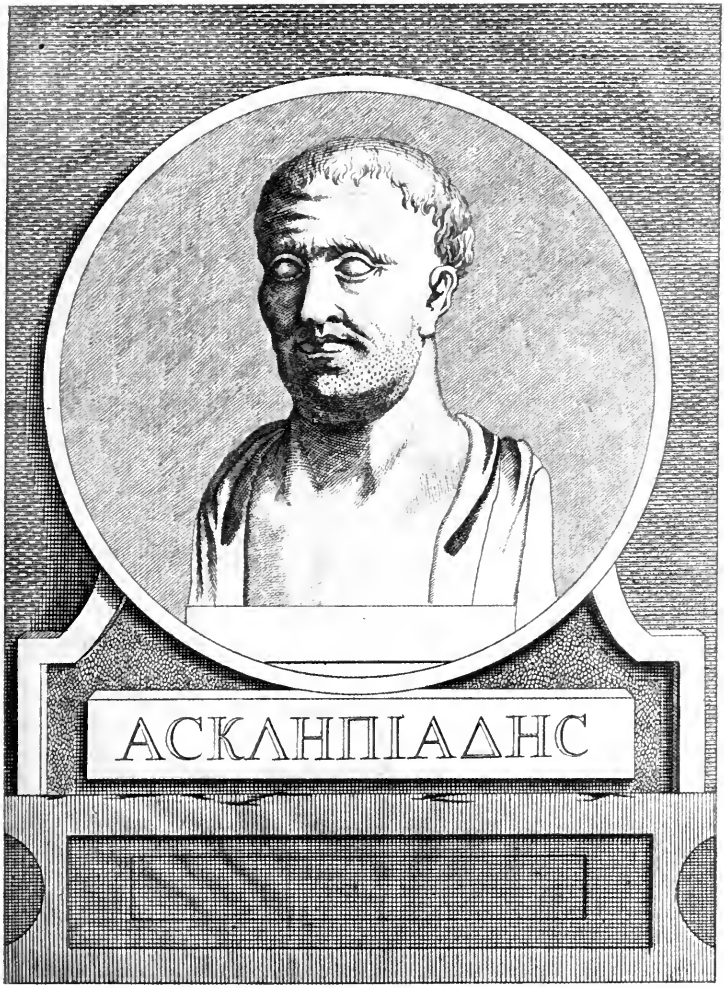
CHAPTER III

GREEK MEDICINE (*Continued*)

Part I.—Epoch of Aristotle

IT is generally understood that Hippocrates lived to a ripe old age. He certainly died full of honors, even if decorations were lacking. No temples were erected to perpetuate his memory, nor, indeed, were they needed. His books were his monument, conceived by his own brain, written by his own hand. They have been translated into all the principal languages of the world, and they will live to emblazon his name when marble crumbles to dust. Great men of all the centuries since his day have vied to do him honor.

Hippocrates was an epoch-making celebrity. It is not in the order of events that there should be a succession of such characters. Satellites could not long survive the death of planets. When a great luminary disappears there follows a period of darkness. Genius is rarely transmissible from father to son. It is an evolution, and like a meteor surprises the average mortal of the earth with its appearance and brilliancy. It



Asclepiades.

Ancient Rome's first great surgeon.
From Le Clerc's *Histoire de la Médecine.*

could not be otherwise than that the death of Hippocrates should have caused a recession in the progress of medicine; nor that he should have been followed by a host of puerile imitators, who were incapable of living up to the exalted standard he set for them. He was several centuries in advance of the multitude, and time was required for them to digest and assimilate the mental pabulum which he left for them, before another genius should appear.

It is also generally understood that his sons, Thessalus and Draco, and Polybus, his son-in-law, succeeded to the profession of their illustrious father. Historians are accustomed to say that "he transmitted his profession to his sons," and so he did, as far as it was possible for him so to do. They at least succeeded to his calling, they and their sons, and their sons' sons for many generations. They do not appear to have risen to their great sire's work however. Polybus seems to have made contributions to medicine, more or less creditable, and to have palmed them off to the world as the veritable writings of his illustrious father-in-law; at least, so says M. Le Clerc (par. 1, liv. iii.). Indeed, for many centuries following the death of Hippocrates he had many imitators; and many were the writings that were falsely fostered upon his name to the discredit of his name and fame. Foësius, who lived at Metz, France, a physician and surgeon of distinguished note, and a scholar of excellence, born about the

middle of the sixteenth century, made a discriminate collection of Hippocrates' accredited books and published a Greek edition of them, following this later by translating them into Latin (1595). To Foësius' unselfish generosity, therefore, are we indebted for a fairly genuine copy of Hippocrates' works in Greek and Latin, and to Dr. Francis Adams, and to the Sydenham Society of London, for an excellent edition in English, to which we have already referred.[1]

Among the Asclepiadæ, who, after the death of Hippocrates, distinguished themselves in medicine, we have to mention the names of Diocles and Praxagoras, the latter of Cos. Both were followers of their master, Hippocrates, and are said to have added materially to the medical art, more especially in diagnosis. The name of Chrysippus is also prominent at that period as a reformer. He is noted chiefly on account of his objection to bloodletting and the excessive use of purgatives, both of which were part of the Hippocratian method of treating certain cases.

It should be observed that Draco and Thessalus, the sons of Hippocrates, together with his son-in-law, Polybus, were the first to form themselves into a sect called the Dogmatic, and to establish

[1] To the Sydenham Society the author feels under great obligations for its translations and publication of works by foreign authors; and the English-speaking profession generally must feel under like obligations. It has done a great work for them, mostly gratuitously.

a school of medicine under that caption. Hippocrates was certainly the prince of Empirics at the outset of his career, since it was by experience and the observation of facts that data could be established on which to base conclusions, or to draw inductions in the prosecution of his profession. It is difficult to believe that he was ready or prepared to abandon that method and to act on the assumption that sufficient knowledge had been acquired, and sufficient data established to justify taking the position of the dogmatists. His sons evidently thought differently. Their object would seem to have been in forming a medical sect to avoid innovations, bar the acceptance of new or incompatible ideas of practice, and in that way to keep medicine purely Hippocratian. Be that as it may, it was the beginning of a partisan warfare in the progress of medicine that was waged with relentless bitterness through subsequent centuries down to within living memory. Indeed, vestiges of that contest may still be observed. And when we pause to reflect on the phenomenon, which at first thought seems so strange and irrational, no course could have been more natural to purblind man. It is in his heart, when once he gains an advantage over his fellows, to take means to maintain it. It may be observed in the Christian Church as well as in business and politics, under the lead of men ambitious of official distinction, or of personal preferment or fame; and it is often inspired, it

is fair to say, by the desire to establish new truths, or introduce improved methods, or root out old and obsolete ones; or to reform abuses that have become perverse and unmoral. It is certain that this last named motive was the chief inspiration of Luther in his war on the mother church, which ultimated, by a conjunction of circumstances unforeseen and undesired by Luther, into a division of the parent church, the disestablisment of a Kingdom of Heaven on earth, and the founding of the Protestant Reformation. We shall see further on how this spirit ultimated in dividing medicine into a variety of warring medical schools, not only at Rome and Europe, but, especially in the freer atmosphere of the new world. Nevertheless, the philosophic observer is compelled to admit that the cause of truth and righteousness has been the gainer, if not by it, in spite of it. In Greece, however, the movement on the part of the Draconians seemed unwise and premature. It was of a truth disastrous, as it resulted at a later day in demoralizing the splendid achievements of Hippocrates and ultimated in throwing medicine back into the hands of religious charlatans and superstitious sorcerers the most flagrant the world had seen.

Not many years after this epoch there arose in Greece a man of unusual force of character and ability. Although he was not a physician by profession, he was a philosopher of the best type and of great use to medicine by his contributions

to anatomy, physiology, and natural history, and profound speculations into man's psychical nature. No study that throws light on the nature and constitution of life and mind is foreign to medicine. Anatomy is its substratum; knowledge of brain and mind its superstructure. For that reason the advent of Aristotle, the great Stagirite, as he was called, upon life's stage in Greece was a most fortunate event. It was he who gave an impetus to the inductive school of philosophy, which, as we have seen, was beginning to wane under the sway of the dogmatic school of medicine.

Aristotle was born in Thrace, on the western side of the Gulf of Strymon, three hundred and sixty years B. C.,—one hundred years after the birth of Hippocrates. His father, Nichomachus, was distinguished in the profession of medicine, which gave the son a bias to that art. He, Aristotle, is said to have been one of the most illustrious philosophers of antiquity, "and, if considered in respect of intellect alone, perhaps was the most remarkable man that ever lived." [1] To him we owe the first treatise on Anatomy.

His medical biographers, for the most part, pass him by with a paragraph or two, yet he did more to advance the science and enlarge the scope of medicine than any man since Hippocrates; more to advance the knowledge of man—not so much of man as so many pounds of flesh and bone

[1] Thomas's *Biographical Dictionary.*

and blood, but as a living personality; and because they have failed to comprehend him, many writers question whether his influence on medicine "has not been unfavorable to the progress of knowledge."[1] Yet, "so great was the ascendancy which this 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."[2]

We may be pardoned, perhaps, for making an attempt to interpret for the benefit of our readers the dynamic or psychical philosophy of this rare sage, who, strange to say, after the lapse of twenty-three hundred years, seems to need an interpreter.

Aristotle is the first man in antiquity to conceive and put forth the idea of the unity of the universe; the unity of matter and force; the unity of physical and psychical; the substantial oneness, monism, of body and soul, force and substance.

Aristotle advanced a new term, ψυχή, anglicised psyché, from which our term psychology is derived. "It is the efficient, the final, and the formal cause of the body," he writes. In modern phraseology, it is the animating, immanent intelligence of sentient beings. It is man's conscious life,—intellection, due to cerebration or brain

[1] Bostock, *op. cit.*

[2] Le Clerc, par. 1, lib. ii., ch. 4.

function. It is to the cerebro-spinal system what φύσις (physis) is to the grand sympathetic system: ψυχή thinks and knows; φύσις feels and knows. The latter has no need of thinking—of processes of intellection. It knows without thinking, and carries on the operations of the material, animated world without any conception of the end toward which it works; such, for example, as digestion, assimilation, growth, and conservation of animal life; and in lower nature the harvests, budding, blossoming, and maturity of plants; intelligent processes all, but unconscious. So it is in the animal kingdom: the coral builds its reef, unmindful of the reef; the clam forms its shell, unconscious of the shell; man builds himself a body oblivious of the process. Yet it is carried forward unerringly to perfection through all its stages, from the cradle to the grave. It is impossible for an intelligent person to question the fact; equally impossible is it for such a person to question the *Intelligence* with which the work is carried on; yet totally unconsciously is it done. Φύσις is the animating principle of Hippocrates; and what he meant by Physis (Φύσις) is related to the Pneuma (Πνεῦμα) of Galen, about which the physiologists have puzzled so much, and concealed their want of understanding by the use of such terms as gravity, nature, instinct, vitality, soul, etc.; blind, apparently, to their sublime significance! But without the presence of Aristotle's Ψυχή, and Hippocrates' Φύσις, the

medical art is vain, and science and philosophy could have no existence.

One does not withhold his admiration and wonder at the works of engineering genius in tunnelling under the Thames or the Hudson, or throwing suspension bridges over rivers too deep for abutments, or the marvellous exploits of electricity in the industrial arts; yet none of these things can compare in marvellousness to the genius that Nature (physis) displays in knitting a bone, without hands or other implements; encysting a poisonous bullet in the body; forming pockets in which to collect and store pus in pyæmia; or incasing bacteria with tuberculin in the lungs of tuberculosis cases, in order to stay its ravages and to prolong the life of the victims. The process of one belongs to the sphere of conscious Intellection, the Ψυχή of Aristotle; the other to the operation of unconscious Intelligence, the Φύσις of Hippocrates.

Hippocrates made use of the term *physis* to comprehend the Supreme Principle in the constitution of Nature; Aristotle used the term *psyché* to mean the same thing—and more. It is more consistent with the modern conception of the subject to keep them distinct and separable —that is, to confine the term *physis* to the genius of Nature, and the term *psyché* to the genius of Mind—mentality. But whether these principles were one or two, single or dual, they were a most important contribution to the science of medicine.

Art could not draw a blister, heal a cut, cure a laceration, knit a broken bone, produce emesis, or correct a sepsis, in the absence of this Force, or these Forces.

One may justly question the wisdom of a too close adherence to hypotheses and theories in medicine; but it should not be forgotten or overlooked that both theory and hypotheses have their place in science and philosophy. The ultimate atom of Dalton is an hypothesis, but it is the basis of modern chemistry and the splendid achievements of that science. The idea of Newton, of the universality of ether, is still an hypothesis; but the laws of optics and wireless telegraphy are predicated on it. It is an admirable working hypothesis, but the truth of it has never been demonstrated. Every man of strong intellect must theorize on matters which he conceives but cannot prove.

We must insist, therefore, that Celsus was not wholly wrong when he declared that "without a knowledge of the nature of disease no one is qualified to treat it," certainly not, along lines of scientific and demonstrable procedures. Nevertheless, in the absence of knowledge, the method of the Empiric is justifiable. No one can have failed to observe that among the greatest philosophers of antiquity may be found the greatest theorizers. And when Aristotle declared that "the philosopher should end with medicine, the physician should begin with philosophy," he uttered a great truth

of which he was, himself, the greatest exponent.

The greatness of Aristotle becomes more conspicuous the more one studies his character and career and the breadth of his mentality. Alexander the Great, who in youth was his pupil, loved him almost to adoration. He was great in every department of philosophy. He was no idle dreamer, though he did write poetry; nor was he an idealist like Socrates and Plato. His writings are mostly practical and upon practical subjects. Sir William Hamilton pronounced him a great logician, "high above comparison with any subsequent logician." Indeed, he was the founder of the science of logic. "For nearly two thousand years," says a writer in Thomas's "Biographical Dictionary," "his authority was not only predominant, but also despotic, in all countries where the light of learning had penetrated, whether in Europe, Northern Africa, or Western Asia." Another writer says "that he was the father of the science of Natural History." The learned Cuvier has called attention to his "extraordinary sagacity as a naturalist, in which character he was certainly in advance of his age twenty-two hundred years." "He was," continues that author, "not only the most ancient author of Comparative Anatomy whose works have come down to us, but he was one of those who have treated this branch of natural history with the most genius, and who best deserves to be taken for a model."

Aristotle was one of the few historical characters of that age, or any age, whose morals were above reproach. In this respect he was like Hippocrates. His many biographers make prominent mention of this phase of his character. He indulged in no jealousies nor rivalries. He was faithful in his friendships, generous and warm-hearted even to his foes who plotted to destroy him; and although he became at one time estranged from his dear friend—in many respects, the incomparable Plato—their philosophy being antipodal, it was more Plato's fault than his own, and he could say, with good feeling: "Amicus Plato, sed magis amica veritas" (I love Plato, but truth is dearer). A great light was extinguished in the death of Aristotle.[1]

Between Aristotle and the establishment of the Alexandrian School of Medicine there is little to record of medical history of interest to the modern student of medicine. It was a period of warfare and antagonism between rival sects of which the Dogmatists appear to have had the advantage, since that sect claimed, with better evidence of justice, to have originated with Hippocrates, and to be supported by the weight of his authority. On the other hand, the Empirical sect claimed the same high descent. Pliny,[2] however, attributes the rise of the Empirics to a contemporary of Hippocrates, one Ærom, a

[1] See Lewes's *Aristotle;* also *Nouvelle Biographie Générale.*

[2] Lib. xxix.

physician of Sicily. Celsus, on the other hand, ascribes the origin of that sect to Serapion, of Alexandria, who, it is said, was a pupil of the famous Herophilus, who afterwards distinguished himself in the Alexandrian School of Medicine under the patronage of the great Ptolemy. This sect professed to discard theories and hypotheses altogether (though, as we have seen, such a procedure is an impossibility) and to be guided alone by experience. As to this, however, we have no valid information, as the writings of Serapion, together with most of the writings of that period, were supposed to have perished at the destruction of the great Alexandrian Library, the first great library in the world. It was to have been expected that Serapion professed to follow the practice of Hippocrates. All medical sects did that.

We should not fulfil the requirements of a historian, were we to ignore the contributions of women to Medicine. Many noted women of antiquity have been physicians, among others the beautiful Hygeia, daughter of Æsculapius, who presided over the temple devoted to the sick at Epidaurus. But the most distinguished, certainly the most famous, and, perhaps, the most infamous, physician among women of antiquity was Cleopatra, the celebrated Queen of Egypt, who lived a half-century before the Christian era. She was a learned and most accomplished woman, to whose "strong toils of grace" Julius Cæsar,

Mark Antony, and others fell easy victims. Galen says she wrote books on the diseases of women; at least, that she gave her name to such books; and while it is probable that she was their author, she declares in the preface to them that they were written by her sister, Arsenoë, whom Antony, at the bidding of his mistress, caused to be put to death. Be that as it may, the books have not come down to us, and of their professional value nothing is known.[1]

Part II.—Alexandrian Medicine

Before proceeding further with the narrative of the westward advance and progress of Medicine, we pause to give some account of the School at Alexandria.

When Greece fell under the subjection of Philip and Alexander [so writes our learned colleague, Russell], mind went into exile; and its first asylum was the city of the latter conqueror. Alexandria had a civilization quite different from Athens. When the sun sinks in the desert, there is at first total darkness; after a brief interval, a pale light shimmers over its surface before night comes on: this strange appearance is called the *after-glow*. Alexandria was the after-glow of Athens. Literature and science were cultivated under patronage (at Alexandria), and produced corresponding fruits, rich and corrupt. The Ptolemies were the first royal patrons.[2]

[1] Le Clerc.

[2] *History and Heroes of Medicine*, p. 69.

One must obtain a commanding position and secure a large perspective, if he would see the beneficial results of human conflicts, and the uses of characters, animated solely by personal ambition and the love of conquest, as were the Philips and Alexanders of Macedon. In this case, Athens, the home of great men and great women, and the pride and glory of the world, was despoiled that Alexander might give his name to a city. It resulted in creating a new impulse to science and art where it had not been cultivated before, and also in extinguishing the glory of Greece.

The course pursued by Rome in subjecting the Grecian States, and destroying Athens, and raising up Alexandria, bore fruits a few centuries later of most excellent quality in averting consequences to Europe of momentous importance. It was not intended by the Roman Emperors, nor foreseen by the Alexanders and Philips, whose object was rapine and the gratification of a thirst for power and dominion. Nevertheless, it had the effect of preserving Europe from a darkness the end of which it is difficult to foresee. I refer to the Alexandrian conquests in Arabia, the second capture of Alexandria, and the destruction of the great Alexandrian Library, early in the seventh century of the Christian era, and its effect on learning, by the preservation and distribution of the ancient classics by a pure coincidence, among them being the literature of Medicine. But for that event we might not have known of Æsculapius,

Hippocrates, Aristotle, and Galen, nor of Homer and the Iliad, nor the Odyssey and other Greek classics, which were surreptitiously preserved by the appreciative soldiery and monks. It would have required a most commanding perspective, indeed, and a vision most prophetic, to have foreseen what these apparently grave misfortunes to Greece meant, or to what beneficent end they would lead. The philosophic observer lives in a state of perpetual suspense as to the significance of such social cataclysms. He knows that while man proposes, it is a Power other than he that disposes.

At Alexandria, under the despotic rule of Ptolemy, about three centuries B. C., medicine was cultivated with a rude hand. It was the era of "Rude Medicine," as it has been stated. It must be confessed, however, that it produced some great physicians. The royal authority and the public exchequer were utilized for that purpose at Alexandria to the extreme. The study of anatomy, physiology, surgery, botany, etc., made great strides at Alexandria. Herophilus and Arasistratus are spoken of by Galen and Celsus as possessing a more accurate knowledge of the human frame than any physicians that lived before their time.

To Herophilus, especially, is ascribed the honor of being the first anatomist of importance in the annals of Medicine. He discovered the circulation of the blood, the pulsations of the

arteries, which, though known to the Chinese, had been unknown to the Greeks; he enriched the science of medicine by discovering the lacteal vessels, the construction of the eye, and advancing the term *retina*, the great nerve of the eye; he also made contributions to the knowledge of the nervous system, all of which he acquired by being allowed to practise vivisection of human beings, such as had been condemned to death.

How much the world lost by the first destruction of the great Alexandrian Library can never be known. Galen, who profited by the works of the Alexandrian School of Medicine, accredits Herophilus with a very intimate knowledge of the anatomy of the nervous system, the principal branches of nerves both sensitive and motor; the spinal nerves and cord and their connection with the brain, and even of the cranial nerves, especially with those leading to the eye—the retina. To the genius of Herophilus, Arasistratus, Eudemius, and others, Galen owed his knowledge of the nervous system. We have seen that these celebrated physicians and their collaborators had the privilege of dissecting criminals alive. Since they were condemned to death, Ptolemy thought it wise that they should serve the ends of science by giving them into the hands of the vivisectionists, who were not slow to avail themselves of a privilege which was never before granted to physicians. The writings of this period were lost in the sack of the great Library and Museum, by

Christian fanatics, and its labors had to be gone over again after the revival of letters—nearly a thousand years later.

Il est fort probable [writes M. Le Clerc], qu' Herophile a été le premier de tous ceux que l' on conoit, qui ait découvert les nerfs proprement dits, et qui ait su les démonstrait. Il faisoit, à ce que dit Rufus Ephésien, de trois sortes de nerfs, les premiers qui servent au sentiment, et qui sont aussi les ministres de la volenté, par rapport au mouvement, tirent, disoit il, leur origine partie du cerveau, dont ils sont comme des germes, et partie de la mouelle de l'épine du dos. Les seconds viennent des os, et vont se terminer à d'autres os. Les troisièmes sortent des muscles et vont se rendre à d'autres muscles. On void par là qu' Hérophile donnoit encore le nom de nerfs à ce qu' on a appellé dans la suite, des ligamens and des tendons; mais il importe peu quel nom on donne aux choses, pourvu qu' on les distingué d'ailleurs. . . . Les écrits d' Hérophile s'étant perdus, on ne fait rien d'ailleurs de ses dé coûvértes à l' égard des véritables nerfs, si ce n'est qu' il donnoit le nom particulier de pores optiques, aux nerfs qui se portent au foud de l'oeil et qu' on appelé nerfs optiques, soûtenant que ces nerfs ont une cavité sensible, qui ne se trouve pas dans les autres.[1]

Arasistratus was a pupil of Theophrastus and Chrysippus.

Public sentiment was horrified at the dissection

[1] *L'Histoire de la Médecine, seconde partie*, liv. i., chapt. vi., p. 319. Old French retained.

of the dead, chiefly for superstitious reasons; one wonders what it was at the spectacle of dissecting the living! "But," said the apologist of this most brutal inhumanity that the world had known—infinitely more cruel and horrifying than burning at the stake—"these were criminals doomed to execution; why not make them serviceable to the cause of science and philosophy? They have but once to die!" One wonders how the devotées of a humane art could bring themselves to the indulgence of such horrors, or even to witness them!

It is the old contention that the end justifies the means. Such has been the justification of the worst inhumanities that ever disgraced the name of man. Nor is it yet extinct.

The great Alexandrian Library and Museum had their beginning in the third century before Christ. It gave a great impetus to learning for several centuries. Some of the best scholars from Greece and Rome were "imported" by the pagan Ptolemy, and every possible opportunity was afforded them for the prosecution of the various branches of knowledge. Literature, philosophy, mathematics, natural history, chemistry, geometry, astronomy, and the various branches of medicine were especially cultivated. Ptolemy, himself, took a hand in these studies, and wrote a work on astronomy, taking the earth as its stationary centre. This movement was destined, however, to decline. It was as a superstructure reared upon a defective

foundation. The development of the race of man must precede institutions. It cannot be created to order.

Medicine and medical men of note were on the decline in Greece when Aristotle died. In the West—at Rome—the science of medicine had not been introduced; nor were the arts and sciences. Rome was too much engrossed in war and conquest, the thirst for empire, to cultivate the arts. This was less than three centuries before Christ. Such notions as the Romans possessed of the medical art were of the crudest sort, such as we have seen prevailed in Thessaly in the days of Æsculapius. The practice of medicine, such as there was, the priests monopolized, with few exceptions; and their remedies consisted of charms, incantations, amulets, etc. A few imitators of Hippocrates, unlearned and pretentious, were to be found there, but the more reputable practitioners had been banished at the instance of the priests.

One of the most eminent physicians and philosophers among the Methodists to achieve distinction at Rome was Asclepiades of Prusa, in Bithynia, one of the most distinguished at that time of any of the long line of descendants of Æsculapius. They were mostly men of learning and philosophy. One of that class lived at Rome, in the second century B. C., and acquired great renown there, both as a writer on medicine and as a practitioner of that art. He was contemporary

with the famous Archagathus, a Greek physician, who, according to Le Clerc,[1] was the first to introduce the art of medicine in Rome. It is said that Asclepiades began his career as a teacher of rhetoric, but, finding that occupation unremunerative, turned his attention to medicine, in which he became celebrated, more by his affable manner than by his skill. His writings, which were numerous, have not been preserved. One bust of him in marble has come down to us. Among his distinguished pupils was Themison, prince of the Methodist School. Asclepiades lived to a great age, dying about sixty years before Christ.[2]

About the same time with the celebrated Asclepiades, flourished Philoxenus, an Egyptian, probably at Alexandria, who distinguished himself as a surgeon, and who was among the first, if not the very first, to write books on that art. According to Celsus,[3] surgery was practised as a profession in ancient Egypt apart from medicine. But there were others at this period (XXXVIII. siècle) who made a specialty of surgery, among them Ammonius, also of Alexandria. This surgeon was surnamed *Lithotome*, on account of his operations for stone in the bladder, and because he was the first to cut for stone, which Hippocrates forbade his pupils to do. Surgery, in fact, at Rome was cultivated more than medicine by reason of

[1] Part 2d, c. i., p. 384.
[2] Le Clerc, *op. cit.*
[3] Quoted by Le Clerc, *op. cit.*, p. 339.

her wars and the necessities of the wounded in battle. Le Clerc, on the authority of Galen and Celsus, mentions the names of several surgeons at Rome, who were famous in their art, but who left no books on the subject to immortalize their names.

Nicander, of Colophon, the poet and physician, who flourished under Ptolemy, according to some authorities, and under Attalus Galatoniée, according to others, was quite celebrated at Rome, both in poetry and as a writer on medical subjects. The latter productions have come down tous, but his practical works are lost. One of his medical treatises was entitled " Theriaca," which embraced remedies for the treatment of wounds inflicted by venomous beasts; the other was entitled "Alexipharmica," being a treatise on poisons with their antidotes. Le Clerc says that Demetrius Phalerius, Theon, Plutarch, and Diphilus de Laodicea wrote commentaries on the first of these books. His contributions on the subjects on which Nicander wrote must have been held, therefore, by these distinguished commentators as authority.[1]

After the death of Asclepiades, his pupil, Themison, came into prominence. He was the leader and founder of a sect in medicine known as the Methodists, by reason of their adherence to strict rules of practice, not unlike the practice or custom of the ancient Egyptians. Themison likewise had the boldness to controvert the

[1] Le Clerc, p. 330.

doctrine of humoralism which was advanced by Hippocrates and called the Humoral Pathology, and to introduce the doctrine of solidism, known as the Pathology of Solidism. It will be remembered that it was held by the Father of Medicine that diseases originated in the fluids of the body. Themison, on the contrary, contended that they originated in the solid parts, and not in the fluids, the two kinds of bile, phlegm, etc., as taught by Hippocrates. Both views were right, of course, but each had its partisans, and the contention between them continued down to within a recent period. It is worthy of note that the Methodists at Rome superseded the Empirics and Dogmatists. The Methodist sect, by pursuing a policy of conciliation, and adopting a medium course between the two practices, finally absorbed them, or at least, composed their differences.

The next physician worthy of mention is Thessalus, a follower of Themison, who lived about fifty years B. C. He appears to have succeeded in the profession more by artifice and cunning than by learning and merit. The idea of metasyncrasis originated with him, an idea which corresponds with what the profession of half a century since designated by the term *alterative*, which comprehended making a decided change in the trend of the organism, or thwarting the natural tendency of nature by a powerful medicament. It was effected by the administration of powerful medicines in large doses, such as blue

mass and mild chloride of mercury (calomel), a proceeding vicious and irrational as a rule of procedure, and directly at variance with the views and practice of Hippocrates. But it had a long run and is not yet extinct in certain remote parts of Christendom.

M. Le Clerc mentions the names of two other physicians of this period who became distinguished at Rome, both of whom were Methodists, Soranus and Cœlius Aurelianus. Soranus was a native of Ephesus, but settled at Rome, where he acquired a great reputation by his medical writings and attainments. His writings have not come down to us, but he is said to have followed the practice and precepts of Themison, according to his successor C. Aurelianus.

Cœlius Aurelianus deserves more than a passing notice. He is generally understood to have been a native of Numidia and to have lived at Rome in the first century of the Christian era. He was a zealous Methodist, and although somewhat illiterate he was evidently a man of great force of character and impressed his individuality upon the profession of medicine of his day. Bostock says, on the authority of M. Le Clerc,[1] that "in the descriptions of the phenomena of disease he displays considerable accuracy of observation and sagacity; and describes some diseases that are not to be met with in any other ancient author. He gives us a very ample and

[1] Seconde partie, liv. iv., chap. i.

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."[1]

But he clearly did not appreciate the medical philosophy of Hippocrates, whose sagacity increases in the light of modern times. He did not, like his august predecessor of Cos, trust to Nature, or be led by her indications. He did not believe in the *vis medicatrix naturæ*, but considered that it was the physician's function to combat Nature with strong and powerful agencies as if she were an enemy in the economy bent on destroying it. He did not discriminate between cause and sequence, the disease and its cause. He discarded the doctrine of humoralism and was a stanch Solidist; nevertheless, his heroic doses and remedies were directed more to the elimination of humors than to the correction of the abnormal condition of the solids. Surely, his alteratives would have that effect whether he intended it or not. Nor is there anything unusual in this phenomenon in the practice of the art of medicine. Greater men than Aurelianus all down the centuries of the Christian era have disclosed a similar inconsistency between their theory and practice. In his method of treating diseases he followed pretty closely that of Hippocrates, except phlebotomy, except also the use of

[1] *Hist. Med.*, p. 28.

purgatives and revulsives, which he used under exceptional circumstances only. These procedures were not avoided altogether in his system, but were resorted to more wisely, probably, than was customary with the Hippocratians. An abstemious diet was rigidly enjoined; also the use of water, bathing, friction, or massage, rest, and exercise. His reliance on external applications in the treatment of chronic cases would naturally make him the forerunner of osteopathy of the twentieth century.

C. Aurelianus' influence upon medicine had a great vitality. It outlived two centuries of the Christian era and is not altogether extinct at the present day.

The death of Themison was soon followed by dissension and division in the ranks of his followers, which led to the rise of two more medical sects, the Pneumatics and Eclectics or Episynthetics. The former sect derived its name or designation from the incorporation into its system of practice of a tenet first advanced by Galen, that of Pneuma (Πνεῦμα) or life principle, which was chiefly manifested in the nervous system. The meaning that its author attached to it was doubtless what the term means, *breath* or the breath of life, vitality. It seems strange to us that intelligent men should divide into sects on a word, the evident meaning of which was so vital to the economy of life. It leads one to doubt the mental status attained by the race of men.

The sect known as Pneumatic was brought into prominence at Rome during the reign of Vespasian, near A. D. 200, by a physician of excellent repute and well versed in the science and practice of his art, Aretæus by name, and who was styled the Cappadocian. He was a follower of the Father of Medicine, adopted his philosophy in the essentials, and pursued his method in the treatment with unimportant modifications. Had he been born in Greece a few centuries before, he would naturally have allied himself with Aristotle by reason of his perception of a living beneficent principle in nature. As it was, he recognized in *Dynamis* the *vis medicatrix naturæ* of Galen and Hippocrates. He followed these sages in the use of the lancet and purgation, although less heroically. In this respect, his practice accorded more with that of Themison; and, like Themison, he was a man of great natural ability; but, unlike him, he possessed learning and culture as well. His works are still extant, having been translated into English and other languages. They show him to be a man independent of the intellectual views of his day, the influence of superstition, belief in the myths, magic, vagaries, and sorceries then in vogue at Rome and elsewhere. His views on epilepsia and nervous diseases generally accorded with those of Hippocrates. We see no reason, therefore, why he should be numbered with either the Pneumatics or Eclectics, as the learned Bostock has done,

since there is nothing in his philosophy or practice to justify his being identified with any sect in medicine.

But little is known of the origin of the sect known as Eclectic, since no writings of theirs of importance have come down to us. The most prominent physician of the sect was Archigenes, a native of Apamea, who practised at Rome in the reign of Trojan, and acquired in all respects a reputable position at that capital. He is said to have written elaborately of the pulse and its indications, and to have made some modifications in the classification of fevers. According to M. Le Clerc, he had a successful career at Rome, enjoyed the confidence and respect of her people, and left at his death many disciples who maintained a reputable standing in the profession.[1]

It would not be doing justice to the subject nor to the reader did we fail to give some account of the existence and career of a Roman, who, though he was not a physician, at least a practising physician, since he is not mentioned by the celebrated Pliny in his History of Medicine, was a great man and acquired great attainments. This man was Celsus. He wrote books on medicine of enduring qualities, and it is not unlikely that his taste for literature and science led him away from the drudgery of practice to devote his rare talents to writing. Such is the experience of many distinguished students of medicine of our day, as we

[1] See Le Clerc, lib. 14, sec. 1.

shall have occasion to notice further on in this work. It was also true of Pliny, one of the world's great naturalists and writers on medical subjects.

Celsus' treatise on medicine is a work divided into eight parts. It gives a brief sketch of medical sects, and follows it with a systematic treatise on medicine proper, including surgery. The treatise evinces rare knowledge of the subject, at least what was known of it at that time, and an acquaintance with the Hippocratian philosophy and practice, with the major part of which he was in accord. Like that great luminary, he attached great importance to dietetics and regimen in general. Like him again, he pursued the inductive method of examination of patients, in observing signs and symptoms of their maladies or affections, following his method or practice of treatment, modified naturally by the modifications of his immediate predecessors, more especially Asclepiades and his distinguished contemporaries. The most remarkable part of his work is that relating to surgery and the treatment of wounds.

Previous to Celsus one hears comparatively little about surgery and surgical appliances. But in his treatise one feels that the surgical art had sprung suddenly into existence. It was certainly in advance of that of medicine proper. The same may be said of his materia medica and pharmacy. They were greatly in advance of any recorded by previous writers.

There is one noteworthy circumstance, which

Bostock observes in respect of Celsus: "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." [1] This is the reason probably that the profession at Rome was under ban of the upper ten thousand.

We have to pass with a bare allusion to one of the most illustrious men in ancient history, that of Pliny, the learned naturalist, but who was also learned in medicine and a distinguished chronicler of medical topics. Because he was not a member of the profession we cannot tarry on his name, but pass it over with warm admiration.

Luke, supposed to have been one of the Evangelists, is mentioned by St. Paul as a physician at Rome about the middle of the first century. It was as an Evangelist that he was known rather than as a physician. He distinguished himself by writing the Gospel that bears his name and also, it is said, by writing "The Acts of the Apostles." He has the distinction of writing the most reliable or trustworthy Gospel.

Then there is the famous, if not distinguished, slave, Antonius Musa, a pupil of Themison, who became the physician of the Emperor Augustus, and noted for the possession of great professional skill; also another slave, Scribonius Largus, who

[1] *History of Medicine*, p. 32.

lived in the reign of Claudius, who was distinguished in his day as a pharmacist. He left a work on pharmacy, which indicated much learning on that subject, but which was lacking in well digested knowledge. It was probably more or less useful at that day of imperfect knowledge of medicinal virtues.

Andromachus, who also followed the art of polypharmacy, a native of Crete, who lived in the reign of the notorious Nero, acquired distinction as the compounder of the celebrated Theriacum, which contained no less than sixty-one ingredients (some say sixty-six), all well-known and approved drugs. It is said to have been put together with great labor and skill, of which we cannot doubt; but which drug was the *basis* and which the *corrigens* the venturesome author gives us no information. It obtained a place in the pharmacopeias, however, where it was retained down to the last century. Andromachus has also the distinction of being the first physician to receive the title of Archiater, or principal physician.

Another name distinguished in the annals of medicine was that of Dioscorides. He was also a pharmacist, whose work on that subject was prized in its day, but valuable these days as a relic of pharmacal curiosity only. Dioscorides was born at Anazartus, in Cilicia. But little is known of the character of Dioscorides, notwithstanding his distinction of being the first person

to assume the great task of systematizing the drugs that were in use in his day. The date of his birth is not known, but he was a contemporary of Pliny, to whom we have referred, and is assumed to have lived in the first century A. D. His name merits more than a passing notice. He claims to have traversed Asia Minor, Greece, and Italy in search of materials for his "Materia Medica," which contains descriptions of more than five hundred plants. Galen spoke of his work in high praise, as being superior to any preceding work on materia medica. Nevertheless its classification of plants, while it is very crude and defective, deserves much credit for that period. What Galen was to medicine during the following centuries, Dioscorides was to botany and materia medica. For more than sixteen hundred years he was supreme in his line, and indeed not without influence in his specialty down to a more recent period. His work contains the famous Theriacum of Andromachus, which was so popular within living memory, but which has now been superseded by a rival prescription of Warburg's, which contains more than one hundred medicaments.

The following remedies entered into this notorious compound, as given by Russell: Squills, hedychroum, cinnamon, common pepper, juice of poppies, dried roses, water-germander, rape-seed, Illyrian iris, agaric, liquorice, opobalsam, myrrh, saffron, ginger, rhaponticum, cinquefoil,

calamint, horehound, stone-parsley, cassidory costus, white and long pepper, dittany, flowers of sweet rush, male-frankincense, turpentine, mastich, black cassia, spikenard, flowers of poley, storax, parsley seed, seseli, shepherd's pouch, bishop's weed, germander, ground pine, juice of hypocistis, Indian leaf, Celtic nard, spignel, gentian, anise, fennel seed, Lemnian earth, roasted chalcitis, amomum, sweet flag, balsamum, Pontic valerium, St.-John's-wort, acacia, gum, cardamom, carrot seed, galbanum, sagapen, bitumen, opoponax, castor, centaury, clematis, Attic honey, Falernian wine. Russell expresses a doubt if any of the physicians that prescribed this mixture knew anything of the toxic effects of any element that entered into it, excepting the last named ingredient. The doubt is well founded. The toxic effect of drugs, or what may be called their pathogenesis, could not be ascertained with certainty without systematic administration to subjects in health, a form of experimentation not in vogue at that time. To the ancients, the empirical method of finding the medicinal virtues of drugs was the only one that was employed. The directions for its use, and the ailments for which the medicine was prescribed and taken, give us a pretty clear idea of the status of medical knowledge of remedial agents during the mediæval period.

Part III.—Galenian Medicine

We have now to give some account of the most remarkable genius of his age, perhaps of any age. Hippocrates we have extolled as the greatest man of his time; but Hippocrates was not a genius. He lacked the versatility and imagination of genius. He was great as a man; but Galen was great as a genius superposed upon a great man. To great natural gifts to begin with, he added the powers of great industrious activity. His father, whose name was Nicon, was a man of rank and fortune, distinguished in belles-lettres and philosophy, who resided at Pergamus, in Asia Minor, where his son was born A. D. 131. His wife's name is not given, but she is spoken of as being a good manager of household affairs and of good character, but given to *mauvaise humeur*, and behaving as a wife toward her husband after the manner of Xantippe. To his son he gave every advantage of education that the world possessed. To complete his education, young Galen visited every centre of learning of the known world, and absorbed knowledge of every description from all sources. Alexandria was in her zenith at that time, about the beginning of the second century of the Christian era, and thither he went, after spending a brief period in Rome, for the study of the arts more than the science of medicine. Its science and philosophy he took with him, having become acquainted with the

works of the Father of Medicine, and imbibed such of his doctrines as seemed rational, and improved on such of them as had become obsolete by the advancement in medical thought and practice, made by his disciples. Mentally, he was a prodigious gourmand, consuming everything within his reach, but digesting and assimilating only the helpful, rejecting the rest as cumbersome and valueless. Leaving Alexandria, he returned to his native city of Pergamus; thence he returned and, at the urgent request of the Emperor, Marcus Aurelius, settled at Rome, where he remained, for the most part, the rest of his life, and where he became a great celebrity.

Some men inherit greatness; others have it thrust upon them; still others acquire a kind of greatness by being clever in the art of politics and society, and possessing the genius of ruling men; others acquire greatness by the weight of their character and the force of solid achievements. Such a man as this last was Galen. His self-sufficiency and independence would have appeared self-conceit in any other man; in Galen it was recognized as something to be conceded. What was a matter of fact in him would have been arrogance in any other man in Rome. His opinion had the authority of an oracle. He was supreme in every department of knowledge, and what is even more remarkable is that his supremacy should have been so generally conceded by his contemporaries at home and abroad. He

over-bore opposition to his views, not because they were true, for he held too many hypotheses that were not demonstrable, but by the overpowering weight of evidence that he was able to bring to his support. Naturally, he was ranked with the Dogmatic sect in medicine, as that sect gave him greater latitude to exercise his genius as a theorist, of which he was the prince. His pathology, theory, and practice were Hippocratian in the main. In the domain of the hypothetical, in the place of Physis of the master, he seems to have substituted Pneuma (Πνεῦμα), the vital or determining principle in animal bodies. He also formulated the doctrine of contraries in therapeutics, which was brought forward by Hippocrates, namely, contraria contrariis curantur, which is held as a maxim among the orthodox or regular physicians to-day.

Galen wrote voluminously and with great versatility. Nearly two hundred treatises on the various branches of medicine and the sciences in general have come down to us. Nothing but the reverence with which his name was held by the Alexandrians who sacked Alexandria and destroyed its great library saved his works from destruction. The Christian vandals who succeeded them likewise preserved the books of Galen, though sparing few others of the ancient writings. Such was the hatred by them of everything pagan, or of pagan origin!

The contribution that Galen made to the art

of medicine was considerable. He enriched its literature by his versatility, and advanced its position by his great personality. He was an enthusiastic polypharmacist, and added an impetus to a custom of combining drugs in a prescription of questionable utility, which continued to be followed with great abuse until long after the advent of the single-remedy man, the distinguished Hahnemann. It is still in existence, though in a modified form.

He rendered some aid to diagnosis of considerable importance, in classifying the causes of disease into exciting and predisposing, remote and proximate—proximate meaning the organic effects which a malady may have left behind. This conception is well founded and wise, and is likely long to endure.

His observations on the pulse were too academic and complicated to be useful. Only a physician of precise and critical acumen could profit by them. Besides, without their diagnostic significance they are of no use. They have been superseded by the more practicable studies of John Mason Good,[1] and enlarged upon by the introduction of the dynamometer and sphygmograph, or pulse writer, the invention of Dr. Dudgeon, London, 1870.

Galen was an eminently successful practitioner and achieved great popularity at Rome by treating citizens of distinction; chiefly, its warriors wounded

[1] *Study of Medicine.*

in battle, and by his success in curing obscure diseases and derangements, many of which had baffled the skill of his less fortunate contemporaries. Le Clerc cites some of these cases. To us, however, it seems more probable that his great success in such cases was achieved more by the influence of his strong personality, his power to arouse confidence and inspire belief in him and hope of recovery in his patient, than to any curative virtues which his remedies possessed. The writer has seen the curative influence of personality illustrated in his own practice a thousand times. So valuable an aid is it at the bedside that no physician ever achieves distinguished success who does not recognize it and possess the power to make use of it, whatever his drug-resources may be. More potent than learning or knowledge, and of vastly more consequence is it as a remedial or, better say, convalescing agency, than the best chosen medicaments of the pharmacopeias. To-day this agency is styled "Suggestive Therapeutics." A few years since, about 1855, it took the name of "Expectant Medicine," a phrase first advanced by Sir John Forbes,[1] of England, and re-echoed on this side of the Atlantic by Dr. Oliver W. Holmes, the poet-professor of anatomy, at Harvard, Boston, Massachusetts.

As to Galen's theory and practice but little need be said. They were for the most part like his great predecessor, Hippocrates'. He did not accept

[1] *Nature in Disease.*

the hypothesis of the four elements in nature, namely: earth, air, fire, and water, that was first advanced by Thales at a much earlier period than Hippocrates; he knew better than that; but he did accept the doctrine of that sage of hot, dry, cold, and moist in regard to diathesis, and made them serve as a working hypothesis in therapeutics. His greatest works were on Natural History, Anatomy, and Physiology, and a treatise on Climate and Epidemy. The last still lives to honor its author's name. His luminous commentaries on the writings of Hippocrates have also survived to do him honor.

In closing this brief narrative of the character and achievements of this remarkable man, a man of such exalted character, possessing those qualities of mind and heart, apart from his attainments as a physician and scientist, that make one feel proud that one belongs to the same race with him (everything unworthy a man being foreign to him), we cannot forbear to add a few words from Dr. John Bostock, whose "History of Medicine" we have referred to from time to time. He writes:[1]

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

[1] P. 35.

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.

As to Galen's medical theories, it is doubtful if either the imitators or critics of Hippocrates and Galen quite understood the system of classifying diseases into dry and moist, hot and cold. We can hardly believe that its author regarded the classification as anything more than arbitrary, nor that it was always applicable. In the limited knowledge of the nature of diseases and the action of medicaments of that day it was a useful guide, and is yet, to some extent, among the medical sect known as Thomsonians. The founder of that sect declared as a maxim of his school, that "heat is life, and cold is death," and formulated his system of medicine upon it. In the cold stage of grippe colds and cold stage of fever, for example, hot drinks and hot remedies were administered, such as the famous composition tea, consisting of hot water, ginger, cayenne pepper, and sugar. In the hot stage the proceeding

was reversed, and cooling and sweating draughts were exhibited. The same course was followed in acute inflammatory diseases, such as pleurisy, pneumonia, and rheumatism, together with such dry remedies of a simple character as experience had proved to be useful. With the larger knowledge of the specific causes of diseases and of the specific virtues of drug-remedies, the classification of the masters became obsolete and has well-nigh passed away in the orthodox system of practice.

