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THE ANCIENT GREEK SCHOOLS OF MEDICINE.

BY

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When I undertook to compose the paper which I have the honour of presenting for your consideration to-night, I found myself at once confronted with not inconsiderable difficulties. Where was I to begin, and where to end? The matter-of-fact person, if in captious mood, would perhaps reply, "Why not begin at the beginning?" A very brief consideration convinced me that this was as sensible a way as any other. Of all the civilizations of antiquity we know most about that of the Greeks. Their story can be traced beyond the confines of history. Their literature is venerable with age. The origin of so primitive an art as medicine may well be studied, therefore, in the record of such a people. But where to end was more difficult to decide. Before it could be settled, as a matter of fact, it was necessary to determine how I was going to deal with the task.

We might, conceivably, approach the discussion of the subject of medicine in ancient Greek times from several different directions. We might, for example, occupy ourselves with a consideration of the origin and development of medical practice. We might study the medical profession as a social force, in other words, in its relationship to the general body politic. Or, again, we might investigate the relationship of medicine to the other natural sciences. Lastly, we might take up the question of the evolution of medical knowledge. None of these aspects of the subject would be unimproving or devoid of interest, nor, in fact, is it possible to give a connected account of medicine from any one point of view without trenching considerably upon the others. But I feel, personally, that it will be at once more illuminating and more stimulating if we, in the main, confine ourselves to tracing the origin and development of medical science, that is to say, of the principles which have governed and should govern the rational application of therapeutic measures. And this, for reasons that I shall at once proceed to elucidate.

Read at the meeting of the McGill Medical Reporting Society, January 17th, 1910.

Medicine has been termed "The Healing Art"—an art, because in the absence of stable guiding principles its successful practice depended on experience and on a sort of intuitive aptitude on the part of the practitioner. Nevertheless, it has always been the aim, at least of the master-minds of our profession, to convert this art into a science, to exchange the tallow dip of empiricism for the glorious and beneficent sun of reason. With what measure of success this has already been accomplished we are all familiar.

A learned interpreter of the doctrine of Cuvier has said, "The first question in science is always a question of method." The method of to-day, not only in medicine but in all natural and applied sciences, is the method of observation and experimentation. John Hunter touched the keynote of this when he said, "Do not think. Try it." The modern scientific spirit, then, is essentially the spirit of enquiry. Do I say modern? It is really old. For we owe this conception to the Greeks. Systems of philosophy have come and gone, many of them the offspring of the brightest intellects. If they exist at all to-day it is mainly as curious relics, illustrating merely stages in the development of human thought, but devoid of vital force. The one thing that has been permanent is the spirit of enquiry. This is the golden thread connecting the present with the past. If this be the case, and it is true of medicine as of the other natural sciences, we are the more readily enabled to translate ourselves into the intellectual atmosphere of the past. By a study of the method of medical learning, therefore, our sympathies and our interest will be best aroused and we will the better appreciate our heritage from the ages

To return, now, to the question, "How are we to bound our enquiry?"

To trace the influence of Greek thought on the science of medicine would be to write a history of medicine. To do this would be obviously impossible within the compass of a half-hour paper. On the other hand, to restrict our enquiry to the medicine of Greece itself would lead to but a partial, and indeed erroneous, conception of the subject. Greek medicine was none the less Greek because it overstepped its geographical boundaries and was transported to Asia, Egypt, or Rome. It has seemed to me, therefore, the most useful plan to deal with the evolution of medical knowledge as it is exemplified in the work of men of Greek race, of Greek education, and of Greek ideals, wherever they may have been found. From the origin of medicine to the time of its greatest perfection as a product of Greek genius is approximately a span of a thousand years. We begin with the dawn of history, for practical purposes the Trojan war; we end with the birth of Galen.

The origin of Medicine, like that of other branches of knowledge, is wrapped in obscurity. The most ancient literary monuments that have come down to us are the Books of Moses and the Homeric poems. In the former, medical subjects are touched upon in some detail and a good many useful rules of hygiene are inculcated. The suggestions for treatment, however, are of a thaumaturgic and mystical, rather than a rational, character, in keeping with what we know were the habits of thought of all primitive peoples. In Homer, we have indications that at the time of the Trojan war (about 882 B.C.) there was a very considerable knowledge of things medical, in fact, there was something approaching a definite system. Now, it is well-known that in the evolution of social and political economy things are always older than they appear to be, and, no doubt, this is the case with medicine also. Medical knowledge has always flourished in direct proportion to the degree of enlightenment of the community, and it may reasonably be inferred that it would progress equally with the arts, sciences, and other polite accomplishments of budding civilization. It is not improbable, indeed, that medicine would antedate all these, for accident and disease have been the unfortunate heritage of all races from time immemorial, and rude attempts at healing would, no doubt, be practiced in all but the most barbarous ages of mankind. The earliest therapeutics would naturally be based upon observation. A dog licking a sore would suggest the utility of washing a wound and protecting it from the air with a bland coating, such as would be afforded by the mucus of the saliva. The relief afforded by the evacuation of the stomach and bowels in certain derangements of the alimentary system would suggest the employment of artificial means to attain the same result. Observation of the effects of various plants upon the lower animals would point out the remedy here. Then, it would be found that the pain of wounds could be alleviated by rest, by the exclusion of the air and foreign substances, and by the application of heat and cold. Darts and arrows would be removed and bleeding stopped by pressure or the application of plugs and styptic agents. Broken bones would be replaced and kept in position. The observation of the course of disease and the attempts of Nature to return to a normal equilibrium would suggest other lines of treatment. The effects of certain forms of diet and the influence of external agents on the body would also early be noted. In this way a certain rough system of medical practice would arise, and, as experience grew, the skill and resources of the physician would be correspondingly increased. Yet, no doubt, the measures adopted must often have proved ineffective and even at times misdirected.

When and how medical knowledge came into being in Greece must

largely remain a matter for conjecture and inference. In the Homeric poems we find that Medicine had already something of an organization. There was a recognized medical profession; there was a definite medical practice, more especially in connection with wounds and other injuries; there was a nomenclature of disease and the parts of the body very similar to that employed by Hippocrates centuries later, all going to prove that even at this early date Medicine had a history and tradition and, in fact, was far from being in its infancy.

We have seen that among all primitive peoples certain rude ideas in regard to the treatment of disease would arise at the demand of circumstances, which would afford a starting point for a system of medical practice. The Greeks were an offshoot of the great Aryan or Indo-Germanic stock and would bring with them, no doubt, in the course of their westward march, their heritage of medical lore. How much they were indebted to the civilizations of Mesopotamia, India, Phœnicia, and Egypt, it is now impossible to say. The inclusion in the Greek pharmacopœia of remedies such as sesame, cadamom, cinnamon, and valerian, has been interpreted by some as indicating the influence of India, while the Egyptian oak and acacia, cumin, animal derivatives, and certain mineral substances, such as alum, salt, and antimony, were possibly introduced from Egypt. Tradition has it that the rudiments of the arts and sciences were brought to Greece from Egypt by Cadmus, together with the alphabet, and it is a fact that the first medical schools were established at Rhodes, Cos, Knidos, and Kyrene, places where in the course of the operations of trade and commerce the civilization of Greece would come in contact with that of Egypt and the Orient. Naturally the centres of traffic would be also the centres of wealth and intellectual life, and the places where physicians would be most apt to congregate. Nevertheless, there is no reason for supposing that the influence of outside races upon Greek medical thought was more than superficial. In fact, the well-known contempt of the Greek for the Barbarian, whose customs he despised and whose language he disdained, would militate against any close intellectual interchange. When the Greek did emerge from his aloofness to establish colonies in Asia Minor, Arabia, Egypt, and the East, it was to plant a civilization far superior to that which he found. Therefore, there is no sufficient reason for concluding that the Greeks, a race so remarkably gifted intellectually, who in the domains of art, music, poetry, philosophy, and science, have left an indelible impress on the page of human history, an influence potent for good even to-day, ever borrowed much from outside nations. They were, rather, creators, true poets and ideasmith. As they could create in one department of mental activity, they could create in another.

Whatever may be thought of the origin of Greek medicine, there can be no doubt that it quickly and immeasurably surpassed that of the other races of antiquity. And the cardinal feature of Greek medicine, the one thing which differentiates it from that of the surrounding nations, the sole principle that has proved true and lasting, the spirit of scientific enquiry, originated with the Greeks. Medicine, then, like all else, they made peculiarly their own and impressed it with their own particular genius.

The age before the siege of Troy may be termed the Prehistoric Period. We have seen reason for thinking that even at this remote time the Greeks were not entirely devoid of medical knowledge. Gradually it would come about, at a time when writing was unknown, that this knowledge would be handed from one person to another, usually members of certain families, and eventually these families would enjoy considerable repute. Later tradition pointed out certain individuals who were thought to have attained more than ordinary eminence in the practice of their profession. Melampus, a shepherd, was probably the first to distinguish himself by the extraordinary cures that he wrought.

The daughters of Prœtus, King of Argos, had taken vows of celibacy, and as a consequence, developed strange nervous manifestations with delusions. They imagined themselves transformed into cows and roamed the forests and fields instead of palatial halls. Their example proved contagious and many other women became possessed of the same monomania. Melampus, having noted the purgative effect of white hellebore, when eaten by goats, gave to the young women milk in which this plant had been steeped, thereby quickly effecting a cure. All this seems strangely familiar. History repeats itself, as some sage, lost to history, has remarked. It seems to me that not long ago I read of the theory being advanced that hysteria and neurasthenia are really manifestations of a gastrointestinal intoxication. The imitative disorders, also, to which neurotic persons are liable were well known in later times. In the Middle Ages, indeed, they assumed extreme and even grotesque forms.

Of greater renown was Chiron, the centaur, a prince of Thessaly, who appears to have flourished about the thirteenth century before Christ. He was distinguished for his preeminence in all the gentler arts of life, and his skill as a horseman probably led to the fable of his dual form. He excelled, also, in medicine and music, and it was at his feet that Asklepios, or Æsculapius, imbibed that knowledge of the art of healing which made him renowned among the ancients. This is, perhaps, the first example of the apprenticeship system in history, it may be remarked.

Asklepios appears to have been the first to devote himself to the study and practice of medicine as a distinct object of pursuit. Before his time a knowledge of medicine was regarded merely as a part of the education, though an indispensable one, of all persons of rank and condition. So far as we can gather, he was a native of Epidaurus, exposed on account of his illegitimate birth, who was found by a shepherd, and placed under the care of Chiron. He was highly successful as a practitioner, for we read that Zeus blasted him with his thunderbolts at the instance of Pluto, who viewed with alarm the diminishing number of arrivals in the nether regions. Wherefore, some wit has said, "The modern children of Æsculapius abstain from performing prodigies." So great was his reputation that he was asked by the twin brothers, Castor and Pollux, to accompany the Argonautic expedition as surgeon. After his death he attained to divine honours. It is worthy of note that in the Iliad Asklepios appears, not as a god, but as a king of Thessaly. This is in keeping with what we know of the origin of ancient myths. We need not scout these as altogether unworthy of credence, as the mere creations of a lively imagination. Carlyle has pointed out that in many cases there was a substratum of fact. An individual becomes renowned in his day for some brilliant achievement or striking peculiarity. He stands out preeminent above all others. As time goes on, his life-story becomes invested with the glamour that always enshrouds the past. His deeds are magnified and his character is exalted. The man becomes a hero, and the hero, a god. His history finally reads like a romance, tricked out with all the beautiful imaginings of poetic fancy. So with Asklepios.

At his death his mantle was divided between his two sons, Machaon and Podalirius. They appear in Homer as professional healers, and are treated with great respect. Machaon's task was to heal injuries, while Podalirius had received from his father the gift of "recognizing what was not visible to the eye, and tending what could not be healed." Here we see, even in this ancient story, an indication of the distinction between physician and surgeon. In the Homeric poems, too, it is worthy of mention, that there is no evidence of the subordination of medicine to religion, as was the case in India and Egypt, nor are the priests invested with healing functions. From incidental references in the pages of Homer and the earlier Greek writers we would infer that the practice of these personages and others of the time was principally surgical, and confined almost entirely to the treatment of wounds. Internal diseases, so-called, were usually looked upon as due to the infliction of the gods, and were to be relieved only by means of charms and incantations. In fact, the arts of magic were invoked to a large extent in surgical prac-

tice as well. The deities of Olympus, moreover, did not disdain themselves to engage in the matter of medicine. Apollo, the reputed father of Asklepios, assumed the prerogative of exciting or subduing epidemics. Apollo, also, was the cause of natural deaths among men, as was Artemis those of women. Here (Juno) was supposed to preside over accouchments. And so on.

The practice of medicine remained for a long time hereditary in the descendents of Asklepios, who were termed Asklepiades. With the development of the cult of Asklepios, which attained wide popularity not a great while after the Trojan war, temples in his honour sprang up in all parts of Greece, and the migrations of the Greeks carried his worship into Asia and Egypt. These temples were usually situated amid salubrious surroundings, in groves or near mineral springs or fountains. They were presided over by the Asklepiades who cultivated assiduously the sacred rites handed down to them from their predecessors. They prescribed venesection, purgatives, baths, frictions, emetics, and mineral waters, as indications arose. A well-regulated dietary, pure air, temperance, peaceful surroundings, and a lively faith contributed to effect wonderful cures. The worship of Asklepios naturally became very popular, and journeys were made to his temple, much, as later, devotional pilgrimages were made to sacred springs or the shrine of some saint. The familiarity which the Asklepiades thus obtained with disease, and their observation of the beneficial effects of simple remedies and external applications would gradually endow them with considerable medical skill. Moreover, the custom which prevailed of patients who were cured hanging up votive tablets in the temple, recording the nature of their disorders and the means adopted to remove them, would contribute to their efficiency. Indeed, some have thought that Hippocrates owed his knowledge of medicine largely to a study of these records. This is probably an erroneous idea, for if they were all akin to the one I now quote, they could have little scientific value: "Julian threw up blood and appeared lost without resource. The oracle ordered him to take from the altar pine seeds and eat them mingled with honey for three days. He did so and was cured. Having thanked the god he went away." Thus, in time, the priests of certain temples would acquire special celebrity. The most famous institutions of this kind were at Epidaurus, Pergamos, Kyrene, Cos, and Knidos. The two last mentioned came, in fact, in course of time, to be rivals and famous centres for the dissemination of medical knowledge.

We learn that the seekers after the cure were put through some preliminary hygienic regimen, and before consulting the oracle they were purified by ablution, sacrifice, prayer and fasting. Then, after contributing a donation to the treasury, (this was absolutely essential!)

they were wrapped in the hide of the slaughtered animal and placed to sleep at the foot of the statue of the god (incubatio or ἐγκοίμησις). The god indicated the cure usually in a dream. To impress the simple mind and to stimulate faith, the deity was often made to reveal himself in an apparition or in some other striking way. The serpent played a prominent part in these various incantations, being used in this way as a means of grace. It will readily be understood that such a system lent itself readily to the perpetration of the greatest frauds, and there can be no doubt that in later times the priests of Asklepios used their power over the minds of the vulgar for the purpose of gain and to maintain their personal ascendancy. Eventually they became utterly discredited and their system became synonymous in the popular estimation with the grossest jugglery. We see some indications of this distrust even in the time of Hippocrates, for the comic poet Aristophanes puts the following in the mouth of one of his characters: "The sacrificing priest of the temple of Asklepios, after having put out all the lights, told us to sleep, adding that if anyone heard the signal of the arrival of the god he should not stir. Consequently, we took our places on our beds without any noise. As for me, I could not find sleep, because the odour of a basin of excellent soup, which an old woman was holding near me, tantalized fearfully my sense of smell. Wishing to slip over to it, I lifted my head gently and saw the sacristan taking up the cakes and figs upon the sacred table, and, making the tour of the altars, one after the other, put into a bag whatever he found. I thought there was considerable merit in following his example, and I got up to go and ask for the basin from the old woman." The spirit of skepticism, of which we have indications here, is attributable to the influence of a new study which was now beginning to make itself felt.

It was about the sixth century before the Christian era that philosophy first made its appearance in Greece. The keener intellects began to speculate on the origin and nature of the universe and the composition of matter. The relationship of the animal body to the general cosmos not unnaturally came in for a good deal of attention, and this led in time to an enquiry into the nature and etiology of disease and the means of alleviating it. Of course it was several centuries before there was much progress in the matter of pathology, for anatomy and physiology had to be created first, but we soon see the effect upon Medicine of a more correct method of reasoning, and, if at first superstition and mysticism seemed strongly entrenched, at least a beginning was made of breaching their strongholds.

Thales, Zeno, Empedocles, and Pythagoras were prominent among

those who attempted to explain the laws of organized bodies by the laws of the universe. In their works we find the first applications of philosophy to medicine. It is unfortunate that time has left few vestiges of the productions of the early medical schools from which to judge of their scientific attainments. All that remain are the Hippocratic collection, emanating from the school of Cos, and the Knidian Sentences of the rival school of Knidos. Some have thought that certain parts of the former, notably the second and third books of Diseases, which contain references to pleuritic friction and the succession splash met with occasionally in connexion with pleural exudates, are interpolated productions of the latter. So far as we can judge, two opposing principles in philosophical medicine make their appearance even at this early age, the influence of which is apparent to-day. The one pretends to localize all maladies and sees therein only a simple organic manifestation or symptom; the other attributes maladies to a generalized disturbance of the economy, modified in the exercise of its functions. The school of Knidos represents the first of these principles; that of Cos, the second. In course of time, the Knidian theory led to the surcharging of medical science with a multitude of useless details, while the Coan hypothesis led to the gradual exaltation of theory to the detriment of observation.

