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LIFE AND WORK OF LOUIS PASTEUR.*

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A study of the lives of the Masters in Medicine or allied sciences is, and ought always to prove, interesting and inspiring to the student of medicine, and the life of Pasteur when so studied will be found to abound in interest, be highly instructive and full of inspiration, especially to those who possess the true scientific spirit. In the course of my inaugural address, delivered in October, 1896, before the Medical Faculty and students of this college, I stated that "the man to whom more than all others we owe experimental medicine is Louis Pasteur. To him we owe our present-day science of bacteriology, for he first indisputably established the microbic causation of many diseases. In fact, Pasteur's discoveries have not only widely extended the boundaries of physico-chemical and biological science, but have been the means of practically revolutionizing medicine and surgery." The Life of Pasteur, as presented by his son-in-law, Vallery-Radot, is one of the most interesting and entertaining books it has been my good fortune to read for some time. I cannot hope to present the subject in any such manner as it is found in his volumes, but will attempt to shortly sketch for you his life and his work, looking at the latter from the medical viewpoint.

Pasteur was born at Dole, in Jura, in 1822, his father, Jean

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Joseph Pasteur, being a tanner and an old soldier of the Empire. He was a man of fair intelligence, of sound common sense, fully cognizant of the value of education, and who made every effort to secure to his son that education which had been denied himself. Shortly after the birth of Louis the family settled in Arbois, taking charge of a small tannery there, and here Pasteur attended the local college, passing through from the primary grades. The work done at this college would about correspond to our public and high school courses. According to the accounts of his fellow pupils Pasteur showed no exceptional brilliancy at school. He was but an average pupil, he worked carefully, even if slowly, and gradually mastered his subjects. He carried this careful conscientious system of study throughout his entire life, and it has often been remarked of him that he never affirmed anything of which he did not feel sure and was able to back up by careful reasoning. At school he showed a taste for portrait drawing, but this he did not afterward cultivate. At the age of sixteen he had mastered all that was then taught in the local college, and he went to Paris, but only stayed a few weeks, as he suffered so severely from homesickness that his father had to come and take him home. He then went to the college at Besancon, which was some forty miles away, where he could occasionally see his father, as it was the main market place for the tannery. There were some good teachers in Besancon then, and they awakened in him some enthusiasm for study, and especially for general science. In two years he had taken his "Bachelor es Lettres". The work required for this degree would not more than equal the first two years of our Arts course. His standing was only fair, but his careful conscientious work recommended him to the authorities, and he was retained as a preparatory master and given an opportunity to continue his science work. In his twentieth year he went up for his "Bachelor es Sciences" before the Dijon Faculty and secured it, but was marked "mediocre". His ambition at this time was to enter on the science side of the Ecole Normale, which was an institution at Paris for training professors. After a course of three or more years therein the government would appoint those passing the usual examination or "agregation" to various positions in the local colleges or provincial faculties. (In France, practically, the whole school system is under central government control and appointments to higher grade schools lie largely, or did in Pasteur's time, in the central government). Pasteur, then nearly twenty years of age, came to Paris to take the entrance examination at the

Ecole Normale, and stood fifteenth out of twenty-two candidates. He did not enter, but decided to spend a year in further preparation, so as to secure a higher average standing on entrance. He spent this year in general study and attending the "open" or popular lectures then given and which are still given by the Paris professors. It was here that, in listening to the lectures of the noted chemist, J. B. Dumas, he became fired with enthusiasm for this subject and ever after was pleased to call Dumas "Master." At the end of the school year, 1843, when in his twenty-first year, Pasteur again took the entrance examination, ranking fourth. I am certain that the great majority of students would have been content with the rank of fifteenth rather than spend an added year for the honor of taking a higher entrance rank. This in itself gives us a good indication of the character of Pasteur. Thoroughness of preparation, patience in carrying on work and steady perseverance in it, mark him at this time and throughout his later life. It was at this time he adopted as his motto "Laboremus" — "let us work," for Pasteur believed thoroughly in work, and that work was and is the key to unlock the secrets hidden by nature's doors. Probably some of you will have read Prof. Osler's address some few years ago, entitled "The Master Word in Medicine", wherein Osler elaborates on this theme, and I would recommend this to the perusal of any who have not yet had an opportunity of seeing the same.

At the Ecole Normale Pasteur took a special pleasure in the lectures on chemistry of J. B. Dumas and Balard, the physics classes of Pouillet, and mineralogy of Delafosse, though careful not to neglect mathematics and other sciences. Pasteur was successful at the "Agregation" or examination, in 1846, ranking third, but decided to wait and take his degree of "Docteur es Sciences." It was while working for this that he began to direct his attention to the study of the tartaric acids, especially their crystalline form, as he had decided to make his doctor's thesis on a subject of crystallography. Let me give you Prof. Frankland's (Professor of Chemistry, Mason College, Birmingham) appreciative description of Pasteur's work on this subject. "The phenomenon which attracted the attention of young Pasteur was the existence of two tartaric acids apparently identical in chemical composition, in chemical properties, in crystalline form, and in fact in every detail excepting alone that the solution of one of these tartaric acids had no effect on polarized light, whilst the solution of the other turned the plane of polarization to the right. Submitting these

crystals to the most searching scrutiny, Pasteur found that there were some minute faces on the crystals of the tartrate inactive to the polarized beam, and such importance did he attribute to these little faces that he recognized that their presence relegated the substance possessing them to an entirely different class of objects from that to which belonged the substance possessing them not.

“For whilst the crystals of the inactive tartaric acid, which were destitute of these little surfaces, he found were symmetrical, the crystals of the optically active tartaric acid he found were unsymmetrical or disymmetric, as he called it. Now to the symmetric character of the crystals of the one tartaric acid he attributed the inactivity of this tartaric acid to polarized light, whilst with the disymmetric character of the crystals of the other tartaric acid he connected its action on the polarized beam.

“In studying these apparently insignificant details, Pasteur found that by crystallizing the inactive tartaric acid in a particular way he obtained two different kinds of crystals, the one set being identical with those of the active tartaric acid already known, whilst the other set were the mirror images of these, and had never been seen by the eye of man before. The young philosopher at once drew the conclusion that if the disymmetry of the known tartaric acid caused it to turn the plane of polarization to the right, the disymmetry of this new tartaric acid would turn it to the left.

“With infinite pains Pasteur picks out from the mixture the individual crystals belonging to each of the two types, and arranges them in two heaps; each of these heaps of crystals was then separately dissolved in water and the two solutions submitted to polarized light. In accordance with his anticipation, whilst the solution of the crystals of the known form was found to turn the plane of polarization to the right, the solution of the new crystals, the mirror images of the old, was found to turn the plane through precisely the same angle to the left. This might have appeared to many a trivial discovery only, but such was not Pasteur's opinion of it, for rushing from the laboratory in a fever of excitement and meeting a fellow assistant in the corridor he embraces him and exclaims, overcome with emotion, ‘*Je viens de faire une grande decouverte.*’ And such in truth it was, although almost his first discovery, and the one which has the least contributed to the general celebrity of its author, it is, nevertheless, almost impossible to over-estimate its import-

ance, in view of the remarkable fertility of the researches to which it has directly and indirectly given rise."

I need not dilate on the value of these researches to the chemistry of organic substances, but need simply say that this discovery is the basis of the research into the special distribution of the atoms in the molecule, explaining isomerism, etc. But Pasteur's study of the tartaric acids did not end here, fortunately. Ordinary tartaric acid is readily fermentable, and Pasteur studied the effects of fermentation of the various tartaric acids and made the remarkable discovery that while the right-handed (to polarized light) tartaric acid readily fermented, the inactive (racemic) acid only partially fermented, the residue being left-handed tartrate which refused to ferment. Thus he established that the atom grouping of the molecule makes a very important difference physiologically, and this has since been widely recognized in many organic substances. From a study of chemical changes effected by fermentation Pasteur was led to study the cause of fermentation itself. At this period fermentation was not looked upon as a biological process, but as a purely physical one, the predominant idea being that of the chemist Liebig, who was at this time (1850-1860) in his zenith. Liebig taught that "the ferment was an extremely alterable organic substance which decomposed, and, in decomposing, set in motion, by the rupture of its elements, the molecules of fermentable matter." Thus in the ordinary yeasty growth in syrupy solution undergoing fermentation, the change was not due to the vital activity of the yeast, the only influence that the yeast would possess would be that its dead cells, in decomposing, would impart the necessary motion to the sugar molecules to disrupt them and transform them into alcohol. It was recognized by many observers that bacteria, yeasts, moulds, etc., were often found in fermenting and decomposing liquids, but it was held that these were the result of spontaneous generation, having nothing whatever to do with the decomposition, but were simply some of its products.