Moreover, it is a matter of observation that many mal-conditions of the human body are characterized by a tendency to perspire; the hands and feet are always moist; while other persons have a mal-condition in a tendency to dryness. The skin is dry, and it is difficult to induce perspiration, even by the administration of the most heroic sudorifics. Then again, there exist those with abnormally low temperatures, their temperatures being subnormal even with ordinarily good health; they require abundance of warm clothing, even in moderate weather, day and night; who seldom find the weather too warm for them. It is said of the great metaphysician, Kant, that he was not uncomfortable rolled up in furs in summer-time. On the contrary, there are those who are always complaining of the heat; they wear thin underwear or none in cold weather; dispense with warm wraps and overcoats; must have cool rooms, and live in the open. Surely these well-known facts afford some foundation for the

generalization of heat and cold, dry and moist division of diseases and constitutions.

The same observation holds true in regard to the old maxim that diseases were cured by their opposites. This opinion was advanced by Hippocrates, and rendered into Latin by Galen thus: *Contraria contrariis curantur.* It was advanced by Hippocrates merely as a working hypothesis, or guide in selecting remedies, not as a universal procedure; it is still authority, however, in theory and practice. Its opposite, *similia similibus curantur*, is as frequently operative in practice, since Nature pays little heed to theories in her reaction against morbificants. As a general proposition, both doctrines are demonstrably true; but they have lost dignity as a law of nature, for in practice there are many exceptions to them. For example:

In cases of simple diarrhœa, it is a good rule to give a medicine with tonic or astringent properties; but if the cause be found to be an indigestion, or a chill, or a toxæmia, the indications of treatment would be reversed and loosening medicine, or medicine with corrective properties, neither for nor against the malady, be administered. If, on the contrary, constipation be the malady under observation, the indication would call for loosening drugs, or drugs that increase the peristalsis of the alimentary tract. In such a case the contrary principle is operative. But, again, there are conditions where a relaxing

medicine would be contra-indicated, when it would not be wise to excite an action of the bowels, as in certain states of typhoid fever, or on the eve of an exanthemata, or an attack of zymotic diseases, as measles, scarlet fever, etc., when the bowels should not be disturbed until after the eruption is assured. Had either of these illustrious men been in possession of the light which recent discoveries have shed on the specific nature of certain maladies and their toxic causation, their maxims would have been worded differently. Infection and toxæmia were effects well known to the Greek physician; but the precise *nature of those morbific poisons* was unknown to them and to their followers down to a very recent period, when the microscope came into use in diagnosis.

Finally, Galen was no servile imitator of the Father of Medicine. He was Hippocrates' foremost disciple and most distinguished descendant, and also his most illuminated interpreter. His genius added lustre to the character of his master, which enabled the generations that have followed the better to understand him. M. Le Clerc, has given us the best account of Galen, which we translate as follows:

Galen has been held in the highest esteem, in ancient as well as modern times. Athenée, who was contemporary with him, remarked the consideration in which he held him, introducing him to the banquet (Festin) of philosophers as one of the learned of the

banquet; and he not only gave him credit as an instructor, by the great number of his writings, but added that Galen was not excelled in clearness of elocution. Eusebius, who lived about a century later than Galen, said that the veneration in which that physician was held was carried so far as to cause him to be regarded as a god by many, who rendered him religious homage. Trallian gave him the title of very divine (très-divin). Oribasius, who survived Eusebius, and who was himself a physician, acknowledged the favor in which he regarded Galen, by the extracts which he made from his books, and by the praises he gave him. . . . Artius and Paulus Aginetius closely copied Galen. Avicenna and Averrhoës and other Arabian physicians placed Galen among the highest, and acknowledged their indebtedness to him for his teachings.[1]

We pass over a part of the favorable testimony of the moderns—that is to say, of those who have written since a century or two, and the great number of his commentators, because it is a fact well known and generally admitted.

[1] *Histoire de la Médecine*, troisième partie, livre iii., p. 667.

FOURTH: THE MEDIÆVAL PERIOD

CHAPTER IV

IMPOSTURE MEDICINE

Part I.—The Dark Ages

THERE is much discrepancy of opinion among historians as to the approximate period of the so-called Dark Ages, when they began and when they closed. Hallam rather arbitrarily fixes (and no historian has a better right) their beginning at Rome in the sixth century; but then there was a long period of after-glow, when the light of Greece went out in the West—a period of twilight of several centuries before absolute darkness finally set in,—and the capture of Alexandria by the Saracens, early in the seventh century (A. D. 638). Interest in learning and things of time and sense began to wane in Galen's day at Rome, in the second century. The climax of darkness was reached in Germany in the tenth century, and in France a little earlier. Hallam says that France and Germany began to improve, to awaken, at the advent of Charlemagne—the tenth century,—but the improvement was slow. In England the darkest period did not reach its climax before the thirteenth, nor end until

Galen.

From an ancient Dioscordian manuscript in the Imperial Library of Vienna—*Russell.*

the invention of printing, about the middle of the fifteenth century, at which time the first book, the Bible, was printed in movable type by the inventors, Fust, Schaeffer, and Gutenberg. This is the date fixed by Hallam as the end of the Dark Ages in England,—about the year 1450 A. D.

We know of no more authoritative writer on this subject than Henry Hallam, LL.D. He says:

A rapid decline of learning began in the sixth century, of which Gregory of Tours is both a witness and an example. It is therefore properly one of the Dark Ages; more so, by much, than the eleventh, which concludes them, since very few were left in the church who possessed any acquaintance with classical authors, or who wrote with any command of the Latin language. Their studies when they studied at all were almost exclusively theological; and this must be understood as to the subsequent centuries. By theology is meant the Vulgate Scriptures and some of the Latin Fathers: not, however, by reasoning upon them, or doing much more than introducing them as authority in their own words. In the seventh century, and still more at the beginning of the eighth, very little even of this remained in France, where we find hardly a name deserving of remembrance, in a literary sense; but Isodore and our own Bede do honor to Spain and Britain.[1]

The death of Galen occurred about A. D. 200, at the approximate age of seventy. The

[1] *History of the Middle Ages*, iii., p. 474.

shadow of the Dark Ages had already begun to spread its sinister aspect over Rome before the death of that sage. It must have been hastened by that event, for he was a genius of uncommon brilliancy and a man of simple life and pure morality. It was as if a luminous orb had been extinguished when death put an end to his illustrious career.

Galen must have had contemporaries at Rome, the field of his greatest triumphs as a physician; but his character and genius were so far superior to theirs as to entirely overshadow them in the public mind. The historian of that period finds, therefore, few medical men whose names and achievements are worthy of mention. All, with one notable exception, were servile imitators of Galen's methods, and with his methods they combined the arts of priestcraft and sorcerer. The exception we have to note is Sextus Empiricus, who appears to have been a contemporary of Galen. He rose to distinction and was celebrated more as a skeptic than a medical philosopher. His writings on medicine and philosophy, chiefly of a controversial character, have come down to us. They show much learning and familiarity with the classic writers. We may justly characterize him the prince of the skeptics. He doubted everything in medicine, religion, and philosophy, and even in mathematics. His works contain all the arguments and maxims of the ancient skeptics, and tend to involve in doubt

all the doctrines of science, religion, and philosophy. The work against the mathematicians ("Adversus Mathematicos") has been described as "a perfect storehouse of doubts regarding every imaginable phasis of human knowledge." He could not have been an imitator of Galen, nor a follower except in point of time, for he was a zealous Empiric, and bitterly attacked the methods of the Dogmatists, of which Galen was the chiefest at that time. He was entitled to his name "Empiricus" by the peculiarity of his philosophical views, and personal characteristics

Two hundred years elapse in the reign of the Emperor Julian, before we find the names of another medical man distinguished in his art. That name is Oribasius, and he was distinguished more by his relations to the Emperor than by any contributions he made to medicine.

Nevertheless, Oribasius was a conspicuous character in the beginning of the fifth century. He was a Galenist. He is reputed to have written seventy books, mostly copied from the writings of Galen. He was the first to describe a species of melancholia which he called Lycanthropia. "Those laboring under Lycanthropia," he writes, "go out during the night, imitating wolves in all things, and lingering about sepulchres until morning." Then he describes the symptoms of the malady: "They are pale, their vision feeble, their eyes dry, tongues very dry and the flow of saliva stopped; but they are thirsty, and their

legs have incurable ulcerations from frequent falls."[1] Oribasius' life was full of adventure. Born at Pergamus, and a pupil of the philosopher Zeno, an intimate friend of the apostate Emperor Julian, "who heaped all manner of favors upon him," he shared the perturbating fortunes of that celebrity, and at his death was sent into exile. His commanding genius as a man and a physician, however, soon led to his recall to the court of Valentinian III. His death occurred at Constantinople about A. D. 450.

Among other names not unworthy of note, although imitators of Galen, were Aretæus, Paulus, and Alexander Trallianus. Paulus, of Ægineta, has the distinction of writing the best treatise on Midwifery that had yet appeared. Aretæus wrote creditably on surgery as well as medicine. This was in the beginning of the seventh century. Medicine had long felt the demoralizing influence of the fanatical spirit which was spreading over the Roman Empire like a contagion.

The development of rational medicine has ever been along the lines of observation and induction. Medicine and philosophy have, therefore, marched side by side. Physicians have been the wise men; philosophers have been the great physicians. And when their influence declined at Rome and the West, and the doctrines of Christianity found favor in the minds of the multitude, and were seized

[1] Freind, *History of Physic*, Russell, *op. cit.*

by ambitious leaders of public opinion, the profession of medicine, for the most part, disappeared —to illumine the East. When the Byzantines merged the practice of medicine into theology and the priesthood, the Saracens illuminated their theology with the science of medicine. It was fortunate for medicine that, with the decline of learning at Rome and its provinces, a welcome should have been open to it in the East, under the rule of the Mohammedans. It was here that medicine again began to flourish. It was here they introduced the works of Hippocrates and Aristotle and the incomparable Galen. The works of Aristotle were said to have been introduced to the Mohammedans of Syria in the second century, and several centuries later they taught their principles in the schools of Spain, France, and Italy. This was in the West. Dean Milman says that the Aristotelian philosophy, under the escort of medicine, "subjugated in turn Islam and Christianity. Physicians were its teachers in Damascus and Bagdad, in Paris and Auxerre."[1] "As in Syria of old," continues the Dean, "so now in France and other parts of Christendom, philosophy stole in under the protection of medicine. It was as physicians that the famous Arabian philosophers, as well as some Jews, acquired unsuspected fame and authority. There is not a philosopher who has not some connection with medicine. The trans-

[1] *Hist. Lat. Christianity*, viii., p. 243.

lators of the most famous philosophy of Averrhoës and Avicenna were physicians: metaphysics only followed in the train of physical science."[1]

Part II.—Medicine and the Dark Ages

The events which followed the general acceptance of Christianity at Rome would have surprised its divine Author could he have lived to see it. It is impossible that he could have foreseen the uses to which his spiritual views would be put by the doctrinaires and system-builders of a subsequent age. He clearly overestimated the common-sense of his disciples and followers. Men of genius, far-sighted, ambitious for glory, for profit and power, seized the occasion to build a spiritual empire—a Kingdom of Heaven on earth,—that should rival in splendor the pomp and power of old Rome, which was then on its decline. They were successful, but at the expense of the ideals of life and duty which Jesus promulgated, with the result to plunge the world into an abyss of darkness and pandemonium of warfare, and disease, vices, and crimes, of which the Christians became the chief actors and sufferers, that the world had seen—so horrible, indeed, that many historians will not soil their pages by transcribing them. Moreover, we are fully warranted in this contention by the course of the early saints and the lives and habits of the sect known as

[1] *Hist. Lat. Christianity*. viii., pp. 244–245.

Christians which followed the death of Jesus. They formed at first simple communities, lived simple, unostentatious lives, having their own quiet places of worship, taking no part in public affairs, given to acts of charity among people worse off than themselves; living to do good, to cheer the afflicted, to help the unfortunate, and to spread the "good news" among the wretched, poor, and outcast, the blessed hope of life beyond this vale of woe, as the inheritance of such as believed in, and accepted the assurances of, their Lord and Master. All about Rome in the first century, according to Eusebius and Origen, as cited by the learned and impartial Mosheim, the sect called Christian became noted for their sweet lives and pure morality. Their numbers increased rapidly, at first among the destitute, unlettered, plebeian class, but after a few generations, among the better classes, and finally embraced some of the ruling class. Then came the cruel persecutions by the temporal authorities, fearing their own religion might be undermined; then came also organizations among themselves, not only for convenience of work and discipline, but for self-protection and mutual helpfulness. As their numbers grew their organizations grew also, and accordingly increased in power and influence. Many men of philosophic mind joined this sect, accepting the Christian faith, but holding fast their philosophical views, since there was nothing in their philosophic thought

inconsistent with the religious life and character. Nevertheless, it was this fact that led ultimately to division and dissension among Christian bodies, and not only division, but to the gravest abuses known to a wild fanaticism, of which astute demagogues in the Church took advantage to promote their own selfish ends.

To the student of human nature it must be evident that character is of slow growth. Purpose may change in a moment, by a vision in the sky, like Constantine's or Paul's, or by conviction, but character never. Character partakes of personality; it does not change with a change of opinion, or belief, or religion, as one changes one garment for another of different hue or pattern. The man who does a wrong or commits a crime to-day and repents to-morrow is the same man that he was before. The barbarian may accept Christianity for gain, or for fear of eternal torments, or some other dreaded punishment, but at heart he is a barbarian still. The congenital thief or robber is the same in character after conversion to a religious cult as he was before. We repeat, character is a fixed element, and is not subject to sudden changes for good or bad, from any cause whatsoever. It is as slow of change as the segregation of the rocks.

This, in fine, is a brief, succinct sketch of the causes that led to the decline of the art and science of Medicine, and of learning and philosophy as well. In the ease with which the goal of life could be se-

cured and eternal life in heaven realized, there was no need of such things. Beginning with the ignorant plebeian, unlettered class, this faith in the course of a few centuries infected all classes and became the dominant faith of Europe, and continued its dominancy until long into the middle of the sixteenth century, when it began to wane under the magnitude of evils itself had engendered, existing to-day only as a gilded skeleton of its former pride and glory.

Near the close of the fifth century, Christianity had possession of Western Europe. The light of reason had been put out in the councils of Church and State. The earth, the air, and the sea, in the opinion of Christendom, were full of invisible beings—gods, angels, and devils were present everywhere. The lunatic was possessed of a devil. "If a spring discharged its waters with a periodical gushing of carbonic acid gas, it was agitated by an angel; if an unfortunate descended into a pit and was suffocated by mephitic air, it was by some demon that was secreted there; if a miner's torch produced an explosion, it was owing to the wrath of some malignant spirit guarding a treasure, and whose solitude had been disturbed." Spirits and disembodied dead appeared everywhere; there was no cavern that did not hold demons; "no grotto or cave thicket in which angels and genii had not been seen"; firedamp and the air of swamps, morasses, and stagnant waters were enlivened with visible

demons of "abominable aspect." "The explosive gases of mines took on the shape of pale faces of malicious dwarfs, with leathery ears hanging down to their shoulders, and in garments of gray cloth."[1]

It may not be unprofitable to dwell at further length on the wild religious fanaticism that swept over the Roman Empire following the advent of the divine Nazarene, and the ultimate disruption of that Empire, since it had a close bearing on the progress of medicine. It is clearly a psychological phenomenon with which we have to deal; but its causes were in no wise related to the supernatural, in the strict sense of that word. Writers have assigned widely different causes for Rome's decline, but it seems to us none of them has discovered the underlying proximate cause of that momentous event. Carlyle designated the French Revolution of '93 "a spasm of virtue." The fall of Rome was more than that: it was a struggle for life of a people; a despairing cry to escape miseries that had become unendurable. Gibbon says Rome fell from moral disintegration of society, which is true enough. The distinguished Italian historian, Dr. Ferrero, declares with doubtful justification, that the separation of Tiberius from his beautiful wife, Julia, daughter of Augustus the Emperor, was a cause.[2] The Rev. Dr. Theodore Woolsey[3]

[1] Draper's *Intellectual Development of Europe*, p. 301.

[2] *Columbia Lecture*, New York, January 6, 1909.

[3] See his work on *Divorce and Divorce Legislation*.

declares its fall was due to divorce and the consequent breaking up of the family, which is partly true. None of these causes can be accepted as the primary efficient cause. They were effects rather than causes. As a matter of fact, Rome was finally, after successive efforts, overrun by the Huns and Goths, the Visigoths, the Franks, and other barbarian hordes that occupied her provinces, as stated by the learned Gibbon. We maintain, nevertheless, that the efficient cause lies deeper than that which is a mere matter of observation. To find that, let us recall the condition of Roman society following the second century of the Christian era.

Roman civilization had reached its zenith; Roman society had already lapsed into a state of mental apathy. The light of Athens was subsequently put out by the conquests of Alexander and Philip of Macedon, when it ceased to illumine the world. Political ambition, the love of wealth, of luxury, of power and conquest; the contempt of justice and human rights, were bearing legitimate fruits at Rome, namely, the grossest inequality. The popular ten thousand, about two per cent. of her population, owned the whole of Rome; the rest were a subject class, plebeian and slaves. It was like a pyramid standing on its apex. Without strong outside braces and supports it must fall. There is a degree of poverty that is as bad as leprosy; it was prevalent at Rome. At Rome, society was divided into two

classes: the rulers, or patrician; the plebeian, the slaves and barbarians. Faith in man was dead; faith in the gods was dying; virtues were disappearing. High ideals no longer influenced the motives of the ruling caste. When an individual lapses into this mental condition he has begun to die; it is no less true of a people and a nation. "Around the shores of the Mediterranean," writes Dr. Draper, "the conquered nations looked at one another, partakers of a common misfortune, associated in a common lot. Not one of them had found a god to help her in her day of need. Europe, Asia, Africa, were tranquil, but it was the tranquillity of despair."[1] The rich of the capital were rotting in the vice of pomp and luxury; the rest of her people were sunk in pitiless poverty, and the direst, most hopeless woe. The family was going to pieces because the daughters of the rich had patrimonies which made them independent of their husbands. Ignorance and want in the humbler classes, excess of luxury and selfish indulgence in the higher or ruling class, bred endless forms of vice and disease—legitimate products, every one. Despair—of suffering without prospect of relief, of dying without hope of justice—had settled down upon the multitude like a pall. The light that the race of men needed to illuminate the darkness that besets its pathway had been wanting. There was no hope of better-

[1] *Intellectual Development of Europe*, p. 196.

ment in the prospective to beckon it on. Life for the common people at Rome had so many hardships, was enveloped in so great a darkness, was full of so many trials, that to escape them by death, could they but find in the beyond hope of relief from suffering and oppression—to escape from a life which had so few joys, so many miseries, so little hope in any turn of events—was a desire that had taken possession of the multitude. Christianity, pure and simple, had thriven under its persecutions, but waned and became corrupt when they were withheld. And it was this condition of apathy on the part of the public mind, toward the subsistence of a State from which for them there was nothing to hope or to expect, that ultimately made its stays weak and effeminate, and an easy prey to an aggressive foe, by which she was subsequently overrun. The converts of the new faith would fight for the glory of God, but not for a State substantially pagan, oppressive, and hateful. The props and stays of the inverse pyramid were thus being gradually undermined with results which the world has seen.

Such, in a few words, was the physical and moral condition of the people in and about Rome two centuries after the advent of the divine Nazarene. One cannot wonder that the great heart of Jesus was moved with compassion for the suffering multitude, the poor, the outcast, the diseased, the despised; nor that he was "touched with a

feeling of their infirmities," as St. Paul wrote; nor that he wept at the sight of the hopeless miseries of the world. Neither can one be surprised, in view of the awful condition to which society had drifted by centuries of war and oppression, of ignorance, injustice and inequality, with no hope of abatement, that Jesus should counsel temporal things to be left in the hands of the State, and that His followers should turn their attention to, and place their hopes upon, a life to come, in a sphere beyond and above mortality, where greed and selfishness, disease and crime, war and its cruelties had no existence. It seems a pity that Jesus' advice was not taken and scrupulously followed. The overpowering sympathy of Jesus, the love that animated his heart toward humanity, a sympathy of such breadth and tenderness as to command the reverent admiration of the world, was a phenomenon in the history of mankind.

The library established by Ptolemy, with its rich treasures of MSS. and works of art of every conceivable variety, the accumulations of two hundred or more years after the death of that great pagan, was first burnt by Cæsar in the first century of the Christian era, and rebuilt by his paramour, Cleopatra. Such books as escaped destruction were turned over to her to form a nucleus of a new library. It was again destroyed nearly three centuries later, by zealots of Christian-

ity in the reign of Theodosius. The destruction of the library, with its pagan treasures, was this time at the instance of the Christians, who were in a majority at Alexandria, led by Theophilus, "a bold bad man," as Gibbon calls him, who affected to be horrified at the presence of idols and the practice of idolatry in this magnificent Temple of Serapis. Again it rose from its ashes; but in place of pagan emblems and objects of worship, it was adorned with those of Christianity.

We will not undertake to describe in detail the change. Works of art of priceless value had accumulated. Mosques and temples had been converted into churches and Christian institutions. The cloister was filled with nuns and virgins; the monastery with monks and priests, whose chief duties were the performance of the rites of religion. But a great catastrophe awaited them. A few centuries elapsed, and a representative of the Caliph of Egypt, in the person of Amru, with an army of Moslems, appeared before the city with the cry of "One God and Mahomet is His prophet," demanding its surrender. Being refused, its gates were broken down and the city was at the mercy of the invaders. The religious institutions were the first to suffer. The panic of the monks and virgins was indescribable. The centuries had served again to equip the library with manuscripts and art treasures almost equalling those of its former glory. It was sacked and its treasures destroyed—but

not wholly. The monks and many of the soldiers secured some of the more valuable manuscripts of the Greek poets, physicians, and philosophers, and escaped with them into Arabia. This was A. D. 638. In his report to the Caliph, General Amru said:

I have taken the great city of the West. It is impossible for me to enumerate the variety of its riches and beauty; and I shall content myself with observing that it contains four thousand palaces, four thousand baths, four hundred theatres, or places of amusement, twelve thousand shops for the sale of vegetable food, and forty thousand tributary Jews. The town has been subdued by force of arms, without treaty or capitulation, and the Moslems are impatient to seize the fruits of victory.[1]

The library was the greatest in the world, the accumulation of the pagan and Christian writers, painters, sculptors, and the art treasures since its former wreck; its volumes in parchment MSS. numbered seven hundred thousand. Amru was said to have looked with sympathetic interest upon these works of the masters, and asked his superior what he should do with them. The answer was characteristic of the fanatic: "If these writings of the Greeks agree with the Book of God, they are useless and need not be preserved; if they disagree, they are pernicious and ought to be destroyed." "The sentence

[1] Gibbon's *Decline and Fall of the Roman Empire*, vol. v., pp. 356–357.

was executed with blind obedience," says Gibbon; "the volumes of paper or parchment were distributed to the four thousand baths of the city; and such was their incredible multitude, that six months were barely sufficient for the consumption of this precious fuel."[1] But this stupendous mass of literature was not all destroyed. Again large numbers of MSS. fell into appreciative hands and found their way to Arabia, Italy, and other parts of Europe. To them the world owes, therefore, such works of the medical and philosophical writers of the ancients as it possesses. It was this circumstance that diverted the progress of medicine into Arabia; and but for it we would never have known, probably, a Rhazes and Ali-Abbas, an Avicenna, nor an Averrhoës; and it would have been long before the Arabians and the Jews would have had the advantage of reading the works of Galen,

[1] It would not be fair to truth, after giving this brief statement of the sack of the great library at Alexandria, on the authority of Gibbon, to ignore the fact that he did not wholly assent to it. His account is based on the authority of the learned Abulpharagius. The rigid sentence of Omar is repugnant to the sound and orthodox precept of the Mahometan Casuists. Gibbon says: "They expressly declare that the religious books of the Jews and Christians, which are acquired by the right of war should never be committed to the flames; and that the works of profane science, historians or poets, physicians or philosophers, may be lawfully applied to the use of the faithful."—*Decline and Fall of the Roman Empire*, vol. v., p. 357. Abulpharagius himself, with candid wonder, confesses that the account it was his duty to record was a most extraordinary proceeding. —*Ibid.*

Aristotle, and Hippocrates, or of Homer, Plato, and other gods of Greece.

The Mohammedans were not less fanatical than the Christians, but their fanaticism was tempered with a love of literature and respect for the learned. The following are some of their epigrammatic sayings:

> The ink of the doctor is equally valuable with the blood of the martyr.
>
> Paradise is as much for him who has rightly used his pen as for him who has fallen by the sword.
>
> The world is sustained by four things only: the learning of the wise; the justice of the great; the prayers of the good; and the valor of the brave.

According to the historian Freind, Ahrun appears to be the earliest Arabian writer on medicine. He was a priest at Alexandria. His work on Pandects, though lost, is said to have contained the first description of small-pox, the first appearance of which in Europe was at the siege of Mecca by Mohammed, in the seventeenth century. Rhazes also wrote a treatise on that disease, and is generally conceded to be the first to have given a full and accurate description of it. Our knowledge of his writings comes through his contemporaries, and indicates that the Arabians were familiar with Greek medicine and practised it with the success which distinguished the Greeks themselves.

Besides his treatise on small-pox, with his

fanciful conception of its nature and pathology, of interest only to the curious, Rhazes wrote twelve treatises on chemistry, tinged with alchemy, of small importance to chemical science. At the same time it must be admitted that he was a man of attainments and that he acquired a great reputation in his day. The full name of this physician was Mohammed-Ibn-Zakaria-Aboov-Bekr. He practised at Bagdad, and died A. D. 930. He appears to have been a Persian, born at Irak-Ajemi, about A. D. 830.

Following Rhazes comes the name of one of the most learned and distinguished men that Arabia produced in that age, the tenth century. We refer to Avicenna, who was born at Bokhara in 980 A. D. Avicenna seems to have been remarkable as a genius, and a sort of prodigy in his youth. He is said to have been a thorough master of Moslem theology and of the chief branches of mathematics and physical science then known, including arithmetic, algebra, Euclid's "Elements," and the "Almagest" of Ptolemy, before he was sixteen years of age. It was at this age that he began the study of medicine and the metaphysical writings of Aristotle. He made no contributions to the science or art of medicine, as we can ascertain, yet he was eminent as a scholar and a man of learning, as has been observed. He earned the title of "Scheikh Reyes," or prince of physicians. Being of unstable, eccentric character he was always in trouble and lived a

chequered career, dying at the age of fifty-eight, in the year 1036. His influence over his contemporaries was potent for many centuries, and almost as despotic as was Galen's, whose scholarship he possessed, but not his breadth of character. "He translated into the Arabic the works of Aristotle, and from this Arabic edition they were rendered into Latin by Michael Scott in the twelfth century. This is the same Michael Scott whose tomb is shown in Melrose Abbey, and whose name has been perpetuated by his great namesake, Walter Scott, in the "Lay of the Last Minstrel."[1]

Avicenna belonged to the Dogmatic sect, humbly following the practice, and holding fast to the precepts and principles, of the master, Galen.

Among other names celebrated in medicine in Arabia was Serapion, who lived in the ninth century. He is supposed to have been a native of Damascus. He wrote a treatise on medicine in Syriac, which was translated into Latin under various titles, such as "Aggregator," "Breviarium," and "Therapeutica Methodus," in which he reviews the Greek authors and gives an account of the contributions to the medical art that had been made by the Arabians. These chiefly consisted of additions to the materia medica and improvement in the composition of medicines—Pharmacy.

[1] *Cyclopedia of Biography.*

A distinguished contemporary of Serapion was Alkheudix, the subtle philosopher, the learned physician, and the Greek astrologer. He was a man of varied attainments, not so much in medicine as in the development of fanciful ideas pertaining to that art, the modus operandi of medicaments, and the dosage, to the regulation of which he applied the rules of geometry and musical harmony.

Another name justly distinguished among the Arabians was Ali Abbas, who, for his skill in ministering to the sick, acquired the title of magician. Like his predecessor, Serapion, he wrote a treatise on medicine, giving an account of the state of that art in his day. Perhaps he was more distinguished by his name than by his medical writings. According to the learned Sprengel, his full name was Al-Hussain-Abou-Ali-Ben-Abdallah-Ebn-Sina.[1]

Freind, Haller, and other historians of this period, mention the names of two other Arabian physicians, both of the same name, Mesue, one of whom lived in the eighth century, the other in the ninth, who are worthy of mention in this place. They are said to have been Christians, and to have practised their profession at Bagdad. The later Mesue made translations from the Greek physicians; the earlier wrote on pharmacy and materia medica. His writings were received

[1] Sprengel, *Histoire de la Médecine*, ii., p. 305.

with great favor and continued to be an authority for many centuries.

Then there is Albucasis, an Arabian, who attained distinction at this last period, the ninth century, a physician so modest and unpretentious as to conceal his personality, or his place of birth and residence, from his posterity completely. He is known to posterity, however, as a physician distinguished in surgery. In the art of surgery he acquired as great a reputation as did his predecessor, Avicenna, in that of medicine. His books on the art of surgery were received as standard and used as text-books in the schools of medicine for many ages of the Christian era, or down to the revival of letters.

Two other Arabian physicians belonging to the tenth and eleventh centuries should not be omitted from this sketch, namely, Avenzoar and Averrhoës. Their names are Arabic, but they lived in Spain. Avenzoar was born at Seville, Spain, and was distinguished chiefly by being the oldest physician in the annals of medicine. He is said to have lived to be one hundred and thirty-five years old. He wrote in the Arabic language, which would indicate his Saracenic origin. His treatise was chiefly a compend of medicine, entitled "Thaissyr," according to Freind. His work was esteemed by the critics for originality,—for while he was a Galenite, like all his Arabian predecessors, he did not hesitate to differ from Galen, should his own experience and observation

lead him to do so. Moreover, he was the preceptor of his great contemporary and successor, Averrhoës, a fact which contributed to his celebrity.

Averrhoës was a native of Cordova, Spain, but like his preceptor, Avenzoar, was of Arabic extraction. His reputation seems to have been based on his literary and academic acquirements, rather than as a practising physician. But medicine was one of his accomplishments. His knowledge of the works of Hippocrates and Galen was acquired through Arabic translations from the Greek language, by which circumstance he is supposed not to have been acquainted with the Greek, a conclusion by no means justified by induction or logic.

Although credit has been given to these physicians for character and learning, many of them resorted to superstitious practices as aids or adjuncts to more rational procedures, being the inevitable results of introducing occult or mystical powers into the phenomena of disease, and the recognition of spiritual forces in the affairs of men. Sprengel has given a very interesting account of this form of therapeutics, which was in vogue among Christians—that is, in all Europe from the second to the seventeenth century and later; indeed, it is not altogether extinct to-day.

Trallianus, or Alexander of Tralles, as he was called, to whom we have referred as a man distinguished in medicine after the fall of Alexandria at the hand of Amru, is said frequently to have used magic in the cure of maladies. For

example, in the cure of colic he used "a stone in which the figure of Hercules killing a lion was engraved." Among his remedies for epilepsia was "a nail taken from the arm of a malefactor who had been crucified." Another of his cures of colic was certain Greek words taken from Homer, engraved on a gold plate, to be used when the moon was waning. For the cure of gout he recommended a plant over which the following words were pronounced: "Jao-Saboath-Adona-Eloi"; for quotidian ague he used an amulet consisting of an olive leaf on which were written in ink the following letters: "KA-POJ-A."

At this period, the twelfth century, Arabia had reached her zenith and was on the eve of her decline. A strange spectacle is presented to one's vision as he surveys the progress of learning and science from Athens, one thousand years B. C., to the decline of Arabia, a stretch of vista of more than two thousand years. What a spectacle it presents to the philosophic mind! It had been a struggle for power and spoils between despots of opposing and irreconcilable ideas, animated with an ambition to wield the sceptre and appropriate to personal ends the advantage and emoluments of nations and peoples of diverse interests. The temporal rulers of Rome cared not for science and philosophy; they wanted the earth and its treasures, apparently blind to any higher conception of life and living. At an opportune time Jesus of Nazareth came

upon the scene, as we have seen, the simple illuminated man of Judea, with visions of a higher destiny for man than war and conquest. He brought into certain reality, by the events surrounding his death, the truth of a future life after death, that shall be free from the perils and sufferings and sorrows of the earth-life. It had the effect on the common minds of Judea of a direct revelation from the Eternal. It led to a change in the direction of their thought and the current of their lives. It gave them an ideal by which to order their lives and living, with consequences too well known to be detailed here.

Part III.—Position of the Church

Medicine had a brief but brilliant period in Arabia. At the period of which we are writing, the eleventh century, it was on the decline, as evidenced by the growing distaste for learning, and the introduction of magic in its practice—largely through the influence of Christianity.

To the institution of the Church, with its abuses and shortcomings, we must concede many merits. While it was the enemy of learning for the people and the propagation of knowledge of science and philosophy, it became in the twelfth century a nursery of these studies for the higher clergy—the higher clergy only. This privilege was denied to the lower orders of them, which as a consequence became greatly degraded and continued so until after the Renaissance.

Macaulay has given a graphic picture of the degraded condition of the priests in England prior to the Reformation, in the third chapter of his "History of England," to which we refer the interested reader. But the Bishops and Prelates of Rome began to acquaint themselves with learning. It began to be regarded as unworthy the position and dignity of a Pope or a Bishop of the Roman Church to be ignorant. He must not only be equipped with a knowledge of the Scriptures and of the customs and usages of his order, but he must possess an acquaintance with what they termed profane learning, which chiefly embraced the writings of physicians and philosophers of the ancients. To this end schools were established in various parts of Europe chiefly for the education of clergymen, which ultimately grew into universities. The curricula of the schools were prescribed at Rome. At first all learning was embraced under the heads of the several liberal arts, three of which constituted what was called the Trivium, and the remainder the Quadvium; to the former belonged grammar, rhetoric and dialectics; to the latter, arithmetic, music, geometry, and astronomy; to these were afterwards added theology, jurisprudence, and medicine. The first seven constituted the faculty of philosophy, and with the remaining three constituted the four faculties; hence came the degrees of doctorships.[1] It was

[1] Mosheim's *Institutes of Ecclesiastical History.*

not uncommon for ambitious ecclesiastics to study medicine, even though they might never practise the art. It was included in a liberal education and indispensable to the proper equipment of a "medical clergy."

It will thus be observed that the leaven of science had begun its work within the hierarchy at Rome as early as 1200 A. D., and that it took three hundred years or more to produce a reformatory impulse of sufficient momentum to arouse the slumbering common-sense of Europe.

We now take leave of the Church and its ecclesiastics, its sacred remedies, and its medical clergy, to discover, if possible, what "profane" medicine is doing. It is now near the close of the twelfth century, and is a most dismal period. Learning is doled out, like bread in a famine, to a few of the hungry with judicious parsimony. It is rare that a physician appeared in the darkness of sufficient reputation to leave a name to the chronicler of events. The medical schools at Alexandria, following its later conquest by Amru, had declined and become extinct. Some attempts were made in Italy to revive the study of medicine, with the result of founding the Neapolitan Schools of Monte-Cassino and of Salerno, the most notable performance of which was the writing by the physicians of Salerno of a poem on dietetics, entitled, "Medicina Salernitana," and addressed to Robert of Normandy. This brochure

met with so much favor as to be commented upon by the distinguished Arnoldus Villanova; it gives, according to Bostock, a good account of the state of medicine in Italy at that time. Bostock ascribes its authorship, on the authority of Haller, to John Milan. Haller avers that "the book ran through *editiones très numerables*."[1]

About this period flourished another physician of considerable note, Actuarius, so named by the office that he occupied in the court at Alexandria. His writings do not seem to have been very important, being chiefly compilations from the Greek and Arabian physicians, in which he mingled views and observations of his own. The real name of this physician is unknown. He is accredited with the distinction of being the first to use chemistry in the preparation of medicine, and of adding to the materia medica from Arabian sources.

Chemistry at that era was in its simplest state. The ideas concerning the constitution of matter were still such as had been promulgated by Thales and Democritus. But speculation was rife and the minds of the curious were occupied with alchemy, which was the forerunner of true chemistry. The idea of transmuting the baser metals into gold, inspired by the hope of gain rather than fame or the love of discovery, had taken possession of a class of men known as Alchemists, who for many generations prosecuted their labors

[1] *Hist. Med.*, p. 45.

in that direction with great industry. The same class of men were also interested in finding a panacea for all the ills of the body, which would prolong life indefinitely, or banish death absolutely. This medicament was the famous "Elixir of Life," to discover which the Alchemists devoted their efforts with the utmost patience and diligence. The fad, or delusion, or whatever it may be called, seems to have haunted the imagination of those embryo chemists for several centuries. The vagary, indeed, is not altogether extinct to-day, among certain pseudo-scientists. The craze had no doubt some salutary effect in preparing the way for true chemistry, the real beginning of which was the discovery of the nature of what the ancients called "Fixed Air," and the true nature of the process of combustion, which had been regarded as due to the fanciful element called Phlogiston. But this was the dismal period. There was no science, and no effort at scientific discovery, and the imaginations of the wisest ran riot with their reason. They had lost the method of observation and induction, which the Father of Medicine and others possessed, which resulted in such brilliant achievements, and were given over to that of intuition and the visionary, which the fathers of the Church had promulgated with such zeal and pertinacity since its foundation, and with such dire results.

The famous medical school of Salerno, the

first European university, of the ninth century, to which we have referred, continued to flourish for some years after the decline of the Saracenic universities of Spain, but without producing any medical men of note or contributing anything to medicine, at least outside of the ecclesiastical profession. The school has the distinction, however, of being the first in the history of the world to pass upon the qualifications of its pupils, and to issue diplomas to such applicants as passed their examinations. It was the only medical school at that time in Europe, and it continued to maintain its reputation until the end of the thirteenth century, when it declined with the rise of the larger and more popular universities of Paris, Montpelier, and Bologna. There was at this time, it should be noted, a more general interest evinced in knowledge, and especially medical knowledge.

The following century, that is to say the fourteenth century, was characterized by an important advancement in the interest of learning by the revival of the study of anatomy, which had been so long neglected. We have seen that under the strong hand of Ptolemy, the study of anatomy was a prominent part of the Alexandrian School of Medicine. It was at that school that the celebrated Galen acquired his knowledge of anatomy. It was there, under Herophilus and Arasistratus, that dissection of the human body was made by orders of the great

Ptolemy, and also vivisection of criminals under penal sentence, by which a knowledge of anatomy and physiology received a strong impetus. And now, after the lapse of many hundred years, dissection of the human body is again permitted. In 1313, Mondini, a professor of medicine in the University of Bologna, which was founded two centuries preceding 1113, made bold to dissect two female subjects, and to publish an anatomical description of the human anatomy of rare merit, which was used as a text-book in medical schools at a later period. Medical historians give this celebrity high praise for genius. Bostock declares, voicing the sentiments of Freind, that Mondini is 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."[1]

Following the line of sequence we have to record here a circumstance of more than ordinary interest to the English-speaking world. We refer to the advent of a man named Gilbert, latinized after the manner of those days, Anglicanus. He was a contemporary of Mondini, and the first Englishman to become sufficiently celebrated, down to this time, according to Bostock, to have entitled him to a brief mention in the history of medicine. We are not unmindful that Roger

[1] *Op. cit.*, p. 56.

Bacon preceded Gilbert many years; but the French claim him, and he was English only because he was by birth a Scotchman. Gilbert gave to the world a work entitled "Medicinæ Compendium," in which the theories of Galen were freely discussed with subtle distinctions and disputations upon matters of trifling interest to the profession. The medical profession is chiefly indebted to Gilbert for a few useful additions to materia medica.

Roger Bacon

An incomparably greater man, whom England claims as her own, was born at Alchester a century earlier than Gilbert Anglicanus. His name was Roger Bacon. He also came from the North and was a product of the bogs and moors of Scotland; and although a devout Christian, was a man of independent character, sturdy convictions and of great ability. He was sent to Oxford at an early age and acquired a knowledge of Greek and Latin; spent some time also at the University of Paris, where he studied the works of ancient philosophers, including those of the prince of philosophers, Aristotle, in the original. He was called Doctor Mirabilis, (the wonderful doctor). While he was a philosopher rather than a physician, like all philosophers, the science of medicine formed a part of his preparation for the discoveries with which he enriched the world.

Roger Bacon, whom Hallam declared to be "the truest philosopher of the Middle Ages," opens his great work, "Opus Magnum," with these memorable sentiments:

There are four impediments to knowledge: First, too great dependence upon authority; Second, allowing too great weight to custom; Third, the fear of offending the vulgar; Fourth, the affectation of concealing ignorance by the display of a specious appearance of knowledge.

These sentiments are truisms everywhere in all times; then, the utterance of them was revolutionary, and it is not surprising that he was called to Rome to give an account for it, since the oracular, "Thus saith the Lord," or "Thus saith the Vicar of Christ," or "Thus saith the Council of Cardinals," were then the sources of knowledge and the authority for everything needful to know. Bacon's learning, however, was tempered by a high degree of respect and reverence for spiritual authority and the Church, which, while it did not secure him immunity for his offence, gave him a lighter sentence than he would otherwise have received. An obsequious reverence appears conspicuously in his letter to Pope Clement IV., explaining to that dignitary his philosophy. In it he writes: "If it were not for the reverence which I have for the Vicar of Jesus Christ, I would not have undertaken what I do."

It was at Paris University that Bacon acquired

the sobriquet of Doctor Mirabilis—wonderful doctor—from the versatility of his talents and the variety of his knowledge. His studies embraced many branches of physical science—Astronomy, optics, mechanics, and chemistry, or, more likely, alchemy; and of the languages, Greek and Latin, in each of which he was a master. Had he quietly attended to his various studies and discoveries it is likely that he would have escaped persecution. But he was ambitious to become a Friar, and connected himself with the Franciscan Order, between which and that of the Dominicans there was a bitter feud. Nevertheless, he was persecuted by Jerome of Ascoli, the General of his own Order, who regarded his works as the instigation of the Devil. To this charge Bacon was defiant. "Because these things are above your shallow understandings, you immediately declare them works of the Devil," he replied. "Theologians and Canonists, in their ignorance, abhor these things as works of magic and unbecoming a Christian," he again wrote, which did not tend to placate his enemies. When, therefore, after the death of the gentle Clement IV., Jerome of Ascoli succeeded to the Pontificate as Nicholas IV., Bacon was condemned to ten years' imprisonment and consigned to a monastic dungeon, dying soon after the expiration of his term.[1] Such was the penalty of incurring the Odium Theologicum in the fourteenth century!

[1] *Vide* Milman, *Latin Christianity*, viii., p. 293.

Among the achievements of Bacon may be mentioned the detection of the error in the Julian Calendar, and "the recommendation of a more complete rectification than that three centuries afterwards was effected under Gregory." He was the first to maintain the spherical form of the earth, which at his time was still held to be flat; he revived the inductive method in science; he discovered the use of magnifying glasses and the camera obscura; his discoveries in chemical manipulations were the forerunner of gunpowder; his studies of the phenomena of the tides show that he had a true conception of their causation. His genius was prophetic. He declared that the time would come when men would navigate the atmosphere, and vehicles be propelled without visible means of power.

With all his learning and wonderful abilities, Roger Bacon was not altogether free from the vagaries and superstitions of his time. The idea of the "philosopher's stone" possessed him, and he confidently looked forward to its discovery as a means of the prolongation of human life, a desideratum which no philosopher will regard as desirable in the present condition of the world. He looked for a medicine that would destroy the baser element, remove the corruptions of the human body and render it less predisposed to disease. This, he says, is the *corpus ex elementis temperatum.*

The search for the "philosopher's stone,"

or the "vital elixir," was a craze with Bacon. "He gravely relates how a ploughman found a jar full of yellow water, upon drinking of which his whole nature so entirely changed that from a clown he became a courtier, handsome and clever, and lived eighty years in the service of the court." Such was one of the wonders of potable gold. The story of van Helmont and his pot of corn appeals less to one's credulity than Bacon's potable gold.

It was an age of intolerance, and it is no wonder that Bacon with his intellectual independence and strongly aggressive disposition should find himself in conflict with the powers at Rome. Men with ideas inconsistent with the dogmas and doctrines of Rome, and that system of philosophy known as the Scholastic, which was established as authority by vote of Council in the previous century, were objects of suspicion. If they be prominent so much the worse, for they were more likely to infect the people with their ideas, which naturally led to their suppression as dangerous to the public good. Accordingly, Bacon was suppressed and his career cut short. The court of Rome found him guilty of inculcating ideas inconsistent with the Oracles, and condemned him to ten years in close confinement. The enforcement of this decree practically ended the career of one of the most remarkable men in all Christendom.

The history of all peoples whose religion is

founded on the Oracles is the same. Whenever and wherever the claim has been advanced and generally accepted of a source of truth above reason or the limits of the rational faculties, bigotry and persecution have followed. "Whenever obsequious reverence is substituted for bold inquiry, truth, if she is not already at hand, will never be attained," writes Hallam.[1] Historians may excuse and apologize for an Ecclesiasticism as a necessity to the development of society, so long as they find it more consistent with charity so to do; but we insist that whatever impedes or impairs the progress of civil and religious freedom is an evil of august proportions.