It was when the bonds of priestcraft, superstition, and mysticism were being broken and the study of science was being relegated to the philosopher and scholar, that Pythagoras appears, the master whose teachings form the point of departure for the naturism of the school of Cos, the influence of whose doctrines is felt to-day.

Pythagoras was born at Samos about 582 B.C. He was an athlete or gymnast by profession and as such must have been familiar with those matters of hygiene and physical culture which were in Greece, as we know, closely identified with certain lines of medical practice. Hearing one day a disquisition on the immortality of the soul he became enamoured of the study of philosophy. Renouncing his profession, he travelled through Egypt, Phœnicia, Chaldea, and India, studying the manners and customs, the religious doctrines and practices in these countries. He returned to the Peloponnesus, but remained there only a short time, finding his way eventually to Crotona in Italy, where he made the acquaintance of the celebrated athlete Milo. There he began his reform in philosophy. His success was immediate and immense. Scholars crowded about him whom he placed under a rigorous and almost monastic discipline. It was Pythagoras who invented the theorem of the square of the hypothenuse, familiar to us in our youth, who also divided the year into 365 days and 6 hours, almost as if he suspected the movement of the

earth and other planets around the sun. His cosmogony is very curious. He conceived of the universe as a cosmos or animated whole, whose members were divine intelligences. From unity, the essence of Nature, is derived the name of the universe. Unity is the principle of everything. It is God. He represented his ideas in a concrete way by the figure one, unity, and two, denoting material things. Thus, the universe is represented by the number twelve, obtained by the juxtaposition of the figures one and two. This idea was perhaps derived from the Chaldeans, to whom we owe the signs of the zodiac. In this system, absolute unity, or God, represents the spiritual soul of the universe, the principle of existence. Between the Supreme Being and man is an uninterrupted series of intermediate beings, whose perfections decrease in proportion to their distance from the creative principle. Man alone is the bond which unites divinity with matter, which brings heaven to earth. He has a body, soul, and spirit, manifesting themselves by three distinct faculties, sensibility, consciousness, and intelligence.

When persecution had dispersed the Pythagorean society, which event took place within the lifetime of its founder, the serious practice of medicine began. His pupils introduced the practice of visiting the sick in their homes. They went from house to house, from city to city. History has designated them the peripatetic physicians. Alcmæon of Crotona, who wrote on the anatomy of animals and on physics, the great Hippocrates himself, and Empedocles of Agrigentum were the most famous of these practitioners.

It is not likely that the philosophers contributed much that was of value to the practical side of Medicine. Their supreme merit was that they introduced more exact and more correct modes of thought and so paved the way for the great revolution, the substitution of naturism for occultism, of reason for superstition. When the times are ripe for a change, there usually arises some individual to act as leader and standard bearer. In this case it was Hippocrates.

Before proceeding to the discussion of Hippocrates' work let us glance for a moment at the state of medicine in his time.

There seem to have been five or six classes of practitioners. First in time come the Asklepiades or priests of Asklepios, of whom we have already dealt sufficiently. They represent the theurgic or wonder-working school.

Next, we have the surgeons, who maintained clinics to which those who were able might repair. In their surgeries, which were often adjacent to their houses, there were facilities provided for treating what we would term minor cases, but also operating rooms and beds for the more serious disorders. Excavations have revealed a great variety of surgical instru-

ments and appliances which go to show that their range of practice was fairly extensive. Among these may be mentioned, copper baths, salve and medicament boxes, cupping-glasses, bougies, stands, basins, scalpels, scissors, spoons, sounds, tooth-brushes and forceps, sponges, bandages, compresses, foot-holders, and enema syringes.

The wandering physicians we have already spoken of as followers of the Pythagorean system, but among them were to be numbered, no doubt, hosts of charlatans, and quacks.

The gymnasts also deserve a word or two. One of the main features of the earlier Greek civilization was the attention paid to physical culture. All persons, save perhaps the deformed, were required to take part in gymnastic exercises and contests, women as well as men. In Sparta only the strong were permitted to live, the weakly and crippled being cast out beyond the walls of the city. To meet the needs of the case gymnasia were established. In course of time it became necessary to deal with accidents and the smaller surgical ailments so that a system of medicine arose, which in the main advocated the treatment of disease by means of baths, massage, and exercise. Some of these athlete physicians were held in great repute.

At the head of these institutions was the director or gymnasiarch, Under him was the sub-director or gymnast, who directed the pharmaceutical treatment of the sick, and, finally, the iatroliptes, who put up prescriptions, annointed, bled, massaged, dressed wounds, treated abscesses, and reduced dislocations.

Military doctors were also an institution and were held in great honour.

Women were not allowed to practice medicine. At most they attended at confinements where they performed minor offices, such as cutting the cord and washing the patient.

The rewards of the physician seem to have been fairly good, considering the times. The minimum fee appears to have been about twenty cents a visit. Of course, in those days the purchasing power of such a sum was much greater than it is to-day. A successful practitioner, Demokedes, received in two years practice in Ægina one Æginetan talent, about 1,600 dollars, and during three years in Athens, 100 Attic minæ, or 1,050 dollars. Polycrates of Samos received from Darius the Mede, for replacing a dislocated bone that no one else could cure, a pair of golden vessels. His modesty did not prevent him complaining to the great king of his ingratitude and stinginess, and he was, therefore, given in addition a well-furnished house and a place at the royal table. Still greater was the reward of Cleombrotus, who for healing Antiochus the First, of Seleucus, received the immense sum of $118,000.

These were the pampered minions of fortune. As in our own time, I fear there were some who received less than nothing for their reward. The state physicians were paid a yearly sum, provided out of the taxes.

Hippocrates, even in his own time styled "The Great," an epithet which has not been begrudged him in succeeding ages, was born in the island of Cos in the first year of the eightieth Olympiad (about 460 B.C.), thirty years before the Peloponnesian war. He was of an Asklepiad family, being according to the story the eighteenth in the direct male line from Asklepios; on his mother's side, the nineteenth from Hercules. He, therefore, would early be instructed in all the traditionary lore of this celebrated race, and would be initiated into the mystic rites pursued at the famous temple in his birthplace. He is said to have studied medicine under his father and the gymnasiarch Herodicus. In philosophy, he was an adherent of Heraclitus, one of the most illustrious of the followers of Pythagoras. He travelled widely in foreign countries, notably Egypt and Asia Minor and thus, no doubt, became conversant with whatever there was of medical teaching and practice in his day.

That we may adjust our mental perspective, let us glance for a moment at the time in which he lived. It was the "Golden Age" of Pericles, the most enlightened and greatest ruler Athens ever possessed. It has been said that while "other ages have had their bright particular stars, the age of Pericles is the Milky Way of great men." Truly, they were giants in those days. Æschylus, Sophocles, and Euripides were producing their immortal dramas. Anaxagoras, Zeno, Socrates, and Plato were creating the new study of philosophy, destined to revolutionize the human mind; Democritus and Leucippus had invented the atomic theory; Myron and Phidias were carving out of marble their incomparable masterpieces; Herodotus was recording his travels in the great work which earned for him the appellation of "The Father of History;" Hippocrates was still a young man when other lights appeared, the historians Thucydides and Xenophon, the orators Lysias and Isocrates; the scoffer Aristophanes. As a man of position and education, Hippocrates must have been thoroughly imbued with the spirit of the age in which he lived and, no doubt, represented in himself the highest literary and scientific culture.

We are enabled to form a very accurate opinion of Hippocrates' character and attainments from his voluminous writings, which fortunately have descended to us in a tolerable state of preservation. Without entering into the vexed question of the genuineness or otherwise of some of these, for it is certain that not a few are the production of his descendants or disciples, or of unscrupulous individuals who desired to add the weight of his name and authority to their own less worthy productions,

we will not go far astray if we see in the collection an accurate presentment of the principles which the "Father of Medicine" laid down and of the lines of practice which he adopted. Renouard, gives the following as the genuine productions of Hippocrates: The Aphorisms; the Prognostic; the first and third books of Epidemics; the Regimen in Acute Disease; the treatise on Airs, Waters, and Places; that on Articulations and Luxations; that on Fractures; and the Mochlic, or the treatise on Instruments and Reductions. Other works included in the Hippocratic collection but probably from other hands, are: that on Treatment; The Sacred Disease; The Laboratory of the Surgeon; treatises on Fractures; on Articulations and Dislocations; on Wounds of the Head; on Diseases of the Eye; on Fistula; on Hæmorrhoids; monographs on Generation; the Seventh Month of Pregnancy; the Eighth Month of Pregnancy; on Superfœtation; on Accouchment; on Extraction of the Dead Fœtus; on Diseases of Women; on Sterility; on Dentition; and some fragments of a work on Diseases of Girls, dealing chiefly with hysteria. To these were added afterwards the works of Pythagoras, Plato, Aristotle and others, the whole forming the so-called Hippocratic Collection, which was recognized as the most considerable monument of medical knowledge and as such formed an integral part of the great libraries of Pergamos and Alexandria.

A study of these works shows that four great ideas stand out pre-eminently as characteristic of Hippocratic Medicine. Hippocrates was probably the first to discover and lay down the fundamental principle that the processes of life and disease alike are governed by what we would now call natural laws, and, as a corollary of this, that it is only by accurate observation of the actual phenomena of disease that we can proceed to safe generalizations on which to base theory or outline rational practice. He denied the influence of the supernatural in pathogeny, and emancipated medicine from the priestcraft and superstition which had enthralled it. Consequently, the Hippocratic school became unrivalled in antiquity for habits of minute observation and the accurate interpretation of symptoms. This principle has proved to be so solidly grounded and so rational that it has lasted until now, and it is not too much to say that the true method of clinical study, the method in vogue to-day, notwithstanding our immense superiority in actual medical knowledge, is the method of Hippocrates. The third great characteristic was the wonderful artistic skill and judgment with which the Hippocratic physician made use of the meagre materials and tools that he possessed. Finally, there was the lofty conception of the duties and personal character of the physician as portrayed in the famous "Oath,"

free alike from the mysticism of a priesthood and the pretensions of a mercenary craft.

It must not be supposed, with all his insistence on the necessity of observation, that Hippocrates undervalued theory. As a matter of fact, suppositions and hypotheses, often fantastical, appear on almost every page of his writings, but he had the rare sagacity, in those cases where theory and observation appeared to clash, to follow the clearer light of reason and experience. Hence, his descriptions of disease, as based on observed symptoms, are generally accurate, and the indications for treatment derived from them are usually sensible and practicable. He professed to examine into the phenomena of disease, to determine the natural properties and powers of the human frame, to ascertain in how far these were affected by external circumstances and morbid causes, and from these data to deduce his conception of disease and his line of treatment.

We have said that the "Father of Medicine" was a Pythagorean of the particular sect that followed Heraclitus. This school held that fire was the prime origin of all matter. By the collision and peculiar combinations of its particles, which are in perpetual motion, the four elements are produced. On this theory Hippocrates based his conception of the nature of the human body, his ideas of pathology, and his doctrine of therapeutics.

What seems to have been original with him, however, seems to have been the hypothesis of a principle which he calls Nature (Φύσις) which pervades the human frame. It is possessed of a kind of intelligence, so that it directs its motions, promoting those activities which are beneficial and repressing those that are detrimental. Subordinate to this general principle are others that he denominates Powers (Δυνάμεις) which are more especially concerned with the various functions of the body. The body itself is composed of the four elements, earth, air, fire, and water, combined in different proportions in different individuals, so as to give rise to original differences of constitution, resulting in the four temperaments. These influence both the intellectual and physical portions of the body, and may initiate disease independently of external causes, and, again, may modify the effect of these causes in different ways and different degrees in different individuals. The combination of the four primary elements, with the four states or qualities with which they were affected, of cold, dry, hot, and moist, gives rise to the four fluids or humours of the body, blood, phlegm, bile, and black bile. On this doctrine, which became known as the "Humoural Pathology," and was the dominant principle of many sects and theorists until the beginning of the eighteenth century, Hippocrates based his conceptions of

disease. A right proportion and admixture of the humours produced health; improper combinations or irregular distribution, produced disease. Hippocrates held, in the case of acute diseases at least, a certain natural process through which the humour passes, being first *crude*, becoming elaborated by *coction* or digestion, finally being expelled by resolution or *crisis* through one of the natural channels of the body. The duty of the physician was to foresee these changes, to guide them into the proper direction, so that he could "enable the sick man to conquer the disease by the help of the physician." His attitude was to be, therefore, one of armed expectancy. A leading Hippocratic doctrine, the influence of which has not entirely disappeared at the present day, was the *vis medicatrix Naturæ*. The guiding principle in therapeutics was to assist and not to hinder Nature. The physician had to watch the operations of Nature, to promote them or attempt to counteract them, according to circumstances. The tendency of these principles would, no doubt, be to engender extreme caution. And in fact, the Hippocratic physician was often reproached with inertness, for he rarely intervened with any vigorous or decisive action. He was accused of visiting his patient, looking wise, and then calmly sitting by to watch him die. There can be no manner of doubt, however, considering the state of knowledge, or rather of ignorance, in the time of Hippocrates and his more immediate successors, that this mode of treatment was much more likely to be followed by salutary results than a more active one dictated by caprice or rash empiricism. Another principle of treatment, which, at first sight, might seem to contradict the teaching of the beneficent and healing power of Nature met with in the works of Hippocrates, is that a disease is to be cured by inducing a contrary state of the system or a contrary state of the diseased parts. Thus, repletion is to be relieved by evacuation and, *per contra*, the effects of excessive evacuation are to be counteracted by inducing repletion. An excess or defect of the humours or qualities is to be combatted by augmenting or diminishing the contrary humour or quality. It may perhaps be said in support of this idea, which unquestionably often works out very satisfactorily, that after all it is only anticipating the operations of nature, which would bring about the same results were they not counteracted or inhibited by some malign condition.

We come now to speak of the famous doctrine of "critical days." When the coction, or digestion, of the humours has been effected it only remains for the elaborated product to be eliminated, which is done by means of the perspiration, the urine, or the stools. The days on which these changes were to be expected were known as "critical days." The signs which preceded or accompanied them were known as "criti-

cal signs." The gradual culmination of morbid phenomena is often yet referred to in medical parlance as *crisis*. It may be remarked, however, that the term "crisis" as anciently employed had not quite the same significance that it has to-day. The word originally meant "judgment." Critical days were, therefore, days for judgment. At these times the physician was able to determine the nature of his case and to make his prognosis. Naturally, these times were looked for with anxiety and a chief point in the Hippocratic system was to foretell them with precision. Influenced by the Pythagorean doctrine of numbers, it was taught that they were to be looked for on certain days determined by fixed numerical rules. Thus, the critical period, or days necessary for coction, was in its perfection four, the so-called quaternary. Seven, or the septenary, was also highly considered. Combinations of figures, however, produced more complicated periods such as, 34, 40, or 60 days. This precision may in some cases have been based upon a certain normal evolution of phenomena, which some infectious fevers, for example, no doubt manifest but in many cases it must have been entirely false and futile. It may, however, have had the advantage of inducing habits of accurate observation. Based upon this theory, the indication for treatment was of course to promote the evacuation. With this end in view Hippocrates employed cathartics, which he exhibited with considerable judgment and sagacity; he made use of diuretics and sudorifics; he bled; he used cupping-glasses; he administered injections and inserted issues. He was also acquainted with the effects of the external application of heat and cold, and prescribed ointments, plasters, and liniments. In his treatment of disease he, farther, laid great stress upon diet, rules for the proper management of which he laid down with great care and wisdom. Medicines he regarded as of less importance, though this phase of the subject was not neglected. Two hundred and sixty-five drugs are mentioned in his works, most, if not all, being of vegetable origin. Some of them still hold a place in our modern pharmacopœias.

The strong point of the Hippocratic physicians was their skill in prognosis, or the art of foretelling the course and result of disease. In this they probably have never been excelled. As showing the importance attached to it, we may quote the following, where Hippocrates observes, "That the best physician is the one who is able to establish a prognosis, penetrating and exposing first of all at the bedside, the present, past and future of his patients, and adding what they omit from their statements. He gains their confidence, and, being convinced of his superiority of knowledge, they do not hesitate to commit themselves entirely into his hands. He can treat also so much better their present

condition in proportion as he shall be able from it to foresee the future." Symptoms were observed carefully and often skilfully interpreted. Hippocrates, it is worthy of note, was the first to keep a detailed record of the progress of individual cases. Diagnosis must, in those days, of necessity have been imperfect, for anatomy was almost unknown and physiology was yet to be. The actual knowledge of Hippocrates and his contemporaries in these particulars was naturally very crude and imperfect. Arteries and veins were confounded, and nerves, tendons, ligaments, and membranes were regarded as analagous tissues.