Now these studies on tartaric acid and its fermentation were spread over a number of years, being taken up when duty permitted. In 1847 Pasteur took his degree of "Docteur es Science," and after acting for some time as an assistant, in 1849 was appointed Professor of Chemistry in the Straasburg Faculty, which position he occupied until the end of 1854. It was while at Straasburg that Pasteur worked out fully the relationships of the tartaric acids and began the study of the causes of fermentation. He also married shortly after going to

Straasburg the daughter of the Rector or President of the Faculty, and he seems to have been particularly happy in the choice of his helpmate. Early in 1855 he was appointed Dean and Professor of Chemistry in the new Faculty of Science being organized in Lille. This city was the centre of the manufacture of beet root alcohol, and also produced much wine and vinegar, so that it was peculiarly well situated for the practical study of fermentations. Let me point out that the proper control of fermentation processes was, and is, of vast practical importance in the wine, beer, vinegar and other industries, including in our province cheddar cheese-making, and that before Pasteur's time, while much was known practically about methods of fermentation, nothing was known as to reason which caused, say, one brewing of beer to be excellent, while another brewing, fermenting similarly, soured in the cask, grew flat or even became ropy.

Pasteur showed that ordinary fermentative and putrefactive processes were caused by and occurred only in the presence of certain yeasts or bacteria as case might be. Further, he showed that without these special yeasts, or bacteria, being present and developing, a material, no matter how fermentable or putrescible, did not undergo any change. Again, that, when a fermentation went wrong, it was due to entrance and growth of other and different forms of organisms. The experiments brought forward to prove these points were exceedingly ingenious and convincing. It took but a short time indeed to convince the brewers of the practical value of his findings, and all large breweries are now equipped with a microscope for a study of yeast and detection of its impurities, and, speaking from my knowledge of English breweries, the use of the microscope is a very important item of training for brewers there. I cannot say the same for this country, as certainly, in so far as my knowledge goes, the microscope is not an instrument seen in our breweries. Perhaps if it were more used there would be a better brand, but it gives us bacteriologists a chance to straighten things out.

It took years, however, and the aid of Prof. Tyndall's decisive experiments, to break down the opposition that was brought to uphold the old doctrine of spontaneous generation. Let me give you a translation of Pasteur's own conclusions on this matter "No, there is to-day no known circumstance which permits us to affirm that microscopic beings have come into the world without germs, without parents like unto themselves. Those who hold that they do have been the plaything of illu-

sions, of experiments badly made, tainted with errors which they have not known how to perceive, or which they have not known how to avoid. Spontaneous generation is then a chimera."

These researches marked out Pasteur as a remarkably acute observer with great clearness of mind. His writings are marked for their lucidity of expression, and in the debates produced by them in the French scientific societies Pasteur proved himself a keen controversialist, absolutely fair to his opponents, but demanding of them proofs of their statements, not mere words. "You say much but prove nothing," was his only reply to one opponent who endeavored to drown his demonstrations in a torrent of words.

Pasteur's work on fermentation and putrefaction set many other investigators to work, and amongst these the one to whom surgery owes so much, viz., Lister. Many men had previously pointed out that there was a close resemblance between fermentative processes and infectious disease, and, when Pasteur proved that fermentation depended upon the vital activity of microbes, Lister began to study wound secretions and had no difficulty in detecting numerous bacteria in these discharges. As Pasteur had shown that the microbes of fermentation were present in the air and surroundings of the fermentable material, Lister concluded that these wound bacteria were in like manner derived from the air and surroundings of the patient, and he then set himself the task of preventing the entrance of bacteria, or preventing their development in the wound. We do not employ to-day the exact system Lister devised, as it has been greatly improved upon with our more exact knowledge of the life history of the wound-infecting bacteria, but our present methods are a direct outcome of his. The antiseptic and aseptic system of wound treatment has, with anesthesia, made modern surgery, and proved one of the greatest blessings and boons to suffering mankind. One can only form some adequate idea of the value of Lister's work when it is remembered that the average mortality from the general run of operations ran from twenty to fifty per cent., and from the saying of the French surgeon, Vulpian, "The merest pin prick is an open door to death." Lister always attributed his basic ideas to Pasteur, freely crediting him with the honor, as witness the following extracts from his address at the Pasteur Jubilee in 1892: "Truly there does not exist in the entire world any individual to whom the medical sciences owe more than they do to you. Your researches on fermentation have thrown a powerful beam which has lightened the baleful dark-

ness of surgery, and has transformed the treatment of wounds from a matter of uncertain and too often disastrous empiricism into a scientific art of sure beneficence. Thanks to you, surgery has undergone a complete revolution, which has deprived it of its terrors and has extended almost without limit its efficacious power."

Pasteur's studies on fermentation, begun at Lille, were continued by him on his transfer to Paris in 1857 as Dean of Scientific Studies in the Ecole Normale, which position he held till 1867, when he became Professor of Chemistry at the Sorbonne. In 1865 Pasteur entered upon another phase of work which was destined to be of great practical importance and a stepping-stone to very important discoveries in the causation of infectious diseases in animals and man. At the request of the Government, Pasteur began the study of phebrine, or silk-worm disease, which was completely destroying the silk industry of France, the annual loss running over twenty million francs. Pasteur and his assistants spent nearly five seasons (only the worm hatching seasons could be spent in study of this disease) in the study of the causes and prevention of phebrine and, incidentally, another disease, which occasionally broke out, called flachery. By this time Pasteur, who had very early found the cause, worked out the life history of the parasite and laid down the rules which, when followed, would secure worm broods free from infection. He found that the presence of the parasite was manifest by the development of a peculiar corpuscle in the bodies of the moths, and that the eggs laid by these moths were always more or less infected, depending upon the number of corpuscles in the moths. Pasteur, after the moths had emerged from the cocoons and had mated, placed each female on a piece of linen, where it laid its eggs. The moth was then pinned up in a corner of the same square of linen, where it dried up, and later in the season the dried moth was moistened in a little water, ground up in a mortar, and the paste examined microscopically for corpuscles. If any were found the seed was burnt. The microscopic examination proved a very simple matter, requiring the use of only moderate power lenses, and the method of examination could be learned by any average individual. The success of his system was immediate and earned for him the gratitude of all engaged in the silk industry.

While Pasteur had been honored by many learned societies already, besides receiving the ribbon of the French Legion of Honor, the Government now voted him an annuity of twelve

thousand francs for his services. About this time, in 1868, to be precise, the German University of Bonn gave Pasteur the degree of M.D., *honoris causa*. This was the only medical degree ever possessed by Pasteur, and he did not retain it long, but sent it back, like a true patriot, after the Franco-German war.

In 1877 Pasteur was asked by the Government to take up the study of anthrax or splenic fever. This disease was one of serious moment in many departments of France, destroying from ten to fifty per cent. of the sheep, and often attacking cattle, horses, pigs, and even man at times. Pollender and Davaine, in 1849 and 1850, had detected rods in the blood of sheep dead of anthrax, but had not comprehended the value of their discovery. Davaine again, in 1863, after Pasteur's publications on fermentation, had re-examined sheep dead of anthrax, and now claimed the rods to be the cause of this disease. Pasteur in his investigation rapidly confirmed Davaine's results, and set himself to work to study the life history of the bacterium. He was able to secure cultures of the bacterium and after many generations showed that these cultures were able to transmit the disease. He showed that the bacterium was a spore-bearer, and that the sanious discharges during the illness of the animal, and the bodies of animals, were the source of soil infection, the spores persisting in the soil, the animals being infected by ingesting spores through abrasions of the digestive tract. The prophylaxis of the disease at first looked somewhat hopeless owing to the extensive soil infection, but a little later a discovery made in pursuing a study of a disease of fowls made Pasteur endeavor to provide a vaccine for the disease. Let us consider what this discovery was. In 1879 Pasteur undertook the study of chicken cholera, an acute epidemic fowl disease, and soon detected the causal bacillus, and was able to secure cultures and with them reproduce the disease. In this work (Pasteur at first used only liquid media) some flasks of culture were overlooked and allowed to lie unused for some weeks. Some fowls were inoculated from them, and to Pasteur's surprise these fowls recovered. These fowls were then inoculated with fresh active virus and proved refractory. In his address, when as Dean he opened the Faculty of Science at Lille in 1855, Pasteur made use of the phrase, "Chance only favors the mind which is prepared." Pasteur's mind seized the facts presented by the above experiment. He had prepared a vaccine, or attenuated virus, for chicken cholera, and he hastened to confirm this observation. Could vaccines

be prepared for other diseases? Could they be prepared for anthrax? Pasteur soon found that the age of anthrax cultures did not cause any alteration of their virulence. This he attributed, and rightly so, to their being spore-bearers. Various methods were tried, when it was found that cultures grown at 108.5 deg. F. did not form spores, while the bacillus itself grew. Inoculation of cultures kept at this temperature for some days gave only a slight reaction, and, when this inoculation was repeated, using for the second inoculation cultures grown for a shorter period, it was found that sheep were then quite refractory to inoculation of virulent bacilli or to the natural disease. This discovery was immediately put into use on a large scale and was found to work out perfectly, so that vaccinated flocks were now immune. This system is to-day employed in all anthrax-infected countries, including our own.

Pasteur next turned his attention to rouget, or swine erysipelas, and was soon able to discover its cause and prepare a vaccine against this disease. As one of the rewards for his services in checking the spread of diseases of animals, Pasteur's annuity from the Government was in 1884 increased to twenty-five thousand francs per year.