A man of genius arose at this period in the person of Guy de Chauliac, who was born at Chauliac, France, early in the fourteenth century. He practised medicine and surgery at Avignon, and was physician to several of the Popes. Besides his rare surgical skill, which certain partisans claim to be hardly surpassed to-day, he wrote an excellent treatise on medicine entitled, "Inventarium Partis Chirurgicalis Medicinæ," which was held in high esteem by medical institutions for several generations. He is said to have been a bold operator, which gave him the celebrity which he attained. Surgery was at that time mostly in the hands of barbers, and Chauliac did more than any man of his time to restore

[1] *History Middle Ages*, vol. iii., p. 349.

the art to its early dignity. Hallam speaks of his "History of Surgery" with high praise, but makes no mention of his marvellous exploits with the scalpel, which, according to some modern professors of medical history, bordered on the miraculous for that age, or this. We think the claim is questionable. Had he possessed the genius which has been attributed to him he would have left a following to perpetuate his fame, if not his genius. Chauliac died about 1370.[1]

Part IV.—The Plague

It was at this period that the malady called sweating sickness, or *sudor anglicus*, or *Bestes britannica*, broke out in England and thence spread to other parts of Europe, producing the wildest consternation wherever it appeared. The phenomenon was not new. Plagues had swept over Europe and Asia many times before in the history of the world, with similar ravages to this one. Early in the year 1300 a malady similar to the sweating sickness broke out in China, taking off fifty per cent. of the population wherever it occurred. And now in the fifteenth century it appeared in Europe. It was characterized by coldness, heat, loss of strength, great prostration, palpitation of the heart; small, frequent, intermittent pulse; brown or black tongue, miliary eruption—in brief, all the signs and symptoms of blood asphyxiation,—and ran a rapid course,

[1] *Nouvelle Biographie Générale.*

often ending in death within twenty-four hours. Its mortality was fifty per cent. Its causation was attributed to various sources by different observers, but generally to "filthy habitations and habits, gross errors of diet, impure water . . . and the Jews, a perpetual plague to Christians." From England the epidemic passed over into Germany, producing an alarm which "surpassed description, and bordered on maniacal despair." The disease was so fatal, and its course so rapid, that often little effort was made to save its victims, and such efforts as were made were usually worse than none at all. The opinion of the celebrated Dr. Kay (latinized Caius), the founder of Caius College, London, was expressed in language more forcible than elegant "that the cause thereof none other there is than the evil dirt of these three countries [England, Brabant, and the Coasts], which destroy more meats and drinkes, without al ordre, convenient time, reason, or necessity, than either Scotlande, or al other countries under the sunne, to the great annoyance of their own bodies and wittes." And he goes on to say that if Æsculapius himself should come to life, he could not save men having so much "sweating stuffe," "so many evil humours laid up in store," from this "unpleasant, fearful, and pestilent disease."[1] The medical clergy were as impotent in their efforts to cure the victims of the malady as the regular

[1] Cited from Russell, p. 135; from Caius, p. 306.

physicians. The alchemists were vainly appealed to, as well as the constellations of the stars, for help. They attributed the cause of the pestilence to their evil conjunction. A number of the physicians of the College of Physicians at Paris got together and issued the following curious pronunciamento:

We, the members of the College of Physicians at Paris, having, after mature consideration and consultation on the present mortality, collected the advice of the old masters, are of the opinion that the constellations, with the aid of nature, strive, by virtue of their divine might, to protect and heal the human race,[1] etc.

This is a rare piece of writing for medical men, rare in its lack of common-sense even in that age. Hippocrates was acquainted with these deadly pestilences and treated them with the most active eliminants, wisely believing that the humors of the body were the seat of the affection, and that the true indications of treatment were purgatives and other eliminants. The malady was the occasion of slaughtering large numbers of the Jews, the people superstitiously believing that they were in some way the authors of the calamity. In Mayence alone, it is said, twelve thousand Jews were burned or otherwise put to death on the occasion.

Looking at the causation of the sweating sick-

[1] Sprengel, cited from Russell, p. 136.

ness and epidemics of other malignant diseases of an allied nature that so frequently swept over England and the Continent, from the objective of to-day, the conclusion is forced upon one's mind that it was largely due to unsanitary conditions of the soil, which naturally infected the water supply of the people. All Europe had been a burying-ground, not only for its own people dying from natural causes, but for hordes of savage warriors that had met death and a grave there by battle; myriads of them since the beginning of the Roman Empire. The bodies of these soldiers all went into the earth—generally into hastily improvised ditches—in the most careless and thoughtless manner, instead of being burned, as they should have been. It could not have been otherwise, therefore, that the springs, streams, wells, and other underground sources of water should frequently have become polluted with germinal matters of the most poisonous kind, and have produced, when imbibed, the most rapid asphyxiation of the blood, cases of which from such causes may occasionally be seen to-day.

Apart from these great and prolific sources of infection, the homes and habits of the people were filthy. As late as the sixteenth century in England, the streets of populous cities were paved with straw and rushes, which soon broke up into powdered dust. Householders swept the filth of their apartments into the streets, and threw

garbage there also; where, with the ground of rush and straw, a most intolerable filthy condition was produced, which rain modified but did not remove. Moreover, people seldom bathed their bodies and washed their clothes. It is largely so among the peasantry in France, Germany, and Italy to-day. Besides this, the food they ate contributed to disease. They lived chiefly on salt-fish and flesh, with a modicum of stale vegetables. The domestic animals, the source of their meat, were herded in enclosures of the worst imaginable filth, such as was and is the custom to fatten hogs in America. Mutton was the chief flesh-food of these people, but their flocks in cold seasons were herded in basements, partly underground, places without light and air except such as gained admittance from the door. Milch cows were confined to these places also. The source of the food supply, therefore, was foul. The flesh of these animals was infected with disease-producing germs; the milk could not have been otherwise than tuberculous. Places of public resort were without means of ventilation. The air of the churches was death-dealing and made tolerable only by the fumes of incense. It was as a sanitary measure, no doubt, that Moses introduced that custom to the Jews as a religious rite, to make it acceptable, which was imitated by the Christians. In view of these things the wonder is that epidemics of typhus in the form of plagues, black death, etc., did not oftener occur.

Aside from the great plague, the sweating sickness, *sudor anglicanus*, which devastated England and the Continent, a brief account of which we have already given, pestilence of a different nature continued its deadly work from time to time, all through the fifteenth century into the sixteenth and seventeenth centuries, with great and alarming mortality.

A most loathsome disease and malignant had been on the increase since its advent into England in the fourteenth century, the origin of which it was difficult to trace. Some insisted that Columbus brought it from America, which was a rather absurd charge against poor Columbus, since the disease had been known in England and elsewhere prior to Columbus's return from America; others attributed it to the Crusaders, who were known to be licentious—as were also the Mohammedans. And we have it on the authority of Buckle that the Crusaders brought the disease from Asia, as we have said elsewhere, or contracted it by means of their licentious habits on the way. We allude to *lues veneris*.[1]

Another malignant disease developed in Europe about this time—of greater mortality than syphilis—which had not been known before in the history of the world, namely, small-pox (variola), so named in contradistinction to the character of the disease just named, the causation of which may be justly attributed to the unsanitary condition of milch cows, since the disease

[1] See *Posthumous Works* of Henry Thomas Buckle.

arose in the dairy districts of England. It was attended with great mortality, which was aggravated by the ignorance of the medical profession in dealing with it. It was a most filthy malady, especially in its third or malignant form, and generally manifested itself at first among the filthy. Being of a highly contagious nature, it spread to all classes. Nor were the nobility and royal families of England and the European states exempt. It was especially fatal in Spain and the German states, including Austria, many of the royal family dying of the disease, probably more from fright that it caused by its known mortality and the dreadful characteristics of the disease, than from any necessary fatality. This disease was also charged to the account of the Crusaders, probably unjustly. It was a filthy disease, and could only have been generated by filth and the dreadful unsanitary condition of the common people among whom it always first appeared. This fact would seem to indicate that it was ingenerated, an *auto-toxæmia*. However that may have been the abodes of the common people were grossly unsanitary. Incessant wars necessitated the frequent raising of money. To this end ruinous impositions of taxes were laid upon the people. Bread was taxed and, worse than that, window-panes were taxed, to escape which the poor built—I was about to say houses, say rather—huts without windows, since only their employers could afford that luxury. Thus

the commonalty lived—say, rather, existed,—a prey to all the creeping things, visible and invisible, that haunt the dark, are bred in the dark and the foulness thereof, and prey on the bodies and brains of its occupants. Was it any wonder that the black death appeared, or small-pox, or the sweating sickness? These were mercies in disguise. How otherwise could the great Inerrant, divinely unconscious Force of nature relieve these poor sufferers of their misery?[1]

To us the causation and origin of these plagues were not far to seek. There was not a sewer in Europe of any consequence, except that built by Nero at Rome, nor adequate means of drainage; nor was there any system of sanitation or knowledge of antiseptics; nor public baths, nor other facilities for bathing and cleanliness on the part of the multitude, the great unwashed; nor boards of health to look after and enforce rules of sanitation and to guard the conditions of public health. These things were not thought worth while. Gilded places were erected in which to worship God; but none for the goddess Hygeia, nor for the protection of the poor against themselves. Heaven

[1] An epidemic of small-pox that broke out in an inland city in America (in 1866), built on the hillside (the infection of which was brought from infected rags to a cotton factory near by), the author had the advantage of observing both as a victim and a physician. He found that the disease developed first among the children employed in the factory who slept in cellars, without light and air, except what came through the entrance door, sometimes several children sleeping in one large room on nothing but straw.

was provided for; earth was left to care for itself. We cannot wonder that plagues came. The wonder is that they went. If the souls of the multitude were as filthy as their bodies (and according to all accounts they were), they would breed a pestilence in heaven!

But, like all evils, the frequent occurrence of pestilential epidemics had their uses,—not in checking over-population, as Malthus thought, though they had that effect,—but in teaching mankind the necessity of looking after their *temporal salvation;* that even the saints and the most godly have bodies subject to the perils of mortality. Warned by these awful invasions of disease, the attention of the Civicists was ultimately called to them, which led to the institution of Health Boards in the large cities, for the regulation and inspection of tenements, etc., at first in England and afterward in all Europe. Though not the first to introduce this measure of protection against infection, private and public, America has not been second in developing the system in its present state of universality. But it is far from being perfect.

Dr. Thomas Linacre, whom we have mentioned on a previous page, deserves more than a passing notice in this place. He was an Englishman, born in 1460, and a man of great learning for that day. He had studied the arts and sciences in Italy, was proficient in the languages, and had become acquainted with the works of Hippocrates, Aris-

totle, and Galen in the original. He was in his prime when this fearful scourge broke out in England. Hallam says that Linacre must have passed through several epidemics of the sweating sickness, and yet among his writings no allusion is made to it. Yet he was the greatest physician of that time, and was physician to Henry VII. and Henry VIII. And Erasmus reproaches him with neglecting his profession and absorbing himself in the problems of grammar; and that "he would consider himself happy if it were permitted him to live until he had certainly established how the eight parts of speech were to be distinguished!" Linacre could not have been indifferent to the frightful mortality of which he was a witness, but, like most lovers of learning who are also physicians, he left the practical part of the profession to other hands, perhaps more practical because less learned than he, while he devoted himself to his study and the things in science and philosophy which commanded him. Hallam also makes him a subject of criticism. "The restorers of the medical science of ancient Greece," he writes, "who were followed by the most enlightened men of Europe, occupied themselves rather with the ancient terms of art than with actual observation, and in their critical researches overlooked the important events that were passing before their eyes."[1]

[1] Quoted from Russell's *History and Heroes of Medicine*, p. 134.

Part V.—The Fall of Constantinople

It is a curious and melancholy phenomenon in the history of ecclesiastical domination that the terrors of eternal damnation should be used to keep the minds of men in slavery to the priestly hierarchies of Rome and Constantinople; and the spectacle is the most hideous and forbidding one that the followers of Christ and Mohammed have with shame to contemplate. We have had occasion to refer to this condition of Rome and her vast possessions before, in tracing the decline of intellectual interests in things. At the era of which we are writing the religious domination of Europe was complete; the spiritual hierarchy at Rome was supreme; the last relic of her temporal dominion was confined to Constantinople. The terrors of excommunication and hell held every king and statesman in Europe in bondage to Rome's spiritual dictation. The people very generally believed that the Pope had charge of the keys of heaven, and that no one could enter there without his sanction or permission. She used the dogmas of scholasticism as a weapon with which to hurl thunderbolts of excommunication from the Almighty in heaven. Who had the temerity or courage to disobey or disregard them was not only damned to all eternity, but was subject to punishment and an ignominious death here. Thus the spiritual hierarchy at Rome, while exercising supreme authority over believers, did

not recognize any obligation to observe the rules of conduct herself that she exacted from others. She was the law and the precept, and could make them or unmake them for herself at pleasure. The moral consequences to Christendom of this state of irresponsibility to the laws of God were appalling. It is not our purpose to go into that subject here at length, as the reader will find it graphically depicted in Dr. Draper's "Intellectual Development of Europe," and in Lecky's "History of European Morals."

Constantinople—the rich and beautiful city, the last remnant of Rome's temporal dominion—had grown weak and effeminate with its vices and service of religion—which latter was the people's chief occupation—and fell accordingly an easy prey to Mahomet II.'s prowess. When, with his rapacious hordes, his General appeared at its gates and demanded the city, it was for spoils and to extend the dominion of the Turks, Mohammedanism. His followers fought in the name of the one God and his chief prophet, Mohammed, and with the assurance of rare and eternal glories in case they fell in battle. Gibbon has given a vivid description of the treasures of Constantinople, the city of the great Constantine, the spoliation and slaughter that followed its capture by the Moslems; the destruction and effacement of everything Christian, its idolatrous works of art in marble and on canvas; and the wreck of its great library, etc. "One hundred and

twenty thousand manuscripts are said to have disappeared on the occasion," he writes; "ten volumes might be purchased for a single ducat; and the same ignominious price—too high, perhaps, for a shelf of theology—included the whole works of Aristotle and Homer, the noblest productions of the science and literary productions of ancient Greece. We may reflect with pleasure that an inestimable portion of our classic treasures was safely deposited in Italy,"[1]—carried there by monks who from their cloisters escaped with them and took refuge in Italy. It was like a baptism for Italy. She thus secured the writings of Hippocrates and Galen, of Democritus and Aristotle, and those of other masters of Greek science and art. It was this circumstance that gave her the lead in Europe for a time in medicine and in the fine arts.

But whatever the effect, good or otherwise, that the capture of Constantinople by the Mohammedans may have had to advance the cause of learning, it was evident that there was a general awakening taking place in Southern Europe. We have referred to the universities of Salerno and Montpelier, of Bologna and Paris, which acquired some celebrity in their day; but at this period the movement had spread to other parts of Europe. Schools where lectures on medicine were a prominent part of the curriculum sprang up at Vienna, and in various cities of Italy—

[1] Gibbon's *Decline and Fall*, vol. vi., p. 532.

Padua, Pavia, Milan, Naples, and even in Rome, where a few centuries before such studies had been forbidden or suppressed. The celebrated Linacre, noted for his love of learning, flourished at this period, as we have seen, and subsequently became physician to the royal household of England. He was also influential in establishing medical professorships in the universities of Oxford and Cambridge, and in founding the College of Physicians and Surgeons (London).

But let us return for a moment to the capture of Constantinople. "The Greek monasteries of that city had been the refuge of 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 was considered as their most precious treasures, the manuscripts of the ancient classical writers. These manuscripts had now been buried for a long time in their libraries, their existence being unknown to the rest of the world"—and when these learned men in monkish garb "were expelled from their retreats by the Turkish conquerors they went back to Italy, taking with them these classical manuscripts." So writes Bostock.[1] These writings served as seed for the springtime of the morning of a new awakening, the dawn of which had now set in throughout the Western world.

Two other events occurred at this time of far

[1] *Op. Cit.*

greater significance than the Mohammedan conquest of Constantinople and spreading a few parchment manuscripts over Italy. We refer to the discovery of the process of making paper, and the invention of printing. Printing by the use of engraving on solid blocks of wood was already in vogue; but printing by movable type or letters was due to the genius of three Germans,—Fust, Schaeffer, and Gutenberg. These inventions marked an epoch in the progress of science and civilization, the importance of which it is impossible to overestimate. By a process most laborious, the works of the gods of antiquity, the unfrocked and uncapped saints of learning, had been transcribed by hand, necessarily toilsome and not without mistakes and imperfections, so gross sometimes indeed as to have distorted their meaning or to have totally misled or bewildered the reader; but henceforth this difficulty was to be removed and the scholar relieved of a situation that had caused no little unpleasant controversy among learned men in philosophy as well as in theology.

The power of the press was henceforth to be reckoned with. Indeed, it soon became more potent a power than the papal bull, or the edicts of kings or emperors. While there came a check on authority to burn or otherwise put to death the writers of objectionable books, Rome still kept the right to burn their books—even to this day. She might still exercise some degree of control over the press; she might have presses of

her own, and print—or cause to be printed—such books as she thought proper or safe for the people to read; but as to the exercise of authority over the minds and judgments of men, it was broken, never to be regained. Dean Milman, a staunch churchman but of a liberal type, in referring to the invention of printing, says:

The sternest vigilance might be exercised by the argus eyes of the still ubiquitous clergy. The most solemn condemnations—the most awful prohibitions might be issued; yet, from the birthday of printing, their sole exclusive authority over the mind of man was gone. That they rallied and resumed so much power; that they had the wisdom and the skill to seize upon the education of mankind and to seal up again the outbursting springs of knowledge and free examination is a mighty marvel. Though from the rivals, the opponents, the foes, the subjugations of the great temporal despots, they became, by their yet powerful hold on the conscience and by their common interests in keeping mankind in slavery, their allies, their ministers, their rulers; yet from that hour the Popes must encounter more dangerous, pertinacious, unconquerable antagonists than the Hohenstaufens and Bavarians, the Henrys and Fredericks of old.[1]

The Dean goes on to say that the sacerdotal class will be compelled to put away their arrogance, give up their authority, become men and citizens like other men, and fulfil their duties

[1] *Latin Christianity*, viii., pp. 495–496.

as fathers of families—and other social relations moral, intellectual, and religious. The ultimate, full and complete triumph of the temporal power would lead, we cannot doubt, to the realization of such a desirable forecast as a result of a free press and free men.

The physicians that came into prominence at this time were naturally the successors of their predecessors Kay or Caius, Bacon, and Linacre. They were bent on the discovery of the philosopher's stone, and the elixir vitæ, which would effectually do away with the need of physicians or medicaments, since man would then live on and on to a period indefinite.

It was an occasion, therefore, for the advancement of chemistry, for it was in this science, still in its nascent state, that men were to find the secret to which the pseudo-scientific were devoted. The practice of medicine became, therefore, empirical. The most noted, not to say distinguished, physician at this juncture was Cardan, a man of singular genius, learned in the languages, a mathematician of great ability, a good dialectician, and an astronomer of no mean order, for a knowledge of the conjunction of the stars was necessary to the chemists of that era. Russell characterizes this erratic genius as "a hybrid between a philosopher and a quack."

Cardan was a Milanese, born at Pavia, 1501. By the separation of his parents he was thrown at an early age upon his own unaided resources.

His father was eccentric, could see in the dark, and had a familiar spirit for a companion which superseded the society of his wife. He was carried off by the plague, leaving the son to his own career. Nevertheless, the son soon rose to distinction as a physician, and acquired an immense reputation. It was his own experience in the profession, probably, that led him to say of the physician that "he cures most in whom most believe," as was said by the famous Burton of a later day. He was in demand all over Europe, and received large fees for his professional services. And yet so lavish was he in his expenditures that he was always in arrears, and was even confined in prison a year for debt. He died at Rome in 1576, to fulfil, it is said, his own astrological predictions.

It was, however, as a mathematician that Cardan most distinguished himself. He made no contributions to medical science, and his success as a physician was due to his personality, rather than to any scientific knowledge or skill that he possessed over his contemporaries. As a mathematician he stands pre-eminent to-day. The rule in algebra that bears his name marks a point in the progress of that science which all succeeding analysts have hardly succeeded in going beyond, according to Professor Playfair, in his dissertation on Cardan in the "Encyclopædia Britannica."

Cardan claimed to have four special gifts:

First, he could at pleasure throw himself into an ecstasy or trance;

Second, he could see with his eyes, not his senses, any vision he pleased;

Third, future events were revealed to him in his dreams;

Fourth, it was also given to him to know the future by certain appearances in his nails.

Cardan was probably the first palmist. His faith in dreams and visions was absolute; he also had, like his father, interviews with demons or spirits, who foretold him of future events.

But, again, Cardan was not in favor with his profession, nor could it otherwise have been expected. He antagonized everything and everybody. His first book, entitled "De Malo Medendi Usa," "The Fallacies of the Faculty," was quite characteristic of the man. He was arrogant, pompous, opinionated, self-assertive to the last degree. Bayle, the French biographical writer, observes that there is a saying about no genius being without a dash of folly, but in Cardan we have an example of folly with a dash of genius.

Closely following upon the death of Cardan in 1576, came another character with a somewhat similar genius, as remarkable as Cardan and vastly more eccentric. His name was Philippus Aureolus Theophrastus Bombastes von Hohenheim, or better known to history as Paracelsus.

Paracelsus is rated the greater genius of the two, though he had not his predecessor's ability nor

his scholarship. But men of a stamp or type such as was conspicuous in them have no need of learning or acquired ability to enable them to succeed, in a way, in any calling that they may choose to enter; although medicine was then a more inviting field for men of that type than any other profession, and is still, and will continue to be so as long as ignorance and superstition have so great a hold upon the masses.

Paracelsus was born of humble parentage, although his father was a physician of modest pretensions in Einsedelm, Germany, about the time that Columbus discovered America in 1492. His father taught him a smattering of Latin. It does not appear that he frequented any school, college, or university. A genius like his would have been so modified by university education as to destroy its picturesqueness. His early life, like some of the Greek philosophers, Pythagoras, Empedocles, and Galen, for example, was spent in wandering from place to place, going everywhere in Europe and Asia, not for the purpose of acquiring learning, like his great predecessors above mentioned, but rather for the gratification of a roving disposition, and self-glorification. It does not appear by what means he maintained himself during this period of vagabondage, but it has been suggested that it was by the practice of necromancy, or the use of secret remedies of his own, together with pompous pretence and assurance. Be that as it may,

upon his return his fame as a great physician spread abroad, and great was his practice. Persons of quality came to him with their ailments from all parts of Europe. One of his patients was the celebrated Erasmus, a collaborator of Luther, who addressed him as Paracelsus Emeritus. "At the age of thirty-three he could boast of having cured thirteen princes whose cases had been declared hopeless by the Galenic physicians of the time."

About this time he was appointed Professor of Physic and Surgery in the University of Basle; and began his academic career there "by committing publicly to the flames the works of Galen and Rhazes, exclaiming that they did not know as much as his shoe latchets." He claimed that a physician must be a traveller. "If a man wishes to learn much of disease," said he, "let him travel far; if he do so, he will acquire great experience. Countries are the leaves of nature's code of law; patients the only books of the true physician. Reading never made a physician, only practice."[1] This is decidedly oracular, with many grains of truth—perhaps more grains of truth than error. It is unquestionably observation and practice that make the physician; the science of medicine may be acquired by study of books; its art never. Learning—the ability to know, to think, and to observe—may be acquired, either by books of the masters, or didactic teaching, before

[1] *Rademacher*, p. 41.

observation and travel could be of much avail. By travel is meant here, of course, the visitation of hospitals and sanatoria where abundance of clinical experience was accessible.

Paracelsus was probably the greatest charlatan and mountebank that ever acquired a celebrity in the profession. Absolutely unlearned in precise knowledge, he attempted to use the language of the learned. Russell cites facts in proof of this statement. For "Œdema," he uses the term "Undimia"; instead of the well-known verse of Ovid, *Tollere nodosum nescit medicina podagrum*—"there is no medicine for gout," he says, nescit cartarium noades curare podagrum, which is almost meaningless. Such incorrect terms occur in his writings as astrum, limbus, aniadus, which no one but himself knew the meaning of in the connection with which they were used. The cultivated and refined of his day had contempt for him. Even his career at the University of Basle was a failure. He began his professorship with a full class and ended it with empty benches.

It is difficult to discover in the writings of Paracelsus any definite or coherent system of philosophy. He is like one with a surplus of undigested material, and promulgates opinions devoid of logical coherence or consistency. Medicine he divides into three parts, Philosophy, Astronomy, and Alchemy. The idea of trinity in unity runs through all his lucubrations. Thus, "man consists of spirit, soul, and body; and the

world of three elements, water, air, and earth; to which three correspond mercury, sulphur, and salt." The word "Alchemy," Paracelsus used with a meaning altogether different from its previous acceptation, as being the process of discovering the philosopher's stone. "Take it not amiss," he says, "that the alchemy I teach yields no gold nor silver; but look upon it as the key which opens the arcana of medicine to you." He sometimes launches into piety, although his habits were such as to exclude him from the society of the refined. For example, he says:

A man who by abstraction from all sensuous influences, and by childlike submission to the will of God, has made himself partaker of the heavenly intelligence, becomes possessed of the philosopher's stone; he is never at a loss; all creatures on earth and powers in heaven are submissive to him; he can cure all diseases, and himself live as long as he chooses, for he holds the elixir of life, which Adam and the early fathers of the earth employed before the flood and by which they attained so great a longevity.[1]

The pathology of Paracelsus was of the most vague and fantastical sort. Indeed, he had none, and his method of curing malady did not need any. All power of healing lay in the physician; which is bred in him, and not acquired. Like the poet, the physician is born, not made. The true physician, according to this view, must have a

[1] *Archidox*, lib. viii., p. 818; Russell, 168.

direct, intuitive knowledge of disease; a preternatural gift which no amount of learning could impart. His duty is to nurse this gift, to keep it alive, by being himself always responsive to nature; for in this relation, "he saw and knew a disease at a glance; and could tell with equal facility and certainty to what plant or mineral this spiritual existence bore the closest resemblance, so that by being similar in kind, but stronger in degree, the one might subdue the other." Subdue what? And which the other? Herein is disclosed the old fanciful hypothesis of minds ignorant of natural causes, normal and abnormal: that the dynamic force inherent in all living organisms is the same in health and disease. He described epilepsy as an earthquake of the macrocosm, caused by the ebullition of the vital spirit; and apoplexia he likened to a thunderbolt. The brain was a microcosmic moon. Jaundice was due to astral impressions. And he declared that we must study the physiognomy of persons "in order to become acquainted with their cosmic affinities." Elsewhere he refers to "Arcana," and uses, or misuses, that term, to represent a spiritual power or dynamis, the Φύσις, of Hippocrates, or the Ψυχή of Galen, immanent in nature, as the fanciful specific for malady, and sends it after the "entity," which, as disease, has found lodgment within the vital domain! So "Arcana," and the Devil fight it out between themselves, as in the fable of the arch Demon and

God, fighting it out in heaven—a deadly duel between the spirit of light and the spirit of darkness.

Such is the conclusion of this remarkable type of man that we have come to, judged by the light of modern science. The major part of his contemporaries held him in high esteem; some of them looked upon him with awe, and revered him as super-personal. Le Clerc devoted a good part of the Supplement to his "Histoire de la Médecine" to him, an honor which he pays to no other savant in all his great work. Although by no means of a religious turn of mind, the Roman Church claimed him, and at his death administered to him its last rites. The following epitaph commemorates his tomb, written, says Le Clerc, "by some poor priest"[1]:

Epitaphium Philippi Theophrasti Paracelsi, Philosophi Germani excellentissimi et utriusque medicinæ Doctoris incomparabilis, quod Salisburgi apud S. Sebastianum ad Templi murum erectum, lapidique insculptum, etc.

A distinguished contemporary of Paracelsus was Jean Gemtherius of Andemac, a medical critic of note. Of Paracelsus he wrote as follows: "J 'avoué, dit il, que Theophraste Paracelse est un très-habile chemiste, et qu'il â mis dans ses livres plusieurs excellences choses, mais il est

[1] "L'auteur de cette epitaphe était apparemment quelque pouvre Prêtre." —Page 802.

fâcheux d'un autre côté qu' il y en ait mêlé un grand nombre de frivoles et de fausses, etc."[1]

Another celebrity of the period, also a contemporary, made bold to deal with the doctrines of Paracelsus in a manner less moderate and more critical. His name was Thomas Erastus, a medical savant and a writer of no mean ability. He devoted four large quarto volumes to the examination of the writings and doctrines and sophistries of Paracelsus, controverting him at every point. The works of Erastus were published at Baden, in 1572.[2]

The man of science must ever recognize, in the study of disease: first, a cause; second, nature; third, effects. The cause is the presence of peccant or morbific matters in the organism, disturbing the solids and the fluids of the organism. Second, nature, in her conservative capacity as a force which excites the so-called disease-disturbance in its endeavor to protect the organism against matters inimical to its life and health and to eliminate them from the organism. To her action against morbific causes are due the phenomena which are recognized as the symptoms of disease, but which are really the reaction of nature against the causes of disease. Third, the effects are subnormal or abnormal changes in the organs and tissues which inevitably follow this action in the warfare of nature against morbificants.

[1] *Ibidem*, p. 819.

[2] Le Clerc's *Histoire de la Médecine*, p. 820.

This philosophy of drug-action and morbific action do not, of course, apply to immune medication, nor to antisepsis. All know the effects of medicaments upon the organism are similar to those of agents that are foreign to the economy. Their effects are determined by the reaction of nature against them, in the absence of which their effect would be nil. Such agents produce no such phenomena upon a dead organism. One cannot produce emesis with ipecac or lobelia; purge with calomel or rhubarb; cause enuresis with nitre or cantharis; nor blister with cantharis, or actual cautery, upon a dead person. These are significant truths which the great philosophers of medicine have understood perfectly, but which Bombastes Theophrastus and his modern apologists and imitators do not and will not understand, preferring to use his erratic genius to exploit self and mislead followers. What is called disease is no enemy to life, be it observed; it preserves life and health. "Without disease life could not subsist," said the late distinguished Virchow.[1]

Paracelsus lived a chequered career, vulgar, erratic, opinionated, and combative to the last. He did not die a natural death, but was cut off in the prime of life. During a heated discussion with a colleague, the latter, being the stronger and equally pugnacious party, threw him out of a window, and in the fall he suffered fracture of the base of the skull, and probably instant death.

[1] *Address before the Internat. Medical Congress*, London, 1888.

His only contribution to medicine was to the materia medica of mercury, sulphur, and salt, without, however, giving any direction for their use, or indicating to what maladies they were applicable. The profession accepted the bequest and have found them excellent remedies for many ailments, thus justifying Cullen's epigram that "A wise man will accept a good remedy which only a fool would devise."[1]

[1] We know nothing in the annals of literature comparable to the exploits of Paracelsus, but the attempt of the celebrated Jean Jacques Rousseau to orchestrate a piece of music, without the least pretence of possessing a knowledge of musical harmony, but solely from his own imagination, which was, as all know, very great. His score was given to an orchestra to play, to the great amusement of that body, and the auditors. It was laughed down. Rousseau relates this story of himself in his "Confessions."

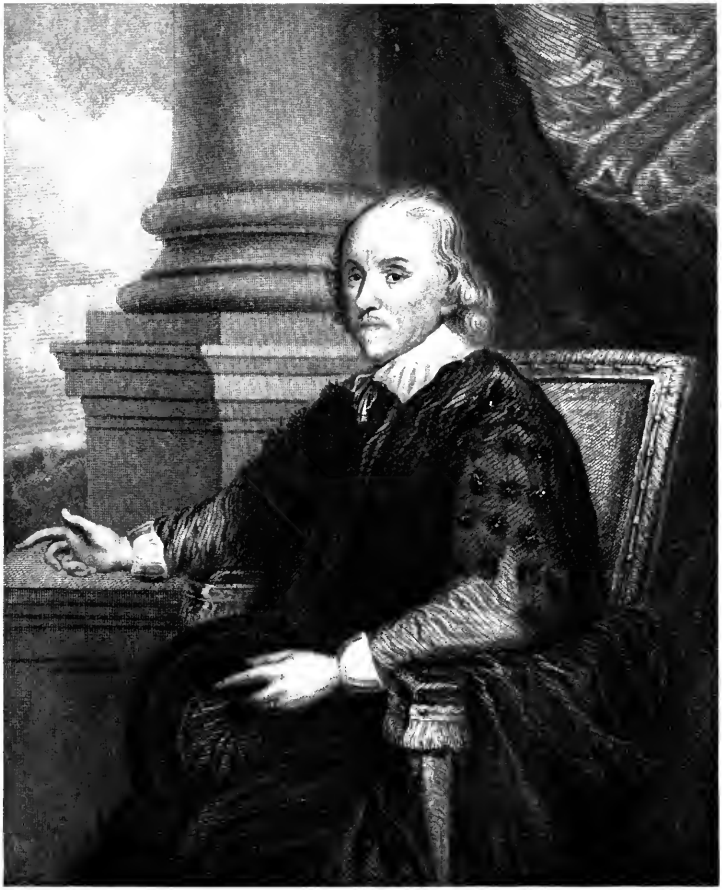
FIFTH: PERIOD OF THE RENAISSANCE

CHAPTER V

Medicine in the Sixteenth Century

IN the beginning of the sixteenth century we find the state of learning advancing in all the countries of Europe, and England behind all the others. She had but two universities—Oxford and Cambridge. France had six; Italy sixteen; Germany eight; Spain none. Medicine was a prominent feature in all of them.

Many great and momentous events occurred in this century to distinguish it above all previous centuries, not only in medicine, but also in statecraft, civil and religious liberty. Many great men adorned this century and great progress was made in science and discovery. The Church had been rent in twain; the map of Europe had been changed; the power of the State was again in the ascendant over Church. It could now protect the individual guilty of heresy from being dragged off to Rome, as instanced in the previous century of the learned and pious Wycliff, whose offence consisted in making a translation—the first translation—of the Bible from the Latin Vulgate into English—an event of greater importance than the



Wm. A. Harvey.

From an engraving.

bill of Magna Charta. Nothing could have saved him for so great a crime from torture and an ignominious death of some sort, either strangulation or burning, but the timely interposition of the Duke of Lancaster, and on a subsequent occasion by the Queen mother of Richard II. The lovers of truth for its own sake had greatly increased in number since the Reformation, emboldened by contempt of the Inquisition; nevertheless, men were still imprisoned or put to death for heresy, as, for example, John Rogers, Savonarola, and Servetus.[1]

Among the peers of the great men of the sixteenth century stands Bruno—Giordano Bruno—who, although not a physician, was yet a great physicist and worthy to be placed in the category of the illustrious. Bruno was born at Nola, in the kingdom of Sicily, in 1550. Early in his youth he joined the order of Dominican monks. His restless speculative mind did not find that kind of life agreeable, and he made his escape, visiting several states of Europe and devoting himself to philosophical studies, on which he published several works, the last of which, "Del Infinito Universo e Mondi," "On the Infinite Universe of Worlds," seemed to have brought him into conflict with Rome. The Inquisition arrested him for heresy, and sent him to Rome for trial. He was found guilty, of course. He was therefore burned, since he would

[1] *Vide* Henry C. Lea's learned work, the *History of the Spanish Inquisition.*

not recant. Scholastic philosophy could not stand a moment in the face of a plurality of worlds, each one of which was inhabited. Bruno's idea was that the fixed stars were suns that shone with their own light, and that each sun had its own planetary family or group of planets, like our sun and its planets. Bruno's conception was probably true. One can imagine the happiness that such a conception brought to the philosopher; the gratitude that must have possessed his heart toward Almighty God that he had been able to comprehend even so little of the grand Kosmos. Death did not count against such a vision.

Bruno was one of the great thinkers. His idea of a Supremacy animating all worlds and life and mind upon them must be true. The modern studies of psycho-physiology and physical science have put the matter within the bounds of rationality.

The works of the ancient physicians were now being studied in the original, instead of in translations and commentaries from the Latin and Arabic languages, with increasing interest in the works of Galen and Hippocrates. The writings of Galen had, for several centuries, held the highest position in the medical mind; now those of Hippocrates were in the ascendancy. Physicians divided on the merits of the two masters, and became Hippocratians or Galenists, according to the natural bias of their minds; the lighter and more speculative sort became Galenists, the more practical, conservative, and stable-minded natu-

rally gravitated to Hippocrates, and became Hippocratians; and a very learned and respectable class of physicians they were, devoted strictly to the inductive method of that author, who were the forerunners and founders of the orthodox school of medicine of to-day. The position of this class of physicians was absolutely impregnable. They had only to continue to observe the phenomena of disease, to keep an open mind, and themselves to be free to accept the new, or at least such of the new as was demonstrable, according to their own method of discovering truth, to bring all the warring sects into their fold sooner or later. The error into which they fell, and by which they lost caste, was in disobeying the precepts of the master in arrogating for him the claim which he never made, of possessing the whole truth, or that there was nothing to learn apart from the Hippocratian aphorisms. This was a human weakness. It was Hippocrates, who set forth the method of arriving at certainties, and himself who set the example—nothing more.

One of the more prominent physicians and theologians of this period was Michael Servetus, a Spaniard, born at Aragon in 1509. Servetus entered into the ecclesiastical controversies of his day with great zeal, writing a book against the Trinity—"De Trinitatis Erroribus"—which brought him in conflict, not only with Rome, but also with the reformer, Calvin. He studied medicine at Paris, and practised awhile at Lyons.

His contribution to medicine was a treatise on syrups—"Syruporum Universa Ratio." He also wrote and published anonymously, at Vienna, a book entitled "Christianity Restored"—"Christianismi Restitutio"—which brought him to the notice of the French Inquisition. His radical ideas as to dogmas of the Church, which had then been rent in twain, brought him in conflict with Calvin, who denounced him as a dangerous heretic. It was through the latter's influence that he was sent to the stake at Geneva and publicly burned to death.

Servetus was a man of unblemished character, with strong convictions, deep hatred of organized error, and a love of truth that was dearer than life to him.

The Galenists constituted at this period the more progressive branch of the regular school of medicine, between whom and the Hippocratians there was in fact no warfare. Hippocrates was their star, the god and father of medicine. The theories of Galen, however, possessed a charm for the awakening intelligence of men, and, without fully comprehending their master, continued to be dominated by him in the sixteenth century as they had been in the fifteenth century. The Galenists were the professors in the universities, and were regarded as regular; their prescriptions polypharmous and complicated, but consisting chiefly of vegetable remedies. It was from the ranks of the Galenists that the Chymist sect sprang,

which came into great prominence in the former century, influenced thereto, no doubt, by its affiliation with Alchemy, and the fascination which the fancied influence of the stars had upon mundane events, and more particularly upon the course and conduct of disease.

The influence of Cardan and the bombastic Paracelsus could not but have left a lasting impression on the medical mind of that age, so strongly infused was it with the mysticisms of the miracle-workers in the Christian and Mohammedan churches.

The Chymists were the bold empirics of that day. They made no pretension to erudition; they did not revere authority, and were not trammelled by maxims and aphorisms of the fore-fathers. They rejected the custom that was characteristic of the Galenists, of complicating their prescriptions with a multitude of drugs; they introduced the use of metals and chemical agents in medicine; gave heroic doses and powerful remedies of all kinds, and by pompous, pretentious, and arrogant contempt for their rivals, acquired popularity and practice, and finally an ascendancy over the more modest Galenists. With the empiric it was cure or kill; and if they killed a case now and then by too strenuous treatment it was no more than was to be expected. In either case, they were wiser for the experience.

By degrees, however [writes Bostock], the Chymical 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 their doctrines which they still professed were altogether unfounded, they were less palpably absurd than those of their predecessors.[1]

The first quarter of the year 1500 was fruitful of many names of distinguished repute in medicine. Such was Mercuriales, an Italian physician, born at Forli, 1530; succeeded Francantiana as professor of medicine at Padua, in 1569. Mercuriales, or Girolamo, his real name, was a man of distinguished ability. He translated the writings of Hippocrates from the Greek into the Italian language and left an important work on Gymnastics.

Contemporaneous with Girolamo was Comarius, a German, who also distinguished himself in the higher branch of medicine as a writer, etc. At the same period lived Foësius, a distinguished French physician and scholar. He has the merit of collecting the genuine writings of Hippocrates, translating them into French and publishing the most reliable edition of the writings of that author extant. We have already mentioned this celebrity. He is known in French as Foës, latinized in accordance with the custom of his day, Foësius.

About the same period flourished Fabrizio, or

[1] *History of Medicine*, p. 55.

Fabrizius, an Italian, born in 1537. He was a distinguished anatomist and wrote many small treatises on that subject and surgery. Fallopius was his tutor, and Fabrizio in turn became the tutor of the celebrated Harvey. To him Harvey really owes the celebrity which he acquired. His tutor before him had written learnedly on the circulation of the blood, particularly on the veins and valves of the heart, disclosing an intimacy with that organ which could not have been acquired except by actual dissection of that organ. To this constellation of celebrities should be added the names of Lominius and Forest, of Holland, among the first to distinguish themselves in that country in the practice of the art and science of medicine. The diligent student of medical history will have noticed that, although science and learning were on the increase, and had been for more than a century, no positive advance had been made in medicine, except in the addition of chemical agents to the materia medica, and by contributions to the knowledge of the human body; that no discoveries had been made that materially advanced the science of medicine. The profession appears to have been content with the emoluments which practice brought to them, and with the experience and contributions to the art of medicine which were left to them by their Arabian predecessors. Anatomy and physiology were still studied from plates made from the drawings of Galen and others

more than a thousand years before, drawings marvellous in their day, but, nevertheless, imperfect and not altogether accurate. It had long been a heresy in medicine to question the authority of the learned Pergamite, the incomparable Galen; his drawings and descriptions of anatomy had been servilely copied, and no attempt made to verify them, or to improve upon them until at this time. Now we have come to a period when the study of the human anatomy received new impetus by the revival of the practice, so long in abeyance, of actual dissection of the human body.

Among the first, if not the very first, at this period to venture upon the dissection of the human corpse was Vesalius, about the middle of the sixteenth century. He boldly threw off the yoke of authority imposed by Galen, and to which men had yielded so long, and began the study of anatomy from original sources—actually to dissect and ascertain for himself the bodily structures. Vesalius is said to have prosecuted his practical demonstrations in anatomy, despite the opposition of his contemporaries and the obloquy of public opinion, and to have produced the first anatomical work of undoubted accuracy and faithfulness to nature, that the world had received. It maintained its precedence over all other works on anatomy down to a recent period.

The industrious and indefatigable labors of Vesalius, the result of which demonstrated the

fallibility of Galen and other anatomists, were not altogether welcomed by the fossils of the day, who continued long to insist that there was nothing new to learn of the structure of the human anatomy outside of Galen's works. The researches of Vesalius led to disputes of the most acrimonious character, and actually to the division of medical sentiment on the subject. Subsequently the labors of others in the same field, among whom were the distinguished Eustachius and Fallopius, who have left their names on the organs of the human body as a perpetual memorial of their existence, proved the truth of Vesalius' work, and at the same time established his reputation and claim to the gratitude of his contemporaries and of mankind. Fallopius is said to have dissected live bodies—the bodies of criminals under sentence of death, as Herophilus had done at Alexandria nearly a thousand years before under the authority of the great Ptolemy. For his humanity it must be said, however, that he first produced narcosis by administering massive doses of laudanum, which, while they did not produce insensibility to pain, measurably modified the victim's sufferings.

Another medical celebrity that flourished contemporarily with Foës and Fallopius, a man of more than ordinary ability, was Jacques Houllier, latinized Hollerius. He was born at Étampes, France, in 1546, and became Dean of the Faculty of Paris. He commanded a large and influential

clientèle in Paris, and wrote much, chiefly commentaries on the writings of Hippocrates. At this same period lived at Paris the Durets, father and son, both eminent physicians, the son a politician also, and successively professors in the Royal College. The father, Louis Duret, was born at Pagé, in 1527, and acquired an excellent reputation as a physician; was successively physician to Charles IX. and Henry III. He, too, wrote an excellent commentary on the works of the father of Medicine.[1]

Bostock observes that

> 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 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.[2]

The Chymist sect of medicine continued to flourish at this time with their empirical practices, and with improved standing in learning and culture; but none of them established reputations of sufficient note to get their names into the encyclopedias. They continued, however, to add to the materia medica and the pharmacopeia, to the advantage of future generations, both pro-

[1] *Nouvelle Biog. Générale.*

[2] *Op. cit.*, p. 55.

fessional and lay. Their clinical experiments are therefore not to be lightly esteemed.

Francis Bacon

Lord Verulam, or Francis Bacon, was born in 1561, in London. He came of good family, though by no means distinguished. His father was Lord Keeper of the Great Seal of England under Elizabeth. His mother was of good family, Lady Anne, daughter of Sir Anthony Cooke. "She is represented as a person of bright talents and no inconsiderable learning, and very decided religious opinions," which her son, however, did not inherit. When about twelve years old young Francis was sent to Cambridge and entered Trinity College. All his biographers credit him with precocious powers in every department of learning, and of advancing in positions of trust and responsibility in a manner very unusual—unprecedented, in fact. That Bacon was a great man in some respects must be conceded; that he was overrated by his contemporaries and followers few thinkers will deny.

The name of Francis Bacon does not usually appear in the galaxy of great names in medicine. Nevertheless, it deserves a place there. He was not a physician, it is true, except in the sense that he was a philosopher, and a man, therefore, whose grasp of things embraced the whole of nature and therefore of man.

Bacon was a thinker, not a genius; a thinker

without an imagination; a thinker whose conceptions seldom rose above the earth. His position was thoroughly rooted and grounded in terra firma, whence he made observations of men and things, and drew conclusions which were predicated upon demonstrable data. Such, in his view, was the only safe and reliable and proper position for a man to take, if he would shun the fallacies and misconceptions of the mystics and intrench himself impregnably upon the verities—upon the solid rock of truth. The truths that lie beyond the reach of this method of research he would leave unexplored, as inaccessible to human reason, and as a field of research misleading, fallacious, and unprofitable. The bent of his mind was in striking contrast to that of Roger Bacon, whose fate might be quoted in proof of the later Bacon's views as to the sphere and scope of philosophy; and in yet more striking contrast to the genius of the still greater genius and mystic, Paracelsus, for whom Francis Bacon entertained the most lively contempt. It is not difficult to conceive in what view a man would hold one who talks of "Archeus" and "Arcana" and "pneuma," and " microcosms"; who could deride Galen, and speak of Aristotle in terms of depreciation; whose philosophy "was only strong for disputation and contention," and "barren for the production of works for the benefit of the life of man."[1]

[1] Rawley's *Life of Bacon*. This opinion as to the great

It was the practical side of life in which Bacon had any interest; it was the practical in which his interests were identified.