To the wide range of the master's mind we owe the conception that all the external circumstances about a case must be made to co-operate as far as possible for the well-being of the patient. The division of diseases into sporadic, endemic, and epidemic forms, as, also, into acute and chronic, was first devised by Hippocrates and he noted the influence of meteorological conditions upon certain types of maladies.

The hundred years following the death of Hippocrates are singularly barren of scientific achievement in medicine. It may have been that the temperament of the age was more inclined to speculation than to research, or the reverence for the name and achievements of Hippocrates was so great that his successors were content to accept his views as final. Few were original enough to strike out for themselves. A more likely explanation, however, is that the conquest of Greece by Philip of Macedon and the enlistment of the country in a policy of world-conquest under his son, led to an atmosphere of uncertainty and unrest, far from congenial to the development of literary and scientific pursuits. Consequently, medicine in common with other branches of intellectual activity began to wane. Little more than the names of the leading physicians of this period has been preserved to us, and their works have been entirely lost.

Hippocrates is said to have left his practice to his sons, in conformity with the custom of the time, and it continued in his family for several generations. Praxagoras of Cos is one of those who is said to have contributed to the improvement of the art. He paid great attention to the pulse, which Hippocrates seems, strangely enough, to have overlooked.

We must not, however, neglect to speak of the work of two great philosophers, who indirectly had considerable influence on the development of medical ideas. Plato, in his dialogue called Timæus and in his Republic, enters into various discussions on questions relating to the functions of the body and on the effect of their derangement in producing morbid states. His speculations are largely metaphysical and probably contributed not a little to stay the wheels of medical progress. This

philosopher, it is noteworthy, introduced into natural science the doctrine of final causes.

To Aristotle medicine owed much more. Belonging to an Asklepiad family he received the partly medical training traditional in this family, and also appears to have practiced medicine as an amateur. He wrote voluminously on questions of natural history. He dissected many species of animals and thus was able to correct some of the anatomical errors of Hippocrates. He was the first to write regular treatises on comparative anatomy and physiology. In this way he laid the foundation of many studies which are related to medicine, and perhaps, more than all, impressed on his disciples the importance of observation in the study of natural phenomena. The cardinal point in his philosophic system is that all ideas are due to sensation, in opposition to Plato, who held that knowledge depends upon mental intuition. The attainments of Aristotle were so great and his genius so commanding that his successors accepted indiscriminately both his speculations and his facts. It is always easier to accept opinions ready-made than it is to enquire for one's self. Gradually, therefore, in an age naturally inclined to reverence authority, the least valuable of Aristotle's work, the theoretical, acquired an undeserved preeminence. As a consequence, for many hundred years the advance of natural science was retarded rather than promoted. Aristotle's influence was, however, exerted for good in connexion with the new seat of learning to which we have now to refer.

One of the redeeming features in the character of Alexander the Great was his interest in learning. Two of his generals alone evinced the same spirit, Eumenes and Ptolemy. The former brought together a library of some two hundred thousand volumes at Pergamos; the latter established at Alexandria an institution that became one of the wonders of the then civilized world.

With the foundation of the Alexandrian library in 320 B.C. the centre of literary and scientific culture was transferred from Greece to Egypt Under the fostering care of the Ptolemies, a collection of from six to seven hundred thousand volumes, many of them of priceless value, was brought together. The most renowned scholars of the day were invited to Alexandria. They were given homes near the library, provided with salaries, and entrusted with the work of classifying and editing the manuscripts. In process of time lectures were given and discussions held. In this way a great centre of learning sprang up, the reputation of which, in almost all branches of intellectual culture, was unrivalled in antiquity. Its medical school soon surpassed the older ones of Cos and Pergamos, and for the next five hundred years the most famous physicians received their training within its walls.

The reason for the excellence of its medical school and the great celebrity which it attained is to be traced to the introduction of the practice of dissection. To the Greek a dead body was sacred. To touch it was profanation. Consequently, the meagre knowledge of anatomy that is evinced in the writings already referred to was gleaned from dissections of animals or possibly from a cursory observation of the bodies of those slain in battle. A systematic and thorough examination of the human body does not appear to have been undertaken. Conditions were, perhaps, a little more favourable in Egypt, owing to the custom of disembowelling and embalming the dead. Even here the prejudice against touching a corpse was intense, for we are told that the embalmers, after having performed their office, were often hooted and stoned out of the place. Under the Ptolemies, however, the practice of dissection was not only permitted but encouraged, and condemned criminals were handed over to the college of Alexandria for this purpose. The age of the Alexandrian ascendency is therefore termed the Anatomic Period.

Two names now stand out preeminent, Herophilus and Erasistratus. Unfortunately their writings are almost entirely lost and we have to judge of their work at second hand.

Herophilus was a Greek, born at Chalcedon, and trained at the schools both of Cos and Knidos. He was particularly noted for his anatomical studies and his skill in practice. The name given to the common meeting-place of the sinuses of the dura at the occiput, the torcular Herophili, still perpetuates his name. He described the membranes of the brain, the choroid plexus, the ventricles of the brain, the tunics of the eye, the intestinal canal, the thoracic duct, and the genitalia. Besides this, he wrote on general medical subjects, such as the pulse, the eye, obstetrics, and made many commentaries on Hippocrates. His reputation was such that four noted physicians wrote upon his work, and he is mentioned by Galen and Celsus in terms of great respect. He professed to be a disciple of Hippocrates and adopted the doctrine of the humours. He advocated bleeding and made free use of drugs.

Erasistratus was the contemporary and rival of Herophilus. He came to Alexandria from the court of Seleucus Nicator at Antioch, whose son Antiochus he healed of a secret malady, which turned out to be a love affair with his mother-in-law, Stratonice. Like Herophilus, he was a devoted student of anatomy. He described fairly accurately the valves of the heart and recognized that the arteries and veins took their origin from that organ. He discovered the lymphatics and maintained, contrary to Plato and some others, that the epiglottis prevented the entrance of fluids into the lungs. Erasistratus on the whole rather depreciated Hippocrates. He laid but little stress on the use of drugs and inclined

to mechanical explanations of disease. He was the first to give a rational, though of course necessarily an inadequate, explanation of inflammation. In his practice he relied on exercise, diet, and baths, and other hygienic measures. He died about 280 B. C.

An important point to which we should now refer is the division of medical practice into different branches, exercised by distinct classes of practitioners, which took place early in the Alexandrian period, a distinction that ultimately became accepted by all schools and sects of medicine. We have seen something of this kind already existing, even before the time of Hippocrates, but the distinctions now become more definite and formal. Three departments became recognized, dietetics, pharmacy, and surgery. It should be remarked, however, that these terms did not then have the same meaning that they have now. Dietetics embraced not merely the regulation of the diet, but everything connected with the management and well-being of the patient. It included very much what would now be considered under the scope of the general practitioner. The second comprehended the duties of the apothecary or compounder of drugs, together with some of those of the surgeon. The third embraced the treatment of surgical diseases, many of the operations, however, being relegated to professors of the second branch. These distinctions, though to a large extent frivolous and invidious, no doubt for the time, at all events, conduced to the improvement of the various departments of medicine.

It is fitting, too, just at this juncture, that we should refer to the first, and what is in many respects the most important, of the great divisions of the medical world into rival camps or sects. The great schism into Dogmatists, or as they are sometimes termed Rationalists, and Empirics, took place in the earlier portion of the Alexandrian period. The dogmatists claimed to be followers of Hippocrates and received their name from the fact that they professed to set out with certain theoretical principles derived by induction from the study of the observed phenomena of disease, upon which they based their line of practice. They held that before attempting to treat any disease the physician should make himself conversant with the nature and functions of the part affected, or rather of the body as a whole, with the changes which it undergoes as a consequence of morbid processes, and with the operation of remedial agents upon it. The empirics, on the other hand, contended that this knowledge is impossible to be attained, and, even if it were attained, is unnecessary. Experience should be our sole guide. If we step beyond this we are liable to fall into dangerous and often fatal errors.

It is easy to see that, in an age when the means for observation were necessarily imperfect, and the observed phenomena of disease were few

and detached from their natural relationships, generalizations must often have been based on insufficient data, and theory and speculation must sometimes have run riot. To this may be added the natural indolence of mankind which is inclined to take its opinions on the authority of others without attempting to verify them for itself, and without any effort to extend the sum of actual knowledge. What happened was what one would naturally have expected. The really valuable portion of the Hippocratean system receded into a subordinate position and the least valuable, the speculative and theoretical, was exalted and made perfect. It is not surprising, therefore, that certain of the more practical spirits should have revolted and eventually cut themselves loose from the shackles of what they felt was an irrational and futile pretension. This change in view-point came about gradually. The germ of the secession may perhaps be traced to Knidos, where as we have seen, the tendency of the teaching was to lay more stress upon the practical aspects of medicine than upon theory. The empirics themselves confessed to no master, but it is a curious and suggestive fact that they believed themselves to be in the true apostolic succession from Hippocrates. Through the influence of Philinus of Cos, a pupil of Herophilus, of Serapion, and Glaucias of Tarentum, the scattered elements of dissent became crystallized into a definite system. The chief feature of the empiric school was that they based their practice on experience, to which term they gave a particular significance. Experience could be obtained from three sources and three alone—observation, history, (or recorded observation), and judgment by analogy. These three bases of knowledge were called the "tripod" of the empirics. They were particularly skilled in surgery and in the use of drugs. In the second century they became closely related to the philosophical school of Sceptics, whose founder, Sextus, was an empirical physician. The system passed to Rome and flourished for many centuries, being recognizable as late as the beginning of the Middle Ages.

For some centuries medical men were attached to one or other of these two schools and apparently in about equal proportions. In the main, the followers of Herophilus clung to the doctrines of Hippocrates, on whose works they commented extensively. They ultimately seem to have become lost in theoretical speculation and to have maintained too high a standard of literary excellence. The Erasistrateans on the whole thought less of authority and paid more attention to the special symptoms of disease, becoming finally absorbed into the ranks of the empirics.

A candid survey of the state of Medicine during this period goes to show that the progress made was great and permanent. The chief gain was, no doubt, the systematic study of anatomy, which paved the way

for greater things in the future. It is evident, however, that the knowledge of function did not keep pace with the knowledge of structure. It was for this reason, probably, that the empirics were able to dispense with the study of anatomy. The methods of the Hippocratean school, no doubt, also were greatly improved, surgery and obstetrics being the points in which they most favourably compared with modern times.

We must now consider how these various systems fared when transplanted to an alien soil.

It is a remarkable fact that the Roman people, with all their great and noble qualities, never attained any particular excellence in the gentler amenities of civilization, to wit, literature, the arts, and sciences. In fact, it was not for several centuries, not until they had extended their authority far beyond the bounds of the Italian peninsula and consolidated one of the greatest empires the world has even seen, that they found time even to tolerate these tokens of intellectual culture. Their literature, in which perhaps they attained their greatest heights, was after all but a feebler reflection of older Greek originals. In art, architecture, philosophy, and the sciences, they were servile copyists. To-day, the Romans are remembered for their language, their laws, and their roads, not for their artistic sense or natural refinement. Perhaps their essentially practical genius was radically inimical to the nobler efforts of the intellect. One would have thought, however, that in so practical a matter as the healing of disease they would have excelled. But not so. In this they were even more lacking than in any department of knowledge. We are expressly told by Pliny, indeed, that they got along for six hundred years without physicians. Probably by this meant only that during this period there was no systematic teaching in medicine, and no persons who specifically devoted themselves to it as a pursuit. There was, it is true, a cumbrous and elaborate practice, inextricably associated with the rites of religion, derived from Etruria, and the worship of Asklepios was early introduced, but when recognized and reputable practitioners make their appearance it is from Greece, or from Greece by way of Alexandria, that they come. The Romans, themselves, originated no medical school or sect, though several saw the light or at least became popular on Latin soil.

One of the most eminent of the early Greek physicians in Rome was Asclepiades, who was born in Bithynia about 124 B.C. At first a teacher of rhetoric, he came to Rome as a young man, where he became the friend of Cicero. Not succeeding as well as he expected in this line of work, he devoted himself to the practice of medicine, with what definite qualifications we do not exactly know. He seems to have been a man of good natural ability, a keen judge of human nature, and of consider-

able shrewdness and finesse. He began, as men who are conscious of their own shortcomings often do, by decrying the attainments and vilifying the practice of others and claiming to be the originator of a more excellent way. He combatted the teaching of Hippocrates, denying, more particularly, the *vis medicatrix Naturæ*, for, as he pointed out, Nature often marred rather than helped the cure. He had the discretion to avoid the more drastic methods of practice and relied chiefly on diet, exercise, massage, and bathing. His great popularity has been ascribed by some unkind persons to the fact that he prescribed wine freely and in everything sought the comfort of his patients, even going to the length of indulging their inclinations and yielding to their prejudices. There must be something in reincarnation, for, methinks, we may recognize the spirit of Asclepiades abroad amongst us even to-day.

His philosophical tenets were based on those of Epicurus. On this master's doctrine of pores and atoms Asclepiades attempted to build a new theory of disease. All morbid action was supposed to be due to alterations in the size, number, arrangement, or movements of the atoms. These atoms were aggregated into passages (*πόροι*) through which the juices of the body were conveyed. Acute diseases depended essentially upon a constriction of the pores or an obstruction of them by a superfluity of atoms; the chronic, on a relaxation of the pores, or a deficiency of the atoms.

This theory, as modified by his pupil Themison, became the dominant theory at Rome, and, under the designation Methodism, for some centuries eclipsed the older Dogmatic and Empiric schools.

Themison seems to have been actuated by a desire to steer a middle course between the hide-bound speculations of the Hippocratic tradition and the rule-of-thumb methods of the empirics. In the main, he held to the idea of Asclepiades to reduce the science of medicine to a few simple laws, which might be readily understood and as readily put into practice. His system was, in fact, simpler than that of his master, in that, while he retained the principles of relaxation and constriction, he discarded the speculation in regard to pores and atoms. He, however, recognized a third or mixed state, in which the two primary conditions were more or less opposed. Treatment was directed not to any particular organ or to producing the critical evacuations of the Hippocratic conception, but to relaxing the body when it was constricted, contracting or astringing it if it were too lax, and if it were in the mixed state, acting according to the predominating indication. These simple rules of practice were the system or "method" from which the school took its name.

This theory of the Methodics regards the solids of the body as the seat and cause of disease, in which conception it is opposed to that of Hippocrates, who looked for the origin and development of pathogenic processes in the humours or fluids.

While to cursory examination the system bears some resemblance to the Empiric doctrine, strictly speaking the Methodists were dogmatists, though with a dogma differing from that of Hippocrates.

The Methodic school was the first important product of Greek Medicine on Roman soil. It attained for a time great popularity, and lived on for several centuries, influencing, in fact, to some extent the revival of Medicine in the Middle Ages.

The simplicity of this system no doubt accounted for the esteem in which it was held, but had the disadvantage that it made it a ready tool in the hands of the half-educated physician and the quack. Of this type was Thessalus of Tralles, who lived about fifty years after Themison. By cunning and unscrupulousness he attained great wealth and reputation in his time. He reversed the Hippocratic maxim that "Art is long," promising his pupils to teach them the whole of medicine in six months. The character of the man is sufficiently evidenced by the inscription which he had cut on his tomb (ἰατρόνικης) or "Conqueror of Physicians." The only addition he made to medical theory was in the introduction of the term "metasyncrasis," which had some vogue, by which he meant a method of producing an entire change in the state of the body.

One of the most considerable names among the worthies of the Methodic school is that of Soranus of Ephesus, who studied at Alexandria, and practiced at Rome during the reigns of Trajan and Hadrian. He is spoken of in terms of commendation by Tertullian and Augustine. One of his writings, on diseases of women, is still extant in the Greek original. It shows a remarkable amount of practical knowledge, and is the only complete work in regard to the subject that has come down to us from ancient times. It is noteworthy that the speculum, which has been so often reinvented since, was employed by Soranus, and specimens of very efficient mechanism and still earlier date have been recovered from the ruins of Pompeii. The Latin work of Cœlius Aurelianus, on acute and chronic diseases, if not indeed, as some think, a translation of an earlier work of Soranus, is valuable in that it is written from the methodic point of view, and gives us an accurate idea of the theory and method of practice of this important school.

Nothwithstanding the great vogue of the Methodic system, it was inevitable that in time its shortcomings would become apparent and attempts were made to harmonize its teachings with other and con-

flicting views. Thus, the Pneumatic school was founded by Athenæus in the first century of the Christian era, apparently with the idea of reconciling the humoural or Hippocratic pathology with the solidist or Methodic. To this end the philosophic concept of the πνεῦμα, or universal soul, was somewhat crudely translated into medical doctrine, to the workings of which both the normal and abnormal processes of the body were attributed.

The visionary nature of the many philosophical theories and the hopelessness of moulding the conflicting views into a coherent whole led many of the more independent minds to dispense with the hallmarks of system. These were the Eclectics or Episynthetics. They held to no shiboleth and professed to pick out what was best in all systems. Many of the most renowned physicians of Græco-Roman times were among this sect. Among them may be mentioned Rufus of Ephesus, and Archigenes of Apamea, who is mentioned by Juvenal. The latter wrote a treatise on the pulse, commentated upon by Galen, in which he indulged in a number of fine-spun distinctions and subtilties, based on preconceived hypotheses rather than on observation.