In 1880 Pasteur's attention began to turn to rabies or hydrophobia in dogs. His first results were unsatisfactory, but in 1883 and 1884, being able to give more attention to the investigation, he discovered that the virus is present particularly in the medulla of rabid animals, but did not yield to his methods of cultivation, nor could he discover anything by microscopic examination. He found, however, that he could transfer the disease by inoculation of animals with the saliva, but more certainly with the medulla of a rabid animal, and that inoculation with the latter under the dura mater was almost always successful. As Pasteur himself put it, "Since this unknown being is living we must cultivate it; failing an artificial medium we will use the brain of living animals." By inoculating the fresh medulla under the dura of rabbits and passing from rabbit to rabbit, the activity of the virus increased till the rabbits invariably died on the seventh day, thus Pasteur secured his fixed or strong virus. He also found that on drying the cord in a sterile cool atmosphere over caustic potash the virus in such cords gradually weakened, so that cords dried for fourteen days no longer give rise to disease when inoculated. This, you will see, is somewhat along the same lines as the attenuation of the cultures of chicken cholera by keeping the culture. Pasteur then tried the effects of repeatedly inoculating dogs

with medulla, beginning with cords dried fourteen days, and day by day using cords dried one day less, till finally the fresh active medulla was used. The dogs then proved refractory even to subdural inoculation or to bites by known rabid animals. Pasteur had conquered this disease in so far as rendering animals refractory, but rabies is a rather uncommon disease, and it would be out of the question to attempt to stamp out rabies by immunizing all animals. Pasteur's next step was to find if he could, after an animal was bitten, render it refractory to the disease, just as when one is exposed to smallpox one gets at once (or should get) vaccinated to prevent the development of the true smallpox. Pasteur found that this method succeeded in protecting such animals from becoming rabid when inoculations were started shortly after the bite. The next step was of course inevitable; would this method succeed in protecting the human subject when bitten. Pasteur soon had an opportunity to put the matter to the test, for early in 1885, almost before his experiments on the protection of dogs were complete, a young Alsatian boy, badly bitten, was brought to him with a request that he do what he could. After consultation with some medical colleagues, and with their approval, Pasteur, with much concern, undertook the task and gave the boy the inoculations; rabies did not develop. Some months after another patient came to him, of his own free will, who had been bitten five days previously. This patient also received the inoculations and remained free from the disease. Thus was firmly established in human medicine the first instance where along purely experimental lines a vaccine was worked out for a disease, and this as a discovery must take equal rank at least to Jenner's discovery of vaccination against the smallpox.

One can note the orderly sequence of Pasteur's work here, building up a good foundation and thereon rearing a superstructure perfect, because experimentally tested in all its parts. As Woodhead so well remarks, "He grudged no labor, spared no time nor energy in filling in the gaps in each stage of the work as he advanced, and never took a step forward till he was perfectly certain of the solidity of the ground on which he rested. This it is that makes his work so reliable and assures to it a permanence that can be hoped for the work of but few."

The immediate outcome of the rabies work of Pasteur, in so far as he was personally concerned, was the organization of a service for the prophylactic treatment of those bitten by rabid animals, and to this Pasteur and his assistants devoted their energy for some years. As an immediate outcome, too, there

was instituted a public, in fact, international, subscription for the erection of an institute for rabies and for infectious diseases generally of man and animals. Over two and one-half million francs were subscribed, and in 1888 this institute, known as the "Pasteur Institute," was opened with much eclat. Pasteur was now sixty-six years of age, and in his address at the opening of the Institute makes this a matter of regret. "Alas, mine is the bitter grief that I enter it, a man vanquished by time, deprived of my masters and even my companions in the struggle." But Pasteur knew that he was building not for the present alone but for the future, and his pupils have indeed increased their master's and their own fame. Let me but mention Duclaux, Roux, Metchnikoff, Yersin, Haffkine, Calmette, Widal, Chantemesse and Nocard as names known in all countries to students of scientific medicine.

While Pasteur's own active labors were over he still took an active interest in the work of the Institute, and had the pleasure of seeing the assured success of his treatment of hydrophobia, together with the wonderful growth of institutes of bacteriological research the world over, more especially those of Germany, where the elaboration of technical details alone have marvelously advanced bacteriological science. In 1892, in his seventieth year, there was organized an international Pasteur Jubilee, at which Lister was the main British representative, and indeed shared with Pasteur the honors of the occasion. Let me extract a few more sentences from Lister's address on this occasion, as expressive of the debt medicine owes to Pasteur: "Medicine is not less indebted than surgery to your profound and philosophic studies. You have raised the veil of mystery which had throughout the foregoing centuries covered infectious diseases. You discovered and demonstrated their microbic nature. Thanks to your initiative, and in many cases to your own special labors, there is already a host of these pernicious diseases with the causes of which we are perfectly acquainted. 'Felix qui potuit rerum cognoscere causas.' This knowledge has in an astonishing degree perfected the diagnosis of these scourges of the human race, and has indicated the path which must be followed in their prophylactic and curative treatment. In this path your beautiful discoveries as to the attenuation and intensification of viruses and preventive inoculations serve, and will always serve, as a guiding star. As a splendid illustration I may mention your researches on rabies. Their originality in the province of pathology as well as in that of therapeutics was so striking that at first many medical men

felt some distrust. As for myself, I was too well acquainted with the clearness of your genius, the scrupulous caution of your inductions, and your absolute integrity, to share for a moment these ignoble sentiments. My confidence has been justified by the event. With the insignificant exception of a handful of ignorant persons, the whole world now recognizes the greatness of what you have achieved against that terrible disease. You have supplied a means of diagnosis which surely dispels the anguish of uncertainty which formerly haunted any one who had been bitten by a healthy dog suspected of being rabid. That alone would have been enough to assure the everlasting gratitude of mankind. But by your wonderful system of antirabic inoculations you have been able to pursue the poison after its entrance into the body and to conquer it there. Monsieur Pasteur, infectious diseases constitute, as you are aware, the great majority of the diseases which afflict the human race. You can, therefore, have no difficulty in understanding why medicine and surgery hasten on this occasion to lay at your feet the deep homage of their admiration and their gratitude."

Pasteur was not fated to live to see the more recent advances in bacteriology, such as the study and use of toxins and antitoxins, and the work that has grown out of them. While much of the credit of these was due to the German school, especially Koch and Behring, yet the pupils of Pasteur have not been backward, as witness Roux's work on the antitoxins, especially diphtheria, Haffkine's work on cholera and the plague, Roux and Yersin's work on plague and plague antitoxin, Widal's work on typhoid, Calmette's work on snake venoms, Metchnikoff on the defensive action of the body cells, especially the leucocytes, also on syphilis, Nocard on pleuro-pneumonia and other diseases of animals, Duclaux on milk, cheese, etc.

Pasteur for the last two or three years of his life suffered from attacks of uremia, and in one of these he passed away, surrounded by his family and his assistants of the Pasteur Institute. He died on September 28th, 1895, in his seventy-third year. His funeral was a public one, and attended by the President of the Republic as a mark of respect of the nation to a man whose genius had done so much for France and for humanity. His work will last as long as the history of medicine, and time will but make his achievements shine with a more brilliant lustre. As Renan has so eloquently said, in summing up his achievements, "His scientific life is like a luminous trail in the great night of the infinitely little, in those ultimate abysses of being where life is born."

SUPPURATIVE BASILAR MENINGITIS FOLLOWING CHRONIC OTITIS MEDIA.

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This case is presented as it will serve to again remind us that many conditions which strongly simulate hystēria have a definite pathological basis, and may terminate rapidly in a fatal result. Though this knowledge may not favorably influence treatment, it will at least lead to a more cautious prognosis and a more careful sifting of the history and possibly a more determined attempt to secure a complete examination of the patient.

The patient was a female, unmarried, and forty years of age. She was fairly well nourished, and of so-called nervous temperament.

For some years past the patient has suffered from severe headaches, in spite of treatment by physicians and powders advised by friends.

Though the headache has been general, at times, it was more definite in its origin and severity over the right auricular and mastoid region.

There has been during the past fourteen months a marked decline in health, with an increased pallor of countenance.

A cough of a persistent character has been a feature of the patient's history. It was irritative in type and failed to respond to either expectorant or sedative mixtures. On an examination of the throat by a specialist it was advised to remove the tonsils. This was done, with no favorable result on the cough. The cough was, therefore, regarded by her physician to be of so-called nervous origin, and especially as it was absent during a visit to the country.

During the last few months the headache and accompanying ear-ache became intolerable, and greatly impaired the patient's condition. On the Friday and Monday preceding Christmas the patient complained of feeling very poorly, and her appearance, too, indicated it. On Tuesday, Christmas Day, the health was poor in the early part of day, but improved towards evening. The following morning the patient was found in a semi-conscious state and medical aid was sought. The pulse was rapid, full and tumultuous, the temperature elevated to 100.2 deg. The condition was one of extreme restlessness, tossing

from side to side of the bed. The patient would lie with the face partly buried in the clothes and the arms raised above the head.

The answers to questions were obtained with difficulty and the replies were meagre and brief. Only leading questions were answered and only these, too, which could be answered by a negative or affirmative.

The whole attitude and conduct were indicative of hysteria. The conditions increased in the presence of sympathetic spectators. At those times that the patient tried to throw herself from the bed it was always on that side on which the attendants stood.