Francis Bacon was born near London, 1561. He must be regarded as an outcome of the reactionary movement of his day, which began a century before or about the middle of the fourteenth century. Man had been living in the vague and unreal, with hopes centred in a world unseen, or seen only by the eye of faith. Bacon came as a strong protest against theoretical conception of life and destiny, and proceeded early in his career to formulate views of life and things of a character quite the opposite of that in vogue. This appears to have been his mission to the world; in philosophy and letters he essayed no other function—and it must be admitted that he performed this well. "Seeing it was manifest to him that the human understanding creates itself much trouble, nor makes an apt and sober use of such aids as are within the command of man, whence infinite ignorance of things and innumerable advantages arise, it is time that he should endeavor to restore the natural relation and commerce of mind with things, and to bring them if possible into a nearer correspondence." His was a mission to restore the relation of our faculties to the external world, which had been so rudely broken

---

Aristotle, the foremost man of his time, one of the greatest intellects of all time, was reached by a lad of seventeen years!

by the fanaticism which had so long possessed the mind of man. His work, the "Instauratio Magum," had this end in view. It was an error to guess at truth; to jump at conclusions; to be in undue haste to reach convictions, or to come to a finality. Man must study with patience the phenomena which on every hand are presented to him, and accept the conclusions which they inevitably force upon the mind.

This view of Bacon is true, of course, if we keep our observations broad enough to cover the whole region of phenomena. It is misleading if it be confined to the narrow restricted plane to which he would confine it, namely, to such observations as come within the range of sense perceptions, sight, taste, smell, feeling, hearing only; herein is an error into which Bacon fell. He recognized only five senses, through and by which means man could receive knowledge. *He* may have had but five; but it is demonstrable that many men—and all women—have six, namely, *perception;* and it is believed that some men have a seventh sense, namely, *knowing.* No one believes that Bacon had the advantage of those two higher senses at the time his "Novum Organum" was written. He saw no necessity of recognizing a supremacy of divine excellence in nature which dominated the natural world, and held with a power supreme and unerring all natural phenomena—including psychical—under the dominion of inflexible law. But Aristotle

Andreas Vesalius.

did; so did the wise Hippocrates, Pythagoras, and the incomparable Galen.

To Francis Bacon has been ascribed the authorship of the Inductive Method in science. The attentive student of these pages has observed that Hippocrates adopted it in the study of the phenomena of disease. Before him, Pythagoras adopted it; and later than Pythagoras, Democritus knew no other method; and still later, it was the method by which Aristotle achieved such brilliant results in natural history and the phenomena of the human kingdom. But Aristotle had a mind broad enough and exalted enough to perceive that there was in the nature of man an invisible supremacy, and not only in the nature of man, but also in all nature, by which the constitution of the world was maintained, and to which the course of things is due. In man this Force or Principle he called Psyché (ψιχή), which corresponded very closely to the modern word spirit, or more nearly, perhaps, to what is commonly understood as soul. To one with a cast of mind like Bacon's this conception of Aristotle was an unwarrantable assumption.

We yield to no man our admiration of what is called the Baconian philosophy, nor of the masterly power of reason which Bacon possessed. He gave a great impetus to science and conferred an incalculable benefit upon medicine by recalling to the attention of men the proper way to approach the study of the phenomena of disease.

He probably would not deny that in the phenomena of malady there was hardly concealed a human personality; but he would decline to admit that the physician had anything to do with it if there were. His sole duty was to observe abnormal phenomena, and by a series of observations to proceed to draw definite conclusions as to the cause and nature of malady. A like course was to be pursued in therapeutics, in the prescription of remedies. When the Empirics have furnished definite knowledge as to drug properties, the physician was to use that knowledge in adapting those properties to the relief of disease, or assuaging pain. In his view, this is the sole duty of the physician. "In art," Bacon observes, "man does nothing more than to bring things nearer to one another, or put them farther apart. The rest is performed by Nature, and on most occasions by means of which we are quite ignorant." Nothing is truer than this in the agency of the physician in ministering to the sick. He prescribes wisely or unwisely; resorts to good measures and methods or bad ones, but there he rests; Nature must do the rest. But if he goes further, and seeks to know, to understand what element, power, or force, or principle it is in Nature that does the rest, is he out of his sphere? We think not. It is the proper function of the mind of man, that is, the intellect of man, to understand, to seek knowledge of causation. He should not be content to refer things to law, for law is a concept

of the intellect's creation, and explains nothing. As Plutarch said, there is a joy in just knowing, and so it is that man forever tries to get behind this beautiful panorama of things, and to find out who it is, by what cause it is, that the wonderful panorama is produced. Is it an unprofitable procedure? Yes, so far as the physician's business is concerned, for he should not proceed to treat his cases upon any hypothesis, but upon actual demonstrable knowledge, that is, if he professes to follow the inductive method, which is certainly the only sane, the only scientific, the only safe and reliable method for him to follow.

Bacon goes out of his way to inveigh against the physician for his want of success in the cure of maladies. In this matter, while his statements are true, his reproach is unjust. He exhibits a woeful lack of knowledge of the situation, or of the nature and causes of the ills of humanity. He seems to infer that there is a balm for every wound, a specific for every disease. As to the devastations of disease, he says, "they ought to have been exactly observed by a multitude of anatomies and the contributions of men's several experiences, and carefully set down, both historically, according to the appearances, and artificially, with a reference to the diseases and symptoms which result from them, in cases where the anatomy is of a defunct patient; whereas, now they are passed over slightly and in silence."[1] This was the

[1] *Vide Advancement of Learning.*

course of procedure pursued by Hippocrates and Galen, and others of more modern times. Elsewhere the author goes on to show how the physicians should deal with so variable, erratic, and inconsistent a person as a patient; the various symptoms that come and go; the multiplicity of phases which the phenomena of disease may present, as well as the unexpected influences to which the sick are subject that may complicate a malady, and aid or defeat the most skilful care and treatment, and bring good fortune or mal-fortune to the reputation of the physician. In this respect he writes with knowledge as if he were a physician.

Bacon declared the right of private judgment, in a qualified sense; that is, that man should not surrender absolutely the right to think for himself when he is able to reason and draw logical conclusions from demonstrable data. "For disciples do owe to their masters only a temporary belief," he says, "or a suspension of their own judgment until they be fully instructed; and not an absolute resignation or perpetual captivity." Nothing can be wiser or truer than that. Slavery of belief and opinion to the authority of the gods or the oracles of illuminated men or women has been the bane of ecclesiasticism and medicine alike, and a heavy weight on progress. It is an evil for which the teachers, or leaders of pupils and the public mind are largely responsible. It is a vanity which the college professor enjoys. He is pleased with homage that his classes pay to

him. This homage is often absolute—his disciples accept his dictum as the highest source of knowledge—the ultimate tribunal of truth. It is thus that he misleads them—perhaps unwittingly. But for this tendency to accept authority there would be no sects in theology or medicine to make war upon one another.

On the other hand, contempt for the oracles of the wise and prudent on the part of minds uninformed or unbalanced, leads to many evils. Teachers like Paracelsus, Sylvius de la Boë, and van Helmont, in medicine, and the ambitious aspirants for leadership in religious sects, with a few grains of truth and a large amount of pompous nonsense, may be referred to as examples—of evils arising from a premature breaking away from the trammels of authority. It is better to be free, however, and in the wrong than to be a slave and in the right.

One of Bacon's indictments against physicians was that "they have no particular medicines which by a specific property are adapted to particular diseases." It is hardly consistent with the scope and effects of drug remedies, and of the nature and causes of disease, for one to presume the existence of specifics for their cure; or a foundation for the belief that drugs have specific analogies for maladies. Such an idea is, for the most part, misleading. The more rational conception of this subject would seem to be that disease is no evil, but, on the contrary, that it is

a good; that instead of destroying health, it really preserves it. The hunt after specific for disease is therefore comparable to the search for the "philosopher's stone" or the "vitæ elixir." These agencies are a will-o'-the-wisp, as all know; but in the same category must be put, for the most part, the vaunted specifics for diseases which haunted Bacon's mind, and which still haunt the minds of many physicians to-day.[1]

With so much to admire and to commend in the writings of Bacon—and he contributed nothing but criticism to the art or science of medicine—it is difficult to understand his misunderstanding of Aristotle and Galen. To his views of the former's ability we have already referred; of Galen he writes in the "Advancement of Learning":

> This is the man that would screen the ignorance and sloth of physicians from their deserved reproach, and preserve them unattacked; whilst himself most fully and unequally pretends to perfect their art and fill up their office. This is the man that like the raging dog star or the plague devotes mankind to death and destruction by denouncing certain types of diseases to be incurable, taking away all glimmering of hope, and leaving no room for future industry. This is the man who makes his own fictions of mixtures to be nature's sole prerogative.

And with an inconceivable misconception of the

[1] The author holds to the abstract or metaphysical view of the subject, but would except immune medication.

natural history of diseases and perversities of the race, of which Galen was fully cognizant, Bacon goes on to suggest that

> A work is wanting upon the cures of reputedly incurable diseases, that physicians of eminence and resolution may be excited and encouraged to pursue the matter as far as the nature of things may permit; since to pronounce diseases to be incurable is to exhibit ignorance and carelessness, as it were, by law, and screen ignorance from reproach.

It is hardly necessary to observe that in regard to incurable diseases Galen had reference to the state of medicine in his day. It was perfectly evident that many diseases of that day, as of this, were incurable by any means known to the profession. Moreover, every physician knows that no organic injury or disease is curable in the strict sense of that term. A contused wound of the skin, or a severe burn of that organ, is incurable. Nature takes care of it, of course, and heals it, but not perfectly. The cicatrix forever remains.

We now part company from a great intellect and a man of great powers of induction, but not from a great man. He shows the lack of the senses of perception and of knowing, without which no man can be really great. He ought to have known, or to have perceived, that death is just as natural a phenomenon as life; that there are individuals born into this world to whom death is a mercy,

both for themselves and for others, for which there is no help and should be none, except death.

Jan Baptista van Helmont

Among the celebrated physicians of the sixteenth century there are, perhaps, none more justly entitled to our consideration than van Helmont, who was born at Brussels in 1577. He was bred for the priesthood, but soon after his course in scholastic philosophy he abandoned that career, and began the study of science and philosophy under the tutorship of the celebrated Martin del Reo, a learned Jesuit. Becoming dissatisfied in this course he abandoned it and went over to the Stoics. Here, too, he did not find the goal of his ambition satisfied. His mind having a natural bias to mysticism he studied the writings of that sincere pietist, Thomas à Kempis. In them he became interested and finally settled in his convictions. While he had a philosophical turn of mind he also had a leaning to the spiritual, and conceived a higher destiny for man than was to be found in physical philosophy. It is for this reason probably that he acquired the reputation of being visionary and a mystic.

Nevertheless, he was repelled by the superstitions of his time from systematic theology and the power and pretence of the monks and ecclesiastics, and sought refuge in the study of medicine. He did not lose faith in the Christian religion,

nor in the great exemplar of Christianity, nor in the beauty of the Christ life and character; but he did lose his respect, as well as faith, *in the Christian system*, its rites, doctrines, and ceremonies which were sought to be enforced throughout Christendom. His ambition was to imitate the divine Nazarene and become a healer of the soul as well as of the body of man. To this end he devoted himself to the study of the works of Hippocrates and Galen. Nor was he to be satisfied with the theory and practice of these celebrated savants until he had put their doctrines to the test of experience. And a very simple experiment decided, strange to say, his judgment, that their system was fallacious. It appears, according to his own statement, that he sought a remedy for the itch in the works of Galen, and put it to use, but finding it unsuccessful in the case, he distrusted the whole system of therapeutics and resolved to reconstruct it upon lines conformable to his own views. A single experiment sufficed to convince his judgment of the fallacy of scientific medicine!

Van Helmont was a man with a flood of ideas and immortalized himself by his ability to theorize and form hypotheses, rather than by acquiring knowledge. He had no doubt that living organisms could be spontaneously produced. "The smells which rise from the bottom of morasses produce frogs, slugs, leeches, grasses, and other things." And he declared that he had been an eye-witness to the spon-

taneous generation of mice. "It suffices to press a dirty shirt into the orifice of a vessel containing a little corn. After about twenty-one days, the ferment proceeding from the dirty shirt, modified by the odor of the corn, effects the transformation of it into mice." This affords a good illustration of his loose method of observation.

The world has conceded van Helmont to be a genius, but, except for the diversity of medical ideas, he made no contributions to the science and art of Medicine. The world owes the introduction of the word *gas* to him; and Dr. Hoefer, one of his biographers, gives him "the glory of revealing scientifically the existence of invisible impalpable substances, namely, gases." The term *gas* he applied to all elastic fluids except atmospheric air. He wrote a treatise on the magnetic cure of wounds, entitled "De Magnetica Vulnerum Naturali Curatione"; and also a work on the origin of medicine, "Ortus Medicinæ, id est Initia Physicæ Inaudita." But these works, interesting and curious in their way, have value only of a negative quality. The term *Archæus* was coined by him and meant the dominating force of the living organism. It is synonymous with vitæ, or vitality, about which hair-splitting sophists have long amused their fellows with acrid disputations. He used the phrase "vital spirits" with the same signification as *Archæus*. In his physiology he recognized this force in all the functions and processes of organic life. Few there are to-day

who would presume to dispute that proposition. But, apart from this, van Helmont indulged in strange, fanciful, unlearned verbiage to express ideas half conceived, with an independence and recklessness not unlike all system-builders.

Van Helmont's theory of disease and remedies was equally peculiar. Archæus is all in all and the basis of all that goes on in an abnormal as well as in a normal body. His objection to certain abuses of practice that had grown out of misconception of Hippocrates' teachings, and Galen's also, were well taken and would be accepted as well founded by all the medical schools of to-day. He was profoundly averse—even hostile—to bloodletting, but found nothing to condemn in massive doses of antimony, so often fatal in such doses, or blue mass, the effects of which, being cumulative, were often most disastrous. Venesection was often practised in van Helmont's day, and often without justification or reason, and his condemnation of it would have had more effect on the practice had his criticisms been more polite and conciliatory. Speaking of venesection in pleurisy, he says:

You adopt venesection and endeavor by means of revulsion to withdraw the blood from the vena azygus, as if it contained the disease. . . . Granted [he elsewhere writes] that the vein at the elbow should part with every drop of its blood, and the vena azygus be thereby emptied, yet the schools ought to know that there would immediately ensue

an equal redistribution of blood throughout the veins; so that, although the vein that was open were entirely emptied, which is impossible, there would straightway be an equalization of blood through the whole web of veins. Whence it is quite clear that the whole talk about revulsion and derivation is mere drivel; for if you concede their assumed effects, all that they really produce is a trifling delay.

All this is good reasoning and sound philosophy, which no one would dispute to-day; but it was revolutionary at that time, and he was a bold innovator who dared to stand up and proclaim it. This practice of bloodletting in certain inflammatory diseases, as pleurisy and pneumonia, brain fever, apoplexia, etc., was orthodox in the author's college days; and it was a practice most violently assailed, even vehemently denounced as murderous by opposing sects, who thought they had, like van Helmont, found a better way. The practice was Hippocratian and Galenic, and continued to be the rule in all cases where fatal congestion of blood was liable to occur, or had occurred, despite all opposition, down to a recent period. Even now, dry-cupping is practised, and leeches used; venesection seldom, only *in extremis*.

Again, writes this bold iconoclast, on the same subject:

Nature, it is true, missing sadly her wonted strength [after venesection] and bankrupt in blood, will not manifest the abnormal symptoms so long as her

weakness remains; and, like a penitent, ashamed of the recent stormy swelling, may begin to think of the propriety of concocting pus as soon as possible, out of extravasated blood. But the desired effects would follow more naturally and more propitiously if you retained the blood, in which the life, that is, the vital power, resides. For nature, the only healer of disease, is emphatically life, and when that goes, the physician can only shrug his shoulders.

This is the Gospel truth. One cannot but wonder that it should find expression in the sixteenth century, and by a man not distinguished by his learning, nor by his extended observation, but who depended more upon his intuitions for truth than upon the Baconian system of scientific induction. The learned Sprengel, whom we have had frequent occasion to quote in these annals, speaks of van Helmont in the highest terms of appreciation. We translate:

With pleasure does the lover of truth hang over the writings of the man, who, however much he adhered to the mysticisms of his age, yet exposed innumerable theoretical and practical errors, and expounded principles which later physicians ignorantly regarded as the fruits of after discoveries. . . . But the incorruptible tribunal of history will award the chaplet of merit to this forgotten physician of the olden time.[1]

All honor be to van Helmont! We would write no words of detraction from his name and fame;

[1] Sprengel, *op. cit.*, vol. iv., p. 316.

but it is due to the truth of history to say that the truths he advocated were uttered long before his day, and his fallacies died with him. Nevertheless, his mind was as a divining rod that pointed the way to truths unseen and invisible, even to monarchs of thought of his generation.

William Harvey

In William Harvey and Francis Bacon may be observed two men like planets in conjunction; born in the same generation, each illustrious in the annals of history, the one in philosophy, the other in science, but in striking contrast to each other. One was a thinker, the other was an actor; one conceived methods, the other put methods into operation; one was an academic philosopher, the other a man of science and discovery; one immortalized himself by his profundity of thought, the other by his contribution to science. Both were stars in the firmament of great men, but long after one has become dim or gone out, the other will continue to shine with splendor.

Both these great men possessed all the advantages of education that the colleges of their day afforded, the one at Cambridge and Trinity, the other at the University of Padua; but the bias of their minds was different. One became a statesman, the other a physician. Each had a position adapted to the natural bias of his

mind. That was a fortunate conjunction of circumstances.

William Harvey was born in the County of Kent, England, in 1578. He entered Caius College fifteen years later, and graduated in 1597. Thence he went to Italy and studied medicine and anatomy under the celebrated Fabricius of Aquapendente, at Padua; thence he returned to London and began to practise medicine in that city. In 1615 he was chosen to deliver lectures on anatomy and surgery at the College of Physicians and Surgeons, and during this course, about four years later, he made the discovery which immortalized his name. It was not announced, however, until the publication of his work "Essays on the Motion of the Heart and the Blood"—"Exercitationes de Motu Cordis et Sanguinis."

All invention and discovery, be it observed, are evolutions, and we are apt to give more credit to the man who perfects, demonstrates, and utilizes them than they deserve. The circulation of the blood in and through that complex organ, the heart, had been guessed before, and some parts of it even demonstrated by the tutor of Harvey while at Padua, namely, Fabricius, or Fabrizio, a celebrated anatomist, to whom we have referred.

The fact that Herophilus of Alexandria, nearly three centuries before the Christian era, discovered the circulation of the blood, the elasticity

of the arteries, the nature of the pulse, the relation of brain and nerves, etc., by vivisection of the living human subject, does not detract from the merits of Harvey's genius. Herophilus' books were probably destroyed at the second destruction of the Alexandrian Library; and no writers except Galen and Celsus had mentioned them. It is not probable, therefore, that Harvey could have obtained a clue to his discovery from the writings of the ancients. Be that as it may, this demonstration of Harvey was by far the most important discovery in the annals of science. It brought to the author more vexation and sorrow than fame. He became the object of envy and hatred by his contemporaries, and unjust criticism and detraction from his colleagues, who ought to have been the first to congratulate him and show him honor, for the discovery was of vastly more consequence to mankind than it was to Harvey.

But a still more important discovery by Harvey was in embryology, in which by watching closely the progress of development of the chick in the egg, he made a valuable contribution to that science, then in its embryo. It was a glory to demonstrate that all animals are developed from the egg. If he had been in possession of a microscope he might have anticipated the discovery of the illustrious Schwann, that all animals originated in a single somatic cell! This discovery of Harvey's, which was true only of certain species, and not true of others, marked an epoch in physi-

ology and its allied sciences; the discoveries of Bichat, Mirbel, and Schwann marked another, especially in the cosmogonies of creation, as it brought that subject into direct conflict with the Mosaic cosmogony. But although treated with disdain and calumny by his contemporaries, partly, perhaps, by being a royalist, as well as by reason of his great and incomparable discoveries, Harvey lived to receive the respectful homage of his peers, and to die full of honors (1657).

This man lived in an age when Alchemy was more popular than science, and the love of mystery stronger than the love of philosophy. Van Helmont was fulminating upon his *Archæus* and antimony, and disputing the wisdom of the ancients; visionists were exploiting magic and the arts of necromancy; yet Harvey remained untouched by any of them. His was to study the things within his comprehension; to think, to observe, and ascertain the relation of things within his daily reach. Thus was he rewarded with the fulfilment of his mission. He was on the trail of the causation of things—the commerce of mind with things—and could not be tempted from his course by the claims and pretensions of mystics, nor by the hypotheses of hair-splitting sophists which were rife in his day. To show the character of Harvey, more clearly than any words of ours could do, we cite one paragraph from his works:

When I first gave my mind to vivisection [he says]

as a means of discovering the motions and uses of the heart, and sought to discover these from actual inspection, and not from the writings of others, I found the task so truly arduous, so full of difficulties, that I was almost tempted to think with Fracastorias, that the motion of the heart was only to be comprehended by God; for I could neither rightly perceive at first, when the systole and diastole took place, nor when and where contractions occurred; by reason of the rapidity of the motion, which in many animals is accomplished in the twinkling of an eye, coming and going like a flash of lightning, so that the systole presented itself to me now from this point, now from that; the diastole the same; and then everything was reversed, the motions occurring as it seemed variously and confusedly together. My mind was therefore greatly unsettled, nor did I know what I should myself conclude, or what believe from others. At length by using greater and daily diligence, having frequent recourse to vivisections, employing a variety of animals for the purpose, and collating numerous observations, I thought that I had attained the truth, that I should extricate myself and escape from this labyrinth, and that I had discovered what I had so much desired, both the motion and the use of the heart and arteries.

And the author in a style of writing so Darwin-like proceeds to set forth the manner in which these laborious discoveries were received by his friends.

These views, as usual, pleased some more, others less; some chid and calumniated me, and laid it to me as a

crime that I had dared to depart from the precepts and opinions of all anatomists; others desired further explanations of the novelties, which they said were both worthy of consideration, and might, perchance, be found of signal use.

Then he says, to allay the envy of uncandid minds, and of the minds who ignorantly "have traduced me publicly": "I have been moved to commit these things to the press, in order that all may be enabled to form an opinion, both of me and my labors."

Harvey, it is believed, was the first to be persecuted by the profession for making discoveries at variance with the drift of public thought and opinion. But he was not the last. Persecution for opinion's sake is the inevitable consequence of the recognition of oracles in the pursuit of truth. The philosopher has no guide in that pursuit, but the truth itself; no authority in the spoken word; no "Thus saith the Lord," to put an end to further research; no Paul, no Pope, Origen, Eusebius, nor Tertullian; no Hippocrates, Aristotle, or Galen; nothing but the truth will answer for him, and to that end he must see for himself, as Harvey did, as all the great masters of thought and diction did before him and shall forever do. Harvey was a type of the truly scientific man, of which the last century was so full; men who questioned nature, and waited answers with patience and no haste.

Harvey's attitude to science and discovery was

more like the Father of Medicine than any man before his time. His modesty, his reserve, his laborious attention to details, the absence of pretension or desire to vaunt himself, which characterized this sage, were only excelled by Hippocrates. Dr. Willis, the translator of Harvey's books, says:

Harvey, besides being physician to the King (Charles I.) and household, held the same responsible situation to the families of the most distinguished among the nobles and men of eminence of his time, among others, to the Lord Chancellor Bacon, whom, Aubrey informs us, "he esteemed much for his wit and style, but would not allow to be a great philosopher. So he said to me: 'he writes philosophy like a Chancellor,' speaking in derision."

We think the very modest criticism of Bacon by Harvey was just, and that time will fully justify its wisdom, if indeed, it has not already done so.

Harvey's penetration never failed him [Willis goes on to say]; the philosopher of fact cared nothing for the philosopher of prescription; he who was dealing with things, and through his own inherent powers exhibiting the rule, thought little of him who was at work upon abstractions, and who only inculcated the rule from the uses he saw others making of it. Bacon has many admirers, but there are not wanting some in these present times who hold with his illustrious contemporary, that "he writes philosophy like a Chancellor."

B. S. Albinus.

The writer of that sentiment, be it observed, was a physician who by his anatomical discoveries left a permanent impression on the history of medicine.

To the same period with Harvey belongs the celebrated French surgeon, Henri François Le Dran. Le Dran was born in Paris in 1685, and died in 1770. He wrote a treatise on Lithotomy, and was the first to perform the lateral operation for that malady. He also wrote "Observations on Surgery," and another work on "Gunshot Wounds." His skill as a surgeon had not been excelled. His operative procedures were pre-eminently conservative and original. In surgical dressing Le Dran made use of oil and deodorants, seeking by such means union of wounds by first intention. It was his wont constantly to admonish his pupils to trust more to Nature—the All-Heal of the Master—to assist, not to thwart her. Le Dran was a contemporary of the celebrated Hunter, but not his equal as an anatomist. No man of that period could claim to be that. The Royal Society of London made Le Dran a Fellow.

An English contemporary of Le Dran was William Cheselden, who deserves more than a brief mention. William Cheselden was one of the most celebrated surgeons of his time. He was born in Leicestershire in 1688, and died in 1752. Cheselden was a pupil of the eminent surgeon Cooper, and in turn became a preceptor of John

Hunter after the latter had quit cabinet-making in Scotland and had gone to live with his elder brother in London. He wrote a work on "The Anatomy of the Human Body," and was surgeon to St. Thomas and Westminster Hospitals, London. Lithotomy was his specialty. He was regarded as one of the most skilful all-round operators of his time. Alexander Pope was his intimate friend, and declared him to be "the most noted and the most deserving man in the whole profession of Chirurgery."[1]

[1] *Biographia Medica.*

Jan Baptista van Helmont.

From a print prefixed to his works.
Russell's *History and Heroes of Medicine.*

FIFTH: PERIOD OF THE RENAISSANCE
(*Continued*)

CHAPTER VI

Medicine in the Seventeenth Century

THE observant student of medical history finds much of exceeding interest to him in the seventeenth century of the Christian era. Bacon was still making his pronunciamentos against false methods in scientific procedures, which the so-called scientific men of his day, for the most part, declined to follow. Van Helmont was busy with his retort, acids, and alkalies. The former left no pupils and had few followers; the latter had a few followers in the profession who were charmed with his empirics, and enthusiastic over the prospects of great things in chemical discoveries. Guy Patin, famous at this time, was one of these, a French physician, who made himself notorious by pouring ridicule upon the vanity of medical theories and pretensions, whose purpose seemed to have been to get as much amusement out of life as possible. While adhering to the Galenic ideas of medical practice for the most part, he exhausted his fund of invective, wit, and witticisms against the Empirics whom he called

"Chemikers." His letters to Sylvius de la Boë are all that he contributed to medical literature, of which there are six hundred that have been preserved to amuse, if not to instruct, future generations.[1]

Sylvius de la Boë, a celebrity of this period, a man without a rational idea in his head, at least a medical idea of that character, was born in Flanders, 1614. He belonged to the innovators, or the Chemikers, as Patin derisively called them, who used chiefly the chemical remedies which were brought into notice by van Helmont. Like most men of his type he aspired to formulate a new system, by contributing the animal spirits of Paracelsus, the Archæus of van Helmont, together with the concoctions of the retort, and the vortices of Descartes; thus equipped, Sylvius now comes forward with his erratic notions of philosophy of mind and matter, and mixes them together to form a very curious jumble, totally at variance with reason, if not with common sense. A single example will suffice to give the reader an idea of his theory and practice. "I consider the cause of intermittent fevers to be," he says, "that some part of the pancreatic juice stagnates in one or more of the

[1] In his interesting *History and Heroes of Medicine*, Russell has given a very amusing and entertaining account of this popular Frenchman and his correspondence with Sylvius de la Boë, extending over a period of more than a third of a century, to which we refer the interested reader.

pancreatic ducts, and as its habit is (*more suo*) it becomes acrid." At this point Russell takes him up, saying:

This acrid acrimony is dissolved by the lymph and poured into the small intestines. Here it comes in contact with the bile, and straightway an effervescence ensues, from which there arises a paroxysm of cold. This acrimony finds its way naturally, sooner or later, to the heart, and thence is distributed over the system. This, then, is the cause of ague—an acrimony produced by a stoppage of the pores of the pancreas or from some confusion among the vortices à la Descartes, giving rise to a fermentation à la van Helmont. Given the cause—and such a cause—can anything be clearer than the true method of treatment? Surely the obvious antidote for an over-acid or acrimonious state of the blood is to pour into it an alkali which will neutralize this condition. This was his method of cure [continues Russell]. He assumed that the blood was too acid or too alkaline. For the former condition he gave largely of salts of ammonia, and for an excess of alkalies he gave opium in equal profusion.[1]

If any further treatment were needed in the course, it would be found in antimonial wine, on the assumption, purely theoretical, that that remedy would correct the excess of either acid or alkalies and restore the equilibrium of fermentation and vital distillations, as the case may be. In his learned medicinal history of this period Sprengel

[1] *Op. cit.*, pp. 229–230.

gives examples of many of Silvius's prescriptions, and remarks:

> And so the lives of thousands were sacrificed for the sake of an empty chimera! But the spirit of the age, the fashion, willed that the physician should see nothing in the animal economy but fermenting elements and chemical processes; and better far that the patient should die in the fashion than live according to the wisdom of the ancients.

But great as the folly was it fell far short of what it came to be at a later day.

Thomas Dover

As a curiosity of a medical man that appeared in England, early in the seventeenth century, was Thomas Dover, the notorious buccaneer, and inventor of the famous *Pulvis Ipecacuanhæ Compositus*, which survives to this day, as "Dover's Powder." A more eccentric character in the profession of medicine the annals of medicine rarely disclose.

Dover was a man of great ability without learning. He possessed the eccentricity of Paracelsus without the latter's genius and clever insight. Dover's operations were on a lower plain. He possessed a keen scent for profits and spoils. He was born in Warwickshire in 1660, and died in 1742; studied medicine; took a Bachelor's degree at Cambridge; began the practice of medicine at Bristol, and after engaging in a privateering

expedition, returned to England, and became a quasi pupil of the celebrated Sydenham.

We next hear of him as Captain Dover, third in command of the ships *Duke* and *Duchess*, two privateers fitted out to prey on the dominions of Spain. This expedition proved to be a great success, not only discovering the long-exiled Alexander Selkirk, the original "Robinson Crusoe," but despoiling the innocent and peaceful people of the South Sea Islands of their possessions and devastating their homes. He returned to England with £170,000. This was in 1710.

This expedition appears to have supplied Dover with funds, and he again settled down to practise his profession, writing meantime his celebrated book, "The Ancient Physician's Legacy," a copy of which, as a medical curiosity, is in possession of the British Museum.

Dover acquired the pseudonym of "Quicksilver Doctor," as that drug was his chief medicine in the treatment of most critical cases of malady. His doses of it were enormous. An ounce and a quarter a day was usually prescribed by him. His famous powder he prescribed in doses of from forty to seventy grains—and even a hundred grains per diem. It is said that apothecaries were accustomed to advise the patient to make a will and arrange his worldly affairs before taking it!

For this generation, the most important, certainly the most instructive, part of Dover's unique career is that which shows the relations

which the apothecaries sustained to the profession and the public. The sick were at that time the prey of both. The physician and the druggist were in league in making the most of every case that they could get hold of. The physician must not cure his cases too quickly, nor allow his prescriptions to be duplicated. In cases of fever, the apothecary must have from each case fifteen to twenty shillings a day. And Dover intimates in his "Ancient Physician's Legacy," that in protracted cases of sickness the apothecaries' bills "amounted to forty, or fifty, or more pounds." It is to Dover's credit, that he resisted these extreme exactions of the apothecaries. The following extract from "The Ancient Physician's Legacy," puts in clear light the medical ethics of that time, and serves also to show the advancement in morals which the moderns have made upon them:

The apothecaries, generally speaking, have it in their power to recommend the Physician, which is the wrongest step the Patient can possibly take. The Physician, to gratify the Apothecary, thinks himself obliged to order ten times more Physic than the Patient really wants, by which means he often Ruins his constitution, and too often his Life; otherwise how is it possible an Apothecary's bill in a fever should amount to Forty, or Fifty, or more Pounds? Nay, I have been creditably informed that several of the Apothecaries have declared they would never call in a Physician, but what should put in Fifteen to

Twenty Shillings a Day in their Pockets. What must the Conscience of such Physicians be, that they would forfeit their reputation and every thing that is dear to them, by cheating for others? I would venture to say, neither Sydenham's nor Radcliff's did ever amount to Forty Shillings in a Fever, and yet they recovered their Patients without the Rule at present prescribed of Vomiting, Bleeding, and multiplying Blisters in all Cases whatsoever. So, since this is to be their Rule of Practice, they are very indifferent in their Enquiries what the Patient's Disease is.[1]

The formula of the original prescription of the Dover's Powder is interesting:

Take Opium one ounce, Salt-Petre and Tartar vitriolated each four ounces, Ipecacuana one ounce. Put the Salt-Peter and Tartar into a red-hot mortar, stirring them with a spoon until they have done flaming. Then powder them very fine; after that slice in your opium, grind them to a powder, and then mix the other powders with these.

The danger of the dose was modified by the directions. The patient was ordered to bed, to be warmly covered, and to drink a quart or a quart and a half of the posset wine. This put him in a profuse sweat, which naturally eliminated much of the medicine.[2]

[1] The capitalizations are his.

[2] Dr. Osler in his entertaining and instructive volume, entitled *The Alabama Student* gives an interesting account of Dr. Thomas Dover and his practice.

René Descartes, latinized Renatus Cartesius, who deserves a passing notice in this place, was born in 1596. He was a genius of varied accomplishments; without balance; prolific of theories, without data to rest them upon; a builder of systems of philosophy with materials drawn from his own mind, and as fanciful in his conception in metaphysics as was Sylvius de la Boë in pathology and therapeutics. One wonders how either of these men, with half-conceived ideas of final causes, could have had the audacity to set them forth.

Descartes' chief contribution to mental philosophy is contained in the sentence: "I think, therefore I am." The phrase would have been logical reversed thus: "I am, therefore I think"—for surely being precedes thought. The same is true of the gosling—of every form of life and mind—and of even the molecule. That says: "I exist, therefore I am and so shall I remain." But it is hardly fair to hold a sixteenth-century philosopher to the terms of to-day. To him "belongs the honor," says Professor Playfair, referring to Descartes, "of being the first who ventured on the solution of the most arduous problems which the material world offers for the consideration of Philosophy. For this solution he sought no other data than matter and motion, and with them alone proposed to explain the structure and constitution of the universe." O vain and impotent endeavor! He conceived the idea of vortices to explain the

motions of the heavenly bodies, something of the nature of vacuums. The planets were carried around the sun by the motion of vortices. A vortex was a revolving circle of currents; or it may assume various shapes, oval, flat, or round as circumstances may require. His mental philosophy is equally fanciful. He speaks of spirits vitalizing the blood, and going to the brain finally became the soul, which he places in the pineal gland.

The philosophy of Descartes [says the learned Professor Playfair] could explain all things equally well, and might have been accommodated as well to the system of Ptolemy, or Tycho, as to that of Copernicus. It forms therefore no link in the chain of physical discovery; it serves the cause of truth only by exploding errors more pernicious than itself, by exhausting a source of deception which might have misled other adventurers in science, and by leaving a striking proof of how little advancement can be made in philosophy by pursuing any path but that of experience and induction.[1]

Professor Playfair's conclusion as to the merits of Descartes' wild, irrational vagaries would seem to be correct. In his day he was looked upon as a kind of supernatural genii, so bold was he to utter and proclaim imaginary views of the unknown. He attracted wide attention simply for his absurdities and the boldness and assur-

[1] *Encyclopædia Britannica.*

ance with which he set them forth. Had he lived to-day he would have excited amusement and had no following among men of science. But in his day there were men who regarded his lucubrations as "brilliant reveries." Had Descartes devoted himself wholly to medicine he would have distinguished himself as the prince of quacks. In philosophy he was a bold adventurer. With this brief sketch we dismiss him with a feeling that we ought to apologize to the profession for giving him a place among physicians. Yet was he distinguished.

About this time appeared Bontekal, a Dutch physician, with a treatise on scurvy in which he professed to find in tobacco a sovereign specific. Few writers have spoken words of greater appreciation of the excellent virtues of the weed than he.

> Like the vital air, we can breathe it in all times, places, conditions, and companies [he writes]. Is one anxious at heart, deaf, joyous, malade, weak, torpid, stiff with scurvy? has one pain in the head, eyes, teeth, or anywhere? Is the sight weak or dim? is one sleepless? has one colic, gout, stone, itch, thinness, corpulency, worms, flatulency? the smoke of the Virginian tobacco is the true remedy against all these disorders!

Such are a few of the words of this most irrational eulogizer of Bontekals' panacea for the woes of mankind, including scurvy, a disease quite preva-

Thomas Sydenham.

From Russell's *History and Heroes of Medicine.*

lent in his day among those that followed the sea.

Despite the delusion of the metaphysicians and the vagaries of the Chymists with their ferments, acids, and alkalies, which continued to exert no small influence on the medical mind, there was another class at this time whose quiet labors were bringing forth fruitful results. The anatomists were busy in their dissecting-rooms, extending their studies to all the structures of the body. The demonstrations of Harvey, though in abeyance for a while, soon began to arouse widespread interest. Heretofore physicians had been content to familiarize themselves with the skeleton of the human frame, and the relations of its different parts, together with the organs and their probable functions. Now they were industriously at work on the nature and constitution of the tissues, ascertaining the minute structure of bone, muscles of various kinds, the veins and arteries, the nerves and brain, spinal cord, etc. The absorbent system was uncovered and disclosed by Anselli, Olaus, Rudbeck, Thomas, Bartholin, and others; while the structure and office of the lungs, and the relation which they bear to the heart, were explained by Malpighi, Honk, Mayow, and their associates. Willis, too, was conspicuous at this time, not only as a disciple of Sylvius de la Boë, having become infected with his chymical mysticism, but influenced, more likely, by the charm of Sylvius's personality,

was practising medicine according to the latter's doctrines. Nevertheless, he was an industrious student of anatomy, in which studies the world knows him and will continue to know him.

Thomas Willis was an Englishman, born in 1621. He studied medicine at Oxford and ultimately became Professor of Anatomy in his Alma Mater, and a member of the Royal College of Physicians. He removed from Oxford to London in 1666 and became physician to the King, having already, 1664, given to the public his great work on the "Anatomy of the Brain" ("Cerebri Anatomie"), in which he pointed out a convolution which bears his name, "The Circle of Willis." Willis was the first to suggest a great and fundamental truth in mental science,—though earnestly combatted and as earnestly defended,—that different parts of the brain were the seats of different and independent faculties of the mind.

One of the most distinguished surgeons in the sixteenth century was Ambrose Paré, who was born at Laval, France, in 1517. His advantages for education were meagre, except such as actual work as a surgeon in the army afforded, which was considerable in his day. He was accorded the honor of "Father of French Surgery," since he greatly improved the art. He was the first to use the ligature for wounded arteries, instead of boiling oil, and cauterization with a hot iron—the "actual cautery"—a very great and humane innovation. He was surgeon to several kings

of France. Being a Protestant, it is said that on the evening of the Massacre of Saint Bartholomew the king sent for Paré and kept him in his own room for safety. Paré died in 1590.

Of the Swiss physicians in this century Daniel Le Clerc was probably the most eminent. He was born at Geneva in 1652 and died there in 1728. He practised medicine and surgery in Geneva and wrote a system of surgery. But the work by which he is best known is his "Histoire de la Médecine" from the earliest records to Galen. The history is a marvel of erudition and painstaking diligence. The author of these pages is indebted to Le Clerc, to a great degree, for the information concerning the earliest chronicles of the medical art and for the state of medicine prior to Hippocrates. His history, a large quarto, was published in French in 1723, at Amsterdam.

In this period belongs the name of Dr. John Freind, an English physician and surgeon, and a writer of conspicuous ability. Born in 1675, he studied the classics and drifted into medicine, and was surgeon in England's war with Spain, 1705–07; later, he became Member of Parliament; later still, physician to the Queen of George II., and Fellow of the Royal Society. He was the author of several works on medicine of more or less note in his day; but the work by which he is best known is a "History of Physics from the Time of Galen to the Beginning of the

Seventeenth Century," in two volumes, 1726–1727. He died in 1728.[1]

An English physician and philosopher, born in the Isle of Wight, in 1635, was Robert Hooke. He was a noted anatomist, and distinguished himself in many other scientific studies; became professor of geometry in the Gresham College; and invented the barometer and the quadrant, balance spring for watches, etc. He also took great interest in architecture, and made drawings for many of the public buildings of London, among them the Bedlam. He was also an accomplished writer and controversialist and wrote many memoirs on scientific subjects. In 1662 Hooke was chosen curator of experiments to the Royal Society and was a Fellow of that body. He died in 1702.[2]

Helvetius Jan Adriance, a Dutch physician, born in 1660, distinguished himself while on a visit to Paris by his success in curing dysentery, an epidemic of which broke out in that city during the reign of Louis XIV. The King offered him one thousand louis if he would divulge the secret of his remedy, which proved to be ipecacuanha. He afterward settled in Paris and became physician to the Regent of the Kingdom, the Duke of Orleans. He also acquired celebrity in his controversy with Robert Hooke, an English contemporary, some account of whom we have

[1] *Vide Biographia Britannica.*

[2] *Encyclopædia Britannica.*

Ambroise Paré

From the original picture, *L' École de Médecine*, Paris.

just given. He also wrote a treatise on medicine. His death occurred in 1727.

Marcellus Malpighius

A contemporary of Willis was the celebrated Italian anatomist Malpighius, born at Bologna in 1628. For many years he held a professorship at the College at Pisa, and afterwards at Messina. He was also distinguished in his studies of plants, and wrote a treatise on "Anatomie Plantorum," a science which he was one of the first to develop in connection with Grew. Malpighi was the first to introduce the microscope in the study of anatomy. The profession of medicine is deeply indebted to him for its knowledge of the lungs and brain, on both of which subjects he wrote treatises. He made also important contributions to the minute anatomy of the skin, glands, vesicles, etc. The name of Malpighi is indelibly impressed upon the text-books of anatomy in all languages, and is as familiar to the student of medicine as household words. He was chief physician to Pope Innocent XII. when he died, 1694.[1]

Another name deserves mention among the students of anatomy of this period, that of Peyer, Johann Conrad, who was born in 1653, at Schaffhausen, Switzerland, and was professor of the physical sciences there. He has the honor of being the first accurately to describe the little

[1] *Nouvelle Biographie Générale.*

glands that stud the mucous membrane of the ileum, and which have come to bear his name—the glands of Peyer. He was a man of modest pretension and little known outside of his immediate profession.

While such men as these, and many others of less note, were slowly pushing their inquiries into the anatomy and physiology of the human system, and thus laying a solid and enduring foundation for science and philosophy, the Chymists continued to exploit their theories and practice to a credulous world. When the south of Europe was well-nigh rid of them they plied their arts with singular success in the more staid and philosophic England. Fludd was one of those physicians who about this time acquired a great celebrity in London. Bostock says that "Fludd's writings 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." But a more noted combination of these qualities may be observed in Kenelm Digby, who flourished in London at this time, who Bostock, on the authority of Sprengel, says, was a man of rank and of refined education. He travelled on the continent, it is said, but more probably in India, and became initiated in the mysteries of chymical philosophy there in vogue. On his return he published an account of the wonders of the "sympathetic powder." And still another con-

temporary who acquired a great reputation for curing diseases solely by the laying on of hands was Valentine Greatrix. He is said to have been a powerful rival to King Charles, who was curing diseases at this time by the royal touch. Well might Shakespeare have declared in view of these things, "What fools we mortals be!"

We have already had occasion to note the connection of the distinguished Willis with the fanaticism of his day. It seems to have been confined to theory; it did not affect his practice of medicine, nor influence the course of his studies, which was altogether inductive. The views which he had imbibed from Sylvius were theoretical and not susceptible of being proved or disproved. They were matters of opinion, therefore, to be put away or ignored when face to face with problems of practice; just as one may believe in a future life as being superior to this without being influenced by that belief to help his patients to go there, and in no hurry to go there himself.

Robert Boyle

Among the great names of this period that have contributed to the advancement of medical science, that of Robert Boyle stands pre-eminent. He was born at Lismore, in Ireland, in 1626. His father was a man of rank and fortune, the Earl of Cork, and Robert was his seventh son. No expense was spared on this son's education.

He was sent to Eton College, and finishing there went abroad, that is, to the Continent, when he was fifteen years old, to study under a French tutor. Returning from France in 1644 he applied himself to the study of the natural sciences in accordance with the method of his great exemplar, Bacon, who, however, died while Boyle was in his infancy. But his influence remained to guide the young aspiring student.

The stronger bent of Boyle's mind was to experimental philosophy. It was not that he had no taste for the metaphysical; indeed, it was conceded by Dugald Stewart, a master of speculative thought, that Boyle possessed powers in that direction that would have placed him on a level with Descartes and Locke. How fortunate it was that he missed the "level," and preferred to occupy a place in philosophy with his feet on terra firma! As it was, he had scarcely reached the prime of life when he was very generally accorded the distinction of being the father of experimental philosophy. M. Libes, a French writer of note, author of "Histoire Philosophique du Progres de la Physique," declares of him that it is impossible to say to what degree of obligation chemistry is to limit its acknowledgment to Boyle. "Searching every inlet which phenomena presented, trying the whole material world in detail, and with a disposition to prize an error presented, as much as a truth discovered, it is impossible to say how many were led to discover

what exists, by being previously warned by Boyle not to search for what has no existence." And a writer in the "Encyclopædia Britannica" says that Boyle was "one of the greatest philosophers, as well as best men, that our own, or indeed any country, has produced." "To him we owe," said Boerhaave, the great physician of the succeeding century, "the secrets of fire, air, water, animals, vegetables, fossils; so that from his works may be deduced the whole system of natural knowledge."

Boyle's contribution to medicine was in the advancement of the science of chemistry. It was too early to complete and perfect chemistry, but it is due to him that much real substantial progress was made at that time. He was not a medical man, distinctly, except as a philosopher is a medical man; but he gave it a great deal of attention, as did Bacon; and indulged in much criticism of the medical practice of his day; pointed out its shortcomings and fallacies, and made suggestions, many of which, it must be confessed, were wise and judicious. His conception of a human body was in strong contrast with that of his day: He says: "I consider the body of a living man, not as a rude heap of limbs and liquors, but as an engine consisting of several parts, so set together that there is a strong and conspiring communication between them." In other words, he conceived the body of a live man as a unit, soul and body, any part of which

was in close sympathy with the other parts and all mutually dependable; and an injury of a part an injury to the whole.