From this time on and for many hundred years, little or nothing that is new in the way of theory was promulgated. The world of medicine was disputed by rival sects, and every man held to what was good in his own eyes. Greece quickly declined as a martial and intellectual leader, though her spirit still lived on. In fact, the theories and speculations to which we have dealt in the preceding pages are not without influence to-day. The humoural and solidist conceptions of the etiology of disease, for example, still have their place, though in a modified form. And empiricism is not unknown. But the old controversy between naturism or dogmatism and empiricism has lost most of its force. With the invention of the microscope, the thermometer, the stethoscope, and other instruments of precision, accurate observation became possible. And with the accumulation of more sufficient data more correct reasoning was arrived at. As a result, the Hippocratic doctrine has renewed its youth. It is at once the most logical and convincing, and we, of the legitimate profession at least, are naturists once more. As a matter of fact, a careful and dispassionate consideration of the ancient controversy will show that the dispute, like so many others that at various times have occupied the energies of mankind, is partly verbal, and in so far as it is not verbal is a question of degree. The most militant dogmatist professed to base his theory upon facts, and the most convinced empiric could not effectively marshall his facts without some aid from theory. Until our knowledge becomes absolute and final, the truth will lie in a judicious compromise between the two extremes. In page after page of

the writings of Hippocrates, speculation and fact lie side by side, but "The Father of Medicine" had the rare good sense to realize that when theory or observation appear to conflict it is the wiser plan to be guided by the light of experience. So it has been with the great physicians of all ages and sects. Whatever their theoretical principles may have been, they invariably came to rely on a judicious combination of both systems, and in practical matters have been guided by an intelligent common sense. With the advance of knowledge, however, Medicine will cease to be an art and will attain the dignity of an exact science.

DEMONSTRATION OF A NEW HUMAN TRYPANOSOME.

BY

J. L. TODD, M. D.

Gentlemen: The specimens which I show to-night are interesting ones. They are interesting because they are from a new disease, and also because they demonstrate very clearly, indeed, how an apparently unimportant piece of research work may lead to very definite results.

Dr. Chagas was working with a species of *Conorhinus* in South America; and he was struck with the large number of flagellate organisms which were present in the alimentary canal of these insects. It is of course, well known that one genus of flagellate organisms—the trypanosomes—are transmitted by tsetse flies. This fact suggested to Dr. Chagas the possibility that the flagellate organiss which he found in the *Conorhinus* might be the parasites of some vertebrate host and that they might be transmitted by the bites of the insect in which he found them. Acting on this suggestion, several *Conorhini* were allowed to suck blood from a monkey and twenty days later trypanosomes were found in its peripheral circulation. The experiment was successfully repeated and the flagellate organisms were found in a very large number of the *Conorhini* which were examined at once.

Dr. Chagas then set himself to find out how these blood-sucking insects acquired the parasite which they transmitted. He went to the district in which they occurred most frequently and he found that these insects were very common in the houses of the poorer Brazilians; and that their habits were much the same as those of the ordinary bed bug,—they hid themselves in the cracks and crevices of the walls of the mud huts and came out at night to suck blood from the persons inhabiting these miserable dwelling-places.

Dr. Chagas observed that a disease was very common among the poorer Brazilians, which was characterized by a progressive emaciation, a high

Before the Montreal Medico-Chirurgical Society.

grade of anæmia and an irregular fever. The disease may be a chronic one and it may end fatally; but it has not yet been observed for long enough to determine its ordinary duration or whether recovery is usual. He examined many persons suffering from this disease without finding any parasite in their blood. It was not until a child was examined during an acute attack, when the temperature was high, that a trypanosome was found. By further examinations Dr. Chagas proved that this disease was a new human trypanosomiasis, produced by a new species of trypanosome which he called *Trypanosoma cruzi*. By his experiments he has proved that *Trypanosoma cruzi* is transmitted by the bite of a *Conorhinus*. The *Conorhinus* belongs to the same species as the insect which has been popularly called the "Kissing bug" in this country; it received that name because it so frequently bit sleeping persons about the face. The South American species has the same peculiarity and, in Brazil, it is called for that reason, the "Barber."

Trypanosoma cruzi will live in experimental animals. Some very interesting observations have been made on the development of the trypanosome in guinea pigs.

Under one of the miscroscopes there is a specimen which shows *Trypanosoma cruzi* as it exists in the peripheral blood of a guinea pig. In appearance it does not greatly differ from the other pathogenic trypanosomes. Under another miscroscope is a specimen of the developing forms of the trypanosome which were found in the lungs. In this form the trypanosome has lost its locomotary apparatus and has become rounded. The nuclear material has divided into eight small bi-lobed bodies; it is very probable that each of these eight bodies, when set free by the division of the parasite, will become a new trypanosome. It is probable that this form of the parasite represents a stage in an a-sexual cycle of development,—inaschizogony. From the appearances which have been seen in the digestive canal of *Conorhini* which had fed upon blood containing *Trypanosoma cruzi*, it seems almost certain that the parasite undergoes a sexual development within the body of its insect host.

The discovery of the method of multiplication of *Trypanosoma cruzi* which takes place in the lung of a guinea pig is especially interesting because the occurrence of such a means of multiplication has long been suspected in the trypanosomes of vertebrates, although it has never been observed. Its discovery demonstrates once again how frequently observations made on the parasites of lower animals may be of value in interpreting the observations made upon similar parasites in higher animals. A similar method of multiplication had long been known to occur in a trypanosome of the frog. The frog trypanosome is a very large one. It casts off its flagellum and blepharoblast, undergoes certain nuclear

changes and forms itself into a sphere. The sphere passes through a number of rapid binary divisions until as many as sixty-four, or more, small spheres have been produced from it, each possessing a single nucleus. Each one of these may develop a blepharoblast, undulating membrane and flagellum and become a small trypanosome; each small trypanosome then develops to become identical with the parent parasite. Some of the trypanosomes of mamals, for example *Trypanosoma gambiense,* had been observed to produce rounded forms in the bodies of their hosts but the subsequent development of these forms had never been observed. The observation made on *Trypanosoma cruzi* makes it more probable than ever that the rounded forms of *Trypanosoma gambiense* represent a stage in a cycle of multiplication of that parasite.

SACRO-ILIAC STRAIN, TENDON TRANSFER, DOUBLE CONGENITAL CLUB-FOOT: CASE REPORTS

BY

J. HAMILTON NUTTER, M.D., Montreal.

This patient on the left, through whose kindness I am enabled to present to you this evening a case illustrating the cure of sacro-iliac strain, was referred to me last summer from the medical clinic of the Montreal General Hospital, through the courtesy of Dr. Campbell Howard.

The patient was forty-five years of age, a well built labourer in a sugar refinery. His complaint was of almost constant pain and tenderness in the region of the sacrum and right buttock. This pain had come on without special trauma about a month previously, and prevented him from working.

On examining him it was easily seen that he walked with a marked right limp, and inclined his body towards the sound side. On putting my thumbs over his posterior superior spines undue mobility could without difficulty be made out and on the right side this was accompanied by a soft, apparently cartilaginous crepitus with a well marked click. On the examining table his right leg, with the knee extended, could not be raised high in the air without bringing on his familiar sacral and gluteal pains. With the knee flexed, on the other hand, the thigh could be moved freely in any direction without discomfort, thus ruling out hip disease. In addition, his left leg was found to be about half an inch shorter that the right, so that his body weight was being unevenly distributed and would cause strain at the sacro-iliac as well as other joints. There being, however, but little bony support on the former articulation, through absence of anything resembling the ball-and-socket mechanism,

strain would here have the greater effect. The patient's sacrum was evidently not displaced, as his back was not specially flat. The condition was apparently one of simple undue mobility at the right sacro-iliac articulation, a mobility which was sufficient to irritate certain of the nerve roots lying immediately across the pelvic surface of the joint, and so cause pain in the distribution of the nerves to which these roots belonged. From an anatomical point of view the nerves in question would seem to be the superior or inferior gluteal or both, and the nerve root harassed by the rocking articulation beneath it would correspond to the lumbo-sacral cord, which lies across the joint in question in its descent from the lumbar spine.

Treatment would logically mean support to a strained mechanism. The patient's pelvis was tightly strapped at the level of the trochanters, the cohesive plaster extending as far forward as the anterior superior spines. This relieved his pain so much that I had a canvas binder made, with perineal straps, maintaining it at the level of his trochanters, which support I have asked him to wear for your inspection to-night. I may add that in women the binder may be kept down by an attachment to the stockings or even to the garters, but kept down it must be, or it is of no service. The remaining essentials are that it should be snugly fitting at the level of the trochanters, and that it should lace at the back.

In order that my patient's weight should be evenly distributed a half inch was added to the thickness of the sole of his left boot, on account of the shortness of that leg. The binder and the high sole were successful in immediately relieving his pain, and were worn something more than six weeks. Both were then discarded as unnecessary. At present my patient has no pain whatever, is very limber for his years and does a good day's work. He presents no symptoms whatever of sacro-iliac strain, and the mobility at the joint in question has disappeared.

This boy (W. S., age 9 years.,) was referred to the orthopedic clinic of the Montreal General Hospital last summer by Dr Walter Smyth. He had had an attack of anterior poliomyelitis some 5 years before, and was left with practically total paralysis of his calf-muscles, to such a degree that he could not raise his heel in the air against gravity. The dorsal flexors were good, the power of inversion was weak, but the peroneals or everting muscles were strong, so strong, indeed, that though dislocated forward from their groove behind the external malleolus they had succeeded in pulling the foot into a vagus or abducted position. In addition the plantar fascia, unopposed by the pull of the calf muscles, had drawn the heel down until the os calcis was perpendicular and the

arch of the foot greatly exaggerated. The boy walked with a decided limp and entirely on his heel. The strength of the peroneal muscles, and the actual harm they were doing in adding to the boy's deformity, suggested their transference to the os calcis to replace the paralysed tendo-achillis, to be preceded, naturally, by a straightening out of the existing deformity.

At the operation the plantar fascia was tenotomised and the excessively high arch lowered. The os calcis was made to point backwards as well as downwards by vigourous wrenching with the hands. The peroneal tendons were then dissected from their position and severed near the outer border of the sole. A heavy silk strand was then quilted up and down them to get a good attachment, and by this they were attached to the os calcis and to the tendo achillis at its insertion. No hole was drilled, but with a heavy needle a deep bite was made into the bone. The tendo achillis, which had been badly overstretched and was too long, was shortened by being folded upon itself. The wounds were closed with catgut, and plaster applied with the heel high in the air to prevent stretching of the transplanted tendons. Healing was uninterrupted, the silk giving no trouble, and to-day, nearly six months after operation, the benefit resulting from the operation can plainly be seen. The foot retains its improved and nearly normal form, the power of plantar flexion is now quite strong owing to the transplanted peroneal muscles, and the boy can walk almost without a limp. He is not yet allowed unrestricted use of the foot, as I wish to allow time for the firmest union of the peroneal tendons to their new attachment. This boy is of interest, also, in that he illustrates the first tendon transfer ever performed, by Nicoladoni in 1885. Nicoladoni also operated for the relief of talipes calcaneus due to paralysis of the calf muscles, but he attached the peroneal muscles to the tendo achillis instead of giving them boney insertion. This tendon to tendon transfer is now seldom employed, as experience has taught us that the paralysed tendon is apt to stretch too much.

My third patient (J.C., age 5 years) referred to me by Dr. Lennon, illustrates the cure of double congenital club foot, relapsed after several operations. Over the inner side of the right foot is seen the scar of a Phelps' operation performed a year and a half ago at one of the hospitals in this city. At this operation the soft parts right down to the bone are cut through at the inner border of the foot and inner side of the sole. On overcorrecting the foot a huge gaping wound is left, which has to heal by granulation. In the case of this boy the after-treatment, so absolutely essential to success, was for some reason not kept up, and

the foot soon relapsed to the condition shown by this plaster cast, which was made on the child's admission to the General Hospital.

On the right side a simple forcible overcorrection did not seem to give great hopes of success, as the inner border of the foot was extremely short and the bones here appeared too small to maintain the foot in a straight position. For this reason a wedge of bone was removed from the os calcis immediately behind the articulation with the cuboid, the peroneal tendons having been pulled to one side. The os calis being then in two parts, the front portion, carrying with it the forefoot, was swung outwards until the varus deformity was slightly overcorrected. In this position the gap in the os calcis was completely obliterated. The equinus deformity was lastly overcome by cutting the tendo achillis, and the foot put up in good overcorrection in all three directions by plaster extending above the bent knee. You will notice that even with the plaster off the foot turns out instead of in, the outer border of the foot is high and the inner border low instead of vice versa, and the heel is the lowest part of all, instead of being drawn upwards. The reason for extending the plaster higher than the knee is that without such procedure there is great danger of the plaster slipping around and being rotated inwards on the leg by the strong tendency of the clubfoot towards inversion.

This boy's left foot, on the other hand, illustrates the result of simple forcible overcorrection by hand, using the padded wedge. In this case the deformity was of mild grade, and a bone operation did not seem necessary. The foot was overcorrected again and again, the procedure being repeated until, after some half hour's hard work, the pressure of a finger was sufficient to maintain its new position. Plaster was then applied in overcorrection, and will be maintained until the bones at the medio-tarsal joints have readjusted themselves, have formed new facets, and are ready to remain in their new position. The boy is now clumping around in his plaster legs, and will soon have his knees freed. The right foot, on account of the operative readjustment of the bones, will not need plaster fixation as long as the left, and another month or two will see the cast discarded. The left foot will need somewhat more restraint, the cast being removed at weekly intervals for massage. When the foot shows no longer any tendency to return to its former position the cast will be removed, and not until then.

AN UNUSUAL RUPTURE OF AN ANEURYSM.

BY

JOHN McCRAE, M.B., M.R.C.P.

Assistant Physician, Royal Victoria Hospital, Montreal.

The subject of this report, a male negro of 43 years, was admitted to my service in the Royal Victoria Hospital on March 30th, and died suddenly on the morning of April 2nd of a ruptured aneurysm. A porter by occupation, he had been troubled for three weeks by pain in the chest, beginning between the shoulders and coming to the front: it was burning in character, quite intense and severe on coughing or sneezing. Swallowing, also, was accompanied by the same pain. For an hour after eating the pain seemed increased, and occasionally he felt as if he were choking; by reason of the pain he could not sleep on his right side.

A Jamaican by birth, his history did not bear upon the case; he denied venereal infection and the use of tobacco and alcohol. A scar on the penis, slight but pigmented, was counted in the balance against his denial of syphilis, as was also the fact that his wife had had a miscarriage and that seven children had died in early infancy, leaving only one alive and well. He had spent ten days in hospital at Fort William since the onset of his illness, whence he had emerged somewhat battered.

The skin of the chest and back, desquamating in large flakes, bore eloquent witness at least to the energy of his treatment, if not to the intensity of his pain. While being examined, he would grind his teeth, and writhe, which was not, it must be admitted, given as much weight as he might have desired, as at other times he lay quietly enough in bed.

In the light of subsequent knowledge, it may be said that no sign of aneurysm was elicited; there were slight glandular enlargement and slightly palpable radial arteries, but no unusual dulness of the heart or in the thorax, no abnormal pulsations, although these were closely searched for, no abnormal ocular reflexes, no signs of laryngeal change, no enlarged spleen, and a liver slightly decreased in external measurements. Pressure on the chest antero-posteriorly gave some pain, and, at times only, the 8th and 9th dorsal spines seemed tender. The urinary examination and leucocyte count were abnormal. Re-examination on the afternoon of April 1st gave no additional information bearing upon the actual state of affairs, and with the remark (a mere guess so far as information went) that aneurysm must be kept in mind, we left him with no apprehension of the tragedy of the following day, when in the early morning he suddenly developed dyspnœa, slowing respirations and a pulse that was barely perceptible. Presently his breaths were drawn at

minute-long intervals and he died, not before it had been observed, however, that the right chest became flat on percussion from the apex to the 5th rib in front. Death followed the onset of dyspnœa in about fifteen minutes.

The autopsy, five hours after death, showed that an aneurysm of the transverse arch of the aorta, not bigger than 3 by 2.5 cm., had ruptured; the blood had passed behind the œsophagus and had dissected up the parietal pleura on the back wall of the thorax, throwing the lung forward, until a clot, weighing more than 1,200 grammes, had nearly filled the available space of the right chest. "The ascending limits of the aorta were not enlarged. The left carotid took origin from the innominate artery. The left subclavian opened 1 cm. beyond this. At the level of the left subclavian opening, on the posterior wall was an area 3 cm. in both diameters, surrounded by a distinct ridge and forming a shallow sacculation in which the wall was fairly transparent from extensive loss of the media." Evidently, we may comment, this was a shallow, old, true aneurysm. "At the upper and outer angle of this area was a somewhat slit-like opening 2.5 cm. transversely by 8 mm. in the long axis of the vessel" (this, in further comment, we may say, was evidently a transverse rupture which had occurred long ago, whose edges had time to become smooth and rounded) "opening into a false aneurysmal sac, lying to the left side of and in front of the aorta. This sac was 3 cm. from side to side, and 2.5 cm. in height. An opening from this sac (the final rupture) led into the tissues behind the œsophagus, and was in direct connexion with the huge retropleural hæmorrhage. In the first part of the descending aorta was another puckered area showing loss of media. Below this the aorta showed little change, save frequent fatty plaques of the intima."