There were only two conditions which pointed to a possible pathological cause. Vomiting occurred in the morning, and again in the afternoon, and a ptosis of the right eye was observed at one time, but was transient. It was impossible to make a more detailed examination, as the patient resisted such attempts as she turned and tossed from one position to another. The face throughout was everted, and made any observation of pupils impossible.

At seven o'clock in the evening the condition was alarming to the friends and aid was summoned. The pulse increased rapidly from its rate of 100 at 8 o'clock to 110 beats. In a half hour the rate was 120; later 130; in an hour, 145, and finally 160. There was much respiratory activity; the rate at times was 60 and harsh in nature. Later the breathing was quieter and less frequent in rate. This did not follow the Cheyne-Stokes type, as it lacked the rhythmic quality attributed to that breathing. The conduct of the patient was entirely suggestive of hysteria, and described by older practitioners as "tantrums."

Though the observation of the patient indicated a functional disturbance, a review of the history, together with vomiting and ptosis, supplied a group of facts which pointed to a more alarming state, probably a cerebral complication following an ear disease. This opinion was confirmed by an autopsy.

It will sufficiently elucidate the case to state at this time that the meningitis resulted from an extension of a chronic otitis media through the tegmen tympani and arcuate eminence to the cerebral meninges, and that the agent was the pneumococcus.

The questions excited by an experience of this kind are: 1st, What symptom or group of symptoms may be depended upon to reveal the grave character of those cases? 2nd, What cerebral or intra-cranial complications may be expected to follow

a middle ear trouble? 3rd, What is the causative agent, and how may the symptoms produced by it be distinguished from those following the action of other bacteria? 4th, What treatment should be instituted to prevent such intra-cranial involvements?

It is impossible in a few minutes to do more than indicate the answers to these questions. On the other hand, it would be quite meaningless to recite such phenomena without trying to appreciate the lesson they should teach and grasp the principles underlying their production.

That trinity of cardinal symptoms, headache, projectile vomiting and optic neuritis, in many cases may be quite useless. The vomiting and headache are common to many states, and frequently it is not possible to determine the presence of optic neuritis, and in rapid cases it may not exist. The eye symptoms are suggestive. The paralysis of the oculo motor is more frequent and more easily recognized. The internal convergence, too, is present, but not always clearly marked.

Dr. Allen Starr, of New York, has called attention to what may be regarded as not only an important but most useful means of distinguishing a meningitis from a cerebral abscess. When a lumbar puncture is made the germ causing the inflammation, whether diplococcus or tubercle bacillus, is found present in the fluid of meningitis, but these germs are not found in the fluid if the disturbance is due to a cerebral abscess.

Again, it is altogether reliable that a leucocytosis is not present in the case of an abscess unless accompanied by a meningitis. It may be somewhat aside the question to refer to the value of the cerebellar seizure in cerebellar disease. This group of symptoms to which attention has been asked by Dana consists of sudden, unexpected attacks of extreme vertigo, roaring in the head, relaxation of limbs and falling to the ground in semi-conscious state, and sometimes accompanied by temporary blindness and tonic spasms. Especially is this true of tumors in angle between cerebellum pons and medulla.

The complications of middle ear disease are: (a) Cerebral abscess, (b) suppurative meningitis, and (c) infective thrombosis of the lateral sinus (infective sigmoiditis).

The three most common agents are the pneumococcus, streptococcus and the tubercle bacillus. The pneumococcus appears to be the one most frequently present.

The "diplococcus intra cellularis meningitidis" forms a class by itself with certain symptoms.

A comparison of the symptoms produced by these agents

shows that the presence of the pneumococcus is marked by the "absence or slight development of symptoms which point to extensive infection of the meninges of the cord and spinal roots and extension along the cranial nerves."

When one remembers that fifty per cent. of the meningeal disorders are the result of secondary infection, it seems incumbent upon us to anticipate such direful terminations by a removal or drainage of the infected area.

The number of recoveries from operation of cerebral abscesses of otitic origin varies from fifty to fifty-five per cent., according to Kocher and Oppenheim.

Berg divides the symptoms of meningitis into three classes:

1. Those produced by the poison of the disease, chills, convulsions, fever, vomiting, nasal catarrh, constipation, etc.

2. Those produced by infection of cord, stiffness of neck, ophisthotnos, pain along spine, hemiplegia, difficulty of micturition, incontinence of urine and feces.

3. Symptoms produced by influence of the brain, headache, slow pulse, hydrocephalic cry, vertigo, convulsions, delirium, stupor, coma, Cheyne-Stokes; eye symptoms, ptosis, strabismus internal infusion of the eye, conjunctivitis, etc.

It is more particularly to the repeated experiences of a simulation of intra-cranial disease to hysteria that our attention is drawn. So frequent and striking has been the identity of cerebral lesions and so-called functional disturbances, as hysteria, that one is constrained to ask whether there may not be a pathological basis for hysteria which our present clinical and microscopic examinations are unable to discover.

The *Lancet* reports the case of a cerebral embolus following pneumonia in which the diagnosis ante mortem was hysteria. Another case of cerebral hemorrhage presented such symptoms that it was considered to be an instance of hysteria.

Several other cases in the practice of local physicians were in their manifestations hysterical, but subsequently were discovered to be of intra-cranial origin.

May not the future show more definitely the relation between the functional and cerebral disturbances mentioned and lead to a readjustment of our views of hysteria and allied disorders?

THE DIAGNOSIS OF CARCINOMA OF THE PYLORUS.

BY GRAHAM CHAMBERS, TORONTO.

The symptomatology of pyloric cancer varies materially with the development of the disease. This variation is principally due to the increasing toxemia and to the fact that in the earlier stages of the disease the motor function of the stomach is normal or only slightly disturbed, whereas in the later stages motor insufficiency is generally present. In the consideration of the diagnosis of pyloric cancer it is, therefore, well to discuss separately the symptomatology of these two periods.

THE DIAGNOSIS OF PYLORIC CANCER IN THE EARLIER STAGES.

In the earlier stages of cancer of the pylorus there are frequently few subjective symptoms. The patient may complain of a feeling of fulness in the epigastrium after eating, belching, loss of appetite and other symptoms such as occur in mild derangements of the stomach; but none of these should suggest any disease except probably gastritis. The condition of the appetite is probably the most important of these early subjective symptoms, as according to my experience there is frequently a progressive loss of appetite from the beginning of the disease, except in cases following affections of the stomach characterized by excessive secretion, such as ulcer and hypersthenic gastritis. The general appearance of the patient may not give any aid in diagnosis. The apparent nutrition may be good, due, no doubt, to the fact that although there is loss of appetite the patient continues to eat sufficient to prevent diminution in weight. In some cases there is impaired nutrition (loss in weight, etc.) early in the course of the disease, and it is this complaint or loss of appetite that frequently leads the patient to seek medical advice. In many cases, however, very little attention is given to these earlier complaints, and medical aid is not sought until symptoms of motor insufficiency of the stomach appear. The loss in weight is an important symptom, especially if progressive. When it is present, associated with symptoms of indigestion, in a middle-aged or old person one should always think of cancer of the stomach as a possible cause.

Physical examination of the abdomen seldom gives any aid in the diagnosis. As a rule no tumor is palpable; no peristaltic waves are visible. The stomach is not markedly dilated, at least as the result of the growth in the pylorus.

The examination of the gastric functions may give better information. The motor function may be normal or slightly diminished. The secretory function is usually decreased to the extent that free hydrochloric acid is absent, with the exception of cases following gastric affections with glandular hypertrophy, such as chronic ulcer and hypersthenic gastritis, there is, I believe, a gradual diminution of secretion of hydrochloric acid. Now it should be remembered that the hydrochloric acid of the normal gastric contents exists in two forms, free and combined with proteid. The latter forms the larger amount, sometimes three times the former. It does not take long, therefore, for a progressive diminution of secretion to cause the disappearance of free hydrochloric acid.

This opinion with regard to the value of diminished secretion of hydrochloric acid as a sign of carcinoma of the stomach is largely formed from the study of the results of my analyses of gastric contents during the last eight years. During this period I have examined about one hundred gastric contents of cases of gastric cancer and in all free hydrochloric acid was absent, with the exception of seven or eight cases. In these the cancer was engrafted on a chronic ulcer or followed hypersthenic gastritis.

There is another sign which, when associated with absence of free hydrochloric acid, loss in weight, etc., is valuable. I refer to the inability of the physician to give relief in many cases. Now, in most benign affections of the stomach one can generally affect a cure or at least greatly ameliorate the complaints. There is no doubt that in some cases of carcinoma of the stomach careful dieting, the exhibition of stomachics, such as condurango, etc., produce marked, though temporary, improvement in the condition of the patient. But the intermission is not for long. The symptoms soon reappear, usually with increased severity.

THE DIAGNOSIS OF PYLORIC CANCER IN STAGES IN WHICH MARKED SYMPTOMS OF MOTOR INSUFFICIENCY OF THE STOMACH ARE PRESENT.