In the system of prescribing drugs then in vogue he found much fault, and justly so. "It seems a great impediment to the further discovery of the virtues of simples," he says, "to compound so many of them in composition"; and again:

I fear that when a multitude of simples are heaped together into one compound medicine, though these may result in a new crisis, yet it is very hard for the physician to know beforehand what that will be; and it may sometimes prove rather hurtful than good, or at least, by the condition, the virtues of the chief ingredients may be rather impaired than improved.

And again he writes:

By heaping up or blending simples into one compounded remedy, I see not how, in many ages, men will be able to discover their qualities of good and bad that are comprised under the name of materia medica; whereas, where a physician often employs a simple, and observes the effects of it, the belief or prejudice of the patient may very probably, if not with medical certainty, be ascribed to the good or bad qualities of that particular remedy.

We think that the learned philosopher's views were sound in the main, and we have no desire to controvert him, nor to indorse him, except to observe that a physician seems to be justified

in giving a compound remedy when its effects *as a whole* have been proved, the same as he would a single medicament, which should also be proved. In neither case is it possible to have, for obvious reasons, perfect foreknowledge of its effects. There is also a distinction to be made between specific medication—that is, the giving of a medicine for its well-known effects in certain directions, as strychnine on the cord and intestinal tract, or cantharis on the bladder, and immune medication, a discovery of the nineteenth century, such as the virus of rabies, properly prepared, for hydrophobia; or horse-serum—anti-toxine—in diphtheria; or vaccination against variola. In all these cases the remedy is a very complicated one, but as to its specificity to the case for which it is given, or adapted, there can be no doubt.

Whoever reads the prolix disquisitions of Boyle on the subject and finds any discredit or doubt as to the agency of nature in curing malady, with or without medication, reads him wrong. He is too great a thinker to commit so grave an oversight. Nature is to be reckoned with when remedies are administered, whether they be "specific" or otherwise. Surely no one could imagine that the specific action of a drug could be manifested in a dead body.[1] Nevertheless, Boyle writes at times as if he conceived the possibility of a "specific" that could supersede nature. One trembles to reflect what dire consequences

[1] *Vide* vol. ii. of Robert Boyle's *Works*, London, 1772.

might result from that! It would be like saving one from the natural sequences of folly, which Herbert Spencer says would fill the world with fools; and a greater man than Spencer, Virchow, says it would put an end to the race. Man will learn only by experience. He lives by struggling against imperfect conditions in the moral world, and against morbific causes in the physical world. That is second only to the chief business of the vital economy.

The bane of medicine has been the system-builders, men ambitious for leadership, distinction, and glory. We are loath to impugn the motives of such men, or any man, but it is difficult to avoid this conclusion on the evidence that has been presented to us. Medicine embraces so vast a field of knowledge, much of which is unexplored, and is related to so many sciences, still in embryo, concerning the nature and constitution of this complex being, man, physically and psychically, that it easily falls a prey to men of genius, with a flood of half-conceived ideas and a head full of undigested facts. Brilliant men are mostly unlearned, but they know how to use such knowledge as they have to move the multitude and create a following. Such a man was Sylvius, of whose career we have already given a brief account. We have now to deal with a much greater genius than he, namely, Giovanni Alfonso Borellus, an Italian physician and mathematician. Although Borellus was born in 1608 he did not

come into prominence until a much later period, and then in connection with an entirely new system of medicine. Borellus acquired a strong following in Italy, and his views spread over France and Germany and infected some prominent men in England, the home of the revival of Inductive Science.

The new system was called the Iatro-Mathematic School, which professed to be able to reduce all the motions and activities of nature to mathematic formulas. Borelli was a great mathematician and devoted to scientific pursuits; he had already written a treatise on muscular motion, in which he set forth how "certain functions of the body may be elucidated and explained on mechanical principles." The modern osteopath could, no doubt, find much in Borelli's system to support his views, or to give them a semblance of learning and dignity. It was subsequently found that much of Borellus' data was false and that his deductions in many cases did not accord with his doctrines; nevertheless, the interest which his doctrines excited led to an increase in the knowledge of the human economy. Being a professor in the University of Pisa, Borelli was able to make many converts to his school, and to draw to his support a few of his contemporaries, and thus to create a large and reputable following. Yet, hardly one of them held a sound philosophical theorem of physiology, nor of pathology and morbific causation.

Among the followers of Borellus, or perhaps we

should say forerunners of that celebrity, no one was, perhaps, more distinguished for ability than Sanatorus, who, although born in the previous century (1561), lived to the year 1636. He held a professorship at Pisa University. He was a zealous Iatro-mathematician. He discovered the true function of the skin; the phenomena of transpiration (insensible perspiration), as well as sensible perspiration, and devised a method accurately to measure the amount of each in a given time. The true function of the skin was little known previous to his studies.

But a more distinguished pupil and follower of Borellus was Laurentio Bellini, who was born at Florence in 1643. Bellini is said to have been a man of great ability and of precocious intellect. At the age of twenty he was appointed to a Chair in the University of Pisa, and entered with great enthusiasm upon the exploitation of the doctrines of his master and tutor, Borellus, and by his eloquence and enthusiasm he added many to the ranks of the new school. Borelli extended the system of mathematics to all the functions and actions of the human body in health and disease. "He maintained that not only every part of the body is under the influence of gravity and mechanical impulse, but that these were the sole agents, and that we may explain all the vital functions merely by the application of the principles of hydrostatics and hydraulics."[1] According

[1] Bostock, *op. cit.*, p. 59.

to Borelli the human body was a system of tubes and pores, rods and pulleys, the diameters and strength of which could be calculated, as well as the friction of the fluids, size of particles, etc., passing along them, or through them, the amount of retardation owing to such friction, including the doctrines of "derivation, revulsion, lentor, obstruction, and revolution," with others of still more ambiguous kind, all founded upon mechanical principles; these could be scientifically demonstrated. So great was the hold that this theoretical system had on the minds of physicians that no other language or topic could be heard except of "pores" and "revulsions" and "derivations," etc., towards the close of the seventh century. They created a greater furor than Descartes' vortices. It had one beneficent effect, however; it drove out the Chymists. As the Mathematicians gained ground, the Chymists declined. But between the two the Galenists were nearly extinguished—for a time. Little more than Humoralism remained, as a basis of theory and practice of either sect.[1]

Of the psychology of the human mind there was as yet but imperfect knowledge. New and fictitious ideas are as contagious as any other

[1] As to the system of pores, pulleys, and tubes, there is some rational foundation for belief in their existence. Professor Howells of Johns Hopkins University, two centuries later than Bellini, claims to have confirmed the discovery of a German physiologist that the muscular fibre is of tubular construction. Bellini did not know it however.

infection. They are subject to auto-infection. One of the most learned men in the last century,[1] a man of science and solid acquirements was so possessed with the idea that the circulation of the blood was due to mechanical principles—sun-force (he had written a fine work on optics)—that he wrote a treatise on the subject in which he demonstrated the truth of his contention—to his own satisfaction. It is a phenomenon of physics when leaders of thought are able to influence whole communities, the ignorant and learned alike; but it is not a phenomenon in religion, and religious leaders; it is rarer in philosophy; but is far from being extinct in medicine, as the modern history of that science shows.

An event of great importance occurred about this time, an event more important to the advancement of therapeutics, perhaps, than the birth of a great philosopher. We refer to the discovery of the specific virtues of Peruvian bark. Few events of so simple a character have ever produced so great a disturbance of the public mind. The Countess of Cinchona, Vice-Regent of Peru, was cured of ague and fever by this bark, from a tree that is indigenous to Peru, a preparation of which was prescribed for her by the aborigines of that country. This was in 1638. In the following year it appeared in Spain, taken there by the Jesuits, hence its name, "Jesuit Powder," which was sufficient in the mind of a protestant at

[1] Prof. J. W. Draper.

that time to brand it with opprobrium. Be that as it may, the specific for intermittent fever, a malady of great fatality all over the Continent of Europe, met with bitter prejudice by people of every class. Fortunately Pope Innocent X. ordered a trial of it; the experiment proving successful, he ordered it to be used in the Papal dominions. This was about the year 1640. The profession looked upon the specific as an invention of quacks, and declined to use it, and it was not until the year 1658 that it began to be used in England. One Richard Talbot, a man of push and enterprise, although a quack, distinguished himself by the cures he made by the use of medicine. But he had to resort to the tricks of quacks and mountebanks to introduce the drug, cautioning the public against using any preparation but his own. It was not long, however, before he was overrun with patients and acquired great wealth. The profession denounced him through one Gideon Harvey, as "a debauched apothecary's apprentice," a "French lacquey," etc. Madame de Sevigné, speaking of Talbot's exploits in Paris, 1640, writes:

The English physician has promised the king, Louis XIV., in so positive a manner, even on the forfeiture of his life, to cure his Highness, the Dauphin, both of his vomiting and his fevers, that if he should fail, I believe on my conscience they would throw him out of the window; and on the other hand, should his predictions prove as true in this case as they have

done in most others that he has had the management of, I shall be for having a temple erected to him, as to a second Æsculapius.

Talbot cured the Dauphin, and obtained ten thousand louis d'or for the secret, besides an annual pension of one hundred pounds, and a knighthood, by which he became Sir Richard—and respectable; received after death honors—a splendid funeral and a monument at Cambridge.[1] Such is success!

No druggist in England would keep the drug in his shop, and those wishing to use it were under the necessity of procuring it from private sources. And when the drug was finally received into public favor, the profession was reproached with the taunt that the great discovery, the first of its kind in all history, was not due to their genius, but to the common-sense of the savages of Peru.

Physicians seem to have been afraid of the "Jesuit Powder"; and although Boyle was still living when the drug was introduced, or found its way across the Channel, it does not appear to have attracted his attention. He who wrote so prophetically of the discovery of specifics for diseases, appears not to have recognized one when brought to his door.

The celebrated Dr. Wilson Willis was the first or among the first of the profession to recognize

[1] *Vide* Russell's *Hist. and Heroes of Med.*, p. 255.

the curative virtues of the drug. And he writes of it guardedly:

> Although I will not dispute whether it be so safe and certain a specific for agues as it is believed by divers eminent doctors, yet I think it can scarce be denied to be a specific medicine to stop the fits of agues, since it does that more effectually than physicians were wont to do.

The drug was slow of recognition in England. Nearly twenty years after it was introduced into Spain and used under the authority of the Pope, Cromwell died of a tertian ague which Peruvian bark would have almost certainly cured had it been given to him early in the disease in proper doses.

One of the most eminent men of his generation, and the most learned, was John Locke, born at Wrington, Somersetshire, England, in 1632. Locke was not a physician, but he was a thinker and a philosopher, and wrote an important work identified with the science of medicine, which had a powerful influence in awakening an interest in the subject of mental science and of the relation of body and mind. We cannot forbear, therefore, to give him a passing notice.

He was a voluminous writer, chiefly on religious and theological subjects; but the work which entitles him to a place here is that "On the Human Understanding." The author denies the subsistence of innate ideas, and maintains with much

force and cogency of reasoning that all our ideas are derived from association and impressions from the objective world. Locke's contention has been a subject of controversy from his day to a comparatively recent period. The advance of a knowledge of brain and mind, and of mental powers, would seem to put the question at rest. It is unquestionably true that a large part of our ideas, or thoughts, spring from sense-impressions; but it is equally true that a much larger source of our ideas, at least of a man of Locke's understanding, is from within. The sub-conscious is a vast resource of ideas, as shown in experiments with hypnotic subjects; the cerebration that may go on in sleep, during which the most intricate problems are often solved, problems in science and philosophy so abstruse as often to defy the waking capacity of the individual. It would seem to be true that all processes of reasoning, all exercises of the logical faculty, and the exercise of the mathematical faculties are due to the powers of mind innate, and independent of impressions derived from the objective world; that the sub-conscious is a vast storehouse of knowledge derived from past experience which man draws upon often without knowing it. The hypothesis of hereditary experience, which seems pretty well established, rests upon the presumption of innate ideas.

John Locke was a great man. Although always in controversy over some abstruse subject

or other, he was entirely free from acerbity and the dogmatic; and never treated his opponent in a manner other than the strictest amity and courtesy. His knowledge was vast. The eminent Sydenham, alluding to Locke's skill in medicine, gave it as his opinion that "in genius, penetration, and accurate judgment he had in that age few equals and scarcely any superiors."[1]

Thomas Sydenham

The works of some men are greater than they; some men are greater than their works. In this latter class we put Thomas Sydenham, Licentiate of the College of Physicians, London.

Sydenham, the "English Hippocrates," as he has most inaptly been called, was born in 1624, of a good English family. He was sent to Oxford at the age of eighteen and took the degree of M.B. He was a contemporary therefore of Harvey and Boyle, and was no doubt familiar with the writings of both Bacon and Boyle, whose method in the study of malady he followed. He was a pure Hippocratian in practice, or perhaps, more like Galen in his heroic treatment of disease. He certainly found no warrant in the writings of the master for the murderous bloodletting in which he indulged in pleurisy and rheumatism, or any other disease. But he learned from experience—and it is a wise physician who does that—and in

[1] *Encyclopædia Britannica.—Nouvelle Biographie Générale.*

his later life became more Hippocratian—that is, he trusted more to nature, becoming skeptical of heroic doses and measures. In his writings, volume one, he gives an experience which seemed to teach him a lesson. He had a patient with a disease the nature of which he knew not, the chief symptom being stupor. He had taken repeated half-pints of blood from the elbow, the foot, the jugular vein; had cupped, blistered, applied clysters, administered diaphoretics, etc., and every kind of treatment he could think of, all in vain. In sheer desperation, he resolved to let the patient die in peace. He left the case to Nature, the great conservator and guardian of life and health, and "*watched what method she might take in such a case.*" Pretty soon he had the satisfaction of seeing improvement setting in. "And now," he says, "while I so watched, the disease departed!" To this account he adds: "I often think that we forget the good rule, *festina lente;* that we move more quickly than we ought to do; and that more could be left to Nature than we are at present in the habit of leaving to her. To imagine that she always needs the aid of art is an error—and an unlearned error too."

Sydenham, as we have said, grew wiser as he grew older, and acquired sufficient independence to acknowledge it.

The chief weakness of medicine is [he says, in the volume before quoted] not our ignorance as to the

ways and means by which certain indications may be satisfied, but our ignorance of the particular indications that want satisfying. How I can make a patient vomit, and how I can purge and sweat him, are matters which a druggist shopboy can tell one off-hand. When, however, I must use one sort of medicine in preference to another, requires an informant of a different kind, a man who has had no little practice in the arena of his profession.

While we do not ascribe to Sydenham the distinction of being a great physician, we must accord to him that of being a great man. He was not eminent for learning and scholarship; there was no branch of science in which he was distinguished; but more than all these, he was a man of character, conspicuous for his virtues; an all-round man; a man of good judgment, discreet in giving opinions; free from cant and pretension; a lover of truth; and was in possession of a high sense of the honor of medicine and the dignity of the profession. To these commanding virtues he owes the high position which he acquired in the profession and which he still holds. The Sydenham Society of London, comprised of men of the highest respectability, put his name on its banner. It has done more for the advancement of medicine than any similar body of men of modern times.

George Ernest Stahl

In Stahl may be observed a man of far different

type from Sydenham. The cast of Stahl's mind was different; he did not confine himself to physics or physical philosophy. His forte was rather in the sphere of forces; he was a firm believer in the Ψυχή of Aristotle, the Archæus of van Helmont, the Pneuma of Galen, and the principle introduced by himself by the term *Anima*. He possessed little sympathy with the views of physicians who tried to explain the physical and psychical phenomena of life and mind on chemical and mechanical principles. Sydenham, no doubt, was in accord with Stahl's psychical philosophy, but probably did not regard it as related to the business of a physician. His head and hands were full of details of a more practical nature.

Stahl was born at Anspach, Germany, in 1660; studied medicine at Jena, and was appointed to the Chair of Medicine at Halle in 1694. For twenty-two years he taught several branches of medicine in that university side by side with his colleague, Hoffman, a man of powers equal to his own. Hoffman was a man of great ability, a most popular teacher, and adored by all, and is said to have been "the glory of Halle." On the other hand, Stahl, while certainly not less brilliant, was not popular. He dealt in the abstruse, the recondite, the spiritual, in a manner which was over the heads of his pupils, and of interest to but few. Haller called him *Homo acris et metaphysicus*—the sour metaphysician. He had little sympathy with the Chemikers; nor

with the more popular Iatro-mathematical School; he could not think of himself as a chemical retort, subject to ferments; nor as a machine with a multiplicity of cords, tubes, vortices, and rollers; but rather as a living personality. The soul was to him the living force of the body, wholly foreign in its nature to the physical forces. It was susceptible of being played upon by a thousand different influences, such as joy, sorrow, and grief; love and friendship, the beautiful, the true, the reverent, the sublime, the exaltations of prayer; and to be moved by the emotions of fear, hate, anger, and resentment; of kindness, sympathy, charity, and good cheer. Can these things be the product of chemical acids and alkalies, and the mechanical devices of the mason and builder? he might have asked. Stahl dealt in sublime truths, and we cannot wonder that he should have failed of just appreciation at Halle; nor that his disappointment should have depressed, or soured him, as it was said to have done.

Stahl contributed nothing to the advancement of medicine proper. Nevertheless, he exerted a commanding influence upon the intellectuality of the profession, which survived the following century, when the brilliant Boerhaave was forgotten. His psychology of the nervous system was the theme of endless discussion by the best minds of Europe. It is somewhat amusing to note the way in which the material theorist subsequently dealt with Stahl's views. There was the celebrated

Whytt and the distinguished Fleming who discoursed on the composition of the nervous fluid, which they concluded to consist of fat, phlegm, earth; "animal salt and earth intimately mixed and incorporated together." Dr. Mead regarded it as "a thin volatile liquor, of great force and elasticity." Imagine, if one can, the attempt to resolve an abstraction into an elastic force! It was no mean achievement to have set the medical world thinking upon hypotheses different from acids and alkalies, cords, tubes, pores, and pulleys, to explain the phenomena of a living body. This was Stahl's great mission.

Frederick Hoffman, as has been observed, was born at Halle, in 1660, the same year with Stahl; studied medicine at Jena, and was advanced to the Chair of Physiology in the University of Halle. His physiology was much esteemed as being an improvement over all previous works on that subject. He became distinguished by the preparation of a medicine known as "Hoffman's Anodyne," which was popular down to a recent period and is still known to the apothecaries. He also introduced mineral salts, in the form of mineral waters, in his practice. He was a writer too prolix and too profuse and voluminous to have produced the influence upon medicine that his real merits entitled him to. Boyle suffered from this same literary disability.

Hoffman was pre-eminently a successful man and physician, but influenced by theory rather

than by experience. If a drug was known to cure a certain fever, he must make its curative action accord with his theory, by which it must act if it acted at all. Thus cinchona he admitted would cure ague, but not because it was a specific for that fever, but because it was a tonic drug and had a tonic action upon the patient, and thus cured him. As has already been observed, he was dominated by the theoretical, not only in therapeutics, but in physiology. In this respect he was comparable to his colleague Stahl. It is not *anima* or soul that is the basis of bodily life and activity, he said,

> but a material substance of extreme subtlety, something like ether—whatever that is,—something of a gaseous nature, secreted in the brain, and poured into the blood which it vivified. This something, finer than all other matter, but not exactly spirit, or soul, or mind, is the moving principle of the animal organization—also called the nervous fluid.

Both these physicians must be classed therefore among or with the Vitalists, as against the Chymists.

Hoffman had less confidence in drugs to cure disease than his contemporaries, for at the close of his career he could say, *Fuge medicos et medicamenta si vis esse salvus*—Flee doctors and drugs if you would be well.

Three other names appeared in this century of great men, who are entitled to more than a

brief reference. Baglivi Giorgio, who was born at Ragusa, Italy, in 1669, was one of them. He was a pupil of the celebrated Malpighi; and became Professor of Anatomy and Medicine at the College of Sapienza, Rome. He also wrote much, and was the first to point out the property of irritability of muscular fibre, a discovery which led him to doubt the hypothesis that to the fluids we are to look for the ingress of the causes of disease; but his deduction was hardly justified by the premise. Hoffman had, indeed, suggested the idea of solidism in this passage in his *Medicinæ Rationalis Systematica:* "Universal pathology is much more rightly and much more easily deduced and explained from faulty microscopic movements in the solids than from various affections of the vitiated humors"; but it remained for Baglivi to prove that there may be disease in solid parts without involving the humors. Be that as it may, he was the first physician to attack with any success the Humoralism of Hippocrates, and to substitute Solidism in its place, which from this on held supremacy over the pathology of the master,—for a time.

Previous to this writer, Francis Glisson, a distinguished English anatomist and physician, born in 1597, a graduate of Cambridge, 1634, published a treatise on anatomy in which he calls in question humoralism, and laid the foundation for Baglivi's brilliant deduction. Glisson made a discovery in the anatomy of the liver, which is known as Glis-

son's capsule. The celebrated Boerhaave said of Glisson that he "was the most accurate anatomist that ever lived."[1]

Thomas Guy, although not a physician, deserves honorable mention in this place as the founder of the great hospital at London bearing his name. He was born in London in 1643, and acquiring a large fortune he devoted it to the building and endowing of hospitals. He made substantial additions to St. Mark's Hospital in that city early in the eighteenth century, and about the year 1710 established the famous Guy's Hospital. No institution of that character in the known world, probably, has exerted a more salutary influence upon Medicine, or been the nurture of more men of medical and surgical genius, than Guy's Hospital. The profession of the nineteenth century is greatly indebted to it and to them. What does it not owe to Sir Thomas Watson for his incomparable lectures at Guy's on the "Practice of Medicine!" Guy died in 1724.

Herman Boerhaave

The last celebrity we have to notice in this century of brilliant physicians is Herman Boerhaave, probably the most brilliant man of his time. He was born at Leyden, the son of a churchman, in 1668. At first he was intended for the Church and pursued certain studies to that end, notably,

[1] *Vide* Thomas's *Biog. Dict.*

the Greek, Latin, Hebrew, and Chaldee languages, and ecclesiastical history. He is said to have been the "prodigy of the university of his day." His taste was for learning, to know, and to acquire knowledge, for which reason any study possessed a charm for him. In 1701 he was appointed lecturer on the Theory and Practice of Medicine in the University of Leyden; in 1709 he was appointed to the Chair of Medicine and Botany in the same institution; in 1715 he became Rector of the university, physician to St. Augustine's Hospital, and Professor of Clinical Medicine in the same; and in 1718 he was given another Chair, that of Chemistry, in the same institution. In all these departments he was said to have been a brilliant teacher. Meanwhile he was in active practice. His reputation as a physician knew no precedent since Galen at Rome in the second century. He began his career, after giving up theology and the Church, without means to prosecute his studies; at the end of thirty-five years of practise he died, leaving a fortune of a million of dollars. He died in the year 1738, in his seventieth year. His biographer says of him:

Boerhaave was the most remarkable physician of his age—perhaps the greatest of that time. A man who, when we contemplate his genius, his condition, the singular variety of his talents, his unfeigned piety, his spotless character, and the impress which he left, not only on contemporaneous practice, but on that of succeeding generations, stands forth

Herman Boerhaave.

From a painting by Mandelaar—*Russell.*

as one of the brightest names on the page of medical history, and may be granted as an example, not only to physicians, but to mankind.[1]

In practice Boerhaave was an Eclectic. While he did not affiliate with that sect, he chose from all the sects what he thought good and serviceable. No wise physician ever does otherwise, however orthodox or heterodox he may be. His writings were numerous. His "Institutiones Medicæ," etc., was commentated on by Haller in seven quarto volumes; and Van Swieten wrote five volumes of commentaries on his aphorisms, making twelve volumes in all, by two of the most distinguished physicians of that age.

Boerhaave was a man of strong common-sense united to a masterful intellect, which he drew upon freely in his practice. He was familiar with all the theories and speculative hypotheses which at that time were dividing the medical world into sects, but he does not seem to have had a taste for such speculations. He contributed nothing to advance the art and science of medicine, except the influence of his great example. Many medical men of the century to which he belonged, of which he was perhaps the most brilliant and popular exponent, will live for their medical discoveries—do live to-day by reason of them,—while the name of Boerhaave is already greatly dimmed or entirely forgotten.[2]

[1] Russell, cited from *History and Heroes of Medicine*, p. 296.

[2] For an interesting and highly appreciative account of Boer-

The most conspicuous fact in Boerhaave's brilliant career was the fortune which he amassed. It is said to have been one million of dollars, all of which was accumulated in his thirty-five years of practice. When one considers the difference between the value of money at that time and this, which was three or four times greater then than now, his accumulation borders on the fabulous. This circumstance seems hardly consistent with a scrupulous regard for the ethical in dealing with his clientèle. His contemporary Stahl inherited a fortune and would accept no fees for his services.

It is pleasant to linger over a character like that of Boerhaave. He seemed to have been fitted to the times in which he lived, and to have perfectly fulfilled the mission on which he was bent, or to have done the work which the occasion had set for him to do. He was the model physician, and has been compared to Galen, without, as Bostock asserts, losing in 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

---

haave as a medical man, it gives us pleasure to refer the reader to Russell's *History and Heroes of Medicine.* We think the author exaggerates Boerhaave's influence on the progress of medicine, however.

branches of science. . . . 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 the inventor, shortly after his death was assailed from numerous quarters, and was unable to maintain its ground.[1]

It should not be overlooked that all the medical ideas and systems of Boerhaave's day were founded upon partial conceptions of the truth, and that Boerhaave's ideas were no exception. No system of thought or philosophy that is founded on conjecture can long endure the progress of knowledge.

Finally, in concluding our review of the progress of medicine during the seventeenth century, it will have been observed that the period was one of great activity in every branch of learning. Its chief contribution to medicine was anatomy and physiology; pharmacy also was advanced and materia medica; some progress was made in the knowledge of the systemic and nervous systems, which led to the introduction of solidism in pathology; no considerable advancement was made in etiology and hygiene; speculative thought had a wild run; new names were given to the animating principle of nature, as if they were new discoveries —Paracelsus with Arcana; van Helmont with Archæus; Stahl with nervous fluid and Anima;

[1] Russell's *History and Heroes of Medicine*, p. 66.

and we shall leave the thoughtful reader to decide for himself wherein any of these terms differ from *physis* of Hippocrates, or *pneuma* of Galen. The love of being original leads to the multiplication of terms and phrases without materially adding to the stock of general knowledge. The seventeenth century was also a period of great men and of great physicians.

Albert von Haller.

From Russell's *History and Heroes of Medicine.*

FIFTH: PERIOD OF THE RENAISSANCE

(*Continued*)

CHAPTER VII

Medicine in the Eighteenth Century

A CURSORY glance at the history of medicine during the last century shows a great advance in the progress of all the sciences to which it is related. It is a long stride of development from Guy Patin and Sylvius de la Boë to Boerhaave; from the speculations of Stahl and Hoffman to the expositions of Haller. The advance has been marvellous; and it has been conducted by men with a genius for work, for toil—toil without hope of reward, except it be the love of truth, unmasking fiction, and establishing the verities. During this period there have been men, brilliant in the profession, grasping the discoveries of others and using them to further their own ends, and winning for themselves fame and glory which wealth brings—making no discoveries themselves whereby to enrich the profession. Kings and nobles have vied with each other to endow colleges and universities as never before, and by such worthy objects multiplied many fold the means of invention and discovery and the progress of science and

philosophy. Great events convulsed the moral and political world, of which the profession was apparently oblivious. The map of Europe was again changed. The civilized world was still in a state of intellectual ferment; the profession, over the action of acids and alkalies; forces, natural and supernatural, chemical and vital; humoralism and solidism; *contraria contrariis*, and *similia similibus*, etc. The theological fraternity were in acrid dispute over questions of equal non-importance, such as the Trinity; Transubstantiation, the doctrine of the Presence; the amount of blood shed at the Crucifixion that was needed for the purpose of redemption, and what to do with what remained, etc. The first specific against an epidemic disease had been discovered and fortunes made by its sale and use. Many men of great ability and distinguished repute won fame and fortune in the practice of medicine, without adding any contribution to the profession of medicine except writing ponderous quartos of opinions and theories of which the medical world was growing weary. The medical luminaries of this period were chiefly men of this sort, learned men, excellent men, men who would honor any position in which fortune might place them. In medicine they took advantage of the occasion to appropriate to themselves, in the practice of the art, the labors and discoveries of other men, on which they wrote voluminously books which may be found on the library shelves, and which are never read except

by historians; their names being well-known and prominent for a while, but soon to dim in public memory, or to be forgotten altogether; while the patient seeker after knowledge, bent on the discovery of the secrets of nature, and never known unless he succeed, makes contributions to knowledge which revolutionize philosophy, and upset the foundations of medical theory and practice. Such an example was afforded in Baglivi, who discovered that diseases might originate in the solids, and proved that humoralism, in the pathology of Hippocrates, while not false, was not the whole truth. Baglivi was a great plodder in science and discovery, and cared little for the glamour of the successful man of affairs. This little discovery did not make him a millionaire, but it put him at once at the head of an epoch in pathology and therapeutics. The discovery was made nearly two hundred and fifty years ago, but every student of medicine knows the name of Baglivi.

Although we are writing of medicine in the eighteenth century, we are by no means out of the shadows of the seventeenth century, nor away from the influence of brilliant men who came upon the scene before the close of that century. Boerhaave was still in the ascendancy, and by his brilliant lectures at the University of Halle, naturally commanded more of the public attention than any other medical teacher in Europe. He was not making discoveries in medical science,

except in materia medica; he was still with very rudimentary notions of the nervous system, though he accepted the *anima* of his excellent contemporary, Stahl; but he exerted a most commanding influence upon medicine by his ready use of the knowledge of his day, and the elegance with which he presented that knowledge to his pupils and classes. Moreover, he was assisted in his labors by his nephew and pupil, Kaau Boerhaave, a man of learning; and also by a pupil by the name of Gaubius; likewise by another pupil, Gorter by name, both of whom made contributions to medical literature of no inconsiderable value. Jan van Gorter, the above mentioned, was born in Friesland, in 1689; studied medicine under Boerhaave while the latter was yet at Leyden; wrote a treatise on "Insensible Perspiration," and a "Compendium of Medicine"; and became physician to Elizabeth of Russia. He is said to have added considerable to the knowledge of the nervous system. He died in 1733.

David van Gorter, a son of the foregoing celebrity, was also a physician of note at this period, succeeding his father as physician to the Empress of Russia. He made contributions to Botany, and wrote a work entitled "Flora Ingrica"; he died in 1783.

Hieronymus David Gaubius, a favorite pupil of Boerhaave, likewise referred to above, was born at Heidelberg in 1705, and through the influence of Boerhaave, was advanced to the Chair of Chem-

istry at Leyden about 1731, when he was twenty-six; and a year or two later took also the Chair of Medicine in the same institution. He made valuable contributions to the knowledge of the nervous system to which Boerhaave was indebted, and wrote *De Regimine Mentis quod Medicorum est* ("On the Government of the Mind which is within the Province of Medicine"); and a work on *Institutiones Pathologiæ* ("Institutes of Pathology"), both works of merit. He reached the age of 75, an unusual age for savants of that era. He died in 1780.

The ambition of medical students at this time, as has been observed, was to discover and to demonstrate truth; to accept nothing on the authority of a great name. The Oracles in theology were dying; and Authority, which had enslaved the minds of the profession for more than a thousand years, was weakening. Patient, persevering toil in the dissecting-rooms and vivisection of animals were being carried forward with industry. The student seemed more ambitious to acquire knowledge by the inductive process laid down by Bacon, of which we have seen examples in the previous century, than to become a merely popular physician, or accomplished in polemics.

A more distinguished pupil of Boerhaave than any which has been mentioned is perhaps Gerard van Swieten, who was born at Leyden in 1699. He was expelled from the University of Leyden by

reason of theological opinions which he held at variance with those of the State religion (Protestant), and was called to the Court of Vienna by Maria Theresa, where he was received with high honor. He held the position of president of the College Faculty for many years. There he pursued his medical studies with unremitting devotion and won a high reputation as a physician. His writings consist mostly of commentaries on the aphorisms of his preceptor, whom he regarded as an authority, imbibing that author's truths and fallacies alike and indiscriminately, according to the learned Bostock. Still, that critic admits that van Swieten's commentaries "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; and the great body of facts which they contain, detailed as they are in a clear, perspicuous style, will always insure them a place in the library of the medical student."[1]

Albert von Haller

The most conspicuous name in the annals of medical history at this period of the eighteenth century was Albert von Haller. He was born at Berne in the year 1708. His intellectual precocity developed at an early age. At the age of ten he wrote a composition in Greek, and

[1] *History of Medicine*, p. 69.

compiled Hebrew and Chaldaic grammars. Few men have equalled Haller's versatility, or the variety of his genius. In these respects he was comparable to the Bacons; the cast of his mind was more like that of Francis Bacon; but he had the versatility of Roger Bacon.

At the age of seventeen, Haller entered the University of Leyden and began the study of anatomy and physiology under the celebrated Boerhaave and Albinus. At the age of nineteen, or in the year 1727, he graduated. He then studied at Paris under Winslow and Ledran, and took a course in mathematics under the tutorship of Bernouilli, at Bâle. Thence he returned to Berne and commenced the practice of medicine, at the same time cultivating botany and poetry. In 1736, Haller accepted the Chairs of Medicine, Botany, and Anatomy at Göttingen, positions which he filled with remarkable credit to himself and the university. Here was laid the foundation for a career of distinction in scientific studies unsurpassed, perhaps not equalled, in a century notable for the numbers of its great men.

Haller was great in everything and conspicuous in possessing those virtues of uprightness, candor, integrity, purity of heart and mind which were characteristic of his preceptor, Boerhaave; but greater than all other virtues was his supreme love of truth. A distinguished historian says he imbibed these ethical virtues from Boerhaave. He could hardly have meant that: no one

imbibes virtues and morality like air or water. If we mistake not, it will be found that they have to be grown, inbred from antenatal influences, and posited in the cerebral cells and convolutions as are the faculties of the mind and heart. One who imitates virtue is closely allied to a hypocrite. To all his estimable qualities,

Haller added one extensive and original genius [says Bostock]. 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. Innate properties of the components of the body, which had been imperfectly seen by Glisson and by Hoffman, were examined by Haller with his characteristic acuteness, and the result of his long and well-directed research was rewarded by the establishment of his theory of Irritability and Sensibility as specific properties attached respectively 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.[1]

Later researches have improved on Haller's conceptions, but his were a marvellous advance upon what had gone before. Haller was careful to avoid all conclusions based upon mere speculative data; they must be substantiated by experiment and observation. Such was the spirit and such was the method of his researches, con-

[1] *Op. cit.*, p. 69.

ducted with scrupulous regard for verities that he pursued in his work on the "Elements of Physiology," and that gave him rank as the "Father of Physiology."

In the words of another celebrity and contemporary, Condorcet:

Haller was aware that the science of physiology, long abandoned to the spirit of system, had become an object of distrust to natural philosophers, and it was with him a principal object to remove this prejudice. He hoped to render physiology a science as certain as any other physical science; a science by means of which philosophers might acquire a knowledge of the constitution of man, and physicians find a basis upon which to found their practice. For this purpose it was necessary to establish the foundation of physiology upon the correct anatomy of man, as well as upon the comparative anatomy, which has so frequently revealed to us secrets respecting the animal economy that the study of human anatomy had failed to discover. It was necessary to banish from physiology both that kind of metaphysics, which in all the sciences had long concealed real ignorance under scientific terms, and those mathematical and chemical theories rejected by mathematicians and chemists, and always employed with greater confidence and adopted with the greater respect in proportion as teachers or their disciples have been ignorant of mathematics and chemistry. It was necessary to substitute in place of all these systems general facts ascertained by observation and experience, to have the prudence to be satis-

fied with these facts, and to submit to remain ignorant of their causes, and to know that in all the sciences there are limits beyond which it is doubtful whether the human mind can ever penetrate, and which it certainly can only pass by the aid of time and a long series of labors.[1]

While those words of M. Condorcet are a part of an eulogy upon the great man Haller, they are simply plain truths. They disclose in a delicate way one of the difficulties that had beset scientific men at that period, and at an earlier period,—investigations into the nature and constitution of man. There was a point beyond which they were forbidden to go by the scholasticism of the age. Thus, investigations must be confined to physical phenomena, which excluded the brain and mind, on pain of giving offence at Rome and at Geneva. It was not man as a whole, man as a personality, with which the physiologist was to deal, but man below the spinal atlas. Above that line was superposed a region too sacred to be touched with dissecting-knife, or examined by microscope; that was the seat and residence of powers to be disclosed only by the Oracles or so-called divine men fitted to receive revelations concerning the soul, its relations and dependencies outside the sphere of physical philosophy! This fear of arriving at an unwelcome conclusion, or discovering truths which

[1] *Les œuvres complètes de Condorcet*, vol. i., p. 379.

were at variance with those of scholastic opinion, trammelled the investigations of men who probably would not confess that they felt any overawing influence from the ecclesiastic powers. The fear of reaching conclusions on religious questions opposed to those in vogue hamper the minds of men to-day; and if to-day—with the degree of freedom of thought and conviction that we enjoy—what must it have been early in the seventeenth and eighteenth centuries? Ask the shades of Bruno, Servetus, and van Swieten.

All animals know their enemies instinctively, and man is no exception. Scholasticism and mental science are absolutely inimical. One must in the nature of things annihilate the other. Psycho-physiology is destined to unfold the whole nature and constitution of man, soul and body, one and indivisible, and to establish a moral cosmogony that shall unfold man's relation to man, and to the divine Supremacy, the great unconscious Life that animates the world. It is not unnatural that the learned men, the pillars of the scholastic system, should know this and profoundly feel it. They have known and felt it from the beginning of the Renaissance. Hence the Inquisition and the Index Expurgatorius, the engines of suppression.

It may not be unprofitable to cite a few examples of the course of Haller's investigations. They may not be edifying to the anti-vivisection-

ists, but they show a minimum of the debt which the science of physiology and of medicine owes to studies of the lower animals:

I come now to Irritability. It is so differing from Sensibility, that the parts that are most irritable are not sensitive, and the most sensitive parts are not irritable. I will prove both of these propositions by facts, and I will demonstrate at the same time that Irritability does not depend upon nerves but upon the primordial constitution of the parts that are susceptible of it. In the first place, the nerves which are themselves the organ of all sensations are destitute of irritability. This is astonishing, but none the less true. If a nerve be irritated, the muscle on which it is distributed is immediately convulsed. I have never seen this experiment fail; and I have often caused the diaphragm and the muscles of the abdomen of a rat, as well as the anterior and posterior extremities of a frog to be convulsed in the same way.[1]

The author goes on to greater length with details of experiments to the same purpose, all clear and demonstrable. This extract will be sufficient, however, to show the new departure in the investigation of scientific subjects, which, though pursued by Glisson, Borellus, and others to some extent, remained for Haller to make systematic use of.

When it came to discourses of matters psychical, Haller was not so much at home. While he proved

[1] From a memoir communicated to the Royal Society of Göttingen in 1752.

that the lower physical life was not identical with what Stahl regarded as soul, or *anima*, he did not appear to have a clear idea in what way the psychical and physical were related. "The soul is that being which feels itself," he says,—which represents to itself its body, and by means of its body the whole universe of things. I am myself and not another, because that which I call "I" is conscious of all the changes which occur to the body which I call "mine." This view would not be satisfactory to the psychologists of to-day. It is allied to Descartes' "I think, ergo I am." The conscious life and the subconscious life of an individual, or the conscious and the instinctive life of an individual, were not in Haller's day so clearly apprehended as they are to-day. Consciousness is not always cognizant of the changes that take place in the body—in the domain of the Πνεῦμα of Galen, or the Φύσις of Hippocrates. For example, we are not conscious of curative or mal-changes in the body so long as they are painless, nor of the processes of digestion and assimilation, metabolism and katabolism—processes which are carried on by the laws of the unconscious forces of the organism. Nor can consciousness, strictly speaking, directly influence those processes by any powers of its own. We are not unmindful of the influences of faith and suggestion over the so-called vital processes, nor of the magnetic or hypnotic power that certain individuals may exert over others; but the further

discussion of that part of the subject would be out of place here.

Haller became too conspicuous a figure in the medical world to escape the shafts of enmity or criticisms of rivals. Such as attacked his physiology were soon silenced or won over; but there were others who combatted his theory of soul and the distinction which he drew between that abstraction and the vital force which animates the living body, and the sensibility which may subsist a while in certain tissues after the death of the body. This was the subject of heated, somewhat acrimonious—certainly personal—controversy between Haller and the learned Whytt and Porterfield, both eminent professors in the new University of Edinburgh. These gentlemen attacked Haller on his only vulnerable point, the doctrine of "anima" (to use a term introduced by Stahl); and since the truth of the views of neither could be demonstrated, the controversy could not be easily adjusted. However that may be, the character of Haller was presented in a light as an antagonist that had not been seen before.

Haller was an intellectual giant. He was described by the eminent French naturalist, Cuvier, as "Anatomiste, Botaniste, Poète, Allemand Savant presque universel." At the age of four he expounded passages of Scripture to the house servants; at the age of eight he had written about two thousand notices of the lives of persons he had

read about; at the age of fifteen he had composed tragedies, comedies, and an epic poem of four thousand stanzas, which he subsequently burned. During his lectures at the universities—Leyden and Halle—he was a voluminous contributor to periodical literature, and wrote pamphlets, brochures, etc., to an extent sufficient to occupy the whole time of the average individual. To him they were a pastime, a diversion from more serious pursuits. Of him Russell writes with warm enthusiasm:

> After having for sixteen years discharged his duty at Göttingen, in the most brilliant style; having been enrolled a member of all learned societies and honored with the title of "Baron" by the Emperor Francis I., Haller returned in 1753 to Berne, where the remainder of his life was spent in the same unremitting toil. He is said to have actually lived in the library and to have pressed into his service his wife, his children, and all his friends, to enable him to accomplish the almost incredible tasks he had undertaken.

And for what purpose? one feels inclined to ask. Chiefly for the joy of working and preserving his faculties clear and unclouded to the last. Haller died at Berne, his native place, in December, 1777, aged 69.

Haller gave a great impetus to science. His views were accepted in the main by investigators of distinction among whom may be mentioned the names of Zimmerman, Caldoni, Fontana, Tissot, Zinn, Verschuir, and Sauvages. Verschuir

improved upon Haller by demonstrating that the arteries had the property of contractility. This fact had been generally accepted, but never demonstrated.

Sauvages was a contemporary of Haller, a Frenchman, born in 1706; was a native of Languedoc, and received his education at the University of Montpelier. Sauvages acquired an excellent reputation in his native city as a teacher of medicine, a practitioner and a writer. He has the honor of making the first Nosology of great and original merit. The work embraces a systematic arrangement of diseases into classes, orders, genera, and species, after the manner of naturalists. The work was most useful to the technical student in its day, but has since been superseded by changes in the nature and causes of maladies. Even in Sauvages' day there was a disinclination to regard disease as an entity; and intimations were rife that the patient should be the object of treatment rather than the disease.

William Cullen

The path of science is less craggy and difficult after such men as Haller. It is really no easy task rightly to estimate their influence. Apart from their personal contributions to the intellectual wealth of their age, there are a multitude of students and followers who have received their intellectual pap from them, and whose genius

William Cullen.

From *History and Heroes of Medicine.*

has been awakened by them. Their pupils are thus enabled to begin where the masters left off, and are not under the necessity of groping a few years in the dark to find a premise, or to discover data, to pin their faith to, or to build a system, or to establish a method upon. The development of a Cullen was much easier after the illuminating genius of a Haller.

William Cullen was born in the town of Hamilton, Scotland, in 1710. The family of Cullen was not especially distinguished either for position or wealth. William Cullen was sent to the grammar school in his native town, and from thence was sent to the University of Glasgow. His preparation for a college or a university course must have been, therefore, very meagre. After a brief period at Glasgow, he became apprenticed to a practitioner of medicine. In 1829, at the youthful age of nineteen, he went to sea as surgeon for a period of three years; withdrawing from that position, he went to Scotland and attended three winter sessions at the University of Edinburgh, a medical school that had not yet become famous. From Edinburgh he returned to Hamilton and settled as a country surgeon. Such, in brief, was the early career of a man who made a great impression on the profession of medicine of his generation.

There was nothing precocious in Cullen. He did not, like Bacon, write compositions in Greek at the age of ten; nor like Boerhaave, master Greek, Hebrew, Latin, and Chaldee before he was

out of his teens; and unlike his contemporary, Haller, he did not expound Scripture texts at the age of four; nor make a vocabulary of the Greek, Hebrew, and Chaldaic languages at the age of ten; nor compose an extended epic poem at the age of fifteen. There was, indeed, nothing in the mental calibre of Cullen in his youth to distinguish him from the average mediocre plodder to be seen at any medical college. Yet, at mature manhood we find him in the possession, not of great learning or scholarship, but of qualities of character that showed him to be a leader of men. The learned Bostock says of him: "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 lifetime, nor has left behind him a higher reputation, than this celebrated individual"; and that author ascribes to his genius in good part the rank that the Edinburgh school attained and held so long, that of being the "first medical school in Europe." It is certain that many great names in the medical profession of America were proud of Edinburgh as being their Alma Mater.

The contrast between Haller and Cullen was very great. They are not comparable—Haller was certainly the more brilliant; and as a lecturer the more popular. He was, too, an original investigator, and wrote the best work on physiology that had appeared down to his age. He was also a keen controversialist, with large

acquaintance with the writings of the masters. These gifts and accomplishments were not shared by Cullen, and gave Haller no mean advantage over the former. On the other hand, Cullen was a man of acute intellect; shrewd to detect and to point out the inconsistent and illogical; not given, like Sydenham, Boyle, or Haller, to redundancy in the presentation of the points of his subject; was pointed, brief, concise, yet forcible and comprehensive. Herein lay his great strength and influence with his classes. He did not pretend to be original. He brought forward no new systems, no catchwords or phrases, except perhaps his *vis conservatrix naturæ*, paraphrased from Hippocrates' *vis medicatrix naturæ*. He was eclectic and took his pathology from Hoffman, his physiology from Haller, his therapeutics from Boerhaave. Moreover, he enlarged the resources of therapeutics and materia medica from his own experience. But the great merit of Cullen, to quote the learned and discriminate Bostock again, is "the sagacity 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 other 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 to improve. In his treatment of disease he manifested no less judgment and sagacity than in the formation

of his theories.[1] In other words, Cullen knew the distinction between fact and fallacy, truth and fiction, what we know and what we believe, the merely theoretical and hypothetical, and the experimental and practical. Like Hippocrates, he threw theories to the wind when face to face with emergencies, where practical common-sense should lead all other considerations. This kind of talent, weighted with tact and judgment, gave Cullen an advantage over his more brilliant and versatile, but at the same time more fanciful and speculative, contemporaries.