By way of final comment, one may say that further examination might not have enabled us to appreciate the lesion; true, larynogoscopic examination might have told us something, but fluoroscopic findings would have proved negative because of the small size, and most of all, because of the position of the aneurysm; it would have remained for some time essentially an "aneurysm of symptoms."

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THE CANADA MEDICAL ACT.

It will be remembered that at the meeting of the Canadian Medical Association, held in Winnipeg in August last, the question of reviving the Canada Medical Act, 1902, came up for discussion. It was found that for certain reasons, three of the provinces refused to join the others in beginning the work made possible by this Act. A large and influential committee was therefore formed, consisting of representatives of all the Councils, and of the profession generally throughout the provinces, for the purposes of assisting Dr. Roddick in obtaining, from the Dominion Parliament, an amendment, to the effect that when five or more of the provinces agreed on the terms of the Act, the scheme of regristration, so far as they were concerned, could be established.

The committee met in Montreal on the 16th November last, all the provinces, with the exception of Alberta and Saskatchewan, being represented. A lengthy discussion took place, in which the delegates from one of the larger provinces objected strenuously to any such amendmend, contending that, unless all the provinces consented, the Act would be unconstitutional. After a time, however, it was found possible to come closer together than had been anticipated, and a series of amendmends were drafted to satisfy those provinces previously objecting. These amendments were subsequently printed and sent to the various councils for their approval. In fact, everything was practically ready for presentation to Parliament, when the executive in British Columbia telegraphed, urgently pleading for delay, being unwilling, in fact, to go

further without submitting the amendments to the entire profession in that province. As the time for presenting bills had already nearly expired, there was no alternative but to postpone the introduction of the Amended Act. Dr. J. B. Black, member for Hants, had kindly consented to take charge of the Bill, and had practically secured the co-operation and support of the medical men in the House. The disappointment was, therefore, universally felt.

As to the amendments proposed by the Committee, these had reference chiefly to the subjects of preliminary education, to the scheme of representation, and to the so-called retroactive clause. It was originally intended that the Dominion council should take some cognizance of preliminary education. It is now proposed to leave that subject entirely to the provinces, whose councils, or whose representatives on the Dominion council, shall be obliged to satisfy themselves that the matriculation passed by candidates for the Dominion license is of a sufficiently high standard. While this concession may seem, to the casual observer, to be a matter of vital importance, there is every reason to believe that it will work out to the satisfaction of all.

The scheme of representation, originally based on census returns, will now give two representatives, on the Dominion council, to each of the provinces, and on account of their greater size, one additional to Ontario and Quebec. The universities, as originally proposed, shall each have one representative; and the Governor-General-in-Council shall appoint three members, each of whom shall reside in a different province. In addition, there shall be three members elected by such practitioners in Canada as by the laws of the province wherein they practise are now recognized as forming a particular and distinct school of the practice of medicine; and as such are by the same laws entitled to practise in the province. Each of these shall also reside in a different province.

As to the retroactive clause, so-called, the original draft practically read that when a person properly qualified had been engaged for six years in the active practice of medicine in one or more of the provinces of Canada, he shall be entitled to be registered under this Act as a medical practitioner, without examination. The amendment extends the period to ten years; but further provides that if the medical council in any province be not satisfied with the period of years thus prescribed, it may exact an examination in final subjects from the practitioners seeking registration in that province.

With reference to the vital question of examinations, it is thought now that the Dominion Council will relegate to a corps of assessors the supervision of the primary examinations as they are being held in the

various universities of Canada; while the Board of Examiners, to be known as the Medical Council of Canada Examination Board, shall undertake the examination of all candidates in the final subjects only. This will greatly lessen the expense, besides economising time. The examinations will be held only at those centres at which there is a university or college actively engaged in the teaching of medicine, or having hospital facilities of not less than one hundred beds.

It is not the intention by the Act to disturb the *status quo*, so far as the provincial boards are concerned. These will remain practically unchanged. For instance, they will still be expected to satisfy themselves by examination or otherwise, regarding the qualifications of candidates seeking a license to practice in one of the provinces only. Doubtless, in time, some of the smaller provinces especially, will refuse to examine, thus obliging all to come armed with the Dominion license. Besides, there being nothing in the Dominion Act to regulate taxation and the discipline of the profession generally, it will be seen that the provincial bodies must, for purposes of that kind, also continue to exist.

It is earnestly to be hoped that the delay in bringing the Amended Act before Parliament during the present session, will not seriously endanger the future of the measure. It is desirable that all the Provincial Councils shall be well represented at the meeting of the Canadian Medical Association in Toronto, in June next, when the work of the Winnipeg Committee will be fully reported and discussed.

The Colonial Reception Committee of the British Medical Association is particularly desirous of bringing the Annual Meeting, to be held in London in July next, to the notice of all medical practitioners residing in the Dominions beyond the seas, as affording them an unusual opportunity of visiting London both for the scientific purposes of the meeting and also for social intercourse with their fellow practitioners throughout the Empire. The Colonial Reception Committee in conjunction with the Colonial Committee of the Central Council, desires, through the medium of this JOURNAL, to extend a very cordial invitation to all medical practitioners in the Colonies, and assures them of a hearty welcome to the Annual Meeting and to the capital of the Empire. Great efforts are being made by these two committees to arrange such entertainments as it is hoped will meet with the approval of their colonial brethren and so add to the success of the meeting of 1910. Of this committee Mr. Edmund Owen is chairman, and Dr. Donald Armour, honorary secretary.

Reviews and Notices of Books.

Diseases of the Nose Throat and Ear, Medical and Surgical. By William Lincoln Ballenger, M.D., Professor of Otology, Rhinology and Laryngology, College of Physicians and Surgeons, Department of Medicine, University of Illinois; Fellow of the American Laryngological, Rhinological, and Otological Association; Fellow of American Academy of Ophthalmology and Oto-laryngology, etc. Second edition, revised and enlarged; octavo, 930 pages; illustrated with 491 engravings and 17 coloured plates. Cloth $5.50 net. Lea & Febiger, Philadelphia and New York, 1909.

The exhaustion of the first edition within a year is sufficient evidence of its popularity. In his preface to the second edition the author informs us that he has sedulously endeavoured to remove the imperfections unavoidable in an issue from the original manuscript, and to make such improvements as are naturally suggested by having the whole book before the eye in printed form. In this he would seem to have been successful, the result being a book most complete and up-to-date, well printed and illustrated, which should admirably serve the purpose for which it was written, viz., a text book for students, as a guide for the general practitioner, and as a reference for specialists.

The book is divided into four parts. Part I. The Nose and Accessory Sinuses. Part II. The Pharynx and Fauces. Part III. Diseases of the Larynx. Part IV. The Ear.

In the chapter on the etiology of deformities of the nasal septum the subject is discussed at length, a number of authorities being quoted with their different views on this debatable question.

The surgical correction of deformities of the nasal septum is treated at length, the various operations described and illustrated, including the submucous resection now so frequently performed and for which the author has devised several instruments including the swivel cartilage knife.

In dealing with the surgery of the frontal sinuses the author states, that according to his experience, in not more than 5 per cent. of the cases in which the skiagraph shows inflammation of the frontal sinuses has it been necessary to perform the external operation; indeed, he says, his records show that only 2.5 per cent. of cases needed the external operation, whereas in 97.2 per cent. satisfactory results followed his operation on what he terms the vicious circle of the nose, an area which includes the middle turbinate, anterior and posterior ethmoidal cells, bulla ethmoidalis and any deformity of the septum interfering with drainage and ventilation.

He then describes the various operations both intranasal and external.

In the surgery of the tonsils he performs and recommends in practically all cases their complete removal either by tonsillectomy or morcellement, and speaks rather disparagingly of tonsillotomy, claiming that in many of the cases operated on by this method there is a recurrence of the trouble. This may be true where the removal is not sufficiently complete, but where the tonsillotomy is properly performed the chances of recurrence or subsequent annoyance would seem to be very remote.

As regards tonsillectomy it occurs to us that until the functions of the tonsils are more fully understood, one should hesitate in removing them completely from every case operated upon.

Snaring of the tonsils, a method gaining in favour in many quarters, is not discussed, mention merely being made that sepsis is more apt to follow a crushing operation than one performed with a sharp instrument, an opinion which is by no means universal.

In the section on diseases of the larynx, the author recognizes a membranous laryngitis as distinct from diphtheria.

In malignant neoplasms of the larynx a tabulation is given showing the improvement in the immediate and the remote death rate, and the net gain in the mortality following laryngectomy prior to 1889, and from 1889 to 1900. This might perhaps have been more instructive had the period been extended to a more recent date.

The tabulation shows the present (1900) total death rate before the end of the third year is 56.5 as against 96 per cent. prior to 1889. This he attributes to improved technique and asepsis and also to the more intelligent selection of cases.

As regards anæsthesia for larynxo-fissure and laryngectomy, rectal anæsthesia as practised by Cunningham, of Boston, and Stuky, of Lexington, is recommended.

Tracheobronchoscopy is fully described and illustrated, the methods of Chevalier Jackson being adopted by the author.

Part IV. on the ear concludes the volume, and like the preceding sections its subject matter is excellent and up-to-date.

The functional tests are fully described, including the caloric and turning tests which are invaluable in the differential diagnosis of labyrinthine and intra-cranial disease, the substance of which is taken chiefly from the recent writings of Barany and Neumann.

An interesting section on nystagmus concludes this instructive chapter on the functional tests.

In describing the operations on the mastoid it is with regret we note that no mention is made of the radical operation in cases of cholestea-

toma without removal of the cholesteatomatous matrix as practised by Siebenmann and which in suitable cases gives excellent results, though the meato-mastoid operation is fully described. A carefully prepared article on deaf mutism brings to a close an excellent text book on diseases of the nose, throat and ear, and we are fully justified in predicting for it a success equal to, if not greater, than that attained by the first edition.

W. H. J.

A Practical Treatise on Ophthalmology. By L. Webster Fox, M.D., LL.D., Professor of Ophthalmology in the Medico-Chirurgical College, etc. With six coloured plates and three hundred illustrations in text. New York and London. D. Appleton and Company, 1901.

It seems but a short time since we reviewed the first edition of this work. Now it appears in a much enlarged form, very profusely illustrated, thoroughly brought up to date, and replete with references of the recent advances in ophthalmology. A point which we heartily endorse is the inclusion of chapters on the anatomy of the eye and the physiology of vision, because, as a rule, the effort to refresh ones memory on these points entails work which many are unwilling to perform. We note that Dr. Fox adheres to the use of the canulas in lacrymal obstruction. The operations for the extirpation of the lacrymal sac are very fully described and illustrated. The bacteriology of the eye has been very thoroughly gone into, and the relation of general diseases to those of the eye is also fully treated. Altogether the book is a valuable one for the advanced student.

J. W. S.

The Medical Epitome Series: Gynæcology. By Child and Peterson. Lea and Febiger, Philadelphia, 1909.

This book differs from most of its kind in that it is not a "Quiz compend," and, as is admitted in the preface, "there has been no attempt made to enter the field so well and so exhaustively covered by the larger textbooks on diseases of women." The treatment of the subject is very sketchy; the embryology of the female genitalia is considered in a little over half a page, while several pages are devoted to such uninteresting illustrations as Wathen's dilator, Sim's curette, a scapula, scissors, irrigating nozzle, etc. We doubt if many of the practitioners, for whom the book is evidently intended, would need the illustration of such an article as "Doyen's tumour screw," which in reality is the corkscrew of commerce.

ON THE PREVENTING AND TREATMENT OF ABORTION. By FREDERICK J. TAUSSIG, A.B., M.D. The C. V. Mosby Co., St. Louis, Mo., 1910.

This book of Dr. Taussig's is extremely complete and satisfactory. Indeed, apart from a few sentences, such as "Abortion is the previable expulsion of the human ovum," nothing but pleasure and profit can be gained from its consideration, There are, so far as the reviewer is aware, few books which have gone so thoroughly into the subject as does this extremely well illustrated monograph of Dr. Taussig. In addition to being well illustrated, and containing the accepted views of the best teachers, cases from the author's experience are introduced so unobtrusively as to give the desired effect, without suggesting that they are the main purpose of the book. The book can be heartily recommended to the general practitioner.

ESSENTIALS OF GYNÆCOLOGY. By EDWIN B. CRAGIN, M.D. Saunders Question Compends, 1909.

This is the seventh edition of this small pocket book, and it is probably the best of its kind that we have seen. The subject is very thoroughly considered, and the sections on treatment have been brought into accord with the most modern teaching. All useless illustrations have been omitted and those in the book are well selected and instructive.

THE PRACTICE OF MEDICINE: A TEXT BOOK FOR PRACTITIONERS AND STUDENTS WITH SPECIAL REFERENCE TO DIAGNOSIS AND TREATMENT. By JAMES TYSON, M.D. Fifth Edition, Revised and Enlarged, with 5 plates and 245 other illustrations. Philadelphia, P. Blakiston's Son & Co., 1012 Walnut Street, 1909. Price $5.50 net.

The first edition of this work appeared in 1896, and it is well known in American Colleges. The fifth edition has the usual addenda that recent research makes necessary, and certain of the subjects have been rewritten. Professor Tyson feels the necessity for consideration, but with advances in knowledge books grow in size, and the present volume consists of more than 1400 pages. Especially interesting are the paragraphs on Graves' disease, in writing which Rogers and Beebe have taken part.

PRINCIPLES OF HYGIENE. By D. H. BERGEY, A.M., M.D., Assistant Professor of Bacteriology, University of Pennsylvania. Illustrated, 3rd Edition. W. B. Saunders Co., Philadelphia and London, 1909. Canadian Agents, The J. F. Hartze Co., Ltd., Toronto.

The reviews of the previous editions of this work have classed it among the best of the books of its kind. The present edition embodies the same

subjects on Hygiene as in the previous editions, but there have been considerable changes made in handling some of the subject matter. In the matter of sewage disposal, the author has greatly extended the subject, particularly concerning modern methods of sewage purification.

It is a matter of common comment that the subject of hygiene is making rapid strides at the present day, and that to a great extent our success in coping with diseases, particularly those of infectious character, can only be accomplished by a thorough knowledge of the methods of dissemination and by instituting active measures along the principles of hygiene.

Dr. Bergey takes up in a thorough manner industrial hygiene, and the methods of improving factory conditions. The value of proper hygienic regulations in our schools, militia and navy, is also discussed. The book is so thorough, that it may be recommended without hesitation.

HANDBOOK OF DISEASES OF THE EAR. By RICHARD LAKE, F.R.C.S. Eng., Baillière, Tindall, and Cox, London, 1910.

This volume is of the conventional textbook type, largely compilation, in which we find little to criticise. Where the author touches on the pathology of the diseases such as otitis media, we think the views given rather sketchy and hardly up to the present day requirements. We think the views given on the operative treatment of adhesive deafness more hopeful than the results of other observers would seem to justify, and therefore misleading. The same applies to his description of operative measures on the labyrinth for the relief of Meniere's disease, or tinnitus. These are given in a routine manner without laying what we consider proper weight on two important points, namely, the necessarily experimental character of such operations and the grave risk to which the patient is exposed by their performance.

W. H. W.

SOME COMMON REMEDIES AND THEIR USE IN PRACTICE. By EUSTACE SMITH, M.D. H. K. Lewis, London.

This is an elementary volume taking up the use of tartarated antimony, oil of turpentine, internally, the use and misuse of iron remedies, of alkalis, antispasmodics and the cure of spasm, some uses of opium, and sodium salicylate in certain serous inflammations.

PRACTICAL MEDICINE SERIES, VOL. X. NERVOUS AND MENTAL DISEASES. By HUGH T. PATRICK, M.D., and CHARLES L. MIX, A.M., M.D. The Year-book, Publishers, Chicago.

Within the past five years the study of nervous diseases has been advancing with gigantic strides. The present volume brings the reader

strictly up-to-date. It is written in a very interesting manner, case after case being cited. The illustrations are good, the field entirely covered, and the reader told exactly what he wants to know. A short chapter on mental diseases is added at the end of the volume.

PROGRESSIVE MEDICINE. Vol. XII., No. 1, March 15th, 1910. Lea and Febiger. Philadelphia and New York. Six dollars per annum.

This volume is taken up with the surgery of the head, neck and thorax; infectious diseases, including acute rheumatism, croupous pneumonia and influenza; the diseases of children; rhinology and laryngology, and otology. The contributors are, Charles. H. Frazier, M.D., John Ruhrah, M.D., Floyd M. Crandall, M.D., D. Braden Kyle, M.D., and Arthur B. Duel, M.D. The description of the surgery of "cranial nerves" is very minute, and Dr. Frazier believes that the procedure which will be finally accepted as the ideal method for the relief of facial paralysis is "faciohypoglossal plus hypoglossal-spinal accessory anastamosis." Perhaps the most valuable section is that on infectious diseases in which we note extensive reference to McCrae's studies on empyæma and delayed resolution in lobar pneumonia, published in this JOURNAL. As further evidence of the care with which the field has been surveyed there is mention of Bruce's consideration of the status lymphaticus in the *Canada Lancet*. We should also like to call attention to the interesting reference to deaf mutish at page 310. Progressive medicine easily keeps its high place as a record of progress in all departments of medicine.