Cancer of the pylorus does not exist long before marked symptoms of motor insufficiency of the stomach appear. The food begins to stagnate in the stomach. Fermentation results and manifests itself by fulness and pressure in the region of the stomach. Nausea and vomiting are soon added to the disease picture. The vomiting usually occurs in the evening, and the vomitus gives evidence of stagnation and retention of food. It

may recur daily, or every few days. At this stage the patient is reduced in weight and complains of muscular weakness. The skin feels dry and usually looks anemic and frequently cachectic. This complex of symptoms is common in pyloric cancer; but it may be observed in any affection characterized by motor insufficiency of the stomach. The following are diseases in which this disease picture may occur:

1. Gastroptosis.
2. Gastrectasis.
3. Ulcer of the stomach.
4. Pyloric obstruction due to adhesion, hypertrophy of the sphincter pylori, or cicatricial contraction.
5. Duodenal obstruction.
6. Jejunal obstruction.

These affections must be differentiated from pyloric cancer. In pursuing the study of a case we must look for other evidence. Unfortunately there is no known pathognomonic sign of pyloric cancer which can be made use of by a physician, except possibly the microscopical examination of a particle of the growth very rarely removed by a stomach tube. However, by studying the symptoms as a whole one can usually determine the nature of the disease.

The physical examination of the abdomen gives valuable information. A tumor is frequently palpable, due, no doubt, to the movability of the normal pylorus and to the fact that the stomach is generally displaced somewhat downward in pyloric obstruction. In some cases the tumor is situated behind the liver and inaccessible to physical examination. In others a rigid right rectus abdominis acts as a barrier to palpation. In these latter cases it is a good plan to teach the patient to relax his recti by drawing up his legs and compressing his abdominal wall with his hand. The tumor of pyloric cancer is usually very hard and frequently nodulated. It generally moves with deep breathing. Occasionally it is very movable. In a case recently under my care it could be pushed down and to the right almost as far as McBurney's point. When pyloric cancer is distinctly movable, tumor of the head of the pancreas or of the duodenum may be excluded. In some cases of pyloric cancer the gastric contents can be felt passing through the constricted orifice. This is important sign, as it shows that the tumor belongs to the stomach. Further proof may be obtained by distending the stomach to different degrees and noting the relation of the tumor to the distended viscus.

Other signs which can be made out by physical examination

of the abdomen are the determination of the positions of the curvatures, the size of the stomach and the presence or absence of visible peristalsis. Slight degree of gastropnoxis is very common in pyloric cancer. Ectasy of the stomach, in lesser or greater degree, is always present. Visible peristalsis, when present, is a valuable sign. It is more likely to occur in benign than in malignant pyloric obstruction, and may also be present in duodenal and jejunal (upper part) stenosis. It is also occasionally present in gastropnoxis, due to kinking of the duodenum. It is probably never present in gastrectasis (atonic dilatation).

The examination of the vomitus and gastric contents after a test-meal frequently gives important information. In some cases hematin (coffee ground) is present, but this may be observed in any gastric affection in which small hemorrhages occur. Free hydrochloric acid is absent in over ninety per cent. of cases. When cancer of the stomach is well advanced I believe free hydrochloric acid is absent except in cases of cancer engrafted on an ulcer or following severe hypersthenic gastritis. Moreover, the combined hydrochloric and the gastric ferments are greatly diminished. When the secretions of the stomach are markedly diminished and free hydrochloric is absent, and at the same time there is retention of food, lactic acid fermentation invariably occurs, and there is generally a profuse growth of the Oppler-Boas bacillus. These three signs, absence of free hydrochloric acid, presence of considerable lactic acid and a profuse growth of Oppler-Boas bacillus, usually indicate the presence of pyloric cancer.

When cancer becomes engrafted on an ulcer or follows hypersthenic gastritis, analysis of gastric contents frequently shows normal or excessive secretion of hydrochloric acid. There is no material change in the gastric contents with the development of the cancer, and consequently there is greater difficulty in making a diagnosis. We must remember that hypersthenic gastritis is very apt to be complicated by ulcer; that the common seat of ulcer is the pyloric region, the same as in cancer; that chronic ulceration of the pylorus frequently produces stricture and spasm of the orifice, and much thickening. The physical and functional signs of cancer and of chronic ulcer may, therefore be alike. The nutritional and blood changes may be different, but these are never sufficiently definite to differentiate the diseases. In these cases one should try the effect of a most rigid treatment of ulcer, and if this fail, which is usually the result in chronic ulceration of the pylorus, the case should be

immediately transferred to a surgeon, lest the ulcer degenerate into a cancer.

In my practice these cases of cancer following ulcer have been far from rare.

The disease-picture is something like the following:

The patient, usually between thirty-five and sixty years of age, gives a history of chronic indigestion of several years' standing. At the commencement the distress was most intense one or two hours after eating, and was ameliorated or relieved by taking baking soda or food. This was the stage of hypersthenic gastritis. After a time symptoms of ulceration appeared. The pain became more intense and frequently appeared in a few minutes after eating. Vomiting became a common symptom. Occasionally the patient vomited blood. These symptoms gradually became worse. The ingestion of baking soda no longer gave relief. The patient became weak and emaciated. If the abdomen is examined at this stage a tumor may be palpated in the region of the stomach. The stomach is usually dilated. Visible peristalsis may be present.

These complex of symptoms may be manifestations of either cancer or chronic ulcer, and laparotomy is the only method of determining which is present.

THE DIFFERENTIAL DIAGNOSIS OF PYLORIC CANCER.

In the differential diagnosis of pyloric cancer one must exclude the diseases mentioned above, which cause motor insufficiency of the stomach.

Gastroptosis, particularly the fish-hook type, may be characterized by symptoms similar to those of pyloric cancer. In this displacement the lesser and greater curvatures of the stomach are much lower in the abdomen than normal, while the pylorus is frequently in about the usual position. As the result the outlet of the stomach is directed almost vertically. The first part of the duodenum makes an acute angle with the second. This causes obstruction, and gives rise to symptoms very similar to those of obstruction of the pylorus. The patients are weak, pale and emaciated. Vomiting is common. Examination of abdomen frequently reveals the presence of visible peristalsis. The head of the pancreas may be palpable and may be mistaken for pyloric tumor. Further examination should, however, give a clue to the diagnosis. In gastroptosis the abdominal wall is frequently flabby. The right kidney is, as a rule, movable. The position of the stomach may be readily determined. In the majority of cases analysis of the gastric contents shows the

presence of free hydrochloric acid. But the most important of all the signs is the rapid improvement of the case under correct treatment. When, in cases of gastroptosis, there is no free hydrochloric acid in the gastric contents one should not hastily exclude cancer of the stomach, as downward displacement of the stomach is frequently associated with pyloric cancer.

Gastrectasis (atonic dilatation) is, as a rule, easily distinguished from pyloric cancer. There is frequently a history of long suffering. Water, as well as solid food, stagnates in the stomach. Free hydrochloric acid is usually present in the gastric contents. No tumor can be made out. Visible peristalsis is absent. Lavage and careful dieting improves the condition.

Chronic ulcer of the stomach is very difficult to distinguish from cancer engrafted on the base of an ulcer. When the nutrition is good it is usually ulcer which is present. This subject is discussed above in the paragraph on analysis of gastric contents. In cancer of the pylorus not preceded by ulcer or hypersthenic gastritis there is invariably absence of free hydrochloric acid in the gastric contents, whereas in chronic ulcer, especially in the form which occurs between thirty and sixty years of age, there is generally free hydrochloric acid and frequently excessive acidity of the gastric contents.

The symptoms of benign stenosis of the pylorus are very similar to those of malignant, and consist of vomiting, loss of weight, anemia, dry skin, thirst, etc. There is ectasy of the stomach, and visible peristalsis is frequently observed. The analysis of gastric contents shows the presence of free hydrochloric in most of the cases. This is a most important sign, as in about ninety per cent. of cases of pyloric cancer there is absence of hydrochloric acid. It is only in the cases following ulcer and hypersthenic gastritis that great difficulty arises in the diagnosis.

Duodenal and jejunal obstruction are usually caused by cancer. The symptoms of the former vary to a considerable extent with the position of the stricture. When the growth is situated above the papilla of Vater the disease picture is very similar to that of pyloric obstruction. The fact that the tumor of duodenum is fixed might be of value in determining the correct diagnosis. Cancer of the papilla of Vater invariably causes jaundice. This sign, together with symptoms of motor insufficiency of the stomach, etc., should suggest the probable cause and seat of the disease. When the obstruction is below the papilla of Vater, either in the duodenum or upper part of jejunum, there is, in addition to symptoms of motor insufficiency of the stomach, vomiting of bile.

Proceedings of Societies.

CANADIAN MEDICAL ASSOCIATION, MONTREAL, SEPTEMBER 11th, 12th, 13th, 1907.

WORKING COMMITTEES.

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Physician's Library.

W. B. Saunders Company, of Philadelphia and London, have just issued a revision of their handsome illustrated catalogue of medical, surgical, and scientific publications. Beyond question this is the most elaborate and useful catalogue we have ever seen. The descriptions of the books are so full, the specimen illustrations are so representative of the pictorial feature of the books from which they are taken, and the mechanical get-up so entirely in keeping with the high order of the context. The authors listed are all men of recognized eminence in every branch and specialty of medical science. The catalogue is well worth having, and we understand a copy will be sent free upon request.