Cullen was a great educator. In conjunction with a colleague, the celebrated anatomist, William Hunter, he essayed to establish a great university at Glasgow. In this project he failed. Nevertheless, he delivered lectures there on Theory and Practice, Botany, and Chemistry, and made the acquaintance of many great men, statesmen, historians, and other literati. In 1756 he turned his attention to Edinburgh, at first occupying the Chair of Chemistry, but later, of general medicine. Here his fame as a lecturer attracted students to Edinburgh from all parts of the world, and the fame of the University of Edinburgh became established. It was called the "modern Athens" by reason of the many learned men that congregated there, and this on account of its great university.

In this connection we yield to the temptation

[1] *History of Medicine*, p. 71.

to cite from an entertaining letter written by Sir James Mackintosh giving a description of Edinburgh society at that period:

My arrival at Edinburgh opened a new world to my mind. That city was then the residence of many extraordinary men: Dr. Smith (Adam), the first economic philosopher, and perhaps the most eloquent theoretical moralist of modern times; Dr. Black, equally philosophical in his character and in his genius, the father of modern chemistry [hardly that], though his modesty and his indolence will render his name celebrated rather by the curious in the history of that science than by the rabble of its cultivators; . . . Henry Mackenzie, to whom we owe the most exquisite pathetic fictions in our language; Dr. Cullen, the most celebrated medical teacher and writer in Europe, whose system of medicine, just then beginning to be on the wane, had almost rivalled those of Boerhaave and Hoffman, and whose accurate descriptions of disease will probably survive a long succession of equally specious systems; Dr. Robertson, the most picturesque narrator among modern historians; industrious, sagacious, and rational, though not often very profound or original; Dr. Hutton, with whose metaphysical works I lament that I am not acquainted; . . . Dr. Robinson, one of the greatest mathematicians of his age. I may truly say that it is not easy to conceive a university where industry was more general, where reading was more fashionable, where indolence and ignorance were more disreputable. Every mind was in a state of fermentation.[1]

[1] *Memoirs of the Life of the Right Hon. Sir James Mackintosh*, cited.

But there were others at Edinburgh even more distinguished, such as David Hume the historian, Thomas Reid the metaphysician, and Edmund Burke the English statesman and defender of American Independence against George III. and the British Parliament.

Cullen rendered to eighteenth-century medicine no inconsiderable contribution in having been the means of giving to the English public a translation of von Haller's "Outlines of Physiology," the most important work on that subject that had yet appeared. This was in 1779. The work was first published in Latin in 1747. A new edition of it appeared in 1751, improved and corrected by the studies of Boerhaave, and added the discoveries of Morgagni, Winslow, Albinus, Douglas, and others. A third edition was brought out in 1764; still another at Edinburgh in 1766, for use in the University of Edinburgh, in which it was the highest authority.

The edition of 1779, gotten out under the auspices of Cullen, is an exact copy of the fourth previous edition, to which so much was added in bringing the work down to date as to make it double the size of the original text. The "Outlines of Physiology" of Haller having been brought out in English, under the auspices of Cullen, has often been mistaken for that celebrity's own work. Cullen was greatly indebted to von Haller for his knowledge of physiology. Had it not been for von

Haller, there never would have been a Cullen as posterity knows him.[1]

To Cullen, more than to any other man, was due the celebrity of Edinburgh as an educational centre. While we consider that he was a great teacher, we insist that he was greater as a man than as either teacher or physician. He broadened the conceptions of men of science, corrected their methods, but made no contributions to the medical art and science. Strong common-sense and sound judgment were conspicuous in Cullen's utterances. We cite herewith a few illustrative examples:

Reasoning in physic is unavoidable, but to render it safe it is necessary to cultivate theory to its full extent. I maintain this by observing that there is in human nature a strong propensity to seek for causes, and to assign them on the slightest grounds; and mankind are very generally guided in their affairs by their judgment of causes and effects. I must own, indeed, that there is nothing more weak and false than their reasonings often are; but I imagine the propensity is irresistible. Sceptics and academics may demonstrate the fallacy, or the rash presumption of human reasoning, but they will never persuade men to give it up, or even to be restrained in the use of reasoning. The only remedy for the abuse that we know of, is the making men better reasoners, the exercising them much on the particular subjects they are to be employed in, and directing

[1] From the preface to the fourth edition of the *Outlines of Physiology.*

their attention to every consideration that may influence their determinations. A physician may sometimes reason in matters of law, but in doing so he gives occasion to the lawyer to smile at his weakness, and I know that a lawyer in like manner may be ridiculous in his turn. In this case, each profession will perceive the abuse in the other; but to correct it, neither the lawyer nor the physician will think of persuading his neighbor to give up reasoning in general, but may properly advise him to give it up with regard to subjects in which he has not been sufficiently exercised. . . .

Now all of this applies to physics [he continues], and, as I judge, very exactly; such is the general propensity I have mentioned that I have not in all of my life known a single person belonging to the profession that did not upon many occasions use reasoning concerning it, and what may properly be called theory. Every practitioner has proofs of the propensity and presumption of his patients in this respect; and among practitioners themselves, though they can declare that Paracelsus was a knave, that van Helmont was a madman, and Descartes a fool, and that all theory is nonsense—yet, I find that they certainly employ it themselves. This man is plethoric, and therefore must be blooded. That man's stomach is foul, and he must be vomited. A third man's blood is full of acrimony, and he must be purged. Everybody acquainted with practitioners must be familiar with reasoning of this kind. The persons who employ them may not, perhaps, perceive that they are using theory, but I know that they are using it and that of a bad kind too.[1]

[1] *Nosology and Physiology*, vol. i., p. 418.

Cullen's "First Lines of the Practice of Physic" is probably his best contribution to medicine and the work by which he will be the longest remembered. John Mason Good, his contemporary, and a greater scholar, if not a greater man, speaks with admiration of it. The "First Lines," when read as they were delivered, in connection with his "Treatise on the Materia Medica," he writes,

constitute the most important course of instruction that has ever, perhaps, been laid down and completed by the same individual. For this purpose they must be read together, though they were not published together, nor for the express design of forming a contemporaneous study; for it is a singular fact that the "First Lines of the Practice of Physic," though full of both mind and matter, of elaborate axioms and theoretical principles, contains little of what the title suggests; while the "Treatise on the Materia Medica," without making any pretension to the subject, is altogether a practical work, replete with practical principles and founded upon a practical investigation.[1]

Cullen certainly possessed a far perceiving mind. In many passages in his "Nosology and Physiology" this sense is discovered or disclosed:

With regard to Nosology we can go somewhat farther than in mineralogy, for we can there find something analogous to the propagation of seed in

[1] *Study of Medicine*, Preface, pp. 11, 12.

the living body. We observe this in the case of all contagions, particularly in those we call specific contagions, and, so far as my observation goes, even in those that are not strictly specific; when we can trace a disease, we can in some measure fix its species. Thus, in the case of small-pox, a great many varieties have been marked, but they are varieties only of one species, a proof of which is that from the same contagion—that is, from the same seed—all the essential circumstances are produced.

This reference to germs as a specific contagion is the first that had occurred in all medical literature previous to Cullen, except by inference in the works of Hippocrates, as the foundation of his Humoral Pathology, and the necessity of elimination in certain diseases. Hippocrates, and Galen his disciple, saw that in continued fevers —especially of the ataxic and toxic type—the blood was infected and became putrid—as in putrid typhus, very prevalent in their time, and later in all malignant diseases.

But to proceed: Inoculation for variola was in vogue in Cullen's day, as it was found to modify the severity of the malady, as a rule, when it did not prevent it altogether, and to render an inoculated subject immune against subsequent attacks of the disease.

This is the solid foundation of inoculation [says Cullen], that we have now learned to modify the body in such a manner that the contagion when applied will not give rise to these varieties and anomalies. I shall

add here [he continues] what I think a curious corollary, namely, that the specific nature of the contagion and the dependence of the variety of the disease upon the nature of the body are presumptions in favor of all specific contagions. When we shall have acquired some more experience [he wisely says] with the manner of fitting the body, and of conducting the inoculation in the disease as we do now in smallpox, I am persuaded that the practice will be equally appreciable.[1]

These words, be it observed, were written half a century before the discovery of the process of vaccination by the English country doctor, Jenner, more than one hundred years before the establishment of the Pasteur Institute at Paris, and the discovery of Immune Medicine by Pasteur and Loeffler, which fulfils the great need pointed out, in a manner truly prophetic, by the sage of Edinburgh, about the year 1760.

Cullen's "First Lines of the Practice of Physic" is his most notable work, and the one by which he will be best known to posterity. Many of his procedures in practice have been superseded by the advance of knowledge, both as to the causation of disease and the improvements and extensions of Pharmacy and Materia Medica, of course; but the work could be used with profit to-day by students of medicine. Not so much could be said of his works on Nosology and Materia Medica; but these were far in advance of his time

[1] *Nosology and Physiology*, p. 252.

and add lustre to the posthumous fame of their great author.

We think the reader will agree with us, from the foregoing citations from Cullen's writings, that he was a profound thinker, and possessed unusual powers of logical induction in matters within the domain of the demonstrable. When he entered another sphere—into the vale of mystery, we were going to say,—he flounders about like his distinguished predecessors. He throws no light upon the *nature of Life* nor of the human Personality, nor of the Ψυχή of Aristotle, which it is demonstrable exists in the body corporeal. "I think, ergo I am," is sufficient demonstration of a fact as fixed in the mental substratum of things as the rocks and the everlasting hills are in the earth.

It is a strange phenomenon that in reasoning upon the facts of life and mind men will leave the inductive method, with which the great structure of Science has been reared, and take to speculation, the hypothetical, when, in truth, they ought to adhere to their method; observe, experiment, pile up data; then reason from the generals to particulars and accept the induction. This will not lead one behind the veil of things, but it will conduct one to the fount whence all things proceed, as far as we can go, or have a right to go, or that it is profitable to inquire. It is doubtful if man possesses any faculties that will ever enable him to inquire into the nature of Final Causes.

FIFTH: PERIOD OF THE RENAISSANCE
(*Continued*)

CHAPTER VIII

Medicine in the Eighteenth Century
(*Continued*)

As one scans the progress of medicine during the last two centuries he cannot fail to have perceived an undercurrent of development along lines of inductive science, that has been unbroken in its flow. Now and then a remarkable genius has arisen and sought the attention of the medical student with hypotheses fanciful and fantastic, just enough to awaken a livelier interest in the occult and abstruse with which medicine must always be identified, and has succeeded for a while in confusing the minds of men as to the verities of practice; nevertheless, the confusion has been temporary, like the mists of a morning which have soon passed away and left the medical atmosphere clearer and more wholesome.

An instance of this kind may be observed in the irruption of John Brown at Edinburgh in the year 1735. Brown hardly deserves to be taken seriously in connection with scientific medicine,

and but for the *furore* which he created in the medical world we should pass him by with a single paragraph. He was born in poverty, the son of humble parents. In some way he managed to acquire a primary education, and ultimately became secretary to the illustrious Cullen at the University of Edinburgh, and was finally advanced to a Chair in that celebrated institution. He was a man of genius of a certain type, of push and cheek, of quick wit and sharp repartee, and made his way to prominence by a show of learning which he did not possess. But he attracted attention and acquired a following in Edinburgh, Germany, and Italy also; and having quarrelled with his former preceptor, Cullen, he boldly advanced a new hypothesis of the theory and practice of medicine, in opposition to his great master. The hypothesis as explained and exploited by himself was simple and brought all the great problems of therapeutics, the nature of malady, and the *modus operandi* of medical agents within the reach of minds the most simple.

Brown—the author of what was called in its brief day the "Brounonian System of Medicine" —built his system on Haller's physiology, and his discovery that irritability and contractility had some relation to vital phenomena. Brown conceived that irritability and non-irritability, excitation and non-excitation, could be used in explaining the nature and causation of disease and the adaptation of medicines to cure it.

His conception of pathology, therefore, resolved itself into two opposite states of the economy, strength and weakness — *sthenia* and *asthenia*. These states of the body constituted a diathesis, to be met by medicines of repletion and depletion, as the case might be. And we must concede genius to the author who could bring the various states and conditions of the organism in disease under these two propositions in a manner so plausible as to make them appeal to the common reason of men. It is of a truth something to marvel at that one ignorant of letters, without learning, without a sound principle of science or philosophy in his head, could create such an uproar in the medical world and win so great a following as did John Brown, of Berwickshire, Scotland. It is always men thus endowed that do these things, in medicine or in theology. It was often done before Brown's day, and it has been often done since, and upon a much larger scale and upon a more ridiculous hypothesis than was Brown's, as we shall see as we approach modern medicine.

We have had occasion to quote from the memoirs of Sir James Mackintosh some account of Cullen in Edinburgh; that versatile writer has given in the same volume his impressions of Brown, when in the zenith of his glory in the same city, shortly before Sir James's arrival in Edinburgh, 1784:

John Brown, first a teacher then a writer of bar-

barous latin, as well as private secretary to Dr. Cullen, had been a teacher of medicine and the founder of a new medical system which, after being destined to "strut and fret its hour upon the stage," and after the miserable death of its author [by apoplexia in London, in 1788], excited the warmest controversies on the Continent of Europe; and combined with some of the singular novelties of philosophical speculation, lately prevalent in Germany, seems likely still to make no inconsiderable stir in the revolution of philosophy. This extraordinary man had such a glimpse into medical experience as enabled him to generalize plausibly, without knowing facts enough to disturb him by their importunate demands, which he never could have given. He derived a powerful genius from nature. He displayed an original invention in his theories, and an original fancy in his declamations. The metaphysical character of his age and nation gave a symmetry and simplicity to his speculations unknown to former theories of medicine. He had the usual turbulence of an innovator, with all the pride of discovery, and the rage of disappointed ambition. Conscious of his great powers and very willing to forget the faults which obstructed their success, he gladly imputed the poverty in which he constantly lived to the injustice of others rather than to his own vices. His natural eloquence, stimulated by so many fierce passions, and delivered from all curb by an habitual, or rather perpetual intoxication, was constantly employed with attacks on the systems and doctrines which had been the most anciently and generally received among physicians, and especially against those teachers of medicine

who were most distinguished at Edinburgh, to whom he imputed as base a conspiracy and cruel persecution as those which Rousseau ascribed to all Europe. This new doctrine had great charms for the young; it allured the speculative by its simplicity, and the indolent by its facility; it promised infallible success, with little study and experience. Both the generous and the turbulent passions of youth were flattered by an independence of established authority. The pleasures of revolt were enhanced by that hatred of their masters, as impostors, and even as tyrants, with which all the powers of Brown's invective were employed to inspire them. Scope and indulgence were given to all their passions. They had opponents to detest as well as a leader to admire without which no sect or faction will flourish much. It ought not to be omitted that some of the most mischievous and effective of the above allurements arose, not from the subject, but from the teacher. Among these every one will number personal invective.

These are the sentiments of an unsympathetic critic, but they are true. Brown was born too late, or mistook his calling. The learned and judicious Bostock says of him: "What he wanted in knowledge he endeavored to supply by the force of his own genius."[1] And that author admits that Brown was actuated by spleen against Cullen, whose pupil he had been, and by a determination to oppose his doctrines, more than from a more legitimate motive. Russell calls him the Paracelsus of Scotland.

[1] *Op. cit.*, p. 73.

In Erasmus Darwin, the grandfather of the celebrated naturalist and philosopher, Charles Darwin, we have a medical man of a far different type from Brown. Erasmus Darwin, born at Elton, near Newark, England, in 1731, was a graduate in medicine and a medical writer and practitioner of note, and a poet, whose poem, "The Botanical Garden," won great popularity. He also wrote a poem entitled "The Temple of Nature," which was well received. His mind was of a speculative order, but while he advanced some views in physiology, the truth of which was not recognized in his day, but which are accepted now, he did not, like Brown, attempt to form a medical system. His work entitled "Zoönomia" is best known. In it he treats, as the term implies, of the laws of organic beings, in a learned and interesting way. He had a son Charles, born in 1758, also a graduate of Edinburgh, of excellent promise, who died in 1778.

Erasmus Darwin was a man of great and varied ability. He possessed a thorough knowledge of every branch of medicine, but given to the metaphysical and abstract. Charles Darwin owed much to his grandfather: the taste for knowledge and for philosophy, the love of truth and the beautiful; and the elevated cast of mind and morals formed a rich heritage for the grandson. Bostock, his countryman, withholds no words of praise from him. The "Zoönomia," he says,

exhibits genius and originality. [And he continues]: 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 "Zoönomia" made little impression on public opinion. . . . It is now seldom referred to except as a splendid monument of fruitless labor and misapplied learning.[1]

The "Zoönomia" came too early to meet the appreciation it deserved. In it may be discovered the first conception of the hypothesis—now no longer a hypothesis—of evolution, for which his eminent grandson, Charles, is popularly given credit. Lamarck, the eminent French naturalist, followed Erasmus Darwin in that conception, and the celebrated Cuvier followed Lamarck with the same thought. But it was given to Charles Darwin and his contemporary, Wallace, to complete its demonstration, and to Herbert Spencer to collate and put into systematic order the evidence of its truth. It has a most important bearing on the science of medicine, since it throws a flood of light on the genesis and constitution of man, without a full knowledge of which medicine could never be perfected.

Among the celebrities of science of this century the name of Jan Swammerdam should not be

[1] *Op. cit.*, p. 74.

omitted. He was born at Amsterdam in 1637; was educated at the University of Leyden, where he took the degree of Doctor in Medicine. He was a zealous and painstaking anatomist, and was the first to discover valves in certain lymphatic vessels. We owe the discovery of the microscope to his genius. His method of investigation was Baconian; his specialty the bees, the minute anatomy of which he was the first to dissect. His treatise on the "Natural History of the Bee" (Biblia Naturæ) gave a great impetus to the science of Apiology. He discovered the ovaries and viaducts of the bee, and fixed the sex of the queen, hitherto regarded a king, "and threw the whole political scheme of the hive into most unexpected light by basing it upon maternity."[1] Apart from his anatomical discoveries, the profession of medicine is under undying obligations to Swammerdam for the microscope. He died in 1777, exhausted by his studies.

Joseph Lieutaud deserved an earlier place in these studies, having been born in 1703, at Aix, Provence. He rose to early distinction in medicine by the force of his own genius. For many years he was professor of medicine in his native place, Aix, and is said to have added largely to the development of medicine in France by his serious studies in anatomy and physiology, and by his wisdom in keeping out of the profitless entanglements into which Brown had drawn the

[1] Maeterlinck's *Life of the Bee.*

profession at Edinburgh and London. In 1749 Lieutaud was appointed physician to the Royal Hospital at Versailles; later, he became physician to Louis XIV. His chief work and the one that established his reputation was entitled "Synopsis of Universal Medical Practice"—Synopsis Universæ Praxeos Medicæ—which comprises a general review of the state of medicine in his day. Lieutaud died in 1780.[1]

Paul Joseph Barthez, a distinguished contemporary of Lieutaud, of whom we have just spoken, was born at Montpelier in 1734. He was not only a great physician and teacher, but a man of science and learning. He, too, exerted much influence on the progress of medicine. At the age of twenty-five he was appointed to the Chair of Medicine in the University of Montpelier. At the same time he was associate editor of the *Journal des Savants*, and the *Encyclopédie Méthodique*. Removing to Paris in 1780, he became consulting physician to the king, Louis XIV., and a Councillor of State. He wrote "New Doctrine of the Functions of the Human Body," "New Elements of the Science of Man," "Discourse on the Genius of Hippocrates," etc., setting forth in these works no new discoveries in medicine, but giving a lucid review of the advancement of that art and science for the benefit of his pupils and the profession in France. Both these physicians were among the most eminent of

[1] *Nouvelle Biographie Générale.*

the University of Montpelier.[1] Barthez died in 1806.

Théophile Bordeu, another French physician of high reputation, was born at Iseste, Bérne, in 1722. He is generally associated with the School of Montpelier. He settled in Paris in 1750, and was physician of the Hospital *La Charité*. His father Antoine was also a physician; his brother Antoine, likewise, and wrote on medical topics. But it was by the distinguished career of Théophile that the name of Bordeu has reached posterity. Many of the physicians of the French, at this period, became noted for their ability and spirit of careful inquiry, which was an augury of the great celebrity of the future of medicine at Paris, and the great reputation its University acquired in the following century. The University of Montpelier, which was founded, as we have seen, in the thirteenth century, was at this time on the wane, and that of Paris was coming into renown. MM. Barthez, Bordeu, Sauvages, and others of excellent repute were the forerunners of this movement. Bordeu wrote an excellent work on the "Pulse," and a valuable treatise on "Chronic Diseases." He died at the early age of fifty-four (1776).

A physician of great distinction was the illustrious Lyman Hall, native of Connecticut, who was born in 1747. He was graduated in medicine at Yale College and settled to practise in Sudbury,

[1] *Op. cit.*

Lavoisier.

Courtesy of Mlle. Laflin, Paris.

Georgia. He rose to distinction by joining the cause of the colonies in the "War for Independence," rather than by his contributions to medicine. Hall was one of the signers of the Declaration of Independence; was chosen member for Congress from his district in 1775, and elected Governor of Georgia in 1783; died in 1791.[1]

About the time of Lyman Hall's death was born a very eminent physician, Marshall Hall, at Nottingham, England. He was a voluminous writer on medical subjects, but his chief contribution to medicine was his two volumes on "Theory and Practice," which was much esteemed in his day, so much so that Dr. Biglow and the poet, Dr. Oliver Wendell Holmes, had an edition of the work printed in America. It was used as a text-book in American medical colleges as late as 1850. Dr. Marshall Hall became widely known in the medical colleges for his method of resuscitating drowned persons, called "Marshall Hall's Ready Method." It is still taught to medical students, being simple and rational.

The Warrens of Boston

Among the more notable characters in the annals of early American medicine should be mentioned the names of the Warrens. General Joseph Warren, born at Roxbury, Massachusetts, in 1741, was an early martyr to the cause of

[1] Thomas's *Biog. Dict.*

American independence. He graduated at Harvard University in 1759, and began at once the study of medicine, in which he rose to eminence. The stirring events of the Colonies in 1770 and the following years attracted his attention, and after the enactment of the "Stamp Act" he became an ardent revolutionist and took a prominent part in the revolution that followed. He was offered the position of Surgeon-General in the Massachusetts army, but preferred the more active career of a soldier. From the ranks he rose to be a Major-General, in which position he immortalized himself in the memorable battle of Bunker Hill, June 17, 1776, in which he was killed. The Massachusetts Congress took official notice of his death in the following words:

> Among the dead was Major-General Joseph Warren, a man who will be endeared to his country, and to the worthy in every part and age of the world, so long as virtue and valor shall be esteemed among mankind.[1]

The services to the cause of medicine of General Warren's younger brother John, however, were important. John Warren had been a pupil of the former, and was graduated from the University of Cambrige (Harvard) in 1771, and subsequently qualified for the practice of medicine, in which he soon distinguished himself as a surgeon. He was the first in this country to ampu-

[1] *Vide* Gross's *American Medical Biography.*

tate the arm at the shoulder joint. Anatomy was his specialty, and he was the first to occupy the Chair of Anatomy and Surgery which had been established at Harvard in 1783. This was the first medical institution in New England. Dr. Warren continued to hold this position during thirty years. In 1784, he with other gentlemen established a small-pox hospital near Boston, at Point Shirley, at which he, in 1792, inoculated more than fifteen hundred persons. Jenner's discovery had not then borne fruit in America, and vaccination had not superseded inoculation.

The character and career of Warren and his European contemporary, Cullen, were similar. Each possessed strong common-sense. Each was moved in all he did by a conscientious desire to serve humanity and to promote the advancement of medicine.

Not diligence alone [says his biographer] in the pursuit and communication of knowledge, and the discharge of those duties to which he had peculiarly pledged himself, but ardor of soul in all that he thought or did, emphatically characterized him. Who so active in business as he? Who more fervent in spirit? What could have carried him through such a course of duty, especially with his slender habit of health, but an eagerness which nothing could repress, a zeal which nothing could abate, a resolution which nothing could impede?

His biographer refers here to his labors as a patriot as well as his active career as a physician.

Calomel, the great remedy of his day, Warren studied with judicial impartiality. In yellow fever he had an excellent opportunity to test its virtues, not altogether favorable in results to the reputation of that drug. The same remedy in massive doses for hydrocephalus was advocated in his day "by a large majority of English and American physicians." Warren did not altogether approve of the treatment. In 1813 he wrote: "Whether it has ever effected a cure in any real hydrocephalus internus may, perhaps, without imputations of skepticism, be doubted."[1] The moderns would certainly justify his skepticism.

Like Cullen, Warren was a good speaker and possessed the art of communicating his ideas with persuasion and clearness. As a teacher, therefore, he was popular with his classes. Had he been surrounded and supported by collaborators eminent in the profession, as was Cullen, Boston would probably have become a powerful rival of Edinburgh as a medical centre.

Warren was succeeded by his son, John Collins Warren, who was graduated at Harvard, and who possessed the fine qualities of his father. The work which the father began was taken up and ably carried on by the son. The progress of medicine was greatly advanced by them. Of a truth it may be said that they were the pioneers of pathological anatomy in America. Dr. John

[1] *Op. cit.*, p. 110.

Collins Warren has the distinction of being the first to excise the hyoid bone, to perform osteoclasis and external urethrotomy, also the operation for staphylorrhaphy.

Germany at this time was not much behind France and the other Continental states in the cultivation of medicine, but far behind England, owing largely to the intellectual industry of Edinburgh. Van Swieten, as has been observed, went to Vienna and occupied the Chair of Medicine in her university with great credit to himself and fame of the Vienna School. Van Swieten was a man of excellent character, wide knowledge, and a great teacher. Some years after going to Vienna, he associated with him the celebrated van Haen, already distinguished as a practitioner of medicine. He was, too, an author of reputation, having already written a work called "great," entitled "Ratio Medendi" or Rational Medicine. Van Haen could not affiliate himself with the visionary and fanciful in medicine, which had had so wild a run in England under Paracelsus, Stahl, and van Helmont. Bostock criticises him for

having been unreasonably prejudiced against new opinions, and even in 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 as 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 were engrafted a certain portion of the new views respecting the action of the nervous system and the contractility of the muscular fibre.[1]

The learned and judicious Bostock may be just in his criticism of van Haen for too great a conservatism, but we must confess to a sympathy with van Haen, nevertheless; one must draw the line somewhere against ill-digested facts and opinions, and we are inclined to think the line drawn against inoculation was well taken; not but that inoculation sometimes modified the malignancy of small-pox, but that it not infrequently caused death from a disease from which the victim might have escaped both the disease and death. It is not unlike the practice, more or less prevailing to-day, of operating on the appendix to prevent an attack of appendicitis, taking the risk of fatality from the operation lest one may have the disease, and thus forced to take the risk of death from having the organ removed. "Sufficient for the day is the evil thereof." Van Haen advised dealing with death risks when face to face with them. As for his prejudice against the use of "Jesuit Pow-

[1] *Op. cit.*, p. 75.

der" under the wild lead of an arrant quack, we must sympathize with him there, too, though he was wrong. But who knew that he was wrong? The virtues of the bark had not been proven beyond conjecture. There was then as there always has been a class of practitioners who make haste to try new remedies on their patients, on the sly often, without consulting the wishes of the patient. If they would try them on themselves no one would have the right to complain. There is another class more conservative and scrupulous, that prefer to wait for more light and experience. The former class have their uses in medicine, it must be admitted, since new remedies would get a slow hearing without them, and the pharmacists find poor encouragement in manufacturing and exploiting them upon the profession. It is the charity cases, however, who mostly fall victims to this peculiar condition of empirical practice.

The father of Pathological Anatomy, a subject but little cultivated until this century, Théophile Bonnet, was born at Geneva in 1620. But little was known of this celebrity until near the close of his life, when he gave to the world a great surprise in his work on that subject. Its title was "Sepulchretum,"[1] and embraced a large number of cases with their pathological anatomy, obtained by dissection after death, being the results of post-mortem examinations. This was a new departure in medical science and led to the enlarge-

[1] *Seu Anatomia Practica.*

ment of a knowledge of the effects of diseases on the tissues of the body. Bonnet's work was called a "Library of True Pathology." He afterwards became a professor in the University of Padua where he pursued his gruesome work with unremitting toil, in which he was assisted by Manget, a distinguished Swiss anatomist, and later by Valsalva, also a learned anatomist, and pupil of the illustrious anatomist Morgagni, to whom we have already referred. Bonnet died at Geneva in 1789.

Antonio Maria Valsalva, to whom we have referred above, deserves more than a passing notice, even if out of chronological order. He was one of the most remarkable men of his age. He was an Italian, born at Imola, in 1666. He studied under the celebrated anatomist, Malpighi, at Bologna, and became Professor of Anatomy in the university of that city. He was a man of great versatility and variety of accomplishments, and improved whatever branch of learning he applied himself to. He improved the art of surgery, invented a method of treating aneurisms, made discoveries in anatomy and physiology, improved and enlarged the work of Bonnet on pathological anatomy; discovered the structure of the human ear, on which organ he wrote a work, being the first Aurologist of which mention has been made. This work was entitled "De Aure Humana," and was published in 1704. Like his preceptor, Malpighi, he was an inde-

fatigable worker in the dissecting-room, and out of it. The profession of medicine was more deeply indebted to Valsalva than to any one man in the history of medicine and surgery since Galen, with two exceptions, namely, the illustrious Harvey and Haller. Valsalva died in the prime of his life, in 1723, at the age of fifty-seven.[1]

Another distinguished name of this period is that of Burserius, who was born at Trent in 1724. He studied medicine at the University of Padua, and later at that of Bologna, and later still became a professor at Pavia. Burserius was remarkable for his culture and learning. He wrote a work on the "Institutes of Medicine," in which he adhered mainly to the doctrines of Haller, accepting Humoralism, and Solidism as well, and consistently maintaining the truths of Vitalism. Bostock commends him for his learning and judgment. He was classed among the Eclectics, by reason of being able to choose his hypotheses from all the medical sects of his day. His practice, however, was regular—that is, such as predominated at that time. The Eclectic sect of medicine, by that name, had not then formulated a distinct school of practice of their own.

It will be observed how much the profession of medicine owes to Italy for its perfection in anatomy, the science upon which medicine is founded. Italy was the very first to awaken after the

[1] *Nouvelle Biographie Générale.*

long sleep of the mediæval period, stimulated, it is believed, by having secured through the monks, at the sacking by the Saracens of Constantinople, especially the works of the Greek masters, not only of Hippocrates and Galen, Homer and Hesiod, Plato, Socrates, Aristotle, and Plutarch, but also the works of the great Arabian physicians, Averrhoës and Avicenna, Rhazes, and the Mesus. Italy was the first to establish institutions of learning and to equip universities. In this respect Italy led Europe, and Europe sent her sons to her to school, which enabled her to maintain her supremacy for several centuries, or until the revival of the great universities of Montpelier and Paris. She returned the compliment by producing the first greatest anatomists, to be eclipsed, however, by France and England in the nineteenth century.

The Italian, Giovanni Rasori, born at Parma in 1766, became quite celebrated as a teacher of medicine at Pavia. He was an enthusiast over the Brounonian doctrines early in his career, but later saw the absurdity into which they led him, and abandoned them. He wrote several medical works, the chief of which was entitled "Theory of the Counter-Stimulus." He died in 1837.

The Gregories of Edinburgh exerted a great influence upon the position and progress of medicine, though none of them acquired any considerable fame in practice. But all of them were devoted to science and acquired distinction in their several branches. James Gregory was born

at Aberdeen in 1638. He became a profound mathematician and held the Chair of that science in the University of St. Andrews, and subsequently a similar position in the University of Edinburgh. He discovered or invented the reflecting telescope which bears his name. He also wrote several important works on mathematical subjects. His son James also distinguished himself in science. He was born in 1674, and became professor of Medicine at the Aberdeen College of Medicine. The elder James Gregory has the distinction of having sixteen members of his family professors in Scotch and British colleges and schools.

James Gregory, grandson of the elder James Gregory, born in 1753, attained eminence in the profession as a physician and teacher at Edinburgh, and wrote several important medical works, the more noticeable of which is his "Conspectus Medicinæ Theoreticæ," which gave an account of the medical theories of that time.

John Gregory, another grandson of James Gregory, the eminent mathematician, became distinguished in medicine and as a writer, even more so than his brother, above mentioned. John became successively professor of philosophy and medicine at Aberdeen, and in 1766 was appointed professor of the Practice of Physic in the University of Edinburgh. His principal work was on the "Elements of the Practice of Physic," which was long a text-book in English-speaking colleges.

John died in 1773. Nearly all the Scottish Gregorys distinguished themselves, some of them in theology, some in letters, but more in mathematics, medicine, chemistry, and physics. Their influence on the advancement of learning was very great in the eighteenth century and continued to be felt for long into the succeeding century.[1]

The celebrated physician and writer, John Abercromby, a contemporary of the Gregorys, also a Scotchman, born at Aberdeen in 1781, though he made no palpable contribution to medicine, yet by his writings he exerted a salutary influence upon its standing and progress. He is best known by his work entitled "Inquiries Concerning the Intellectual Powers of Man," a work much in advance of his time. He died in 1844.

No inconsiderable influence on the progress of medicine and surgery was exerted by John Abernethy, who was born at London in 1764. He was a pupil of the celebrated anatomist, John Hunter, and became assistant surgeon at St. Bartholomew's Hospital, and later surgeon-in-chief there. He acquired great popularity as a teacher of anatomy and surgery as well as a general practitioner. To Abernethy is accorded the honor of being the first to ligate the carotid artery and the external iliac artery. He was distinguished by his wit and humor, as well as by his professional accomplishments. He died in 1831.[2]

[1] *Vide* Chambers's *Dictionary of Eminent Scotchmen.*

[2] *Lives of Eminent Scotchmen.*

Franz Joseph Gall

Among the celebrities of the eighteenth century must be mentioned a physician whom medical historians and biographers have mostly overlooked. Franz Joseph Gall, best known as the founder of phrenology, or "bumpology," as it has been derisively called, was born at Tiefenbrunn, in Baden, in 1758. Gall possessed a philosophical cast of mind, and applied himself to the study of the natural sciences early in his youth. From the natural sciences to medicine was but a step, and so in 1781 we find him in the University of Vienna, where he took his degree in medicine in 1785. It was there that his medical career began, and there also that his studies of brain and mind began. Like Hippocrates, Boyle, Sydenham, and Cullen, he was an acute observer of phenomena, which he studied and compared with unremitting industry. He was the first to demonstrate, upon a collation of observed facts, that the brain was the organ of the whole mind, and that it possessed a plurality of mental functions or organs. John Hunter made the same induction soon after Gall,—and Willis before Hunter,—and without the knowledge of those celebrities' generalization. These organs Gall conveniently divided into three groups, Faculties, Sentiments, and Propensities; again he divided them each into units of organs, or centres of functions, corresponding to the known elements

of independent mental manifestation. Was this procedure arbitrary? Not altogether. It was based upon a long series of observation of the heads and physiognomies of people of all shades of character and dispositions, under all circumstances, by the wayside, in the hospitals, jails, and other penal institutions of his native land and in France. These studies and observations he began in college among the medical students, where he soon discovered evidence sufficient to base his hypothesis upon. Dissections of the brain were resorted to by him with the aid of his pupil and disciple, Spurzheim; but these afforded him little help. The fibrous nature of the white substance of the brain was disclosed thereby, however, for which the learned anatomist Spurzheim, must be given the credit.

We cannot enter in detail upon Gall's discoveries and hypotheses in this place, but must postpone them to the following century, to which most of his work belongs. Gall was a man of fine endowments and masterful learning in his profession, more especially in connection with his specialty, the brain and mind; and the profession owes him much for the advancement of brain-physiology. His chief work, in French, in four volumes, is entitled the "Anatomy and Physiology of the Nervous System in General, and of the Brain in Particular," and was published in France in 1810–1819.

The hypothesis which he advanced was not

received by the profession; it was too early, and, like Hahnemann's hypothesis, it claimed too much. It was the shadow of a great development in mental science which was in course of being evolved, as we shall see later on. Gall died at Paris in 1828.[1]

John Mason Good

Perhaps the most eminent man of this period, if not the most distinguished,—for men of modest mien often possess great talents and accomplishments so carefully guarded and concealed as never to be known until after they die, when by some chance accident their virtues are discovered,—was John Mason Good, who was born at Epping, England, in 1764. He was apprenticed to a surgeon at Gosport in 1779; studied medicine in Guy's Hospital and began the practice of medicine at Sudby in 1784. Wearying of country life and practice, he, a few years later, removed to London, where a larger field for the cultivation of his genius for literature opened to him. And here he availed himself of it with great industry and pertinacity. At first he confined his essays to newspaper and magazine articles, and the great quarterlies which soon after began to appear both in London and Edinburgh.

Good's first serious venture in literature was a translation of Lucretius' "De Rerum Natura," in

[1] *Nouvelle Biographie Générale.*

verse, which fell very flat. Lord Jeffrey said of it: "Upon the whole this book is very dull, and as a translation very flat and unpoetical." The critic commends the translation, however, as careful and correct, and the man who did it as being "vigorous and intelligent," the author of it being unknown to him. Good published "The Book of Nature," three volumes; a translation of the "Book of Psalms," and several original poems, probably not of acceptable quality, since they did not come into popular favor. Good was a great man; a man of most excellent character, of sterling virtues, a great scholar, both in the ancient writings and languages, and all the collateral branches of the science and art of medicine. His attainments were of the solidest kind. Amid the wild frenzy of the medical sophists of his time, with their ambitious zeal for unlettered notoriety, this poor plodding, masterful man was almost overlooked. He did not ask for the degree of Doctor in Medicine until a few years before his death, in 1827, when Marshall College of Aberdeen conferred one on him (1820).

John Mason Good's greatest work, "The Study of Medicine," in five volumes, the work by which he is known and will continue to be known so long as learning and scholarship are appreciated, was first published in this country about 1840, by Harper Brothers. The first volume opens with an excellent "History of Medicine" by the

learned J. Bostock, M.D., LL.D., from Æsculapius to 1800. Following this, is one of the most complete and careful nosologies to be found in the English language. All subsequent attempts of this kind of work recognize the merits of Good. It was standard until the progress of discovery into the nature of morbific causes made it look like a moss-grown monument to the author's incomparable genius.

The plan of Good's great work is well conceived. He divides it naturally into four great fundamental parts, namely:

I. Physiology, or the Doctrine of the Natural Action of the Living Principle.

II. Pathology, or the Doctrine of its Medical Action.

III. Nosology, or the Doctrine of the Classification of Diseases.

IV. Therapeutics, or the Doctrine of their Treatment and Cure.

Thus was this great work on a great subject well conceived and planned, and, according to the judgment of posterity, masterfully executed.

Advancing to the body of the work, the author begins Class I. with a physiological proem, or prologue, giving a succinct account of the physiology of the part of the organism affected or involved in diseases of that class. Thus he proceeds with each class, according to his classification, always preceding it with the dissertation, or proem, of the part involved. These are models of

learning and scholarship. His style is a model of conciseness and simplicity—at the same time, learned. He does not hesitate to use the language of science in his treatises; he presumes that he is writing for scholars, and it is the scholar in medicine to whom he appeals. Nevertheless, there is a tone of modesty, almost humility, in presenting what is known on a subject, and what is as yet unknown, that is most captivating to the appreciative student. The student falls in love with the author.

Good was firmly of the opinion that the family, genera, and species, etc., of diseases were as stable as the species itself, of animal and vegetable life. We cannot but think otherwise. Referring to a few species of animals that have become extinct, he says:

> And in like manner, while a few species of diseases are no longer to be found which are described by earlier writers, a few seem to have supplied their place, which are of comparative modern origin. Yet, upon the whole, the march of nature is little interfered with in either case; and hence the Prognostics and Aphorisms of Hippocrates, the medical histories of Aretæus and Galen, of Rhazes and Avicenna, and the natural histories of Aristotle and Pliny, are transcripts of animal life in our own day, as well as in times in which they were severally composed. . . . The extensive families of fevers and spasmodic affections are in the main the same now as they are represented in the ancient writings that have descended to us; the plague of Athens as described by

Thucydides we shall find in the ensuing pages to be the prototype of what still takes place occasionally in Egypt and along the Barbary coast.[1]

And the author maintains that even leprosy is the same to-day as it was in the time of Moses. We are loath to controvert the learned author; but we are inclined to believe that had he lived until to-day he would have changed his views on the subject. His views are founded upon induction, and the error lies, if error there be, in the need of a longer period of inductive observation to correct it. The conceptions of the moderns, as to the nature and rationale of disease, have broadened very much with the progress of knowledge, and have constrained the physicians to lose sight of disease as an entity, with family, genera, and species, and to treat the individual whose normal vital activities have become disturbed by morbific causes, either imbibed from without, or generated within by deranged functional processes. In the learned Good's day the microscope had not begun its revelations as to morbific causation; the idea of germs as contagion had not been conceived, though Cullen came very near to it; for which reason allowance should be made for the shortcomings in pathology and nosology to which he and his confrères were exposed. We cannot enter, however, into this interesting field of controversy further in this place.

The author of these pages writes these words

[1] Preface, p. 111.

from personal experience, having early in his career as a student of medicine fallen under the tuition of a preceptor who possessed Good's "Study of Medicine" and treasured it more highly than he did his Bible. The first thing we did was to secure a copy of the work for ourselves, to which we have ever since turned to refresh our memory for any half-forgotten lore. If one wants to know what Hippocrates thought of a certain malady, or how he treated it, one was quite likely to find it there; or if one wished Galen's views on the nature and treatment of a certain disease, or Celsus, or Pliny the younger, or Aretæus, or Avicenna, or Averrhoës, behold in the "Study of Medicine" he was most likely to find it set forth, with references duly and accurately interpolated in the text. Foot-notes he confined to commentaries, either by himself or by his English or American editor.

The American editor of the sixth edition of Good's "Study of Medicine," taken from the fourth English edition, the learned Dr. A. Sidney Doane, dedicates to his learned countryman, Dr. John W. Francis, who died a few years since. Let us see with what feelings Dr. Doane approached his task. In the preface to this edition he writes:

It was with extreme diffidence, and with no little dread of appearing presumptuous, that the American editor assumed the responsibility of adding notes to a work characterized by such profound learning

and deep research; but he was encouraged by the consideration that, although the "Study of Medicine" has been used as a text-book for several years in this country, and is thought to be indispensable to every medical library, it contains but few allusions to the important results of American practice, etc.

The diffidence which Dr. Doane felt when he assumed the responsibility of issuing a new and revised edition of Good's august work was likewise felt by his learned countryman, Dr. Cooper, in issuing the fourth edition. It will be understood that the author had died before this time, and could not be consulted.

In the author's own preface to the work he writes:

Whatever may be the theory of the practice advanced in the ensuing volumes, the author will generally be found to have taken nothing on trust, but to support, or illustrate his assertions by authorities which he has endeavored to give with some degree of copiousness from ancient as well as modern times, so as to render the work in a certain sense a summary of the general history of medicine in most ages and countries.

A glance at the author's pages is sufficient to verify this statement.

It is no easy matter to estimate the influence of a man of the character of John Mason Good. One may concede that his influence on the course of medical thought in his day was inconsiderable.

Brown was thundering in London, and pouring invective hot and heavy against those who did not accept his ill-conceived doctrines, and creating a wild tumult of huzzas on the part of his thoughtless, enthusiastic supporters; while Good was in his study studying the works of monarchs of thought, and evolving in his brain a series of essays comprehending a concise and accurate record of what was really known in the art and science of Medicine, that should be a guide to the student and practitioner of that art. He did not teach medicine. He held no professorship in any university. He had neither pupils nor followers; and one can imagine that his practice was limited, for he had no time to make himself known to the public and thus to cultivate a clientèle. His health was poor and the time at his command to execute the tasks he had undertaken must have seemed too short to him. As it was, he lived just long enough to revise and add to and amend the second edition of his "Study," dying at the age of sixty-one, in 1827, when most philosophers are in their prime.

It is no easy task, I repeat, therefore, to estimate the influence of Dr. Good on medicine. Down to 1840, or thereabouts, there had been six editions of his "Study" sold in America, and four editions of it sold in London, which probably includes the Continent. It was a text-book in the medical colleges in Europe and America down to within living memory, and was warmly appreciated by

the scholars in the profession of which they constitute a small class—too small. But whatever the influence of Dr. Good was, be it little or be it much, it was always for good. Like Cullen and Galen, like Boerhaave and Haller, he helped to exalt medicine above the position of a trade. He maintained the dignity of the medical character,—maintained, did we say?—he gave it dignity, because he was a representative of the true type of a physician; a fount of wisdom for the weak, the halt, and the blind to go to for balm to cure their woes and for advice to strengthen failing courage. That Dr. Good felt the magnitude of his responsibility as a physician is well disclosed in the prayer which at his request was published in an edition of his "Study," which was on the eve of being brought out at the time of his death. We transcribe it here:

Form of Prayer

O thou great Restorer of health, strength, and comfort, grant thy blessing upon the professional duties in which I may this day engage. Give me judgment to discern disease, and skill to treat it; and crown with thy favor the means that may be devised for recovery; for with thine assistance the humblest instruments may succeed, as without it the ablest must prove unavailing.

Save me from all sordid motives, and endow me with a spirit of pity and liberality towards the poor; and with tenderness and sympathy towards all; that I may enter into the various feelings by which they

are respectively tried; may weep with those that weep, and rejoice with those that rejoice.

And sanctify thou their souls, as well as heal their bodies. Let faith and patience, and every Christian virtue they are called upon to exercise, have their perfect work; so that in the gracious dealings of thy Spirit and of thy Providence, they may find in the end, whatever that end may be, that it has been good for them to have been afflicted.