TRANSACTIONS OF THE AMERICAN ASSOCIATION OF GENITO-URINARY SURGEONS: Vol. III., 1908, and Vol. IV., 1909.

NEW AND NON-OFFICIAL REMEDIES. American Medical Association, Chicago, 1910.

In February, 1905, the American Medical Association established the Council on Pharmacy and Chemistry. Its main object was to afford some guidance to the profession in prescribing proprietary articles. Under certain reasonable rules proprietors may have their preparations listed in this book which is known technically as N. N. R. The book is very interesting—much more so than the Pharmacopœia or National Formulary—and is reminiscent of the pleasant visits which all physicians have from the charming gentlemen whose business it is to "push the sale" of these commodities. One notices the frequent employment of the words "claim," "is said," "supposed to," "according to some authorities." Criticism is requested by the Council, and the present reviewer ventures to suggest that words have a meaning. The first sentence reads: "This book contains the medicinal substances," etc.

Retrospect of Current Literature.

SURGERY.

UNDER THE CHARGE OF DRS. ARMSTRONG, BARLOW, ARCHIBALD, AND CAMPBELL.

DR. LUDWIG BURKHARDT. "Intravenous Narcosis with Ether and Chloroform." *Münch. Med. Wochen., No.* 46, November 16, 1909, page 2365.

Burkhardt first experimented with intravenous physiological salt solution saturated with chloroform, narcotizing animals with ease and without complications. This method applied in four cases to the human was from the point of view of the anæsthesia most satisfactory but was followed in two instances by a passing hæmoglobinuria. Burkhardt next experimented with a 10% solution of ether in normal saline,—ether offering the advantages of being more soluble in water and of vaporizing at body heat. This concentration produced in animals severe hæmoglobinuria and in several cases a thrombosis which ended fatally. A 5% solution of ether, however, induced prompt narcosis in animals and was not followed by hæmoglobinuria or other complication. The method was then employed in narcotizing 33 patients.

The technique was that in vogue for ordinary intravenous saline infusion with, in addition, a preliminary hypodermic injection of scopolamin-morphine one hour before operation. (0.01 scopol. ydrobromate, 0.15 morphine). The temperature of the salt solution was 28°C. Cocaine was used as a local anæsthetic. In a majority of the cases the reflexes were abolished in from eight to ten minutes without the appearance of the stage of excitation. The odour of ether appeared promptly in the expired air. The solution was allowed to run freely until the abolition of reflexes was obtained. The tube was then clamped until consciousness began to return when from 30 to 70 ccm. was usually sufficient to recall complete anæsthesia. The quantity of solution required to produce primary anæsthesia varied greatly. In children of fifteen years 200-250 ccm. =10-17 ccm. of ether was sufficient. In adult females the average was 320 ccm. = 16 ccm. ether, and in men, 500 ccm. = 25 ccm. of ether. In 29 cases (women and children) narcosis was maintained without a return of reflexes throughout the whole operation,—in some instances for one hour and a half and over. In four cases only (all of them young men) was the anæsthesia incomplete, although the operations were carried out without consciousness on the part of the patients. The incompleteness of the narcosis is these cases is attributed by Burkhardt not to the method but to the nature of the anæsthetic.

Although the preliminary injection of scopolamin-morphine is recommended in muscular subjects, complete anæsthesia was successfully induced in several cases without its use.

Burkhardt claims that during the administration of the anæsthetic no respiratory disturbances occur and that the cyanosis so frequently accompanying ether inhalation is not observed at any time; further, that the pulse either remains the same as before operation or becomes stronger with the increase in the content of the vessels. Vomiting or retching did not occur once during narcosis. Subsequent effects—vomiting, nausea, headache—were absent entirely in thirty cases. In no instance was albuminuria or hæmoglobinuria following operation noted; neither did thrombosis nor infarction occur. In two patients a male aged 61 and a female of 63 years—there was observed after the narcotic a "transient bronchial irritation." Owing to the small quantity of ether in the solution, recovery from the anæsthetic is extremely rapid.

Burkhardt also employed combined ether and chloroform: Ether 5%-7% = chloroform ½%, in equal volume. This method was found of service where a complete absence of reflexes could not be obtained by the use of ether alone.

Burkhardt concludes as follows:

(1) That intravenous ether anæsthesia (combined with scopolamin morphine in adults) is the safest and most pleasant method of inducing general anæsthesia; that it is, however, to be reserved for special cases because of the special technique.

(2) That by its use irritation of the respiratory organs is avoided and blood pressure adequately maintained, and that, therefore, its use is indicated in all subjects suffering from impairment of the respiratory or circulatory organs.

(3) That over dosage is hardly possible.

(4) That, having consideration for the comfort of the surgeon, it is most suitable for operations upon the head and neck.

(5) That it is indicated, also, in cases where there is a strong dislike on the part of the patient for inhalation methods.

DR. PETER JANSSEN. "The Question of Intravenous Narcosis." *Münch. Med. Wochen., No.* 3, January 18, 1910, page 136.

In this article Janssen refers to Burkhardt's paper reviewed above, and gives a cursory account of his own experiments with various solutions, including chloral hydrate, ether salt solution, and Nerking's fluid (ethyl urethan and chloral hydrate), all of which, as he states, are liable to produce thrombosis and embolism.

To Witzel and his pupil, Schöning, is given the credit of having first, in 1906, investigated experimentally the value of intravenous anæsthesia, using 5-10% chloral hydrate and ether salt solutions. These experimenters abandoned the method on account of fatal embolism and extensive necrosis at the point of injection.

Janssen substituted for infusion the intravenous instillation of pure ether, inserting the needle into a collateral near the junction with the main vein (and has invented a special syringe for this purpose), believing by this method that the dangers of thrombosis were lessened. He, however, concludes from his experiments that Burkhardt's article is misleading in its statement that "intravenous ether narcosis is the most harmless and the most pleasant method of inducing general anæsthesia," and that the discovery of a fluid suitable for intravenous narcosis which will not only anæsthetize but will also be without ill effect upon the constituents of the blood, is still a matter for bio-chemical research.

HERMANN KÜTTNER. "Intravenous Narcosis. *Zentralblatt für Chirurgie, No.* 7, 1910, s. 233.

In this article Küttner tabulates his experience in twenty-three cases with Burkhardt's method of intravenous narcosis. While no serious mishap was met with, pulmonary embolism undoubtedly occurred in two patients and in two others clotting was observed at the point of infusion, resulting in a blockage of the flow.

Küttner concludes that while the method offers many advantages to the operator, the anæsthetist and the patient, it must be abandoned, as it can be considered only good luck if no serious accident occurs during or following the administration of the anæsthetic.

E. M. v. E.

PATHOLOGY.

UNDER THE CHARGE OF DRS. ADAMI, KLOTZ, AND NICHOLLS.

OEDEMA.

Meltzer, *Amer. Med.*, 1904, viii, No. 1, 2, 4 and 5.
Pearce, *Archiv. of Int. Med.*, 1909, June.
Bolton, *Jour. Path. and Bact.*, 1909, xiv, p. 49.
Fleisher, Hoyt and Loeb, *Jour. Expt. Med.*, 1909, xi, No. 2.
Fleisher and Loeb, *Jour. Expt. Med.*, 1909, xi, No. 3.

The author (Meltzer) discusses the question of œdema from various standpoints, and gives the most important views which have been written on the subject. By œdema is to be understood the pathological increase

of lymph in the tissue spaces or in the various cavities of the body. This lymph which is increased, is similar in quality to that normally present in the tissues. To properly understand the accumulation of this excess of fluid in the tissues, the author discusses at some length the normal process of lymph secretion in various parts of the body, for it is on these principles that the various theories of the pathological excess are established. Apparently one must admit from the first that all are not agreed on the normal process of lymph production. Ludwig, who studied the question in the early 40's of the last century, came to the conclusion that the lymph was secreted in the tissues mainly by process of filtration. By various experiments, he showed that the increase and decrease of the lymph flow and also the actual amount of lymph in the various tissues was directly dependent on the blood pressure of the capillaries. He thus found that, when the venous return from any tissue was impeded, there was a corresponding slowing of the blood stream in the capillaries, with a passive congestion. Following this, an excess of lymph passed from the blood vessels into the tissues. This could also be hastened if the tissues were kneaded. Ludwig also introduced the factor of filtration in urinary secretion. Ludwig's findings were accepted until recently in the 90's Heidenhain began his studies on the secretion of various glands. He came to the conclusion that various tissues have attractive forces, and these are able to draw to them materials for their use. When such tissues had attracted fluids, they were in a position to again dispose of this by other secretion. In other words, the process of lymph production was not a mechanical one, but that of a vital action on the part of the endothelial cells of the blood capillaries. Heindenhain found that there was not a constant relation between the blood pressure and the lymph flow. He was able to considerably increase the pressure both in the arteries and in the veins, without obtaining an œdema. Heidenhain, moreover, found that there are various substances which, without altering the blood pressure, are able to increase the flow of lymph, and from this he concluded that the endothelial cells of the capillaries can be stimulated to greater action of secretion.

Lazarus-Barlow was also opposed to the physical theory of lymph formation. He found that the temporary obstruction of the venous circulation did not lead to increase in the lymph flow. He believed that the accumulation of waste products within the tissues in some way reacted upon the blood vessels, which responded by a local arterial congestion and an increased output of lymph.

There have been others who have extensively studied the process of

lymph formation, and among these, Asher and Busch have found that the lymph itself contains a toxic substance which is foreign to the body, and which in some way iritates the tissue in which it is lying; thus the tissues forming lymph will be stimulated in accordance with the amount of the toxic substance contained in the fluid. It was found that the re-inoculation of an animal with this lymph stimulated the lymph-producing tissues everywhere to greater activity. These studies, of course, support the vital theory of lymph secretion. Whereas Heidenhain and Hamburger consider the endothelial cell as the seat of vital or physiological tctivity, Asher, in common with Lazarus-Barlow, places the physiologic or vital forces in the cell of the particular organ.

There is still some question as to which of the vascular streams are the most active in producing lymph. It was for a long time held that the lymph, after it had been utilized by the tissues in various parts, was again reabsorbed by the lymphatic channels and returned to the blood stream through the thoracic duct. Only recently has more definite information been received respecting the course of lymph after it has passed out of the blood-vessels. At the present date, it appears that the lymph of the tissues is handled mainly by the blood stream, and that resorption by lymphatic vessels is only small in degree. The blood capillaries are far more active in reabsorbing materials in the lymph and passing them on to the respective organs, than are the lymph channels.

Exactly how this absorption takes place is also still under discussion. Starling believes that the endothelial membranes of the blood channels are permeable. Others consider that osmosis plays an important part in the diffusion of the fluids, while Lazarus-Barlow and Asher strongly adhere to the vital forces of the tissues, whether these are located in the endothelial cells or in the cells of the organ. Respecting the lymph in man, the views of the various authors are divided into the mechanical and vital theories.

It is an interesting fact that our knowledge concerning pathological œdema antedates the physiological studies of lymph formation. Early in the last century, Bright recognized the almost constant occurrence of anasarca with albuminuria. Bright believed that the loss of albumen through the kidney caused the blood to become watery, and that now the capillary vessels allowed this thin fluid to pass into the tissues. It was, however, later shown that the occurrence of albumen in the urine had no direct relation to œdema. In the matter of renal œdema, Cohnheim found that diminished kidney secretion could not alone cause œdema, but he believed that the blood gave up more water to the tissues, and hence the kidney secretion was diminished. Cohnheim further found

that large quantities of fluid could be introduced into the circulation without producing œdema, though if the amount introduced was excessively large, ascites would be produced. In none of the cases, however, was there œdema of the skin. If, on the other hand, along with the introduction of fluid, the skin was irritated in the least way, œdema occurred at the point of irritation. In other words, it was found that the local irritation produced an increased permeability of the vessel wall similar to that of inflammation. In introducing excessive amounts of fluid, Cohnheim found that certain regions (intestines and glands) were more liable to excrete fluid than others. This he explained by assuming that the enormous hydræmic plethora produced by transfusion was sufficient to cause transudation through the more permeable capillary walls of certain regions than others. Acute hydræmia alone he believed caused no transudation, but if this hydræmia become chronic, transudation soon occurred.

After studying many experiments, Cohnheim arrived at the classification of the many forms of œdema. (1) Oedemas which are due to excessive permeability of the capillary wall and (2) Oedemas due to venous congestion. In each instance, however, the author believed that a change in the vitality of the endothelial cells is of great importance.

Senator agrees with Cohnheim that renal œdema is really of an inflammatory character, but whereas Cohnheim considers the œdema as a secondary condition due to a toxic agent produced by nephritis, Senator is of the opinion that the œdema is just as primary a condition as nephritis, and that both are brought about by the same toxic agent.

Hamburger believed there was a common law governing all œdemas, and in this he discarded all physical factors. He believed that there was a hyper-secretion of lymph by the endothelial cells of each, and they were stimulated by the metabolic products in the stagnated venous blood. He believed that in some way there was a greater permeability of the vessel wall, which might later lose its secreting power and act as a filter. The theory of osmotic pressure has been brought into prominence by the recent investigations on the elimination of chlorides in nephritis. Several

In considering these various theories in relation to diseases in man, authors have found that in nephritis the tissues contain more chloride than in the normal state, and on this account they believe that water was attracted to these tissues from the blood channels, increasing the amount of fluid in the various tissues, while, at the same time, the vessels were depleted. Of course, it must be considered that when the tissues have increased their chloride content, while the blood is low or at least normal, the extra vascular osmotic pressure is much increased. Exactly

what role this process plays in the various œdemas is not fully investigated.

There is one other form of œdema which does not appear to follow the general rule of œdemas of the body. Acute œdema of the lungs has several distinctive features, among which may be mentioned its rapid or sudden onset and often its quick disappearance. It occurs in relation to several acute and chronic diseases, although not a general factor in any. It is probably most frequently seen in relation to circulatory disturbances. Welch, some years ago, studied this condition. He believed that the disease is the result of a disproportion between the working power of the left ventricle and of the right ventricle, of such a character that the resistance remaining the same, the left ventricle is unable to expel in a unit of time the same quantity of blood as the right. This, then, results in the excessive engorgement of the pulmonary system with the consequent œdema. Welch has found that this œdema could be artificially produced by pinching the left ventricle while the right ventricle was still in action, and also by reducing the lumen of the aorta. Both of these experiments are extreme ones, and such as probably seldom occur in life. Nevertheless, the feature of a disproportion of the output of blood from the right and left ventricles can easily be pictured, and no doubt occurs in some cases of heart disease. In the acute pulmonary œdema there is not alone an exudation of fluid through the capillaries of the lung, but also the loss of blood cells. Welch's theory has received some opposition, but, at the present time, his explanation appears the best. Since his experimental work, it has frequently been noted that by the injection of adrenalin, acute pulmonary œdema can readily be produced. It would appear in this instance that the great peripheral resistance, which is developed against the left ventricle, is cause sufficient to conform with Welch's theory.

To the many theories and explanations which have been advanced, there still remain numerous factors to be discussed. The laws of osmotic pressure, the difference between intra and extra-capillary pressure, the nature of permeability of the endothelial wall, the mechanism of absorption; all require much further study. To this might be added the question of potocytosis or the ability of the various tissue cells to absorb fluid. As these more minute points are not fully cleared up, we will not attempt a discussion at the present moment. It is probably true that with each form of œdema (cardiac, renal, obstructive, inflammatory), there is more than one factor in action, and that œdemas in general cannot be explained by any one individual cause.

Concerning these different œdemas, there have recently been several papers illustrating some of the experimental work on the subject. Pearce has studied the œdemas occurring with experimental nephritis. He finds that the kidney lesions produced by uranium salts simulate most closely the lesions as seen in the human.

Pearce has found some very interesting results following the experimental kidney lesions. When rabbits were treated with uranium nitrate, severe kidney lesions were produced, but no œdema followed. If, however, these same animals received excessive amounts of water by the stomach, œdema of the general tissues occurred.

On the other hand, when animals were treated with arsenic, which substance acts not only as a renal poison but also as a vascular one, œdema could be readily produced when the animals received large doses of water.

Again, in using ricin and venom, which substances act upon the vessel walls mostly, no œdema was produced, even when water was given in large doses. When, however, ricin and venom were combined with chrome salts, the latter producing renal lesions but no arterial ones, the œdema was readily produced on the administration of water. From these experiments it would seem that kidney lesions alone are not responsible for the various œdemas. With the kidney lesions there must be a concurrent vascular damage along with a condition of hydræmia.

Bolton studied the question of œdema from a different standpoint. He attempted to explain the œdemas occurring with heart diseases aside from kndney lesions. In his experiments, he used cats, and in them he produced various mechanical vascular disturbances. In different experiments the inferior and superior vena cava was constricted. During the experiment, the arterial and venous pressures were observed and also the onset of dropsy. He found that when the inferior vena cava was obstructed, the vessels became engorged, and within one-half to one hour after ligature, some ascites began, while the liver showed evidence of venous obstruction. If the obstruction was persistent, the venous anastomoses developed and the ascites diminished. Similarly, the obstruction of the superior vena cava led to an œdema of the mediastinum, the root of the neck and the thorax, but no ascites developed. When the portal vein alone was obstructed or narrowed, ascites set in very rapidly.