Timeliness of interest, aside from any other condition, lends especial importance to the announcement of the early publication of "Foods and Their Adulterations," by Harvey W. Wiley, M.D., to be immediately followed by a companion volume, "Beverages and Their Adulterations." Dr. Wiley is Chief Chemist to the United States Department of Agriculture at Washington, and his wide researches in the interests of purity in food commodities give anything that he might write on the subject an authoritativeness that is unquestioned. The fact that the new National Food and Drugs Law became effective after January 1st, and that public interest in it is now at white heat, will no doubt result in quite a demand for both volumes. Publishers: P. Blakiston's Son & Co., Philadelphia.

Canadian Almanac.

This is the jubilee year of the Canadian Almanac, a miscellaneous directory for the year 1907. It contains full and authentic commercial, statistical, astronomical, departmental, ecclesiastical, educational, financial, and general information. It is edited by Arnold W. Thomas, and is published by the Copp, Clark Company, Limited, Toronto, of whom copies may be obtained for 50 cents. The Canadian Almanac is one of the most valuable productions issuing annually from the Canadian press.

The Doctor's Recreation Series. Vol. IV. A Book about Doctors. The Saalfeld Publishing Company, Akron, Ohio.

The contents of this volume are twenty-seven chapters devoted to various subjects interesting to medical men, and all of unusual interest. There are four illustrations: Prof. Billroth's Surgical Clinic, The Founders of the Medical Society of London, An Accident, and The Anatomist. It is a good volume in the series.

A. *Manual of Normal Histology and Organography.* By CHARLES HILL, PH.D., M.D., Assitant Professor of Histology and Embryology, Northwestern University Medical School, Chicago. 12mo volume of 463 pages, with 312 illustrations. Philadelphia and London: W. B. Saunders Company. 1906. Canadian agents: J. A. Carveth & Co., Toronto, Ont. Flexible leather, \$2.00 net.

Written in the interests of primary students, this admirable book contains the fundamental facts in histology succinctly and clearly set forth. It is nicely illustrated, of the best type, and the 2,000 medical students in Canada before whom this journal is placed regularly may take our recommendation that it will fully meet their requirements in this particular study of medicine.

Atlas and Text-Book of Human Anatomy. Volume II. By PROFESSOR J. SOBOTTA, of Wurzburg. Edited, with additions, by J. PLAYFAIR McMURRICH, A.M., PH.D., Professor of Anatomy at the University of Michigan, Ann Arbor. Quarto volume of 194 pages, containing 214 illustrations, mostly all in colors. Philadelphia and London: W. B. Saunders Company. 1906. Canadian agents: J. A. Carveth & Co., Toronto, Ont. Cloth, \$6.00 net; half morocco, \$7.00 net.

Volume II. of this work has more than fulfilled the great promise of Volume I. We are highly pleased with it. Essentially a beautifully illustrated work on anatomy, no medical library will be complete without it. No doctor in practice, no surgeon in practice, will lose anything by getting these two books right away. The illustrations are remarkable in their exactness, as they are striking in their artistic effects. The text is short, crisp, clear, precise, sufficient for general work.

A Manual of Pathology. By GUTHRIE McCONNELL, M.D., Pathologist to the St. Louis Skin and Cancer Hospital and to St. Luke's Hospital, St. Louis, Missouri. 12mo of 523 pages, illustrated. Philadelphia and London: W. B. Saunders Company. 1906. Canadian agents: J. A. Carveth & Co., Toronto, Ont. Flexible leather, \$2.50 net.

Brevity yet clearness is the essential feature of this neat, leather-bound, profusely and aptly illustrated book. The final student will find this book a splendid acquisition in getting a quick grasp of the subject of pathology, as well as a good reviewer just prior to examination time.

Woman. A Treatise on the Normal and Pathological Emotions of Feminine Love. By BERNARD S. TALMEY, M.D., Gynecologist to the Metropolitan Hospital and Dispensary, New York. For Physicians and Students of Medicine. With twenty-two drawings in the text. New York: The Stanley Press Corporation, Publishers.

There is certainly a great deal of knowledge in this book that teachers do never think of imparting to their students. Hence the reason for its publication. Indeed the author must have read widely and observed closely to produce it. There are some things, however, better spoken than written. Some of these might have with good propriety been omitted. It is all right to teach practitioners some things, but it would be immature to do the same by medical students. Therefore, while practitioners may gain something from this book, we would flatly refuse to recommend it to medical students. It is assuredly a book to be kept out of the hands of the laity.

A Text-Book of Pathology. By ALFRED STENGEL, M.D., Professor of Clinical Medicine in the University of Pennsylvania. Fifth revised edition. Octavo of 977 pages, with 399 text-illustrations, many in colors, and 7 full-page colored plates. Philadelphia and London: W. B. Saunders Company. 1906. Canadian agents: J. A. Carveth & Co., Toronto, Ont. Cloth, 5.00 net; half morocco, \$6.00 net.

A large part of the sections of this book dealing with general pathology has been thoroughly revised, especially the chapters on inflammation, immunity and animal parasites, which have also been augmented. It is a work of nearly 1,000 pages, and is an admirable text-book for both students and practitioners.

Plaster of Paris and How to Use It. By MARTIN W. WARE, M.D., Adjunct Attending Surgeon, Mount Sinai Hospital; Surgeon to the Good Samaritan Dispensary; Instructor in Surgery, N. Y. Post-Graduate Medical School. 12mo, 72 illustrations, about 100 pages. New York: Surgery Publishing Co., 92 William Street. Cloth, \$1.00.

This is one of the most useful books ever presented, not only on account of the general demand for the information and instructions upon the subject which this book so explicitly, practically and comprehensively covers, but because this knowledge was not previously available except from such a vast experience as enjoyed by Dr. Ware, or, in part, by reference to many books on allied subjects.

It is a vivid narrative, profusely illustrated, of the many uses to which plaster of Paris is adaptable in surgery. The whole subject, from the making of the bandage to its use as a support in every form of splint, corset or dressing, is graphically described and illustrated. The use of plaster of Paris in dental surgery is also covered. The book is presented in the artistic manner characteristic of the productions of the Surgery Publishing Company. It is printed upon coated book paper and attractively bound in heavy red buckrum, stamped in white leaf and gold.

The Practitioner's Medical Dictionary. An Illustrated Dictionary of Medicine and Allied Subjects, Including all the Words and Phrases Generally used in Medicine, with Their Proper Pronunciation, Derivation, and Definition. By GEORGE M. GOULD, A.M., M.D., author of "An Illustrated Dictionary of Medicine, Biology, and Allied Sciences," "The Student's Medical Dictionary," "30,000 Medical Words Pronounced and Defined," "Biographic Clinics," "The Meaning and Method of Life," "Borderland Studies," etc.; editor of "American Medicine." With 388 illustrations. Octavo, xvi. + 1,043 pages. Flexible leather, gilt edges, rounded corners, \$5.00; with thumb index, \$6.00, net. Philadelphia: P. Blakiston's Son & Co., publishers, 1012 Walnut Street.

This book is in every respect and detail new. Its object is to supply the practitioner with trustworthy, modern definitions of essential medical words and terms. It is based on recent medical literature. It contains, among other new features, the terms

of the Basle Anatomical Nomenclature (BNA). The standards of pharmaceutical preparations as authorized by the eighth decennial revision of the United States Pharmacopeia are given. Tables of signs and abbreviations used in general medicine and the specialties, and of the English and metric systems of weights and measures are introduced. It has been made up in a form most suitable for ready reference, complete in text and illustration, and attractive in appearance. Printed on tough, thin paper, excessive weight and bulk is eliminated, while the dull surface of the paper, together with the employment of new, clear type, facilitate ease and comfort in reading. The book will lie perfectly flat at any page to which it may be opened.

That, before the issuance of this special work, over 200,000 copies of Dr. Gould's other medical dictionaries had been sold, is sufficient attest that this work is worthy the most earnest consideration of every active practitioner.

International Clinics. Vol. IV. Sixteenth Series.

The colored plates, the plates and the figures, of which there are many in this volume, which closes the series for 1906, are fine and artistic. They are exceptionally good. The volume comprises 322 pages in all. The first article is on electrotherapeutics, which alone, in a separate volume, would readily command the price of the entire volume. It is a very clear and practical article. There is another good article on the treatment of hemorrhoids, a better one on the principles of treatment of fractures of the lower extremity, and, the best of all, one on placenta previa and its treatment. The selection of these four for special mention casts no reflection on the others, which are all good and thoroughly modern. We understand that these quarterly volumes will be issued a little earlier than heretofore. Reader, if you want something absolutely good and progressive in medicine, subscribe for "International Clinics" without delay.

The Canadian Medical Protective Association

ORGANIZED AT WINNIPEG, 1901

Under the Auspices of the Canadian Medical Association

THE objects of this Association are to unite the profession of the Dominion for mutual help and protection against unjust, improper or harassing cases of malpractice brought against a member who is not guilty of wrong-doing, and who frequently suffers owing to want of assistance at the right time; and rather than submit to exposure in the courts, and thus gain unenviable notoriety, he is forced to endure black-mailing.