Grant this, O Heavenly Father, for the love of that adorable Redeemer, who, while on earth, went about doing good, and now ever liveth to make intercession for us in Heaven. Amen!

This prayer illustrates to some extent the character of Dr. Good. It was his morning prayer to precede the duties of the day. It was printed by his request in his work after his death, for then no one could think that it was printed and published through any vanity on his part, or love for the good opinion of the world, but solely for the good example it might be to others. It was Dr. Good's distinction to have written the best medical work that had then appeared in the English language.

Surely the good that men do lives after them.

FIFTH: PERIOD OF THE RENAISSANCE
(*Continued*)

CHAPTER IX

Medicine in the Eighteenth Century
(*Concluded*)

WE have followed the development of medicine through almost another century, from Stahl and van Helmont to Cullen and Good, seemingly a brief period, but marked by a succession of great men, great events, and of magnificent progress in science and discovery, The previous century was distinguished by men of inspiration, men with vague visions of the truth, like Stahl, de la Boë, and van Helmont; half-conceived ideas, ideas too grand for their vocabularies to frame, or to put into intelligible form; who made up with "brass mouths and iron lungs," like Brown of Edinburgh, for what they lacked in clearness of perspective. But contemporary with them were men less brilliant and pretentious, quiet workers, persevering, plodding men, who lie awake at night to follow new lines of invention and discovery, with no thought of reward or remuneration for their time and lost sleep, except the glory of achievement, or of advancing science

and learning, such as van Swieten of Vienna, James Gregory and William Cullen of Edinburgh, and John Mason Good of London, and an innumerable host of others whose day and night dreams never come to fruition, at least in their day. Other men less ingenious and more practical take them up and make practical application of them. Neither a learned man nor a thinker, nor even an inventor and discoverer is necessarily a great man. He is the greater man who is able to comprehend the meaning and significance of new truths and discoveries and to bring them to fruition. It is rare indeed that an inventor comprehends the significance of his own discovery; and it is as rare that he ever turns it to account, to the benefit of humanity, or to enrich himself. This phenomenon is no less true in the development of medicine than it is in the industrial arts.

These reflections have naturally led us to a man of the century of which we are writing, who, by a mere coincidence, discovered a specific for the prevention and cure of small-pox, which had been such a terror in Egypt and Asia since the beginning of the Crusades. This man was not a great man. He possessed neither scholarship nor the faculties equal to become a scholar. He was simply a plodding country doctor, of excellent character and humble abilities, with a mind alert for causes of diseases with which he came in daily contact. Nevertheless, he possessed the powers of observation

and induction and made good use of them. One wonders that those powers did not lead him to another induction. Since the cow was the repository of the small-pox virus, changed by her vital alchemy into a less virulent virus, the induction seems logical that she was the original source of the infection—the hostess as one might say—of the human species through their dependence upon her for milk, cream, and butter, etc. Such an induction is rather belated, however. The man to whom we refer was plain

Edward Jenner

This celebrity was born at Berkeley in Gloucestershire, England, in 1749. His father was a clergyman of the Church of England. Young Edward had the advantages of a village school, and later was put under a preceptor for further instruction and to determine what pursuit the boy should follow. His preceptor was not a medical man, but, nevertheless, young Jenner drifted into medicine without the advantages of a college education. At that time scholarship was not needed as a necessary precedent for the practice of medicine. A license to practise was the only requisite. Physicians thus qualified were called licentiates of this or that college or medical society. So far as we know, this was Jenner's only authority to practise.

However that may have been with Jenner,

an inkling of his discovery dawned upon him while with his preceptor in Gloucestershire. It happened to be a dairy country, and small-pox was rife thereabouts as elsewhere in Europe. It appears that a country woman called upon his preceptor on one occasion for advice, and remarked to him that she could not take small-pox for the reason that she had had cow-pox. It was a tradition in the country there that one who had taken the cow-pox could not take the small-pox —that which was popularly known to them as cow-pox rendered them immune to small-pox, a similar malady, but far less terrible in its results, when not fatal. The dairy-maids were usually exempt from the disease.

Not long after this circumstance Jenner went to London to perfect his medical studies, and while there talked over the subject that had been uppermost in his mind with the celebrated anatomist, John Hunter. This was in the year 1770. Dr. Hunter, when asked what he thought of the possibility of the virus of cow-pox taking the place of inoculation with the virus of small-pox, bluntly advised young Jenner "to try it." Two or three years later Jenner returned to his native town, Berkeley, and set himself up as a surgeon. The dream of substituting vaccination in place of inoculation continued to haunt his nights and days, and it seems that he then began "to try it," as advised by Dr. Hunter. He confided his secret to a friend, cautioning him not to divulge it;

Edward Jenner.

From a print engraved and colored by I. R. Smith in possession of the late John Ring, Esq.

"for," said he, "should anything untoward turn up in my experiments, I should be made, particularly by my medical brethren, the subject of ridicule, for I am a mark they all shoot at."

It is hardly consistent with our method in these annals to give details of the life of heroes; biographies are now accessible, and we pass over, therefore, many events in Jenner's career of exceeding interest, during the next score of years. His was an amiable, lovable character, fond of natural flowers and of the quiet of country life. About this time he fell in love with a lady of fortune, who finally turned away from him, whereupon he sought consolation in his friend Hunter, who advised him "to never mind"; to devote himself the more closely to his investigations, and to forget all else, etc., which he did—for a time.

At the end of a few years Jenner writes of his discovery in no diffident terms. He says:

My inquiry into the nature of the cow-pox commenced upwards of twenty-five years ago. My attention to this singular disease was first excited by observing that among those whom in the country I was called upon to inoculate many resisted every effort to give them the small-pox. These patients I found had undergone a disease they called the cow-pox, contracted by milking cows affected with a peculiar eruption on their teats. On inquiry, it appears to have been known among the dairies from time immemorial, and that a vague opinion pre-

vailed that it was a preventive of small-pox. . . . In the course of investigation of this subject, which, like all others of a complex and intricate nature, presented many difficulties, I found that some of those who seemed to have undergone the cow-pox, nevertheless, on inoculation with the small-pox, felt its influence just as if no disease had been communicated to them by the cow.

This circumstance and others of similar nature occurred in the course of Jenner's investigations, which served to dampen his ardor, but not to repress it absolutely. He continued his labors, and discovered that the virus of cow-pox was liable to undergo progressive changes from the same causes as that of the small-pox virus; and that when it was applied to the human skin in its degenerated state, it would produce the ulcerated effects in as great a degree as when it was not decomposed, and sometimes far greater; but having lost its *specific* properties, it was incapable of producing that change upon the human frame that is requisite to render it unsusceptible of the variolous contagion; so that it became evident a person might milk a cow one day and having caught the disease be forever secure, while another person milking the same cow the next day might have other than the desired immune effects.

Here, very truly, the author observes:

The close analogy between the viruses of small-pox and cow-pox becomes remarkably conspicuous; since the former, when taken from a recent pustule and immediately used, gives the perfect small-pox to a

person on whom it has been inoculated; but when taken in a far advanced stage of the disease, or when, although taken early, previously to its insertion, it be exposed to such agents as, according to the established laws of nature, cause its decomposition it can no longer be relied upon as effectual. This observation will fully explain the source of those errors which have been committed by many inoculators of the cow-pox.

Suffice it to say in this place that Jenner continued his experiments and practical observations on his patients and others whom he could induce to be operated upon with the virus of vaccine, for many years, or until he had gained the ear and favorable consideration of his contemporaries. All know how slow and painful a process it is to prove to the profession that a real discovery of importance has been made. Again and again his patience was exhausted. After having demonstrated over and again the certainty of his discovery, and its beneficent effects upon the public health, he went to London to exploit it; and it was three months before he secured a single subject on which to operate! Three months without a single case! The profession turned a cold shoulder to him. Jenner's patience was at last worn threadbare, and he returned to his native vale,—glad to get away from the torture of suspicion which he met upon every hand;—back to Berkeley he went with his devoted wife and little family, and wrote the memoir of "The

Origin of Vaccine Inoculation" from which we have extracted this condensed account. But we cannot leave the subject without a few words more.

Soon after Jenner's return to Berkeley a surgeon of London, who was doing a prosperous business with Jenner's discovery, wrote to the author of it, begging him to return to London, take a house in Grosvenor Square, and make $50,000 a year. Jenner's reply is characteristic:

It is very clear from your representation [he says] that there is now an opening in town for any physician whose reputation stood fair in the public eye; but here, my dear friend, is the rub. Shall I, who, even in the morning of my days, sought the lowly and sequestered paths of life, the valley, and not the mountain; shall I, now my evening is fast approaching, hold myself up as an object of fortune, reward, and fame? Admitting that it is a certainty that I acquire both, what stock should I add to my stock of happiness? My fortune with what flows from my profession, is sufficient to gratify my wishes; indeed, so limited is my ambition, and that of my nearest connections, that were I precluded from future practice, I should be enabled to secure all I want. And as for fame, what is it? A gilded butt, forever pierced by the arrows of malignancy! The name of John Hunter stamps this observation with the signature of truth.

It is interesting to observe that in the course of a few years, about 1805, the practice of vaccina-

tion had been generally introduced into England, not, however, without the most bitter and virulent opposition from certain of the profession and certain of the clergy, styling the virus *Lues Borilla;* that the "venom had removed many an infant untimely from the world," etc. The subject was brought before Parliament, and statistics advanced by its friends showing that vaccination was saving forty thousand lives of Englishmen annually. Encomiums were heaped upon Jenner and many were the congratulations that poured in upon him for his success. He was a distinguished benefactor of mankind. He had already well-nigh banished the plague, the greatest terror that had ever visited the British Isle, and the most fatal. Some suggested that his fame was a sufficient reward; others thought that he ought to have kept the discovery secret, or had it patented *à la* the man of business; or sold it in the dearest market, *à la* the maxim of Sir Robert Peel. Finally, on the occasion of Parliament's making awards to individuals for distinguished public services, a certain Irish statesman received $250,000, while Jenner was granted from the Royal Treasury $50,000! Fully to appreciate the public value of Jenner's discovery, one has only to examine statistics of the fatality of small-pox before the introduction of cow-pox virus, and afterwards, in Europe. Nor is its beneficence properly measured and estimated by that showing. There is a psychological (moral) benefit

derived from the discovery which far outweighs every other consideration. While there may be a question as to the expediency of rewarding a member of the profession above want, with money for distinguished services to the public for which he never asks and seldom receives any reward from government or other sources, it seems to us there can be no question as to the propriety and expediency of governments granting old-age pensions to worthy, poor, and worn-out physicians. It is a matter of record that some of the best scholars in the profession die in penury, when age is unduly prolonged, and many who are not cared for by relations and friends find their way at last to the county house and become a public charge, such, at least, as have not courage to commit suicide.

It is difficult to estimate the benefactions that Jenner's discovery conferred on Europe. He believed and insisted that vaccination would banish that pestilence from the earth wherever it was introduced and enforced. It would hardly be logical to attribute the decline of the disease in Europe and America altogether to vaccination; something is due to improved sanitary conditions; but making due allowance for that, the civilized world owes a heavy balance to vaccination. We cite the following conclusive statistics on the subject from Dr. J. Rutherford Russell's article in the *London and Edinburgh Monthly Journal of Medical Science* for the year 1842,

and republished in his interesting "History of Medicine."

In Anspach, in Bavaria, in the years 1797–98 and 1799, five hundred died yearly of small-pox, and in the year 1800 no less than one thousand and nine; whereas, from 1809 to 1818, a period of nine years, there was not a single death from that disease, although it prevailed epidemically in the neighborhood. In Copenhagen, in twelve years, before the introduction of vaccination, 5500 persons died of small-pox; from the year 1802 to 1818, a period of sixteen years, after vaccination had been peremptorily insisted upon, only 158 persons died in the whole of Denmark. Sezay Manazia, Prefect of the Rhine and Mozel Department, published in his report for the year 1810, that in his district not a single case of small-pox had occurred since vaccination had become general; and in consequence the population had increased to the number of 1911. In Rouen the mortality had decreased 500 annually from the effects of vaccination. In Glasgow 15,500 persons had been vaccinated, and during the ten years previous to the date of the report no individual of that number had taken the small-pox.

It would appear that the prediction of the discoverer of vaccination was being fulfilled. In the United States children cannot be admitted into the public schools to-day without a certificate of vaccination.

Jenner died in 1823, at the age of seventy-two, with honors beyond his fondest dreams—beyond almost any other physician in English history. Russell well says:

It is meet that his statue should now forever stand in the centre of the Metropolis of the British Empire, and his name be associated with Trafalgar. It is well that England has learned to honor her heroes in peace as well as her heroes in war.

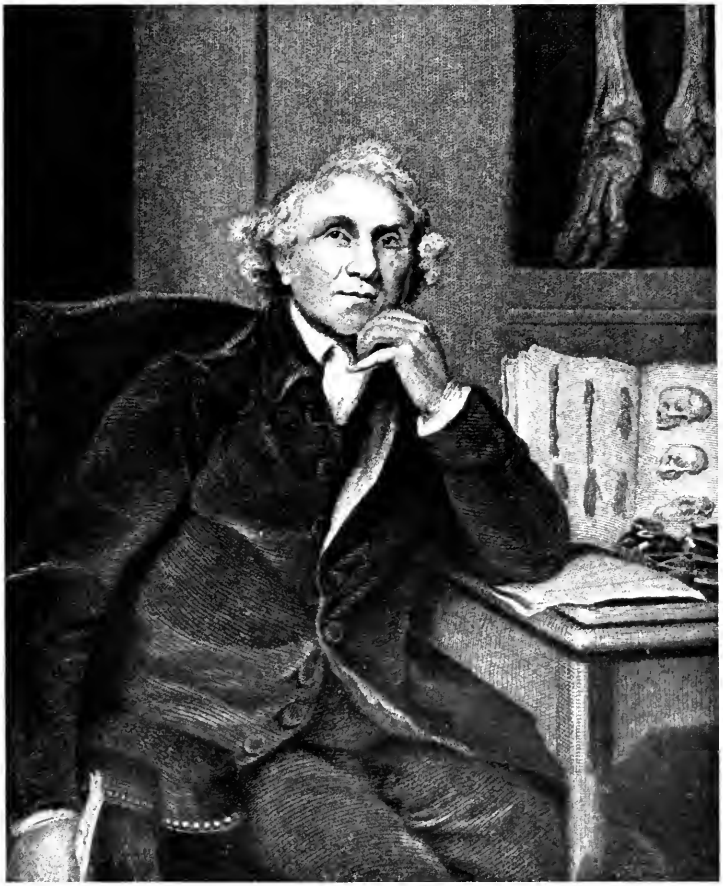
And he cites from the words of Coleridge:

Pronounce meditatively the name of Jenner, and ask, What might we not hope, what need we deem unattainable, if all the time, the effort, the skill, which we waste in making ourselves miserable through vice or error, and vicious through misery, were embodied and marshalled to a systematic war against the existing evils of nature?[1]

John and William Hunter

Among the great anatomists of the eighteenth century the names of John and William Hunter stand pre-eminent. They were Scotchmen. William, the elder, was born in 1718, at Calderwood, near Glasgow. He was sent to Glasgow University and came under the celebrated Cullen's influence. After finishing his education, he removed to London and engaged in the practice of medicine, and continued his anatomical studies. He was made Fellow of the Royal Society, physician extraordinary to the Queen, and founded in London an Anatomical Museum, to which a classical library was attached, and wrote an important work on the "Anatomy of the Gravid

[1] *Op. cit.*, p. 382.



John Hunter.

After the painting by Sir Joshua Reynolds.

Uterus." His brother John became his pupil and assistant in the dissecting room and museum. William died in 1783, honored among eminent Scotchmen.

John Hunter, whose distinguished brother is referred to above, was born in 1728, being the youngest of ten children. John Hunter achieved greater distinction than his brother William, although he was deprived of the advantages of a university course. Instead of going to school he was apprenticed to a cabinet-maker. This trade he followed until the age of twenty, when he became his brother William's assistant in London.

Under his brother's care, John rapidly rose to distinction as an anatomist. Subsequently he entered the army as a surgeon. Returning from the army he was elected Fellow of the Royal Society, and became surgeon at St. George's Hospital. He was eminent for skill as a surgeon, and acquired great celebrity for his researches in Comparative Anatomy, Physiology, and Natural History, on which he wrote several treatises. "He is admitted," says his biographer, "to be the greatest British anatomist of the eighteenth century." His best treatise is probably that on the "Blood, Inflammation, and Gun-shot Wounds." He seems to have rivalled his brother as well as all his London contemporaries in the excellences of his attainments and the value of his contribution to medical science. His museum of anatomy is said to have cost £70,000. To the genius

of John Hunter mental science owes the first conception of the plurality of mental functions in the brain, to which Gall owed, in all probability, his grand generalization of a few years later.

Hunter had a checkered career. All testify to the excellence of his character, and unselfish devotion to his work. He was a most helpful preceptor to the struggling pupil and aspirant. Edward Jenner found a stanch friend and supporter in Hunter, whose pupil he was on his first going to London. It is hardly probable that so modest and unambitious a man as Jenner would ever have succeeded in exploiting his great discovery of vaccination but for the friendship, advice, and encouragement that he received from this remarkable man. Jenner appreciated this generous kindness and said that he should always revere the name of John Hunter. Hunter died suddenly in 1793, in the heat of a medical controversy.[1]

John Hunter was the greatest anatomist of his time—perhaps of any time. He was educated in the school of experience—mother-taught, as the Greeks would say. He hated books and the lecture room, yet he indulged in both. His studies in natural history were enough for one man; but through experiments on animals he became acquainted with man. He tied the carotid artery of a stag to see what the effect would be on the antler on that side. At first it was cold. After a few

[1] *Vide* "Physic and Physicians," *Dict. of Eminent Scotchmen.*

days it regained its normal temperature. He then killed it and found that the anastomosing arteries had enlarged on that side so as to compensate for the loss of the main artery. He was thus emboldened for the first time to ligate for aneurism in man the main femoral artery of the leg in the popliteal space. In a few weeks the man was well and the leg normal. This created a furore all over Europe—for its rashness. Amputation had been the usual procedure. He left his wife without a penny; not that he did not earn an income, but that it was spent in specimens for his laboratory, the greatest private one in Europe. It cost him near $400,000, and sold after his untimely and tragic death for $75,000. He was the first to use a clinical thermometer—1780. He was one of the greatest workers, rising at 5 A.M. for work in the laboratory; then office work, till 12 M.; then visits outside; then return to the laboratory until midnight or later. He required the same industry from his pupils. What does medicine not owe to John Hunter!

To the same period belong the names of the justly celebrated Aloisio Galvani and Alessandro Volta, the latter born at Como, Italy, in 1737. Galvani was an eminent anatomist and physiologist and became professor of anatomy in the University of Bologna in 1762. He made important discoveries in comparative anatomy. His most celebrated discovery, however, and that

by which he is known and will be forever known, is the discovery of the relation of electricity and muscular motion—a discovery of far reaching importance to physiology, and which he made by the accident of having touched his scalpel to the nerve of the hind legs of a dead frog which he was dressing for an invalid wife. This circumstance revealed to Galvani the fact that all animals had electricity in their nerves and muscles by which contraction was produced. He published a treatise on the subject in 1791, entitled "De Viribus Electricitatis in Motu Musculari Commentarius." Galvani died at Bologna in 1798.

The celebrated Volta was a natural philosopher and electrician and not a physician, and for many years held the Chair of Natural Philosophy at Padua. He made several important discoveries in electrical science to which the world is greatly indebted, the most important of which is perhaps the electric pile bearing his name: the Voltaic pile, an apparatus for the excitation of a continuous current by the contact of different substances. Referring to this invention, Sir John F. W. Herschel says that it "placed him in possession of that most wonderful of all human inventions, the pile which bears his name, through the medium of a series of well-conducted and logically combined experiments, which has rarely, if ever, been surpassed in the annals of physical research." Volta also invented the Eudiometer. Medicine owes much to Volta, but electrical science more.

The electrical industries of the world rest upon Volta's discoveries. He wrote a number of treatises on his favorite subject, entitled "Opere di Volta," in five volumes, and received the empty title of Count from Napoleon I. He died in 1827 at Como.[1]

The Medical Society of London was established in the latter half of the present century, 1773—an association of physicians and surgeons to promote the interests of Medicine. This is believed to be the first society of the kind that was ever formed. Its example was, however, soon followed in other countries and municipalities.

The profession as well as the science of medicine is greatly indebted to the learned and distinguished Kurt Sprengel for his literary and scientific contributions. Born in Pomerania, Germany, in 1766, he studied medicine at Halle and took his degree of M.D. in 1787, and ten years later became professor of botany in that institution. Sprengel was a voluminous writer. Among his works are a "Manual of Pathology" in three volumes; "Institutes of Medicine" in six volumes; "Flora Halensis"; "Pragmatic History of Medicine." Nor are these all. His "History of Medicine from its Origin to the Nineteenth Century," in nine volumes, is a marvel of erudition. It has hardly its equal in any language, except that of Le Clerc's. He spared no pains to make it complete and authentic. The condensed references

[1] *Nouvelle Biog. Générale.*

to Latin and Greek, Hindu and Chinese, and other historical writers, are most profuse, occupying nearly one-fourth of his pages. It is simply impossible that he could have read all the works to which he refers, even had he lived long and done nothing else. Sprengel died in 1833, soon after the publication of the second edition in French of his great history.[1]

It is not a correct criticism to estimate a physician's influence on the advancement of his profession by his personal success in practice. If it were, Boerhaave would be accounted superior to Cullen, for he made an immense fortune in practice; and Talbot for the same reason would stand higher than Jenner, or Good, or Harvey; and Sir Astley Cooper's achievements would be greater than any of his English predecessors, for his earnings exceeded a hundred thousand dollars a year, besides winning his way as physician to the Royal family and a baronetcy. And Mesmer, who exploited "Animal Magnetism" at an earlier day, would stand with the most eminent, for he accepted several thousand livres for his discovery, or rather to exploit it, besides receiving enormous winnings from his dupes and patients. He died in Germany in 1815 at the age of eighty-four, leaving to the profession an unread treatise on Magnetism and a name to a nervous phenomenon which the moderns have termed hypnosis.

[1] *Nouvelle Biographie Générale.*

Benjamin Rush

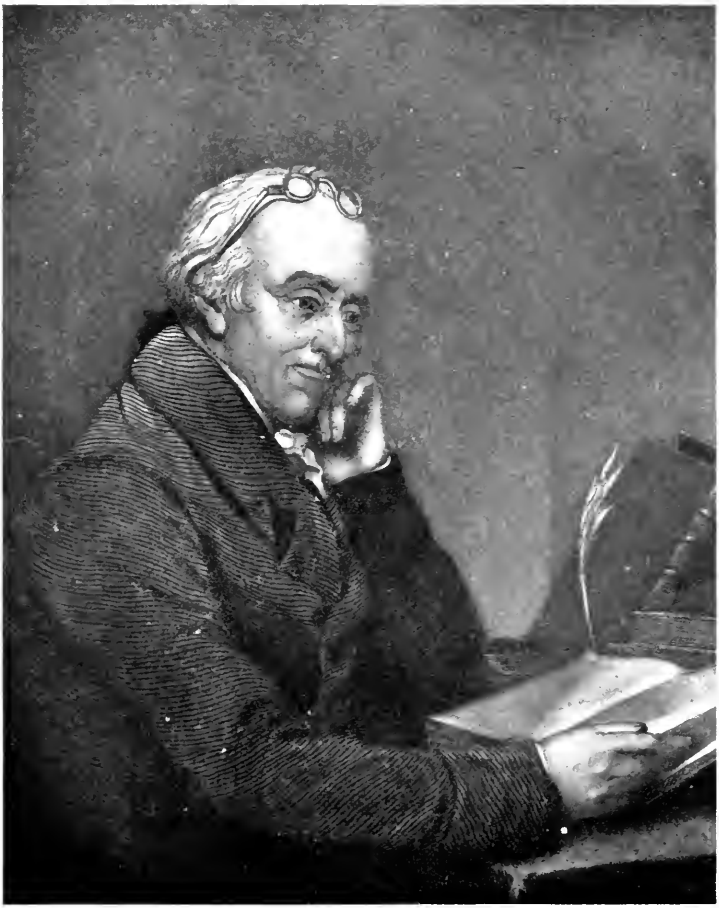
One of the earliest and most conspicuous names in the medical annals of the New World at this period was Benjamin Rush, who obtained the pre-eminence of being a great physician, statesman, and philanthropist. Dr. Rush was born near Philadelphia in 1745. He was contemporary, therefore, with most of the great physicians of the eighteenth century. Rush was educated in Princeton, and afterwards studied medicine at Edinburgh, London, and Paris. Returning from Europe he was appointed Professor of Chemistry in the Medical College of Philadelphia. In the War of the Revolution he was Surgeon-General. He was a versatile writer on many subjects. In 1791 he was appointed to the Chair of "Institutes of Medicine" in the University of Pennsylvania. He was a great teacher in medicine and contributed much to the advancement of medicine in America. He has the distinction of visiting and prescribing for one hundred patients a day. He wrote several medical treatises, among them "Medical Inquiries and Observations," in two volumes, and "Diseases of the Mind," in which he maintained that insanity was not a disease of the brain, but of the cerebral arteries. This he states on the facts of dissection of the brain of insane cases. It is evident that his post-mortem observation of cerebral processes and conditions were too limited to justify his making such an assertion. Another

strong insistence of his was that debility was the predisposing cause of all disease.

"Rush on the Mind," although obsolete now, was much esteemed in its day, and it continued to be used as a text-book in American medical colleges down to within living memory. It was prized especially by reason of the support the author gave to the philosophy of mind as distinct from brain function. Dr. Rush was a devout theologian and could not entertain any view of the philosophy of mind and spirit that savored in the least of so-called materiality. Science of mentality, or of cerebral processes, involving thought and feeling, was under the dominance of metaphysics at that time. Dr. Rush attended Washington in his last illness (1797). Rush himself died in 1813.

Dr. Rush was one of the most popular teachers of his time; and his opinions upon medical subjects were looked upon by his students as oracular; and his attitude and bearing in the lecture room gave the impression that he held that view of himself. He often assumed the manner of the celebrated pulpit orator, Whitefield. "His voice was full and sonorous, strong and clear, so that he was easily heard in a large room of four hundred and thirty students, even in his sixty-eighth year." He was also a fine reader, and took delight in exhibiting the art.

Sometimes his enthusiasm would seem to violate the sobriety of science, as when declaiming against



Benjamin Rush.

nosology, he cried out in imitation of Cato, "*delenda, delenda, delenda est nosologia*"; and when treating of debility as the predisposing cause of disease, he said: "I will associate this doctrine with an act which I hope will not be forgotten. Behold me then rising from my chair, imploring you by your regard for the lives of your patients, for your reputation, the peace of your conscience, and all that is dear to you, whether in earth or in heaven, to regard debility as the predisposing cause of nearly all the diseases of the human body."

This scene was described as "solemn, impressive, and memorable." But the eloquent speaker was in error, nevertheless. Strictly speaking, debility is never a *cause* of disease, although it is often an occasion and sequence. With that change in the author's declamation he was probably correct.[1]

Contemporary with Benjamin Rush was his eminent pupil, Philip Syng Physick, who distinguished himself as a teacher and surgeon at Philadelphia, toward the close of 1800 and also as a physician in the epidemic of yellow fever which raged with great fatality at Philadelphia that year. Physick was born in that city in 1768. After acquiring his A.B. in the schools of Philadelphia, his father took him to Europe for medical studies. He was placed under the celebrated anatomist and surgeon, John Hunter, and by his proficiency in physiology won the compliments of that preceptor, who invited him to

[1] *Vide* Gross's *American Medical Biography.*

remain in London and share his practice. From that city he went to Edinburgh and attended a course there at its famous University, where he took the degree of Doctor in Medicine. Returning to Philadelphia, he soon distinguished himself as a lecturer on surgery. At this time he was advanced to the Chair of Surgery in the University of Pennsylvania, which was especially created for him. Later he resigned that position to take the Chair of Anatomy in that institution. This he resigned in 1831, and was made Emeritus Professor of Surgery and Anatomy in the same University. Physick died soon after, 1837, at the age of sixty-nine. He was not a writer, and contributed nothing to advance the science of medicine or surgery, except by his standing as a man, and his influence as a teacher, in moulding the minds of his pupils and raising the standard of medical education and the position of medicine as a profession in America. In these respects Dr. Physick's influence was hardly second to that of any American contemporary.[1]

The advancement of chemistry received a great impetus in the discovery in this century of the true basis of atomic composition, by a farmer's son, untitled, undiplomaéd, John Dalton, who was born at Eaglesfield, England, in 1766. From an early age Dalton had devoted himself to the study of mathematics and physics, in which he distinguished himself; but it was not until he

[1] *Vide* Gross's *American Medical Biography.*

was about the age of forty that he was able to announce his hypothesis of atomic composition. This announcement was made in a lecture in London in 1804, and published in a volume in 1808, entitled "New System of Chemical Philosophy." Dalton's discovery is fundamental to the science of chemistry, and marked an epoch in Chemical Philosophy and manipulations. It must be conceded to have been the most important generalization in chemistry that had yet been made. It put chemical manipulations at once on a mathematical basis and disclosed the law of chemical affinity. Heretofore chemistry had been an art, and as such had made some progress. Dalton's discovery at once made it a science and prepared the way for the genius of a Davy and a Liebig. Like another great chemist of this period, Dalton was a bachelor. He died in 1844, a pensioner of the British Government. His great talents, devoted to the advancement of science, had not protected him from penury.

Perhaps the most notable man in the eighteenth century, notable for his substantial contributions to physics and chemistry and the allied philosophies, was Henry Cavendish, grandson of the Earl of Devonshire, who was born in 1730, at Nice. Cavendish was wedded to science and philosophy and resisted the allurements of society, spending his time in the study and laboratory. Through his discoveries in chemistry he did as much as any man of that century, except Dalton,

to put medicine upon a scientific basis. In the first place, he ranked among the first in mathematics; discovered hydrogen; the composition of water and of the atmosphere; the proportion of each of the gases hydrogen, nitrogen and oxygen in common air, and with such profound accuracy that no subsequent experimenters have disputed it. Cavendish was the first to demonstrate the mean density of the earth. Chemistry was advanced by him upon a solid basis of induction. The celebrated Sir Humphry Davy wrote of Cavendish this spontaneous tribute:

> Whatever he accomplished was perfect at the moment of its production. His processes were all of a finished nature. . . . The accuracy and beauty of his earliest labors have remained unimpaired amidst the progress of discovery; and their merits have been illustrated by discussion and exalted by time.

The encomiums of his scientific contemporaries and successors, which have been profuse, were not influenced by personal considerations. There were no charms of manner, no warmth of personal friendship or persuasiveness to excite admiration and add to his distinction; he did not toy with popular or professional favor to advance himself to the notice of his contemporaries, or to exalt the importance of his achievements. On the contrary, he avoided publicity and observation, and shrank from the association of his fellows, living the life of a recluse, without companionship, except

such as he found in his mathematical and geometrical instruments, the retort, and of acids and alkalies.

Few men have achieved more enduring renown than Henry Cavendish, and yet without aiming to do so. He was chosen a member of the French Institute of Science. Learned societies conferred honorary membership upon him, and gave him the privilege to write their initial letters in capitals after his name. Kings have sought to honor him with their presence; and he could have been covered with the rubbish of gilded insignias and stars had he coveted them. He died, however, a recluse as he had lived, with contempt for the idle pomp of the world. Will any one undertake to say that he did not choose the better part? Cavendish died in London in 1810 at the age of eighty years.[1]

Contemporary with Cavendish and a collaborator in the same branches of science was the illustrious Antoine Laurient Lavoisier, who was born in 1743, at Paris. Lavoisier's talents were similar to those of Cavendish, but more diversified and practical. Each appears to have labored to the same end without a knowledge of the other. The same observation may be made of Joseph Priestley of this same period, who discovered oxygen at the same moment, apparently, that it was discovered by Lavoisier, across the Channel, and along similar lines.

[1] *Vide Encyclop. Britannica.*

Lavoisier may be said to be the father of modern chemistry. He discovered the true nature of combustion, which was of world-wide consequence to science and physiology—yes, and to natural psychology as well, since the laws of chemical affinity and chemical union apply to the organic kingdom as well as to the inorganic—to the production of psychical forces as well as to physical forces. So broad an extension of the subject of oxidation was probably not foreseen by Lavoisier, nor by any of his collaborators; and as it developed in the broadened view of men at a later period, it was fiercely combated by the scholastics, lest it might undermine some of the fundamental doctrines of their faith. The controversy has been waged all down the nineteenth century, as we shall have occasion to notice, between the chemico-physiologists and the vital or psycho-physiologists, and has scarcely yet been laid at rest. The disputants still live but have dwindled to a quiet and harmless minority.

This grand discovery of Lavoisier that phlogiston (flame) was not heat—*caloric*, but that heat was the result of the oxydization of carbon and other substances, was published by him in 1773, in a work entitled "Orpuscules Chimiques et Physiques"—"Physical and Chemical Essays." He boldly announced this demonstration to the French Academy of Science in 1775, the similarity or identity of respiration and combustion, a revolutionary doctrine to those who saw its

significance. This discovery, says the celebrated naturalist, Cuvier, "belongs to Lavoisier in his own right, and forms the basis of the new chemical theory." Lavoisier was also the chief author of the new chemical nomenclature, "Méthode de Nomenclature Chimique," to take the place of the absurd and fanciful terms of the alchemists. That nomenclature is still in vogue. He invented the pneumatic cistern, the gasometer, and many other chemical apparatuses. His last work, "Traité Elémentaire de Chimie,"—"Elementary Treatise on Chemistry," two volumes, published in 1789, is the first systematic work on chemistry that had been published. It obtained for its author a wide celebrity. It was in use as a text-book in all colleges in all civilized countries down to almost within living memory. At the time of his tragic death by the guillotine, during the "Reign of Terror" in France, in 1794, he was engaged in the application of his chemical discoveries to the fertilization of farms, which opened a wide scope for the exercise of his genius of vast importance to mankind, as the moderns at last have come to know. Foreseeing the fate that awaited him on a charge purely fatuitous, he begged for time to complete a new discovery, but was informed that the "Republic had no need of Philosophers."[1] He left "Mémoires de Chimie" unfinished. A beautiful monument in marble, whereon his benefactions to mankind

[1] *Vide Nouvelle Biog. Générale.*

are engraved, is erected to him near the Church of Magdaléne, Paris, with his statue.

A publicist and man of prominence was Count de Fourcroy, a French physician and man of science, born in 1755. He was also an eminent chemist and a contemporary of the ill-fated Lavoisier. Cuvier pronounced him "a great teacher." His chief and most esteemed work was the "Philosophy of Chemistry" ("La Philosophie de la Chimie"), published during the "Reign of Terror," from which he barely escaped the fate of Lavoisier. His career, which promised much for the advancement of chemistry, was cut short, however, by death.[1]

To Louis Bernard (Guyton de Moreau), born at Dijon, France, in 1737, we are indebted for the first modern conception of disinfection and fumigation. Bernard was a lawyer by profession, but had a fondness for chemistry and became a zealous collaborator of the illustrious Lavoisier. In 1773, he made the discovery of the power of certain fumigations against infectious effluvia, and is said to have checked a fatal epidemic at Dijon by the use of chemical gas. Hippocrates had, however, used the fumes of burning sulphur for a similar purpose, but the procedure had been forgotten. Bernard assisted Lavoisier in the elaborate scheme of chemical nomenclature which is still in use with slight corrections and improvements. He made many contributions to the

[1] *Nouvelle Biog. Générale.*

science of chemistry, just for the love of it. While Lavoisier discovered the composition of water, it was left to Bernard to demonstrate the atomic proportion of oxygen and hydrogen which formed that substance, to be corrected, however, at a later day. The Royal Society of London made him a member, and the great Napoleon gave him a title, and conferred on him the Legion of Honor. He died in 1816.[1]

The chief work and influence of the eminent French physician Laennec were more in the nineteenth century than in the eighteenth; still, as he was born in the latter century, his place naturally comes here. René Théodore Hyacynthe Laennec was born at Quimper, France, in 1781, and went to Paris to study anatomy and general medicine, in which he soon became proficient, and acquired a reputation. His first invention of importance was that of the stethoscope, in 1815, which opened at once a new era in the study of diseases of the chest, more especially of the lungs and heart, to which he devoted himself with great diligence. His 'Treatise de l'Auscultation mediate et des Maladies des Poumons et du Cœur," in two volumes, which was published in 1819, produced a great sensation, and must be regarded as the most important contribution to the science of physical diagnosis that had been made. Laennec held the Chair of Professor of Medicine in the College of France

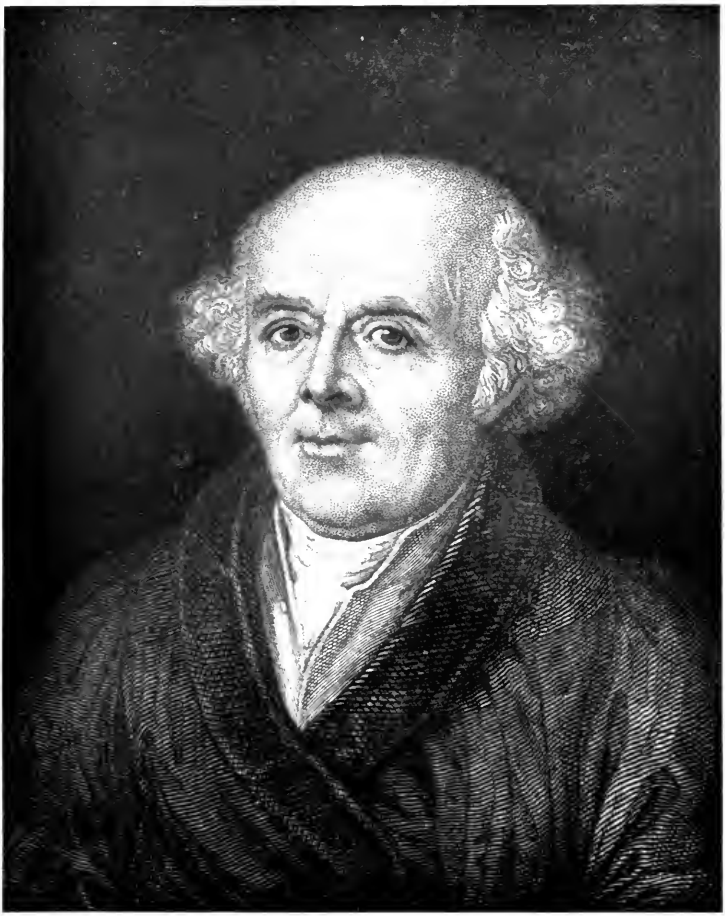
[1] *Nouvelle Biog. Générale.*

when he died. Strange to say he died of a malady of which he was an expert, consumption, in 1826.

Born at Bremen in this century were the distinguished brothers, Trevianus Gottfried Reinhold, in 1776, and Ludolph Christian, in 1779. The latter became professor of botany at Bonn, and was the author of a work of merit on "The Physiology of Plants." Gottfried Trevianus graduated in medicine and was an eminent practitioner at Bremen, besides being a writer of note. Among other works, he published a work on biology, entitled "Biology, or the Science of Living Nature." He was the first to introduce the term, biology, to the profession. His work was a valuable contribution to science. He died in 1837.

Samuel Hahnemann

New ideas in science, or new methods of procedures, encounter opposition and obstruction as obstinate as that met with in the introduction of a new custom in society. And while conditions change with increase of knowledge, the growth of population, and intermingling of races, the laws and customs are apt to remain fixed, and whoever essays to change them, or to improve upon the old, has a hard and often a painful task before him. So it is with institutions and laws. It is often that they have no right to be, the thought



Samuel Hahnemann.

Gemahlt von Schoppe, 1831. By courtesy of Mlle. Laflin, Paris.

and the customs of the time having outgrown them; nevertheless, they hold on with the tenacity of grim death. Systems of philosophy, of religion, of theology, of jurisprudence, of medicine, obey the same law. They become bred in the bone, as it were, and are a part of the warp and woof of the body politic, the family and national way of thinking and doing, and are sought to be made perpetual; and when it happens that a few individuals, or a good minority, see the absurdity of the old, seek to adopt a new or an improved way in laws or methods, the warfare at once begins. The conservatives hold fast to the traditions of their fathers; the radicals cut loose from theirs; and it requires a wise statesman, jurist, leader, pope, or bishop, the medical philosopher, or the moderator in the ecclesiastic convocation, to compose their differences, or to prevent an actual conflict. Many people know that the present system of education, so beneficent once, has in many particulars outgrown its usefulness; that many of our religious doctrines are lingering beyond their time and are inconsistent with improved knowledge—yea, stronger, are an offence to common-sense; that the system of criminal jurisprudence is based on a hypothesis wholly untenable, *i. e.*, free will, or inconsistent with the present development of mental pathology, or criminology; and that many of the doctrines of medical philosophy, and the methods of treating diseases, or the primitive conceptions of the nature

of disease, are false in the light of to-day, although they were the best that could be formulated in the light of the knowledge of their day. It is wise, perhaps, that man will hold on to the old with tenacity, lest the evils of a premature change would be greater than those they leave. People have to undergo a course of preparation before they can safely lay aside the old and accept the new. This is certainly true in the science and art of Medicine, as its progress shows.

We have now to give some account of a movement in Germany, toward the close of the eighteenth century, to introduce a reform in the method of medical practice, of so radical a nature as to be quite revolutionary. That it met with virulent antagonism was altogether natural, since it radically interfered with fixed methods and vested interests. We refer to the advent of Hahnemann and Homœopathy. It is more than a century since that movement began, long enough ago it would seem for passions and prejudices to subside and to enable the historian to treat the subject in a spirit of judicial fairness.

Samuel Hahnemann, the founder of the school or sect of Homœopathy, was born at Meissen, in Cur-Saxony, Germany, in 1755. His parents were highly respectable folk with a large family and narrow means, and could give this son but a meagre education. He was taught to read at home, and then sent to the Stadtschule, a school corresponding to our district school. When about

sixteen years old he was sent to the Furstenschule, an institution corresponding to our high school. Hahnemann possessed an ardent thirst for knowledge and made the most of these opportunities for its acquisition. His character was amiable and lovable, for which reason he made warm friends of both preceptor and pupils wherever he went. It is hardly necessary to follow the young man through the vicissitudes of fortune, after he left the parental roof. It was like that of other young men who have had ambitions to follow. It will suffice to say that at the age of twenty-four Hahnemann took his degree in medicine at the College of Erlangen; and at the age of thirty he found himself practising medicine at Dresden. At this time he had acquired an acquaintance with the classics and the principal languages of Europe. Chemistry was a favorite pastime with him, and ere long he produced a new salt of mercury, soluble mercury, mercurius solubilis Hahnemanni, as it is known to-day, to the pharmacists. This preparation has been found so useful in the treatment of so many affections that its discovery alone would have perpetuated his name.

Hahnemann possessed an inquiring turn of mind, thoroughly imbued with the scientific spirit. He had no doubt read Bacon's "Novum Organum," the works of Sydenham, Haller, and Cullen's "First Lines" and "Materia Medica"; and when he fell upon a specific for quartan ague,

which the savages of Peru discovered, he received an inspiration. Like Jenner, his English contemporary, he put two and two together and made a deduction, or at least drew a conclusion. If intermittent fever had a specific, why may it not be true of other diseases? The question was a logical one at least, so far as fevers were concerned, and he proceeded to answer it. To this end he read the clinical experiences and the report of cases in all the medical treatises he could lay his hand upon, and experimented with drugs upon himself, carrying his experiments to the verge of poisoning. It was not many years before he had found thirty drugs, that he had proved upon himself, and verified their specific virtues in his own practice and the practice of physicians prominent in the profession, that would cause the same maladies when administered in health, and that would likewise cure the same when caused by morbific agents—disease. Here was a clear demonstration, he thought, of specifics for disease, and a certain method of finding them. These experiments and demonstrations led him to dispute the theorem of Galen that diseases were cured by their contraries, or, as Galen phrased it, contraria contrariis curantur, and to declare that they were cured by their similars, *i.e.*, by remedies that acted with the disease and not against it. Accordingly he phrased the classic, similia similibus curantur, and discovered a very happy term, though not strictly accurate, to express the same

idea—Homœopathy. And in contradistinction to this term he characterized the opposite method of dealing with malady, Allopathy, which still survives in the vocabularies.

Hahnemann continued year after year to accumulate facts in support of his hypothesis and to pile up evidence in favor of his contention ere he dared to come before the profession, of which he was an honored member, with them. Finally, about the year 1800, he published an essay on the subject in the fourth volume of Hufeland's "Journal," entitled, "Are the Obstacles to Certainty and Simplicity in Practical Medicine Insuperable?"

Dare I confess [he writes] that for many years I have never prescribed but a single medicine at once, and have never repeated the dose until the action of the former one had ceased: a venesection alone, a purgative alone, and always simple; never a compound remedy, and never a second until I had gotten a clear notion of the operation of the first? Dare I confess it [he asks again] that in this manner I have been very successful, and have given satisfaction to my patients, and seen things which otherwise I never should have seen?

Thus far he had carried forward his work within his own arena, quietly and unostentatiously, and naturally had provoked no hostility, neither from his professional brethren, nor from the druggists, who had an aside interest in the sick.

Had this amiable, truth-loving man halted

there, or had he gone on with his work, giving out to the profession from time to time the results of his labors, like the incomparable Harvey, Cavendish, and Lavoisier, the honors which he received would not have come exclusively from a class, but the whole profession would have been delighted to do him reverence as was meet, and the world would have been spared possibly the unpleasant spectacle of a competitive commercialism in the profession of medicine. It was not to be. Hahnemann became possessed of vainglory. The importance of his discovery increased with its contemplation. That he was a thinker of no mean order, both friends and foes readily admitted. But he was not content with his great achievement in medical philosophy. He must build a system—a new, complete system of medicine, on foundations he himself had laid, point out the grievous errors of the old, which its chief members freely admitted and regretted, and place in bold relief the virtues of his own—"the only true system of medicine," as he called it. We cannot but regard this procedure as a grave error. Systems are not built any more than the race of men who practise them. They grow, are evolved from what has gone before, and embrace the experiences of the ages. The experience of no age, however primitive, is wholly wrong. There are some truths, and many errors, it may be said, that hold over and are passed down the centuries to give nurture and fruitfulness to

the new. Medicine is built up in that way, and has grown stalwart, and will continue thus to grow stalwart, until the sciences to which it is related shall have given mankind a sound and demonstrable philosophy of Life and Mind—and of Morality—in health and disease, and a rational procedure in malady.