When the inferior vena cava was gradually constructed, the venous pressure rapidly rose, but the arterial pressure fell. It was found that the radicals of the inferior cava, particularly those of the mesentery, could contain an enormous amount of blood, and as this became stored

up, the arterial pressure was reduced gradually. In part, the arterial pressure was restored by the constriction of the arterioles. Besides this, the circulatory system attempts to restore the arterial pressure by the rapid absorption of fluids, and thus to increase the total blood quantity of the body.

This is also true in cases of uncompensated heart disease, where the total blood quantity is increased. While, however, the venous obstruction is limited to a certain area, and the arterial pressure falls in the remaining portions of the body, it is found that in the unobstructed areas no œdema occurs, but rather a depletion of the tissues takes place to compensate to a certain degree the low blood pressure. The arterial construction in the unobstructed areas has two effects, that of increasing the peripheral resistance and that of diminishing the capacity of the arterial system. Whether venous pressure is high or low, dropsy is produced in the congested area in which the blood flows with a diminished velocity.

At first sight it would seem that in the areas where the venous pressure is above normal, and the arterial pressure at normal, that the capillary pressure would be above normal. This need not be the case, for the increased resistance in the arteries with a relative high pressure, gives less blood to the capillaries than normal.

The author suggests two factors in the dropsy of venous stagnation: (1) Diminished absorption by the veins of the congested area, and (2) increased output by the congested veins. Besides this, there appears to be a direct relation between the velocity of the blood current in determining the production of œdema. In instances of diminished blood flow, certain changes are taking place in the vascular walls which admit of greater loss of fluid.

Fleisher and Loeb found that certain changes in the composition of the blood fluid had various effects on the secretory organs and also upon the production of œdema. Whereas, ordinarily, the intravenous injection of normal salt solution increased the secreting activity of different glands and the kidneys, this was markedly decreased when calcium chloride was added to the solution. With the decrease in the elimination of the fluids by the kidneys and intestines, there is also a concommitant increase in the transudation of fluid into the peritoneal cavity. This secretion into the peritoneum is in part associated with the diminished amount of urine secreted and may act quite independently of the kidney secretion. Whether the peritoneal secretion is due to an increased activity on the part of the endothelial cells is not determined.

In another series of experiments, they found that in performing the infusion experiments in any animal, when the rate of flow was very rapid, the ascites and œdema was more prone to occur than in cases where the infusion into the animal was slowly administered. They found, moreover, that when adrenalin was added to normal saline or normal saline with calcium chloride, both the quantity of ascitic fluid and the quantity of urine were increased, while the intestinal secreton was diminished. It appears, therefore, that in respect to the secretion of fluid into the peritoneum, the adrenalin assists the action of the calcium chloride to bring about ascites, but that, on the other hand, the adrenalin counteracts the action of the calcium chloride on the kidneys.

Animals in which experimental myocarditis had been produced showed a considerable decrease in the renal secretion. At the same time, however, the peritoneal transudate is not markedly influenced by myocarditic changes. The authors indicate that each of three factors—calcium chloride, adrenalin, and myocarditic lesions—effect the elimination of fluids from the kidneys, from the mucosa of the small intestine and from the endothelial lining of the peritoneal cavity in a specific way. The conditions influencing this elimination of fluid appears to be characteristic for each type of tissue. The authors do not throw much light upon the actual methods in which the increase or decrease of fluids from the vessels takes place. We should presume, however, that their experiments indicate the production of œdema by hydræmia, associated with true vascular changes.

O. K.

Society Proceedings.

MONTREAL MEDICO-CHIRURGICAL SOCIETY.

The eighth regular meeting of the Society was held Friday evening, January 21st, 1910, Dr. Grant Stewart, President, in the Chair.

PATHOLOGICAL SPECIMENS.

1. Typhoid Perforation of the Sigmoid.
2. Cancer of the Œsophagus.
3. Malignant Endocarditis.
4. Tumour of the Appendix.

W. H. Tytler, M.D., of the Royal Victoria Hospital exhibited these specimens.

A. Lapthorn Smith, M.D. One point interests me and that is about the appendix. I have written several papers urging that it should be removed when the abdomen is opened for other reasons, and Dr. Chip-

man evidently thought it justifiable in this case. Especially do I think that this should be done when there are adhesions, showing that it has gone through one or more attacks of inflammation.

W. GRANT STEWART, M.D. Referring to Dr. Smith's remarks regarding the removal of the appendix when the abdomen is opened for other causes, I saw Stiler, of Edinburgh, and he had done 1,000 cases of the radical cure of hernia in young children and babies, and he makes it a rule in doing this operation at the same time to remove the appendix.

H. A. LAFLEUR, M.D. Caricinoma of the appendix is sufficiently rare to warrant a few remarks about it. Dr. Hamilton White presented a specimen of carcinoma of the appendix either last year or the year before. There are not, if I remember rightly, more than 30 or 40 cases recorded in the literature; in Nothnagel's System I think the collection does not exceed 30 or 40. It is almost invariably an accidental finding. There are very few cases operated on with the idea that one would find a carcinoma of the vermiform appendix.

SKIAGRAPHS OF TWO AORTIC ANEURYSMS, WITH REMARKS.

H.A. LAFLEUR, M.D. The first case is that of a woman of middle age; I first saw her on June 4th, 1909. She gave a history that for two years previously she had had a good deal of precordial pain which sometimes radiated to the left shoulder and down the left arm to the fingers. It was extremely severe lancinating pain and she mentioned that it was usually when she went to bed that she felt it most, and she had had very few hours sleep at night for some months. Apart from the pain she felt well and indeed looked quite well. She had absolutely no shortness of breath and walking never increased the pain. There was nothing very relevant in her previous history except that three months before she had gone through an attack of pneumonia very satisfactorily.

On examining her there was really only one point in the physical examination which caught my attention immediately. There was absolutely nothing to be made out on inspection, the chest was symmetrical, there was no pulsation to be seen except a slight cardial pulsation in the usual situation. Her radials were both palpable and equal, no pupillary changes, cardial dulness well within the normal limit. On applying the stethoscope towards the base of the heart I was struck by the peculiar booming, echoing character of the second sound. After I completed the examination I suggested that she come to the hospital and have an X-Ray picture taken. The result was the plate which I present here tonight; the picture was taken with the arms up. Here it is plain that we are dealing with an aneurysm involving the descending portion of the arch of the aorto which explained the severe pain very satisfactorily.

On careful enquiry no history of lues, either in the patient or in her husband, could be elicited.

The diagnosis in this case was suggested chiefly by two signs, a subjective one, the intense pain, particularly the nocturnal pain on lying down, and second, the booming, echoing character of the second sound. I put her on full doses of iodide and she is now quite free from pain.

The second case is more interesting and presents some features which may not be explained by the fact that this woman has aneurysm. She is a woman of middle life, 41 years of age, and I saw her first in the first week of October or the last week in September. Her complaints were that she had fainting spells with sensation of smothering in the throat. She is of American birth, but had lived in Montreal for 20 years. Had the ordinary infections of childhood, but up till last summer had enjoyed good health, in fact she did not recall any illness from 15 to 40. Her habits were decidedly bad; she was an excessive cigarette smoker, smoking from 30 to 40 a day, and for the last two years her allowance of champagne had been a quart a day. She had led a pretty easy life and appeared to be a woman fairly well preserved and apparently in good health. The acount she gave of her illness was that she was in New London in August, 1909, and complained of not feeling well during that month, was drowsy and tired, and one day when walking along the beach to the bath house she suddenly sank to the ground unconscious. She did not injure herself at all and in a few seconds was able to get up. The next attack of a similar kind occurred on the 15th of September in her own house here in Montreal. When she came to this time she found herself sitting on the floor; she had a good deal of headache. A few days later she had a similar attack, this time falling over the banister on her head and bruising herself severely. She had three more of these spells later on and, on September 21st, had half a dozen of these fainting attacks and then noticed some twitching of the face and hands. She called in a French-Canadian physician and he put her in the Homeopathic Hospital where she remained for some time, till the 26th of October. While in hospital she had several attacks but the interesting point is that these attacks never occurred while she was lying in bed. I saw her shortly after this and had her admitted to the Montreal General Hospital where she had two attacks lasting a very short time. These attacks are described by the nurse as chiefly being attacks of dizziness and then loss of consciousness for a short period; she had some pain in the cardiac region at the beginning of these attacks. Never in any of these attacks did she bite her tongue or micturate involuntarily.

What attracted my attention first was the fact that her radials and

ulnar arteries showed no pulsation whatever and I examined for this repeatedly, neither could a pulse be felt in the brachials. There was a feeble impulse in the sides of the neck. On the other hand, the femorals were very well felt and the pulsation of the posterior tibials, could easily be made out. Examination of the percordial area showed no visible deformity. There was nothing to be felt and the cardiac dulness as far as one could make out seemed to be within normal limits. The only suggestive thing was the very visible beating impulse as if the arch of the aorta was situated unusually high. No pupillary changes. On auscultation the same feautre as in the previous case was noted, not only accentuation of the second sound but a peculiar booming quality. Here, again, I thought an X-Ray picture might possibly be of assistance. Here one can see the shadow distinctly. I could elicit no history of lues. I put her on pretty large doses of iodide and this had the effect of diminishing the frequency of the severe attacks a very great deal; she often goes a whole week without an attack.

The symptoms here might possibly be conceived to be epilepsy, possibly of alcoholic origin in the presence of the marked abuse of alcohol. But they seemed to me to be rather analogous to the peculiar syncopal attacks which one sees in the Stokes-Adams syndrome, and my impression is that the supply of the blood to the brain is always below par and that under conditions of greater exertion possibly through a valve-like action at the roots of the vessels the blood is still more cut off from the brain and hence anæmia accompanied by syncopal attack with the more or less epileptiform features. I have not tried bromides, but she has made a substantial improvement on the iodide. This is the only case of aneurysm I have met with in which I have seen such attacks—they are syncopal with epileptiform features.

In the first case the aneurysm is not very large and it would be hard to be sure of this without an X-Ray examination though the character of the auscultation sound points that way. While she was being photographed under the X-Rays I could see the slightest little impulse to the left of the sternum high up involving the left sterno-articulation, which in itself was suggestive of the underlying vascular tumour.

C. F. Martin, M.D. In view of the very beautiful X-Ray pictures which aid the diagnosis here it is very suggestive, to anybody who works with the fluoroscope, of the value of these means of diagnosis. So useful does it seem to use the fluoroscope in the diagnosis of diseases of the chest that I can recall more than one case in old individuals in which examination by the fluoroscope revealed that the bronchitis was due to some neoplasm or aneurysm as the case may be. An inter-

esting feature that struck me in Dr. Lafleur's cases was the fact that the fluroscope is so useful in making diagnosis where the physical signs are so obscure. The pictures shown here are excellent because in stout people it is very hard to get a clear picture though Dr. Lafleur has succeeded admirably.

H. A. LAFLEUR, M.D. We are indebted to Dr. Walter Wilkins for these excellent X-Ray pictures. We have every reason to congratulate ourselves in having him in our X-Ray Department at the Hospital.

SOME CONSIDERATIONS BEARING ON THE SURGEON, THE PATIENT, THE STUDENT, AND THE NURSE.

WESLEY MILLS, M.D.

SHOULD ECLAMPTIC MOTHERS NURSE?

J. R. GOODALL, M.D.

J. C. CAMERON, M.D. This is a very valuable communication indeed, one deserving careful study, and the question submitted by Dr. Goodall is an important one. Eclampsia has been called a "disease of theories." At present the general concensus of opinion seems to be that it is a toxæmia: but when we come to consider what is the nature and origin of the causative poison or poisons, we have many theories but as yet we know really very little. That toxines do pass through the placenta has been demonstrated time and again; that they may pass out through the milk and may produce unfortunate results seems now to be equally certain; but that the fatal toxæmia in Dr. Goodall's cases is to be attributed solely to the milk is an open question. Is it not possible that the child was previously infected *in utero* through the placenta, and that after birth the infected milk being superadded became the last straw and determined the fatal issue?

Again, that in some women toxines may pass over to the child in the milk we must admit, but that they so pass over in all women, or that they always do so to an injurious extent, we are not at all prepared to admit. If we consider how greatly the function of lactation varies in different women, how variously nursing women are affected by what they eat and drink, how some can take the most extraordinary things without apparently affecting their milk or hurting the child, while others cannot take even an orange or a lemon or vegetables without causing colic in the child, we must admit that there must be a great deal in the constitution of the woman herself. We find the same thing happening among the lower animals, the cow for instance; when certain vegetables or distillery products have been fed to cattle, the milk of some cows has been found to be actually poisonous, while that of others seems to have been little changed or only slightly modified. The cause of the disturb-

ed milk function in some cases seems to be more in the cow herself than in the food she has taken. Dr. Goodall asks, Should eclamptic mothers be permitted to nurse their children? In medicine it is very seldom that we can lay down such stringent rules as "Never do this," or "always do that." Circumstances alter cases. With regard to the advisability of nursing in such, it seems to me that we should ask ourselves two questions, first, "Is there any great good to be gained by nursing either for the mother or the child," and second, "Is there any risk?" If there is no great good to be gained, and if there is any risk, it seems to me that it is more prudent not to take the risk.

In eclampsia our aftertreatment consists chiefly in flushing away and getting rid of the poison, and in aiding nature to eliminate it as soon as possible. We rely chiefly upon purging, sweating and forced fluids to attain this end, and may not lactation provide another outlet for the toxines, form another means of excretion? Certainly such a supposition seems reasonable. A great deal depends upon the severity of the eclampsia and the time of its occurrence. In Dr. Goodall's first case, a postpartum eclamptic, the nursing took place before the fit occurred. Here the blood of the mother must have been laden with toxines, as proved by the subsequent eclamptic attack. I do not think that we should make the same rule apply to a case in which there is only one convulsion, or where the toxæmia is very slight, as we would do to those cases where the fits are numerous or the toxæmia severe. At the Montreeal Maternity, so far we have had no bad results from nursing. I may say, however, that most of our eclamptic cases have been difficult ones. Most of the women have been very ill indeed, many premature, most required to be bled, many to be delivered rapidly by artificial means, and all have been given forced fluid treatment for 4, 5, 6, and even 10 days. Under such circumstances a woman does not secrete milk at first, she is too ill to nurse, and the tendency would naturally be to keep the child away from her for some time. As a rule we put the child to the breast about the 5th or 6th day, the woman not seeming fit to nurse before that time, giving her time to eliminate a great portion of her toxines and get fairly back to her normal state. How then are we to answer Dr. Goodall's question "should an eclamptic be permitted to nurse her child?" I would answer it in this way, that it is not prudent for an eclamptic mother to nurse her child until she has returned to a fairly good condition of health, that is to say, until her eliminative organs have had an opportunity to right themselves and the toxines have been pretty well swept away. In one woman this may take two or three days, in another perhaps a week or longer; and I should certainly say that until the albu-

min has been much reduced and the quantity of urine increased, it would be imprudent for her to nurse.

W. W. CHAPMAN, M.D.

These cases cited by Dr. Goodall certainly illustrate very clearly the grave danger that may arise to the child from nursing an eclamptic mother. The rule that is followed, in such cases, in the Edinburgh maternity hospitals, is I think a good rule. It is this: A distinction is drawn between albuminuric women and eclamptic women. An albuminuric woman, even if she show œdema of the feet, hands or face, may nurse her child provided only she evince no eclamptic symptoms. Should she, however, show any of these latter sypmtoms, for example, headache, vision-disturbances, epigastric pains, extensive nervousness or muscular twitchings, the nursing of her child is denied to her, until at least these manifestations of the toxæmia have disappeared.

The above affords us, I think, a safe clinical rule to follow in these cases. It is, of course, based upon the opinion that the condition of the mother's milk is to be judged not so much by the urine-judging in these instances as upon the presence or absence of any manifestation of the symptom-complex of eclampsia; the patient's toxæmia and the consequent toxicity of her mammary secretion is more correctly reflected in the so-called eclamptic signs and symptoms, than by any chemical analysis of the urine.

Mere albuminuria unaccompanied by any toxic signs or symptoms does not contra indicate lactation.

D. F. GURD, M.D. I have been very much interested and even startled in hearing these cases to-night as they do not correspond at all with my experience. I have had some 12 cases of eclampsia, some very severe and others tolerably so; one in a little lady who had twins. In this case the convulsions lasted many hours. I removed one child by forceps and the other by the feet and she nursed her children without any apparent effect on them. They both grew up and are alive and well. In looking over several others I have not had one case correspond with any such as Dr. Goodall has described. I have had one or two born dead, and one where the child lived three weeks, but here there was some malformation. One interesting point was that these children of Dr. Goodall's died before the breast function had been well established. In one of my recent cases the mother began her convulsions about 5 in the morning and continued till 11 o'clock at night, dislocating her shoulder in one of the spasms and she nursed her child with no ill effects.