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And Ontario Medical Journal

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COMMENT FROM MONTH TO MONTH.

The Ontario Medical Association will meet in **Toronto** a little earlier than usual this year, namely, on the 28th, 29th and 30th of May. We have emphasized Toronto for two reasons. The first is that it may be known where the meeting is to be held; the second is in order to once more call the attention of the active members that it is a mistake to try to make Toronto the perpetual home of the Association. In the councils of the Association each year Toronto is selected principally because a majority of those who attend are from the city, and because year by year it appears that the attendance falls from the outside points. It will quickly be rejoined in support of always meeting in Toronto, that outside points have been tried. True, a few have been tried in the past, but because the attendance did not loom as large as at Toronto, back the meetings came to this city. Change of scene and travel would be a good prescription for the Ontario Medical Association.

The Formation of Medical Associations is a healthy sign. One has recently been organized in the Ottawa valley; another in Oxford County; another at Goderich. Those that have been formed for years are no longer languishing; they have been revived. This augurs well for the national association. It should be of untold advantage to the provincial societies. Union in this way will greatly benefit the profession in every community. There are many good reasons why the medical profession should be a united body. Far too long has it been individualized. Too often have doctors been indifferent friends in small and even large places. Union need necessarily not mean "trade-unionism," with the associated thought of strikes; although trade-unionism to better the lot of the rank and file of the profession has the powerful sanction and advocacy of Sir Victor Horsley. Doctors should not falsely pose before the public that they prefer honor and gratitude to money and pay for their service. A united profession does not call for a profession less charitable to the poor. There are other professions and trades and callings which do a great deal for the poor as well as the doctors. Every calling should unite to sidetrack dead beats. It is the people who will not pay when they can pay that should be shunted. Apparently Sir Victor, from his address before the Medical Library of the Sheffield University, believes that the time is come when medicine should be stripped of all foolish chivalry and romanticism.

The Osteopaths of Ontario are getting Ambitious. They are going to apply to the Ontario Legislature to be incorporated in the Ontario College of Physicians and Surgeons, almost precisely on the same footing as are the Homeopaths. They want to practice their massage by Act of Parliament. No one can make any objection to an exponent of osteopathy entering the profession of medicine by the regular path which leads to practice, which we have all trod but one in this province. If the thin end of the wedge of quackery ever enters the profession of medicine in Ontario, we may expect it to cleave a cleft into which will pour a voluminous stream of charlatanism. The

Medical Council must be watchful and active. The Ontario Medical Association must take an active moral part. In fact, all the medical societies in the province and the entire medical profession must be diligent in fighting the nefarious principle which would make doctors by Act of Parliament. In this instance a powerful advocate has been engaged to draft the proposed bill for the osteopaths. With all the sanctimony of which he is a past master in displaying when occasion demands it, or even when it does not, he will not hesitate to make Holy Writ responsible for the existence of the osteopath. This body of masseuers has no status and are awfully presumptuous.

The University Magazine, the continuation of the McGill *University Magazine*, is a new periodical, which doctors, as university graduates, will be interested in. It will be distinctly a Canadian production and is to express an educated opinion upon questions concerning Canada. It is proposed to get all the universities in Canada interested in its production. Dr. Andrew Macphail, the editor of the *Montreal Medical Journal*, is the editor; and as Dr. Macphail is getting a good foot forward in literature, this will be a guaranty that meritorious literary articles will alone secure insertion. As educated men, physicians will hail with pleasure a magazine with such high ideals, and all over Canada they will hope that the scheme for the consolidation of the monthlies now published into this *University Magazine* by the universities will go forward to a successful completion. Dr. Macphail, himself, contributes an article to the first number on John Knox; and there is another by Dr. John McCrae, of Montreal, on "The Oldest Drama." It is a magazine of fine promise.

Physical Diagnosis made some distinct advances during the past year. Goldscheider fully described his method of orthopercussion, whereby the cardiac outlines obtained by percussion coincided with those obtained by radiography. Treupel and Engels, after extensive observations stated that orthopercussion surpassed every other method in obtaining the outlines of the

heart. Meyer and Milchner consider that by it alone can the infantile heart be outlined. The method is essentially as follows, according to a writer in the Progress Number of the *Interstate Medical Journal*: The percussion must be done so gently that in a quiet room the sound is just audible to the ear held close to the percussion finger; only the tip of the plessimeter finger must be held against the chest; the percussion must be done only in the intercostal spaces, not over the ribs; the direction of the blow as one passes around the chest must not be perpendicular to the thorax wall but should always be kept saggital, *i.e.*, parallel to a line perpendicular to the sternum.

The Canadian Medical Association meets in Montreal on the 11th, 12th and 13th days of September. Working committees have been struck, and members should bear in mind that now is the time to be thinking of preparing papers and case reports. This will most likely be the largest meeting in the lifetime of the Association. The question of re-organization and the establishment of an official journal will be up for discussion. Both are very important and are now exciting keen interest. The Canadian medical profession is awakened to the advantages of meeting in national convention. The fact that over eight hundred Canadian physicians attended the meeting of the British Medical Association last year in Toronto will stand out before all; and this meeting will prove just how truly loyal Canadians can be to their own Association.

Science Notes.

Facts About Black Lead Pencils.

It is difficult to determine the exact period in which "black lead" was first utilized as an instrument for writing or drawing, as it has been confused with other mineral bodies to which it bears no relation. The ancients used lead, but the metal was formed into flat plates, and the edges of these plates used to make the mark. If an ornamental design was desired, the transcriber drew parallel lines, and traced their illuminated designs, usually with a hard point but also with soft lead. That lead was known to the ancients is also proven by the fact that it is mentioned in the Book of Job.

During the year 1615 there was a description of the black lead pencil written by Conrad Gesner. He says that pieces of plumbago were fastened in a wooden handle and a mixture of fossil substance, sometimes covered with wood, was used for writing and drawing. About half a century later a very good account of this mineral was given, and it was then used in Italy for drawing and mixed with clay for manufacturing crucibles. We are informed in Beckman's "History of Inventions" that the pencils first used in Italy for drawing were composed of a mixture of lead and tin, nothing more than pewter. This pencil was called a stile. Michael Angelo mentions this stile, and in fact it seems that such pencils were long used in common over the whole continent of Europe. At this period the name Pulmbago or graphite was not in use, but instead the name molybdena or molybdoids, which is now applied to an entirely different mineral.

Graphite or black lead is formed in the primary rocks. In the United States it occurs in felspar and quartz, in Great Britain in greenstone rock and gneiss, and in Norway in quartz. The mine at Borrowdale, Eng., has supplied some of the finest black lead in the world, but the quantity varies, owing to the irregularity with which the mineral occurs.

The Jews were for a while the only manufacturers of pencils. It required great skill to perfect the manufacture, according to the degree of hardness or softness required. Of recent years the manufacture of pencils has increased to such an extent that the price of these articles has decreased proportionately. Graphite and pure clay are combined and used in the manufac-

ture of artificial black lead pencils, and on the other hand the greatest perfection is attained in the making of the higher class pencils. Graphite is exposed to heat to acquire firmness and brilliancy of color. Sulphur is also used to secure a more perfect color.—Katherine B. Calhoun, in *Sc. Am.*

The Yawning Cure for Throat Diseases.

A little book, recently published in Vienna, is devoted to a method of vocal culture, and also health culture, that has stood the test of practical experience in numerous cases but is not as well known as it deserves to be. It is based upon the vocal method of the concert singer, Josephine Richter, the mother of the celebrated orchestra leader, Hans Richter, and consists essentially of peculiar movements of the jaws which ultimately give the pupil an astonishing command over the soft palate, besides strengthening the muscles of the face, neck and chest.

Herr Lanz, the author of the book, quotes a letter written to Mme. Richter by the late Prof. Helmholtz, in which that famous physicist says: "I can readily understand, from theoretical considerations, that the flabbiness of the soft palate and the back of the mouth must act as a damper upon the voice and an obstacle to precision of attack and utterance. Hence if the command of the palate, tongue and larynx which you possess can be acquired by your method of exercising the muscles of the face and throat, as your own example appears to prove, the fact is clearly of great importance. It is physiologically probable that such exercises would have that effect."

That the exercises do have that effect is proved by an examination of an average untrained throat and the throat of a singer trained by the new method. In the former the soft palate and its conical extension, the uvula, hang limp and constrict the vocal passage, which is further narrowed by the prominent tonsil at each side. In a mouth so encumbered, as in a room filled with furniture, it is impossible for the voice to ring loud and clear. The tonsils and soft palate of the trained singer, on the other hand, are retracted and hardened and the pendent uvula has entirely disappeared, giving the voice a clear and wide passage with firm walls, and consequently increasing its volume and improving its quality.

The method is recommended for the cultivation of the speaking as well as the singing voice and for the prevention and alleviation of various diseases of the throat. "It gives

astonishing relief in catarrh of the throat and suggests new possibilities in the treatment of enlarged tonsils."