Moreover, Hahnemann grew dogmatic under the persecution which he had brought upon himself, and, not content with solid achievements, proceeded to indulge in highly spun theories as to the nature of disease, in the abstract, holding that there was but one, and that that was of the dynamis or anima of the organism, of which one could know nothing and must be content with its symptomatology. There may be one grain of truth to the ounce in that hypothesis; but he gave the same principle or powers to drugs, and laid down rules and formulated methods to develop it to an almost infinite extent. Thus he continued to wander in a maze of mystery and absurdity to which Paracelsus' vagaries were not a circumstance, and to draw his followers with him.

We have said that Hahnemann aspired to be the founder of a new system of medicine than which no conception is more irrational in all his writings. In his "Organon of Medicine," a work of great erudition and well worthy of perusal by the medical student, he writes: "Thus Homœopathy is a perfectly simple system of medicine."

Again: "There remains, accordingly, no other method of applying medicines profitably in disease than the Homœopathic. And in the second edition of his "Chronic Diseases," he speaks of the perfection of our art, "the only healing art," etc. And again he says: "Since I last addressed the public on the subject of our system of medicine," etc. (p. 103). Returning to the "Organon of Medicine," footnote, page 17, he avers:

> Homœopathy sheds not a drop of blood, administers no emetics, purgatives, laxatives, or diaphoretics; drives off no internal affection by external means; prescribes no warm baths nor medicated glysters; applies no Spanish flies, nor mustard plasters; no setons nor issues; creates no ptyalysms; burns not with moxas, nor with red-hot iron to the very bone, and the like; but gives with its own hand its own preparations of simple uncompounded medicines, which it is accurately acquainted with; never subdues pain by opium, etc.

Yet he must have known, as a general practitioner of medicine, that there are emergencies met with when all these things are useful, indeed, indispensable, even to the taking of blood—venesection.

It is not our function to take sides in the discussion of medical theories and hypotheses, that learned men—honest men, with partial conceptions of the truth—are led by a variety of motives to advance. Our function ends with recording them, and making—or trying to make—impartial observations. But while we have thus stated

as briefly as possible the truths which Hahnemann postulated, yea, demonstrated, as to the action of medicines under the normal and abnormal conditions of the human economy, the reverse of their action has been demonstrated also under suitable circumstances and conditions; and that therefore it is no subject about which either party to the controversy should dogmatize. It is true to history, likewise, to say that the Homœopathy of Hahnemann has practically ceased to exist; only the skeleton remains as a reminder of what once produced a violent commotion in the profession. If this fact be conceded it is difficult to find an excuse or reason for maintaining separate schools and societies. The Hippocratian School is broad enough to-day to include members of all medical sects who are qualified and duly licensed to practise the art and science of Medicine.

Again we are constrained to say that it may be regarded as almost if not quite a truism, that he who disregards the precepts of his predecessors, of whom he is an evolution, whether he know it or not, is an egoist, of whom Paracelsus, Dover, and Brown were types, as we have seen. When a man vaunts himself above all that has gone before, and claims to possess wisdom and knowledge superior to all the gods in human form that have preceded him, he is, we repeat, an egoist, whether he be a Mohammed, a Paracelsus, a Sextus Empiricus, or a Hahnemann.

Men of science are no longer in leading-strings,

nor are they listening to sirens. We certainly find that Hahnemann's attitude toward his contemporaries, wise men and learned, and the claims he put forth for his discoveries, bring him within the scope of our criticism, in declaring that Homœopathy was "a perfect system of medicine," the "only healing art," etc.

Apart from his discovery of soluble mercury, which was an excellent achievement, and his contributions to specific medication, and the introduction of the single remedy, Hahnemann did little to advance the knowledge of medicine. His physiology was taken from that of Haller and Bichat; his idea of specifics from Boyle; his dynamis from Hippocrates. We cite a paragraph from his "Organon" which gives one a clear insight to his defective knowledge of pathology, and of the relation of mind and body.

In the so-called bodily diseases which are dangerous, such as suppuration of the lungs, or that of any other essential viscera, or other acute disease, viz., in child-bed, etc., where the intensity of the moral symptoms increases rapidly, the disease turns to insanity, melancholy, or madness, which removes the danger arising from the bodily symptoms. The latter improve so far as almost to be restored to a healthy state, or rather they are diminished in such a degree as to be no longer perceptible, except to the eye of the observer gifted with penetration and perseverance. In this manner they degenerate into a partial (einseitig) disease, even as if local, in which

the moral symptoms, very slight in the first instance, assume so great a preponderance that it becomes the most prominent of all, substitutes in a great degree for the others, and subdues their violence by acting on them as a palliative. In short, the disease of the bodily organs, which are grosser in their nature, has been transported to the almost spiritual organs of the mind, which no anatomist ever could or will be able to reach with his scalpel.[1]

The judicial observer must admit, we think, with perfect respect to the author of Homœopathy, that he at least discovered an elegant method of applying Suggestive Therapeutics under the guise of medication.

[1] *Organon of Medicine*, Fourth American Edition, pp. 187, 188.

FIFTH: PERIOD OF THE RENAISSANCE
(*Continued*)

CHAPTER X

State of Medicine in A.D. 1800

THE century to the end of which we have come was crowned with a galaxy of great men in every department of science and philosophy. The classical period of English Literature had come and gone. France and Germany were just entering upon theirs. Benjamin Franklin was popular at the French Capital among a brilliant coterie of men and women of genius in Literature, Science, and Art. Germany was hardly second to France in the number of her great poets and philosophers. Goethe was her rising star. For great philosophers and writers England outranked them both. Neither of them had produced a Hume or a Gibbon, a Newton or a Herschel. America had achieved her independence and was coming into notice with the high and distinguished character of her public men. Napoleon had entered upon his career; Frederick the Great had closed his. The influence of the Encyclopedists in France was on the wane; so, also, was statecraft. Statesmanship was, however, in the

ascendancy. From the French Capital were being echoed all over the world sentiments of Liberty, Equality, and Fraternity. The great Lavoisier, the chemist, had been slain by the Tribune; but Davy, a greater than a Lavoisier, arose in England to carry forward a work so auspiciously begun by him. Priestley, the illustrious chemist and joint discoverer with Lavoisier of oxygen, had taken himself off to the wilds of America, there to enjoy without persecution or molestation the freedom of opinion and conviction denied him in England. The priests of the parent church still discoursed on Christianity in a dead vernacular, of which their auditors were wholly ignorant; but to read the Holy Bible in one's native tongue had ceased to be a crime. Nor was it any longer a crime in Western Europe to teach children to read, or to send them to school, could their parents afford it, or if the workshop and factories had not a more pressing claim upon their services, or their parents for their wages. Men and women, innocent of every sin but delusions, were no longer hung for sorcery or witchcraft; but the insane were kept in chains and dungeons as madfolks, or guilty of obsession. Buffon had written his great work on Natural History; Cuvier had written his; the great Huber had finished his; Dujardin likewise his. The period of the great historians had passed; but the firmament was ablaze with great thinkers and men of science and discovery. The new century

which lies before us will inherit an imperishable love of science and philosophy, and receive from its predecessor a multitude of great men who had barely passed their maturity. The whole West was illuminated by them; their influence was being felt across the sea. If, therefore, the nineteenth century shall have reaped a greater harvest of science and discovery, and made a greater stride in civilization than the eighteenth, it will be because of the seed sown by, and the great impetus for knowledge that the nineteenth received from, its great predecessor.

Chemistry had made great advancement by the discoveries of the immortal Dalton, Cavendish, Lavoisier, Davy, and Priestley. The true nature of air, water, combustion, respiration, etc., had been revealed by them, as well as the constitution of certain gases. The illustrious Sir Humphry Davy came upon the stage at this juncture, with a genius for chemical research which had not been surpassed in all history. His way had been made straight for him by Lavoisier and Cavendish, having been born about the time that the discoveries of these celebrities were being made. We should not fulfil the expectation of the reader were we to pass with a mere mention the name of this great scientist.

Humphry Davy was born in Penzance, Cornwall, in 1778. His father was a wood-carver. Neither father nor mother was conspicuous for mental traits and acquirements. Davy's edu-

cation was meagre, and not such as to fit him for a scientific career. He had at an early day manifested a taste for fiction, and in poetry found a congenial field in which to exercise his bent. At the age of eleven, Davy began an epic poem, making the Greek Diomede the hero. It was never finished. When he was sixteen years old he had the good fortune to meet the son of the celebrated James Watt, the inventor of the steam-engine. This acquaintance brought him into fellowship with other men with a taste for science; among others, Dr. Beddoes. In the year 1800 he published his first work on "Researches, Chemical and Philosophical, chiefly concerning Nitrous Oxide and its Respiration." The discovery of this gas, nitrous oxide, or "laughing gas," we may fairly attribute to him. In the following year, at the age of twenty-three, he lectured on chemical subjects before the Royal Institution, London. Dr. Paris praises him as a lecturer. He was eminently successful at the outset. "His youth, his simplicity, his natural eloquence," says Dr. Paris, "his chemical knowledge, his happy illustrations, and well-conducted experiments excited universal attention and unbounded applause."[1]

The decomposition of the fixed alkalies by galvanism, is said to be the most important achievement in his brilliant career. These alkalies, soda, potash, silica, magnesia, etc., had

[1] Paris's *Life of Sir Humphry Davy*, p. 90.

hitherto been regarded as primary elements. Davy demonstrated that they were metallic oxides, compounded with oxygen. It marked an epoch in the advancement of chemistry, and in the progress of the medical art. Eulogiums were showered upon this man by men of science beyond any that man had ever received. The Government vied with learned Senators in doing him honor. It is not at all to be wondered at that such homage should have turned his head. The learned Cuvier declared him to be entitled to a position of the "first rank among the chemists of this or any other age." This was when Davy had scarcely reached his thirty-third year. Among the principal works of Davy are, "Elements of Chemical Philosophy," "Elements of Agricultural Chemistry," besides many papers on these subjects contributed to the Royal Institution. To the world, Davy is chiefly known as the inventor of the "Safety Lamp," to protect miners against the fatality of mines, from the explosion of what was called "fire-damp" in coal mines. Of so great importance was this discovery to human life in the mines in Great Britain that the English Government took notice of it and conferred a baronetcy upon him. He was then forty years old, but his work was done. He died in 1829 at Geneva.

The brilliant and important discoveries in Chemistry and certain other collateral branches of Medicine, which we shall have occasion to

note farther on, seem to have overshadowed the progress of the art of medicine. Be that as it may, medicine proper, at the close of the eighteenth century, was for a time in a state of quiescence. Nothing different could be expected, since the advancement of practice depends largely upon a knowledge of morbific causation, which was very limited. As the development of etiology must precede the science of rational therapeutics, practice had to bide its time. The same observation is true of surgery. It had to wait for Lister and Simpson for fertilization. Surgery had made progress in the skill and variety of its operations; but wounds of the peritoneum were still regarded as necessarily fatal; and the surgeon opened the abdomen only when necessities of the case required it, uncertain of the consequences of his temerity. Lister had not yet been born, and the cause of the fatality of lesions of the abdomen and compound fractures had not yet been discovered, or, if discovered, the means of prevention of them were unknown. Minute anatomy, in the hands of the younger Hunter and the still younger Bichat, had made great progress, and so far as the general structure and relations of the parts of the human anatomy were concerned, at least below the foramen ovale, but little remained to be known. The knowledge of Physiology, however, had naturally lagged behind, awaiting its further progress, the genius of Bichat and Flourens, the development of chem-

istry, and improved means and methods of studying histology and the functions of the organs; the phenomena of secretion and excretion, their composition and significance, and a fuller knowledge of the nervous system, including the brain and mind. At this time, only a few of the elements of the science of Neurology were known. Since this is a part of Physiology, and a highly important part, the state of the latter science was not greatly advanced since Haller. Indeed, the physiology and pathology of Haller and Cullen were authoritative in the schools of medicine throughout Europe and America, until superseded by the studies of the great Magendie, nearly a quarter century later.

Magendie was the greatest physician that France had produced down to his day. His work on physiology appeared in 1816 and was promptly translated into English and German. It was modestly entitled "Précis Élémentaire de Physiologie"; but it was the most important contribution to the subject that had yet been written, although produced when the author was at the age of thirty-three. The work was based throughout upon original experimental research. In it he controverted successfully some of the doctrines of Haller, particularly the irritability of the arteries. He thought he proved that the veins were absorbents; that the arteries had the property of elasticity rather than irritability. He was the first to discover the function of the spinal

nerves; and he contributed more to the knowledge of the nervous system than any of his distinguished predecessors. All his discoveries were based upon demonstrations on the living subject. They gave his writings, therefore, an authority superior to that of most of his predecessors. In pharmacy also his genius was felt. Many physicians of to-day remember "Magendie's Solution of Morphia" for hypodermic use. His most important work was "Lectures on the Functions and Diseases of the Nervous System," delivered at the College of France, and published in two volumes in 1839.

Magendie's remarkable genius as an original investigator brought him into prominence and popularity at an early age. He was born at Bordeaux in 1783; studied medicine at Paris and became Demonstrator of Anatomy in the Faculty of Medicine, Paris, in 1805; was admitted as a member of the Academy of Sciences in 1821; and became Professor of Anatomy and Medicine in the College of France in 1839. Meantime, he founded the *Journal of Experimental Physiology*, which he edited for many years, besides making valuable contributions on Public Hygiene, as President of the Board of Health of Paris.

Magendie died in 1855, but his work was done early in his career. He was one of the most brilliant pioneers of medicine in the nineteenth century.[1]

[1] *Vide Nouvelle Biographie Générale.*

More than a passing notice deserves Gabriel Andral, born at Paris, in 1797. He was another medical light of great brilliancy, and a contemporary of Magendie, Laennec, and other physicians of prominence. Andral was a popular practitioner and acquired a large following in Paris. His specialty was Pathological Anatomy, on which he wrote four volumes. He, too, wrote from experimental knowledge, and his contributions to the subject were in advance of any contemporary or predecessor. He greatly enriched the science of pathology. His opinions upon the treatment of diseases were regarded as authority, and may be found quoted by prominent writers on Medicine of the early century. All the honors of professorships and memberships in colleges and scientific societies at the French metropolis were accorded him. Andral died in 1853.

One of the most illustrious German naturalists at this period, although born in 1779, at Bohlsback, whose genius eclipsed perhaps all previous investigators in the natural history of the human species, was Ockenfuss, or Oken, as he preferred to be called. Oken was educated at Göttingen and devoted himself to the study of natural history, and became one of the most learned men that Germany had produced. In 1807 he was professor of Medical Science in the University of Jena, where he gained a high reputation for his lectures on zoölogy, physiology, and other branches of medicine. Many of his doctrines were revolu-

tionary at that time, for which he was called to account by the Church, the Roman Catholic being dominant in Austria at that time. He published a work on the "Religion of Geology," in 1802. In this book he advances the doctrine of Evolution. "Plants and animals can only be metamorphoses," he said, "of infusoria." "No organism has been created," he says, "of larger size than an infusorial point; whatever is larger has not been created, but developed. . . . The mind, just as the body, must be developed out of these animals. . . . Everything that is, is material," etc. Being exiled from Austria for the publication of these doctrines, in 1832 he obtained a professorship at Zurich, where he died a score of years later, at the age of seventy-two. His contributions to the advancement of science were most suggestive, many of which were to be demonstrated at a later period by Haeckel, Darwin, Pasteur, Pouchet, Virchow, and others.[1]

The close of the eighteenth century was characterized, as we have observed, by great activity in the study of the collateral branches of Medicine, such as natural history, botany, physiology—comparative and human—chemistry, pharmacy, etc., all of the first importance to the science of medicine; but in theory and practice, therapeutics and hygiene progress was almost at a standstill. Hahnemann, it is true, was exploiting his new "System of Medicine" in Germany,

[1] *Vide Encyclopedia Britannica.*

patiently studying the medicinal virtues of drugs in small doses on the healthy; seeking in the writings of the past and present for evidence to support his hypothesis of *similia similibus curantur*, and to disprove that of Galen, *contraria contrariis curantur*, and substantiating the new practice by clinical reports of marvellous successes, without a record of signal failures, and all without producing a ripple on the pulse of the profession of England. The theory and practice of Galen, slightly modified by Sydenham, Hoffman, and Cullen, was almost stationary. Bloodletting in pleurisy and pneumonia and other inflammatory diseases was the leading practice, which was carried sometimes to the verge of syncope. This was the first and chief reliance in pneumonia, which was seconded by the wine of antimony, the famous tartar emetic, for the stage of expectoration. Cupping and blistering followed *secundum artem*.

We have said that the fulminations of Hahnemann awoke no response at London and Edinburgh at this time, nor in other medical centres in Europe, except in Germany. The "Organon of Medicine" of that sage was written in German, and had not been translated into French and English until late in the first decade of the nineteenth century. It was too soon, therefore, for considerable effects to have been produced upon the medical mind outside of Germany. In the latter country Hahnemann had a few followers

at a later time, the more prominent of whom were Charles von Boeninghausen, a physician of prominence; Noake, Trinks, Stapf, Hartmann, Neidhard, Bruchhausen, Hempel, and the celebrated Hufeland, professor of medicine in the University of Berlin, which was established, in the first decade of the nineteenth century (1808), with von Humboldt at its head,—author of a work on the "Practice of Medicine" ("Enchiridion Medicum"), and founder and editor of Hufeland's *Journal*, and many others. Later, the spread of Hahnemann's doctrines created no little stir in Germany in medical circles, a stir which led to the passing of an edict against physicians dispensing their own medicines. The promulgation of this law drove Hahnemann and some of his disciples out of that country into France, England, and to America. At Paris, Hahnemann won a reputable following, and a second time built up a respectable and profitable practice. He died there in 1843, at the advanced age of eighty-eight, leaving a widow and a son, eighteen years old. This celebrity spent some time at Weimar about the year 1832, and became a great favorite there among the students and professors of the University, by his distinguished mien, gentle, unassuming manners, and learning. It was there that the distinguished poet and writer, Jean Paul Richter, made his acquaintance, and spoke of him in this manner:

"Hahnemann, this extraordinary double-brain

(Doppelköpf) of philosophy and erudition, whose system must eventually lead to the ruin of the common Recipe-crammed brains (Receptirköpfe), but which has yet been little accepted by practitioners, and is more detested than examined."[1]

Dr. Russell, being a stanch disciple of Hahnemann, has given an excellent account of the life and works of that philosopher and of his medical system, to which we refer the interested reader.

The celebrated Hufeland wrote of Hahnemann in warm terms in his *Journal*, praising his scholarly accomplishments and his personal character, and setting forth the claims of his doctrines with judicial fairness, which few of his opponents at that time had done.

The practice of medicine had not kept pace with the progress of the collateral branches of medicine, as we have observed. It was less liberal—more dogmatic—than in the preceding century. This will appear evident by a glance at any standard work on Practice of that time. For example, we cite in the following pages the treatment of a few of the more prominent maladies then prevalent in Christendom that was prescribed by some of the leading physicians, as recommended and recorded in John Mason Good's great work, "The Study of Medicine." Referring to the treatment of pneumonia, he says:

From the time of Hippocrates to the present day, pneumonitis has been considered as one of the

[1] Russell, *History and Heroes of Medicine*, p. 418.

disorders in which the abstraction of blood is productive of the most unequivocal good effects. The same argument, however, has not prevailed in respect to the quantity of blood to be drawn at one time, the period of the disease when bloodletting ceases to be useful, and the part of the body from which the blood ought to be taken. The greater number of the ancient physicians, as Laennec has remarked, bled only at the outset of the disease, and allowed the blood to flow until syncope took place. The same practice is common in England where physicians frequently direct twenty-four, thirty, or thirty-six ounces of blood to be taken away at the beginning of the pneumonitis.

And his editor adds: "In subjects not debilitated by age or previous habits and disease, Dr. Good, in former editions of this work, recommended the bleeding to be prompt and copious, at least to eighteen or twenty ounces, and necessary to be repeated in twelve hours." M. Andral states that the first bleeding should be from sixteen to eighteen ounces, and that the operation may be repeated twice, or even thrice within twenty-four hours.[1] And Dr. Good's editor goes on to say that "the advantage of a very copious bleeding at the outset of pneumonia has been placed in strong light by Dr. Robertson," an eminent physician of the period, of Edinburgh, whose practical observations on the subject merit attentive consideration, and whose precept is

[1] *Study of Medicine*, vol. i., p. 494.

supported by Dr. Gregory's celebrated aphorism that "the danger of a large bleeding is less than the danger of the disease." Furthermore, says the editor: "Notwithstanding the propriety of copious bleeding in the early stage of pneumonia, the extent to which the evacuation should be carried ought certainly to be modified according to the age and strength of the patient." In the final edition of Dr. Good's work the author advises the following caution:

> The chief evil is that the fever is apt at times to run into a typhus form and assume the second variety of the disease before us. And hence, when there is any doubt on the subject, local bleeding is to be preferred, whether by leeches or cupping glasses, and repeated according as the evacuation appears to be demanded.[1]

The principal adjuvant of venesection in pneumonia was tartarized antimony. Laennec, the inventor of the stethoscope, and one of the most distinguished specialists in the treatment of diseases of the chest, of that day—a man whose opinions and methods were almost servilely followed by his contemporaries,—gave, after venesection,

> a solution of one grain of tartarized antimony, every two hours, repeating the dose six times. After this, if the symptoms be not urgent, and the patient disposed to sleep, he leaves him quiet for six or eight

[1] *Study of Medicine*, vol. i., p. 494.

hours. But if the oppression be great and the head affected, the medicine is continued, the dose being then increased to a grain and a half, or two grains, or even two grains and a half. Many patients bear the medicine without being either purged or affected with vomiting. Most of them, however, vomit two or three times, and have five or six stools the first day. On the following days they have very slight evacuation, and sometimes none at all. As soon as some amendment is produced we may be sure [says Laennec] that the continuation of the remedy will effect a cure without any fresh relapse.[1]

When the medicine operated too freely, Laennec gave a small proportion of opium with the antimony. He also used blisters pretty freely as an auxiliary to his method; and for the cough, when troublesome, he added demulcent drinks, and inhalations of steam. Opium was given also as circumstances seemed to require, either to promote rest or to alleviate cough. The custom was to give it in conjunction with gum ammoniac or squills. For the same purpose the extract of white poppy was used, and the garden lettuce; but "in my hands without significance."[2]

The success of this heroic treatment, as it seems to twentieth-century folks, was hardly below the present percentages of recoveries of modern treatment. Of forty-seven cases of pneumonia, treated by Dr. Hellis at Rouen, France, in

[1] *Op. cit.*
[2] *Op. cit.*, p. 495.

1826, in which emetics, presumably of tartar emetic, were administered freely, "only five were lost," being one case in nine. "Laennec experienced even greater success with large doses of the medicine," with free venesection as was his custom. "The average number of deaths under the treatment with bleeding and derivatives, is computed to be one in six or eight cases." M. Preschier, of Geneva, at the same period, was successfully treating the disease with tartarized antimony alone—without bleeding. He gave large doses of the drug, "so as to purge as well as to vomit."[1]

Mercury was also used at this time in combating inflammation of the lungs, more especially in the second stage, when hepatization had set in, "but," adds the learned editor of "Study of Medicine," "it must of course be preceded by bleeding."

The practice of bleeding in pneumonia, which was inherited from the "Father of Medicine," and sanctioned by the great authority of the incomparable Galen, declined in the seventeenth century under the vehement denunciation of van Helmont, as did likewise antimony at the ridicule of Guy Patin; but both were restored in the eighteenth century to their former favor, by the powerful influence of the popular Rasori, an Italian physician, reinforced by the influence of the learned Laennec. This author was Gio-

[1] *Op. cit.*, p. 495.

vanni Rasori, born in 1767, who distinguished himself as a professor of medicine at the University of Padua, and as the author of a new medical doctrine known as the theory of the "Stimulus and the counter Stimulus," which he applied with great assurance in the treatment of pneumonia and its allied diseases, and presumably with a larger percentage of cures, since any new thing in medicine starts out in that way. However that may be, in the University of Edinburgh, the most popular medical centre in Europe at that time, if there was a single voice raised in opposition to the practice of venesection, it did not make itself heard. Hahnemann's influence against the practice was not without effect in Germany. But what was one man's voice against the powerful trend of the great body of a learned profession? Moreover, communication between foreign countries was not frequent and speedy then as it is now.

In pleurisy, the treatment did not differ materially at this time from that laid down for pneumonia. Says Good:

Perhaps there is no disease in which profuse bleeding from a large orifice may be so fully depended upon, or has been so generally acceded to by practitioners of all ages and all nations; the only question which has ever arisen upon the subject being whether the blood should be taken from the side affected or from the opposite. The early Greeks recommended the former; the Galenites and the Arabians the latter;

and the dispute arose so high at one time that the medical colleges themselves not being able to determine the point, the authority of the Emperor Charles IX. was whimsically appealed to, who, with much confusion to the controversy, died, himself, of the pleurisy before he had delivered his judgment! He, too, had been bled, and his death was immediately ascribed to the blood having been drawn from the wrong side! At present [continues the author], from a knowledge of the circulation of the blood, we can smile at those nugatory solemnities. It is possible, however, that there are some controversies of our own times that have as little groundwork, and at which future ages may smile with as much reason. The blood drawn, in this disease, has a peculiarly thick, yellowish, tenacious corium, and is hence specifically distinguished by the name of "pleuritic" corium, or coagulum.[1]

At a later day the appearance of the blood referred to was called "buffy," and bleeding was to be continued at intervals until it disappeared.

The custom was generally to purge freely for pleurisy; to blister after venesection; and to give diaphoretics. Opium was prescribed more freely than in peripneumonia; calomel was a prominent remedy in serous effusions; for the promotion of absorption of such effusions, acetate of potassa, digitalis, and mercurial inunction were also recommended, and paracentesis of the chest was practised only when all other means failed to

[1] *Op. cit.*, p. 500.

promote absorption and relieve the oppressed breathing.

Another illustration of medical practice of the last century from the same erudite author may not be uninteresting. We will take, for an example, the treatment of cephalitis.

The cure of cephalitis [observes Dr. Good] must be attempted in the same manner as that of inflammation in general, or rather as the cure of inflammation by resolution; for resolution is the only means by which a cure can be effected in this case. Copious and repeated bleedings must have, therefore, the first place, and the nearer the blood is drawn from the affected organ, the better chance it gives us of success. The temporal arteries and the jugular veins have been recommended as the most effective vessels to open, but for various reasons it is better to begin by drawing blood freely from the arm, and afterward by a free application of leeches to the temples. The head should be shaven as soon as possible and kept moist with napkins wrapped round it, dipped in cold vinegar, or equal parts of water and the neutralized solution of ammonia, or, which is still better, with ice-water; all of which is preferable to blistering, which is too apt to increase the morbid excitement; and the practice has the authority of Hippocrates, who was in the habit of applying cold epithems, not only in inflammation of the brain, but even of the abdominal viscera. The effect of blistering in the early stages is looked upon by Dr. Abercrombie as rather ambiguous. When it is employed he recommends it to be on the back of the head and neck, where it will not interfere with

the more powerful remedy, the application of cold. After the first violence of the disease has been subdued, however, he approves of successive blisters to various parts of the head and upper part of the spine. The bowels should be thoroughly evacuated, and even stimulated, at first by calomel alone, or mixed with jalap, and afterward kept open by cooling saline aperients; nitre should be given in moderate quantities, repeated as often as the stomach will bear; and it is often considerably assisted by the tincture or infusion of digitalis. The chamber should be cool and airy, and no more light admitted than the eyes can endure without inconvenience.[1]

Dr. Abercrombie, whom Dr. Good so often quotes, and for whose judgment he held the highest opinion, advocated the most heroic purging in brain inflammation, and declares that he has seen the most gratifying results follow it. He recommends the most drastic purgatives for the purpose. Even the croton oil he would not withhold in the treatment of phrenitis.

The treatment of acute rheumatism was along similar lines, with little variation from the method of Galen. The etiology of the disease was unknown at that time, but it was usually attributed to undue exposure to cold and damp, preceded by the predisposing cause of Dr. Benjamin Rush, namely, "debility."

When fever is violent, and especially where the frame is robust [writes Good], our only effectual

[1] *Op. cit.*, p. 465.

remedies are copious bleeding and the use of diaphoretics; by the former, which will often demand repetition, we take off the inflammatory diathesis; and by the latter, we follow up the indications which nature seems to point out, and endeavor, by still relaxing the extremities of the capillaries, to render that effectual which, without such collateral assistance, is, as already observed, for the most part exerted in vain, and with an unprofitable expenditure of strength. The most useful diaphoretic is Dover's powder, and its benefits will often be increased, if employed in fusion with the acetated ammonia, and sometimes if combined with camphor. Aperients are useful to a certain extent, but they have not been found so useful as in various other inflammations. Small doses of calomel have occasionally, however, seemed to shorten the term of the disease, though they have not much influence in diminishing the pain. For this purpose the general practice was to combine calomel with opiates, since it was their one object of treatment to mollify suffering as much as practicable or expedient. Opium alone [remarks Dr. Good] is rather injurious; nor has any decided benefit resulted from other narcotics, as hyoscyamus, hemlock, and aconite.[1]

The rhododendron was in use at Edinburgh at this time by Dr. Home, who found it to be of value in the treatment of rheumatism from its diaphoretic and narcotic effects. But it did not acquire much foothold in the profession and was accordingly soon discarded.

[1] *Op. cit.*

Peruvian bark, which had come into general favor in the previous century, found many advocates for many maladies in this. Its free use in rheumatism and irritable neuroses had been found of benefit. Good thought the use of the bark in acute rheumatism to be highly irrational and inconsistent. Cullen was of the same opinion. "I hold the bark," said Cullen in his "Materia Medica," "to be absolutely improper, and have found it to be manifestly hurtful, especially in its beginning, and in its truly inflammatory state." Nevertheless, despite the authority of Cullen, bark was used in rheumatism by many of his distinguished contemporaries, both in London and Edinburgh. Dr. Whiting, of London, among others, found it beneficial. He administered it in the form of sulphate of quinia, in 1826, which is the first mention of the salt of quinia that has come to our notice.

In his "Clinical History of Diseases," the versatile and distinguished Elliotson, of London, gives his mild adherence to bark as a remedy for rheumatism, after the patient had undergone a thorough course of antiphlogistic treatment, when perhaps no further medication was needed. "The two best internal remedies are," in his opinion, "without doubt, colchicum and mercury. Colchicum, here, as in the case of gout, generally does no good till it purges; and when once it purges the patient thoroughly, the disease usually gives way." It was his custom to give

the drug with magnesia. "If you give a dose of one, two, or three minims of hydrocyanic acid," he says, "with the colchicum, it sits better in the stomach." In obstinate cases, which had resisted the virtues of colchicum, he gave mercury until the mouth became tender—that is, to the point of salivation. "If you do this in the first instance," he writes, "instead of giving colchicum, the success is about the same." Colchicum may gripe, and mercury may make the mouth sore, so that you may not be able to continue them, and you may then leave off the one, whichever it may be, and exhibit the other; or, if you begin with one, and find it does no good, you may exhibit the other.[1] The names of Morton, Hulse, Smith, Fothergill, Haygarth, Fordyce, and others (distinguished physicians of this period), discarded bleeding in rheumatism and prescribed bark instead. Surely, Cullen's influence was waning!

Thus far, we have confined ourselves to an examination into the state of Practice in eighteen hundred to diseases physical. We will now turn our attention to diseases of the nervous system, and confine our inquiry to the oldest known malady of its class—epilepsy. The etiology of that affection is yet in doubt; so, also, is its nature; it remains to be seen how far the moderns have improved over the previous century in its treatment and cure.

[1] *Op. cit.*, pp. 570, 571.

In epilepsy, remedies have usually been prescribed with the object of removing the suspected exciting cause in each particular case. If that appeared to be in the bowels, purgatives were prescribed. For this purpose, gamboge, colocynth, sulphate of magnesia, and calomel, were the favorite medicaments. If worms in the bowels were suspected, the rectified oil of turpentine was given the preference. The dose was massive; from one to two ounces for the adult. De Haen employed emetics chiefly for the purpose of exciting a new action in the economy, on the principle of contraries, of Galen. Stimulants have been employed externally, sometimes, with good results. "The spine has been rubbed night and morning with different preparations of ammonia, camphor, cantharides, and the antimonial ointment; and setons and issues have been applied to different parts of the body, as have also the actual and potential cautery," and Dr. Good declares that "there can be no question that these means frequently have proved serviceable, especially in preventing the recurrences of subsequent fits, where a habit of return has been established." This procedure was recommended by Galen and other Greek writers. Good says, in regard to the actual cautery, that "in several instances an accidental burn has answered the purpose of a surgical escharotic, and fortunately proved a radical cure." Ligatures have been applied to the limb

from which the aura, or hilatus, proceeds, in epilepsy, above the point "whence the vapor issues," and had been found successful in preventing the fit, "in one or two cases."

The remedies which were most in use in epilepsy were those whose effect was to soothe, or allay, the irritability of the nervous system. These were camphor, valerian, stramonium, cajaput, opium, hyoscyamus, digitalis, etc. Stramonium had a great run in the last previous century, then declined; "but now," says Good, "it has been once more rising in esteem." About the beginning of the nineteenth century, "fourteen epileptic patients in the Royal Hospital at Stockholm were treated with pills of Stramonium." Of these, "eight were declared by Dr. Odhelius, in the official report upon this subject, to have been entirely cured, five had their symptoms mitigated, and only one received no relief." Massive doses of the drug were probably employed, "for the greater number on first using the remedy were affected with confusion in their heads, dimness of their eyes, and thirst. But these symptoms gradually disappeared."[1]

The credibility of such reports is impaired by the well-known fact that it is not in the power of any one to know when a patient is cured.

As might be supposed, the use of mercury was pushed to extremes at this period in the treatment

[1] *Op. cit.*, p. 367.

of epilepsy. When exhibited to the extreme of salivation, "some practitioners *pretend*," says Good, "to have found it highly useful." The distinguished Elliotson, lecturer upon medicine at the London University in 1820, did not admit its efficacy. He was likewise skeptical of the utility of the metallic salts of zinc, tin, arsenic, copper, iron, etc., in the disease. "I do not believe," he writes, "that these things are to be depended upon." The salt of silver was experimented with at St. Bartholomew's Hospital, London, at this time with results more promising. Dr. Powell, of that institution, is said to have tried nitrate of silver on a large scale. The dose was in the form of pills, beginning in doses of one, two, three, and five grains, three and four times a day, advancing the dose to the limit of toleration by the stomach. The patients were mostly children of both sexes, from nine to fifteen years of age, "in all of whom the medicine proved successful, and is said to have operated a perfect cure. The learned Elliotson whom we have already quoted, and whose large experience gave his opinion great weight, had no faith in the drug. "If it be not given for a long time," he said, "you will do no good; and if it be given for a long time you run the chance of blackening the patient." Armstrong, an English physician of note at this period, and author of a work on "Morbid Anatomy: Nature, etc., of Acute and Chronic Diseases," was of the opinion that

"nitrate of silver stops epilepsy, but most frequently fails." Dr. Elliotson, before quoted, expressed the opinion that the failure of these metallic salts to effect a cure may be due to need of first depleting the patient. "I am quite sure," he observes, "that remedies are completely prevented from doing good, because we do not remove a plethoric state of the system."[1] Dr. Reid found much efficacy in counter traction during the convulsive attacks, ameliorating, or cutting short the spasms. All students of epilepsy advise the strictest regimen to be insisted upon in the disease, even to a diet so abstemious, in some instances, as to border upon a fast.

Apparent cures of epilepsy have been effected by surgical procedures, such as lifting the skull from over the centre of muscular action,—the supposed site of brain irritation in the malady. One remarkable instance of this kind was reported in the *New York Medical and Physical Journal* for the year 1826, by Dr. Rogers of New York. "It was a protracted epilepsy cured by elevating a portion of the os frontis, which had been depressed upon the brain fourteen years."[2] This operation of Dr. Rogers is the first for the relief of epilepsy in the annals of Medical Science. The operation has been frequently performed since, sometimes with relief to the sufferer.

Of all the diseases, either of body or mind,

[1] *Vide Study of Medicine*, pp. 363 *et seq.* and references there.
[2] *Op. cit.*, p. 367.

none has received so much study and attention as epilepsy, and none has concealed its causation so effectually. Hippocrates knew as much of the nature and causation of epilepsy as the learned physicians of the early nineteenth century—no less, no more. It remains to be seen whether the investigations of the learned of the twentieth century are to be more successful in their search than their distinguished predecessors.

It is interesting to observe that many distinguished men have brought forth many curious and absurd remedies for the cure of this strange and obdurate malady—epilepsy. Thus Celsus advised the warm blood of a recently slain gladiator, or a certain portion of human or horse flesh, for the cure of epilepsy; Abraham Kaau Boerhaave, a nephew of the celebrated Boerhaave, is said to have successfully used this remedy in the poorhouse at Haarlem, Holland, in epileptic cases. Among the specifics for the malady brought forward by Trallianus, was the liver of a weasel, freed from bile, this to be taken for three successive days, fasting; also the skull of an ass, and the ashes of clothes stained with the blood of a gladiator. Pliny recommended for epilepsy the stones taken from the claws of young swallows. Democritus, the celebrated Greek philosopher, declared that some cases of the disease were best cured by anointing with the blood of strangers and malefactors, and others with the blood of our friends and kinsfolk.

Artemon cured epilepsy with dead men's skulls, and Antheus relieved convulsions with human brains. Among certain of the common people in the early centuries of the Christian era, hydrophobia, a disease of allied nature to epilepsy, was cured by feeding the person on the diaphragm of the dog by which he was bitten.

In respect of the treatment of fevers, of which there was an almost endless variety laid down in the Nosologies of the period, the procedures in general did not differ in principle materially from the practice of Galen, except in the use of remedies that were unknown in Galen's day. Bleeding was the leading indication in what was called sthenic fevers. We should weary the reader should we give details of treatment in this class of diseases, and we will, therefore, confine our brief exposition of the subject to a fever that was very prevalent at that time all over the Western world, namely, intermittent fever of the tertian type, since that was the most characteristic variety with which the profession had to deal.

We have already given, in a previous chapter, some account of the furore created, not only in England, but on the Continent likewise, by the introduction by the Jesuits from Peru of Peruvian bark as a remedy for the various species of ague, and the final victory for the drug, under the directions laid down by the illustrious Sydenham, who saw that its use was greatly abused; that

it was often given in poisonous doses, and often adulterated so flagrantly as to rob or deprive the drug of any specific virtues which it might possess. He therefore laid down the following rules and regulations for its use:

First, to be peculiarly cautious in the quality of the bark he employed, and to allow of no admixture, whether from fraud or a view of increasing its virtues.

Secondly, to administer the bark in the intervals, instead of in the paroxysms, of a fever.

Thirdly, to give it at the rate of two scruples every four hours, instead of two drachms twice a day, after the "Schedula Romana," which had been drawn up by the physicians of his holiness, Pope Innocent X. in 1661, and to which the Pope had given his sanction. Under these regulations the drug rose rapidly into favor, and justified the claims of its advocates.

The practice of medicine had labored under great disadvantages, and continued to be thwarted in its usefulness by the ignorance of its friends. Doses of great magnitude were frequently given in the mistaken notion that, "if a little were good, more were better." Doses of the powdered bark, of an ounce, and even as large as two ounces, were frequently given, and repeated from two to four times a day. It was no wonder that failures occurred, or that the drug disagreed with the stomach, which it often did. The wonder is that it did not kill oftener than was reported.

It is interesting to observe that great improvement in the preparation and administration of that remedy was introduced by the discovery of a French chemist, by which the alkaloid of the bark, its active principle, was separated from it, forming what has ever since been known as quinia, or quinine, usually a sulphate of quinia. The credit of this discovery, one of the most important in pharmacy that was ever made, has been given to the great Magendie, a brief account of whose distinguished career we have already given. It was a long time, however, ere the profession could be induced to reduce the size of its doses, so accustomed had it become to give large and massive doses. Still, instead of giving scruples and drachms, or ounces, of the powder, it soon reduced the doses of the salt to grams, and finally to half grams, and even to smaller doses repeated oftener, with more satisfactory results. It was not long before the use of quinine found its proper place in the materia medica and Dispensatories of the Western world, and the dosage had settled down to what it is to-day, the beginning of the twentieth century.[1]

We have endeavored in the foregoing to give a fair exposition of the state of Practice in the medical centres of the civilized world at the

[1] *Vide* Copeland's exhaustive account of Peruvian bark in his great *Dictionary of the Medical Sciences;* also Good's *Study of Medicine* and references cited there, vol. ii., p. 364, *et seq.*

opening of the nineteenth century, unbiassed and without comment, drawn from the text-books then in use. The exposition might be greatly extended, but to do so would only multiply facts and occupy space without adding to knowledge, or changing inferences or deductions. It is clear from what has been shown that Practice had not advanced beyond the state of Empiricism, not far removed from that in vogue in the time of Galen and Asclepiades, at Rome, especially in the treatment of neuroses, the nature and causation of which were obscure or unknown. But it was still largely so in the diseases of every-day life, the most common and prevalent diseases which demanded the services of the physician. In such ailments, where the medicine which from long use and experience had been found to be beneficial proved ineffectual, the next most eligible remedy was exhibited, and this failing, the next was tried, and so on until the physician descended from the rank of being a devotee of experimental medicine to that of an empiric, subject to the taunt of empiric, than which nothing was more insulting to his dignity.

It goes without saying, that until the profession of medicine had acquired experience in the treatment of malady, multiplied their resources, and increased their armamentarium so as to cover all the ills and emergencies to which humanity are subject, their attitude toward the sick must necessarily be that of an empiric. The most

that could be in reason required or expected from the doctor is that he should know what the best informed knows; in other words, not only that he be well-read, but that he keep well-read as to the progress of his art.

It is not our purpose to indulge in criticism of the state of the profession of medicine at the time of which we are writing. The world never knew a greater or a nobler class of men than that which filled the chairs of the universities, and occupied the lecture-rooms of the hospitals of Europe at this time. They challenge our admiration. There was little of the spirit of jealousy, rivalry, evil-speaking, or a disposition to discredit the importance of the labors and discoveries of colleagues and collaborators, which were so prevalent in the previous centuries. It was an age of work; and if rivalry existed at all it was to see which university could graduate the best students, or which professor could write the best thesis on the medical art, or make the most important additions to the knowledge of chemistry, or add most to the resources of the materia medica.

What impresses the judicial mind of the historian the most at that time in reading works on Practice, is the poverty of materia medica. There was at this time no real science of chemistry and no real pharmacy; but a few of the primary elements had been discovered. A hundred or more herbs and a few metals composed

the materia medica. Of the true medicinal virtues of plants but little was certainly known. The art of chemical synthesis had not been discovered, and the active principle of an infusion or a tincture was a matter of conjecture. There was no real pharmacy in existence. The Dispensatories were the product of a few years later. Physicians had to collect their own herbs, make their own infusions and tinctures, and grind by mortar and pestle their own powders, or have their students do it for them. To a large extent, therefore, every physician was his own apothecary. It is to some extent the same to-day in the back countries of Europe and America. To this fact was largely due the industry of proprietary medicines and quack nostrums.

Another fact, of interest to note, strikes the impartial mind in this connection, namely, the vitality of the philosophy and practice of Hippocrates, especially in respect of the custom and practice of venesection for the more serious forms of fever and inflammations, and the use of mercury in small doses and large in the treatment of so large a class of maladies. Nothing was more common in certain well-known conditions than to give mercury to complete salivation and the falling out of the teeth. This was doubtless due, in part at least, to the poverty of medicaments of wide range of action, and in part to the unrivalled powers of the drug, which invited abuse of them. Its use justified Prof.

Paine's epigram,[1] "that we do but cure one disease by producing another; Nature does the rest." That was his idea, or explanation, of the *modus operandi* of medicaments. Indeed, the value of most drugs of powerful reactions appears to be upon that principle. It is in accordance also with the maxim of Galen, *contraria contrariis curantur*, that diseases are cured by their contraries.

Nothing could be more rational, however, than that the treatment of maladies, the nature and causation of which were unknown, like epilepsy, etc., should be the object of endless experimentation. Try this, then that, and that, has been the order in the selection of remedies in serious diseases from the beginning; and that method of treating epilepsy, which is on the increase, or at least is believed to be on the increase, is still in vogue. But that disease has long since lost its sacred character, which is an advance in the direction of discovering its nature.

In the foregoing observations, we would not be understood as criticising the order of medical progress. When a sage like Hippocrates, or Moses, acquires the position of an oracle in the mind of humanity; when utterances are in some mysterious way the voice of God, they possess an authority which it is difficult to uproot or to displace. They may be outgrown by time and circumstance; conditions may change the nature

[1] *Vide* Paine's *Institutes of Medicine.*

and indications of the treatment of malady, and supersede, or render inoperative, or worse, the oracles of the old régime; nevertheless, they continue in force, and must be obeyed, until belief in something better possess the multitude. The oracles said take blood in pneumonia and pleurisy, again and again, so long as the "buffy" coat of the blood remain; give mercurials to the verge of salivation in hepatic complications and venereal; use cupping glasses and leeches in local congestions; blisters for local pains; give tartarized antimony freely in lung hepatization, and opiates for the cough; and if the patient die, be consoled by the reflection that the treatment was at least according to the oracles, *secundum artem*, and that the providences of God were fulfilled, so that at the last rites over the remains of the deceased it could be said, with some show of consistency, "The Lord gave and the Lord hath taken away."

End of Volume I

DATE DUE

NOV 17 '65			
NOV 28 1966			
DEC 5 1966			
DEC 13 1967			
NOV 14 1971			
GAYLORD			PRINTED IN U.S.A.

57

UC SOUTHERN REGIONAL LIBRARY FACILITY
A 000 411 721 4

25472

WZ
40
G675
v. 1
1910

Gorton
The history of medicine, philosophical and critical

UC-CCM LIBRARY