J. C. MEAKINS, M.D. In relation to what Dr. Fry has said as to whether drugs pass over from the breast to the infant, I had an oppor-

tunity of studying a case of gastro-enteritis in a child at the breast of an apparently healthy mother. The child was admitted into the children's ward of the Presbyterian Hospital, New York, suffering from a very intense gastro-enteritis. On going over the history of the case I found that the mother had been on small doses of the liquor arsenicalis. I examined the secretions of the breast of the mother and I found the secretions gave a very marked reaction for arsenic. I have examined the breast secretion from a patient on urotropine and it gave a marked reaction for formalin, showing that urotropine after it had been broken down in the body will be secreted in the milk as formalin, the same as in the urine, bile and cerebro-spinal fluid.

W. GRANT STEWART, M.D. My experience in the last twenty years coincides very much with Dr. Gurd's. I have never had any case such as Dr. Goodall has reported. Certainly, after this, I think I would be perhaps a little more careful about putting the baby to the breast in such cases. I think, however, in the first few days in these cases there is very little milk. I have a case at the present time, a patient who has had an eclamptic attack and for the first few days she had no milk at all; I put the baby to the breast after a few days and he is now alive and well. With regard to the passage of drugs through the milk I have just had a very interesting case of a lady who was recently confined. I put her on a mixtu re of Ferri Ammon Cd. ℥vi, nux vomica ℥iii, syrup of orange ℥ip and maltine 16 oz. ℥phd pc., and after she had been taking this for a day or so her baby slept for several days and finally looking for the cause we thought that the medicine had something to do with it and on stopping it the child became normal again. I have very often given morphine for after pains and I have never had any difficulty with the baby and I have given it hundreds of times.

J. R. GOODALL, M.D. I have just a few words to add. I think the difference arises out of the one factor that in the great majority of cases the eclamptic seizures are before labour or immediately after, and under those conditions the toxines are soon eliminated from the system before the secretion of milk has started. In the two cases I reported the eclamptic seizures came on in the second or third day and in the third case she had a tremendous amount of albumin in the urine and she still has albumin.

The ninth regular meeting of the Society was held Friday evening, February 4th, 1910, Dr. W. Grant Stewart, President, in the chair.

PATHOLOGICAL SPECIMENS.

A. LAPTHORN SMITH, M.D., exhibited a lacerated cervix which he had

removed by his method from the posterior lip of which two large polypi were hanging. They had the effect of pulling down the uterus and causing great distress to the patient. One of the polypi was deeply ulcerated and bled freely when bruised by sitting on it or bruising by the clothing. The other polypus contained a large mucous cyst.

(1) LIPOMA OF SPINAL CORD AND (2) MALIGNANT STRUMA.

S. B. Wolbach, M.D. The excuse for offering the case of the spinal cord is first of all its great rarity, and secondly, because of the association of the congenital tumour with other congenital defects. The case is that of an infant of ten months with complete cleft palate. It was a well nourished infant and was taken to a Foundling Asylum to be cared for. and there died, apparently from acute gastro-intestinal disease. We were unable to get any history as to paralysis though the attendants, who were not trained, said there were no symptoms relating to the central nervous system. At autopsy there was a considerable degree of internal hydrocephalus and complete absence of the right kidney so that we had two congenital defects, cleft palate and absence of one kidney. The spinal cord was greatly enlarged symmetrically, and there were two tumours at the base of the brain, one at each cerebellar pontine angle, and a third on the dorsum of the medulla. All these tumours and the diffuse enlargement of the cord were found to be due to a growth of fat—subdural lipomata. The case is unique in the extent of the growth and the absence of spina bifida or spina bifida occulta which was absolutely ruled out in this case. The terminal filament was invested with an unusual fatty growth. In the drawing the gross appearance of the spinal cord shows simply an enormous cord for an infant of that age, with certain irregularities. On cross section it was white and had exactly the appearance of a fresh section of fish muscle. The accompanying micro-photographs show the relation of the tumour to the cord. The preparations are osmic acid preparations so that the tumour itself appears black.

The other case was that of an elderly man who for about five years had been treated for aneurysm, or at least watched with that diagnosis He had a tumour of the chest, bulging of the upper portion of the sternum, and the clinical signs were such that an eminent diagnostician in New York made a diagnosis of an aneurysm of the arch of the aorta. This diagnosis, however, was combatted by an Albany physician who maintained that there was a mediastinal tumour. The patient got along with pretty fair comfort until towards the end, when he developed a complete paraplegia and, of course. retention, cystitis, and death, immediately due to pyelonephritis. At the autopsy, the manubrium of the

sternum was filled with a large tumour mass; it was entirely replaced so that it was surrounded only by periosteum. There were a number of small metastases in the lungs, two solitary metastases in the liver each about 1 cm. in diameter. On removing the spinal cord a large tumour mass was found either in the 10th or 11th dorsal vertebra which pressed upon the spinal cord and accounted for the paraplegia. When the organs of the neck were dissected out there was found a tumour of the thyroid. This was not very large but the trachea was invaded, and what is more interesting the internal jugular was invaded so that there was a knob of tumour tissue projecting into the superior vena cava. Histologically all portions of the tumour and the metastases showed the structure to be practically that of normal thyroid tissue, at least there is no more indication of malignancy than in colloid hypertrophy of the thyroid. The condition is a very rare one but a well recognized condition, which has led to a great deal of discussion as to what constitutes malignancy. Some pathologists say that these tumours are simply metastases of normal thyroid tissue. That, however, has been quite well disproved and the belief is that they all take origin from small tumours of the thyroid. A few cases are on record where no tumour of the thyroid could be found, but in this case we had this tumour. The interesting features are the long duration of the disease, the extensive transplantations to bone, and the structure of the tumour, which is astonishingly like that of normal thyroid gland.

CASE REPORT.—TRACHOMA BODIES.

HANFORD MCKEE, M.D.

DR. H. L. PAVEY.. It appears to me that it would be a great step if the cause of "trachoma" could be found out and the disease prevented. We all know what a common disease "trachoma" is and we have learned to regard it as a contagious affection.

As I was ship's surgeon for some months on a transatlantic liner I was enabled to see this disease frequently and was struck with the vast amount of suffering it gave rise to and with the careless manner in which some of the examing officers handled the eyes of the immigrants.

Many foreign families came to Liverpool to emigrate to this side of the water, and it was a frequent sad sight when one or two members of the family would be refused passage owing to "trachoma," while the others would be hustled aboard. The eyes of all applicants for passage were examined carefully for "trachoma;" and naturally many bad cases were found. Yet these examining officers after everting the superior tarsus of a case of "trachoma" would proceed without any attempt at sterilization of the hands to the examination of the eyes of other ap-

plicants. It seemed to me that they could thus infect healthy eyes which would, perhaps, not develop "trachoma" until they reached this side of the water. If this be the case we are doing more harm than good, for we may, it is true, find a few cases and refuse them passage, yet we may at the same time inflict many other unfortunates who would be settled in Canada before they showed well marked granulation. Something should be done to prevent infection in this way.

THE BOARD OF HEALTH IN CONNEXION WITH INFECTIOUS AND CONTAGIOUS DISEASES.

J. E. LABERGE, M.D., read the paper of the evening which appears in February number of the JOURNAL.

E. J. C. KENNEDY, M.D. I would just like to say we all appreciate what we have heard from Dr. Laberge to-night. Quite a number of us do not know what is going on in the City Hall, and to have him come here this evening and lay the work of his Department before us is certainly of very great interest. Dr. Laberge has said that notification of contagious diseases is not made by many medical men in Montreal. I believe that the explanation of this oversight on the part of the profession is due to the fact that it is impossible to communicate with the Contagious Diseases Department by telephone. The line is always engaged, and one may ring up several times without being able to get a hearing. When this is remedied notification will be found to be the rule instead of being the exception.

In reference to the medical inspection of the different institutions in Montreal, it is stated that it is not satisfactory; there is no doubt that under the new conditions existing at the City Hall, some improvement could be inaugurated. At the present time the work of the Medical Inspectors is too varied to get proper results. Their time is divided between attention to professional practice and inspection. It should be possible to have inspectors who would give all their time to the work, and specialization might be introduced. Some could give their attention to the examination of school children, others to factories, while others could investigate contagious diseases, and devote most of their time to these duties. We owe a great deal to Doctor Edward Laberge for the manner in which he has organized the Department of Contagious Diseases at the City Hall, and I am sure it is our wish to assist him all we can.

A. D. BLACKADER, M.D. I have listened with interest to Dr. Laberge's statement of the work carried on by the Contagious Diseases Department at the City Hall, and notice with much pleasure the

improvement in the character of the work that has taken place during the last few years. There are, however, a few points upon which I desire to say a few words. It is all very well for the Health Department to say that they expect physicians to report contagious diseases within twenty-four hours, but in a large city like Montreal, may not physicians look to this Department for assistance in the bacteriological work necessary for the diagnosis of difficult cases. In the case of typhoid fever, it would be of much assistance if the Department could give us a report on the presence or not of the Widal reaction. This is almost invariably necessary before a case can be reported as definitely typhoid fever, and I think the Health Department should, for our poorer patients at least, do this work for us.

A bacteriological investigation is desirable before a case can be reported as one of definite diphtheria. To render such an investigation easy for the physician culture-tube outfits should be readily obtainable by the physician. It appears to be desirable that the Health Department should make some effort to supply fresh culture-tubes to the more important drug stores, which would be available on the request of any physician, and take measures to have a report on the presence or not of the Lœffler bacillus returned to the physician within twenty-four hours. In this way the physician could feel sure that he was dealing with true diphtheria and take steps for such isolation as may be necessary.

In connexion with the disinfection of houses, it is important also that officers inspecting infected houses, should carefully disinfect themselves before going from one house to another. I have on several occasions received bitter complaints that the inspectors made their visits without taking sufficient precautions for the careful disinfection of their own person after each visit.

Again, physicians have also much difficulty in obtaining telephone connexion with the Contagious Department at the City Hall. It would add much to the ease of reporting infectious cases, if the Contagious Department had a number for itself, which could be easily found in the telephone book. I have frequently found it difficult to obtain telephone connexion with the Department.

F. R. ENGLAND, M.D. There are just two points I would like to mention. For many years I have observed that after the Medical Health Officers come to a house and get this, what is doubtless valuable information for statistical purposes, they go away and if the patient elects to stay at home nothing is done to prevent the spread of the disease until the case is cured, that is to say, nothing is done until after fumigation.

Now this system could be improved upon, e.g., if a defective drain exists it should be remedied at once and not allowed to remain until the case recovers. I would also like to know what course is adopted when a contagious disease is known to exist in a house, to prevent other members of the household from continuing their work and going about spreading the contagion. We report a case at present of contagious disease and leave the "precautions" in the hands of the Health Department. I have often found difficulty in controlling the different members of a household and fear that under existing conditions there is a serious division of responsibility between the attending physician and the Health Department.

G. P. GIRDWOOD, M.D. One point which strikes me is in Section 51 which requires that persons having charge of an infectious case had to notify the Health Officer within so many hours that they had charge of such and such a case. The physician in that section is bound to notify the Health Department in so many hours as to what is the situation of the person, who is the employee of some firm, and one of the inhabitants of that house who still attends his duties in his employer's office where there may be from 10 to 100 employees. What is the duty of that employer when he becomes acquainted with the situation? What can the Health Department do in those cases where such on inmate of such a house goes to his employment, and does not notify his employer of the disease in his house. I think it would be a good thing if we could get some responsibility laid upon such persons coming from houses where there is a case of infectious disease so as to protect his fellow employees.

D. F. GURD, M.D. This address shows that we have an admirable head for our Contagious Diseases Department, and I think if we were to back him up more we would be able to get a civic bacteriological laboratory. The curious rule of not examining and testing the drains of a house till after fumigation, struck me as being absurd for the reasons given by Dr. England. Some years ago I wrote to Boston and New York and asked the authorities what they did there. In Boston they test the house as soon as the disease is reported; in New York they do as we do here, wait till after fumigation. Dr. Laberge mentioned that in all probability the water was the cause of the recent epidemic of typhoid fever in our city. There is no doubt about it. The water supplied by the Montreeal Water and Power Co. has been the cause. The municipalities and wards of the city supplied from this source have had for years past as well as this year immensely increased numbers of cases of typhoid whilst the part of the city supplied by the Montreal water works

have had no increase. It is an amazing thing that this has been allowed to go on so long. During my time as a practitioner in Montreal we have had two epidemics of typhoid fever traceable to milk supplied by two dairies. They were promptly stopped from selling any more milk till the Health Department was satisfied that the cause had been removed.

F. G. FINLEY, M.D. The great difficulty that the Contagious Diseases Department have to contend with is that physicians as a class do not report their cases sufficiently often. I think if the authorities would follow the example of Glasgow and pay a small fee for each case reported it might be of service in bringing them to time. I would like to ask Dr. Laberge what steps are taken in tracing typhoid to milk. It seems to me that it is the duty of the health officers to follow up the milk supply and see if the disease follows the route of any special milkman. I was very much struck recently in reading the report of the District of Columbia health authorities. They had a number of cases of typhoid there and began to trace the milk supply, and found the disease limited to the route of two milkmen. After investigation they found that it originated in one woman who handled the milk on a certain farm, she had had typhoid fever 18 years previously and bacilli were found in her stools.

DR. HART. There is one little point to which I would beg to draw Dr. Laberge's attention, and that is with regard to the reporting of cases to the Health Department by telephone. It has occurred to me several times, when I have had occasion to call up the Contagious Disease Office, to be told that the line is engaged. I think it would simplify matters a great deal for medical men, especially the busy ones, if the department were to put in two or three instruments, so that reports would have some one to receive them at once. It may occur, and probably does, that if on the first call, a doctor finds the line busy, and on a second call is again told that the line is busy, the report is not made at all, or postponed for a day or two, especially may this be so if the cases to be reported are measles, whooping cough, &c., &c.

W. GRANT STEWART, M.D. I would like to ask Dr. Laberge whether they do here as in Edinburgh; they have a laboratory which examines all the specimens of the infirmary and city and all the surrounding country, and all the doctors from the country around send in specimens of sputum, swabs from throat cases, specimens of fæces, gastric contents, etc., for examination and report. I would like to ask Dr. Laberge whether they do that sort of thing in the city laboratory or whether such a thing would be feasible. Another point is the matter of stations all over the city where one could get culture tubes, etc. The late Dr.

Wyatt Johnston started a scheme of this sort where one could send specimens and get a report next day.

J. E. LABERGE, M.D. Certainly we need a bacteriological department at the City Hall to be put at the disposal of medical men in Montreal who may want to have diagnoses made in cases of diphtheria, etc., or to find out if a sputum contains the tubercle bacilli, to have a Widal test made, etc., etc., to aid in diognosis. Years ago when I was in charge of the Health Department that was done, but this department was taken out of my hands and I have no control of it. Under the new administration, however, it is possible that this may be re-established. The employees who go into infected houses from the Contagious Department should always wear a gown when they go into a house and should take it off before they leave; they should also wash their hands and face, as that is their instruction. With regard to the telephone we have only one telephone for the infectious department and that is going almost all the time. I have asked many and many times that another be installed but I am always told that there is no money for this improvement. When a case of infectious disease is in a house and there is a defective drain. the duty of the inspctor of the City Hall is to find out the defect, not to remedy it. The plumbers are allowed to go into the house only when the infection is gone. We may make an exception, but as a rule we only do this reparation to drains when the infection is over. When a house is placarded for a case of infective disease the people are not allowed to go outside unless the patient is properly isolated and the physician in charge of the patient assures us that this precaution has been taken. We try all the time to induce these people to go to the hospital, but in case they refuse the City Hall does not supply them with food. and in poor families the father has to go out to work, so that I do not think we can do better than induce them to go to hospital.

As to the typhoid fever nearly all our cases, between October 1st and the end of January, were from the following wards: St. Henry, 441; Ste. Cunegonde, 159; Delorimier, 77; St. Denis. 235; Mount Royal, 9; West, 5. Centre, 5; East, 13; St. Mary, 61; St. Jacques, 4.; Hochelaga, 62. For the first week in January 204 cases were reported, the second week 186, third week 50, fourth week 89.

The tenth regular meeting of the Society was held Friday evening, February 18th, 1910, Dr. W. Grant Stewart, President, in the chair.

DR. W. H. TYTLER exhibited the following specimens:—

1 CANCER OF THE GALL BLADDER. 2. INTUSSUSCEPTION.
3. MESENTERIC THROMBOSIS.

Dr. A. Lapthorn Smith also showed specimens from three cases of tubal pregnancy.

J. Appleton Nutter, M.D.

1. CURE OF SACRO-ILIAC STRAIN, SHOWING TREATMENT EMPLOYED. 2. TENDON TRANSFER, PERONARAL GROUP MADE TO ASSUME ROLE OF THE CALF MUSCLES. 3. CURE OF DOUBLE CONGENITAL CLUB-FOOT.

A report of these cases appears in this number of The Journal.

The cases were discussed by Dr. A. E. Garrow, Dr. W. G. Turner and the President, Dr. Stewart.

W. S. Morrow, M.D., read the paper of the evening which included the following:—Rythmic tissue in the primitive heart; normal heart rhythm; the auriculo-ventricular node, sometimes the seat of extra systoles, and sometimes assumes the cardiac rhythm (nodial); frequency of nodal rhythm; diagnosis; prognosis; treatment.

This paper was discussed by Dr. F. G. Finley, Dr. W. F. Hamilton and Dr. A. Lapthorn Smith.