Now these exercises consist essentially of yawning, which has recently been recommended, independently, as a valuable exercise for the respiratory organs. According to Dr. Naegli, of the University of Luettich, yawning brings all the respiratory muscles of the chest and throat into action and is therefore the best and most natural means of strengthening them. He advises everybody to yawn as deeply as possible, with arms outstretched, in order to change completely the air in the lungs and stimulate respiration. In many cases he has found the practice to relieve the difficulty in swallowing and disturbance of the sense of hearing that accompany catarrh of the throat. The patient is induced to yawn through suggestion, imitation or a preliminary exercise in deep breathing. Each treatment consists of from six to eight yawns, each followed by the operation of swallowing.

It should be added, however, that it is quite possible for deep breathing to be overdone, particularly by persons with weak hearts, and it is at least open to question whether the obstacles to free respiration which the yawning cure is alleged to remove are not useful in preventing the entrance of germs and other foreign bodies.—*Sc. Am.*

News Items.

SMALLPOX is spreading in Peel County, Ontario.

DR. GEO. R. McDONAGH, Toronto, has gone to Egypt.

DR. S. F. WILSON, of Montreal, is dead, aged fifty-one years.

DR. H. A. BOGUE, of Richford, Ont., is moving to California.

DR. J. T. CLARKE, Toronto, has been appointed an associate coroner.

DR. CHAS. W. VIPOND has returned to Montreal from Jamaica.

THE *Western Canada Medical Journal* has been established in Winnipeg.

THE stork was busy in December in Winnipeg, the births numbering 232.

SELKIRK, Man., wants \$2,500 from the Manitoba Government for a hospital.

OTTAWA Board of Health is interesting itself in a pure milk supply for that city.

THERE were treated at the Montreal General Hospital last year 50,441 patients.

OUT of 120 deaths in Winnipeg in January, thirty were caused by pneumonia.

DURING 1906 there were 16.138 deaths for every 1,000 of Winnipeg's population.

DR. J. D. HAMILL, for many years the popular and efficient Mayor of Meaford, has been appointed to the important position of postmaster of that municipality, and recently entered upon his new duties.

Dr. W. EGBERT, from Calgary, is renewing old acquaintances in Milverton.

DRS. McCONNELL and Bradford, of Morden, Man., have entered into partnership.

THE Ontario Government will grant \$50,000 for a Hygienic Institute at London, Ont.

DR. J. G. HARDY is dead at Carlyle, Sask. He had practiced in the West fifteen years.

DR. McINNIS, M.P.P., Brandon, Man., has collected \$15,000 towards a provincial sanatorium.

DR. W. S. FOWLER, who has been visiting in Vancouver, has returned home to San Francisco.

NINETY deaths occurred in St. John, N.B., in 1906 from consumption. The total deaths were 775.

DR. ANDREW MACPHAIL, Editor of the *Montreal Medical Journal*, was in Toronto the last of January.

DR. R. B. BRICE, well known in Kingston, died in Chicago, January 3rd, of paralysis. He was 69 years old.

DR. AGNES TURNBULL, of the Women's Presbyterian Missionary Society of Canada, is dead in Central India.

SIXTY-TWO cases of diphtheria, fifty of scarlet fever, and thirty of typhoid, were reported in Toronto in January.

DR. F. J. SHEPHERD, Montreal, has been appointed consulting surgeon to the Royal Victoria Hospital of that city.

THE following have been elected to the medical branch of the Corporation of the Western University: Dr. A. V. Becker, President; Dr. Septimus Thompson, Secretary; Executive, Drs. H. T. Reason, H. A. McCallum, C. H. Reason, F. R. Eccles and J. B. McCallum.

AN effort is being made in Manitoba to have the Provincial Government give the University of Manitoba \$250,000. The Dominion Government endowed the University with 150,000 acres of land worth \$1,000,000, but the Manitoba Government is said to have been a little niggardly with its own university.

DR. THORNTON, a very promising physician of New Richmond, Que., was suffocated in a fire which destroyed his home there recently.

DR. J. K. M. GORDON, of Ripley, has been asked to take charge of the Muskoka Free Hospital at Gravenhurst as acting chief physician.

DR. KENDRICK, who has been with Drs. Brien and Doyle, of Essex, the past six months, has returned to Toronto to take special studies.

DR. JOHN D. CAMERON, one of the best known medical men of Montreal, died, January 4th, of typhoid fever, at the early age of 38 years.

DR. A. H. TROTTIER, of Tilbury, gold medallist of Western University, London, will assist Drs. Brien and Doyle, of Essex, in their practice.

TWO new associate coroners are appointed, Dr. John Wesley Brien, of the town of Essex, and Dr. Percival Chapman Casselman, of Morrisburg.

DRS. C. S. MCGUFFIN, E. Seaborn, J. B. Campbell, and J. D. Balfour, London, Ont., have been elected to the Western University of that city.

MR. ROBERT REFORD, of Montreal, has offered \$50,000 to McGill University, conditional on an endowment fund of \$1,000,000 being raised.

DR. THOMAS TURNBULL, lately of Winnipeg, has entered into partnership with a leading Chicago specialist, and has gone to take up his new duties.

SUBSCRIPTIONS aggregating \$239,000 have been received for the new Notre Dame Hospital in Montreal. Senator Forget contributed \$200,000 of that amount.

DR. ROSS, who has been practicing in Seaforth for the past five years, will leave this month for Europe to spend several months taking special work in surgery in London and on the Continent. In his absence his practice will be looked after by Dr. Smillie, formerly of Hensall.

WE desire to call the attention of our readers to the announcement of Mr. Clinton T. Brainard, New York, who is offering some exceptional bargains in well-known authors.

MR. WM. SOUTHAM, Hamilton, will give \$10,000 to the Hamilton City Hospital for a wing for tuberculosis cases if the Governors of the Hospital will take charge of it.

DR. S. T. RUTHERFORD, late of Listowel, has removed to Stratford and taken up the practice of his profession in commodious offices specially fitted up for him in the Windsor Block.

A VERY important step on the part of the Government in connection with the treatment of the insane has been taken in the appointment of a clinical director and pathologist in the Toronto Asylum. Dr. J. G. Fitzgerald, who has received the appointment, has the highest qualifications for the position. He was born near Harrison, Wellington County, and was graduated from the University of Toronto and the Toronto Medical School. After completing his studies he became a member of the staff of the Buffalo Asylum for the Insane. Later he went to Johns Hopkins University, and for the last two years has been studying psychiatry and pathology at the Johns Hopkins and Shepard and Enoch-Pratt Hospitals.

PHYSICIANS who are interested in the study and legitimate practice of the physical (drugless) therapeutic methods, notably electro-therapy, photo-therapy, mechano-therapy, hydro-therapy, suggestion and dietetics, are invited to join the American Physio-therapeutic Association. Address the Secretary, Dr. Otto Juettner, No. 8 W. Ninth St., Cincinnati, Ohio. The officers for the ensuing year are: President, Dr. H. H. Roberts, Lexington, Ky. Secretary, Dr. Otto Juettner, Cincinnati, Ohio. Treasurer, Dr. Geo. H. Grant, Richmond, Ind. Executive Council, Drs. W. F. Klein, Lebanon, Pa.; Jas. Hanks, Brashear, Mo.; J. W. Unger, West Point, Miss.; Chas. S. Northen, Talladega, Ala.; R. W. Gibbes, Columbia, S. C.; S. J. Crumbine, Topeka, Kans.; F. L. Keeler, Perry, Okla.

THE OXFORD COUNTY MEDICAL ASSOCIATION was organized recently by the medical men of the county. For some time there have been several efforts made to form such an organization, and the endeavors met with a successful issue recently. Nineteen medical men were present. The action of the association is for the discussion of medical questions and of matters

pertaining to the medical profession in general as well as for social intercourse. The officers elected were: Hon. Presidents, Dr. Joy, Tillsonburg; Dr. Williams, Ingersoll; Dr. Adams, Embro. President, Dr. A. B. Welford, Woodstock. Vice-President, Dr. Rogers, Ingersoll. Secretary, Dr. Brodie, Woodstock. Treasurer, Dr. Neff, Ingersoll. Executive Committee, Drs. Parke and Mearns, Woodstock; Dr. Green, Embro; Dr. Coleridge, Ingersoll; Dr. Staples, Princeton. Committee on By-laws, Drs. Parke, Mearns and Sinclair, Woodstock; Dr. Bennett, Tillsonburg; Dr. Canfield, Ingersoll. The next meeting of the association will be held at the call of the President. Similar organizations are in existence in all the leading cities, and in many of the counties of Ontario. The doctors of Oxford feel confident that the new society will be both successful and beneficial.

THE HOMEWOOD SANITARIUM, GUELPH, ONT.—On Saturday afternoon, the 2nd of February, Dr. Hobbs, Superintendent of the Homewood Sanitarium, very kindly showed our Managing Editor through his institution and especially explained and showed the new wing now rapidly nearing completion. This is composed of two large wings connected by passageways, which so provides for isolation of violent patients without entire separation from the main building. The admirable appointments of this institution, the beautiful surroundings, and the comfortable, home-like air pervading every part of the institution, places it on a par with similar American institutions, indeed, if it does not in a great measure surpass the best this continent has established. The new wing is to be opened with appropriate ceremonies in April of this year.

THE Committee on Papers of the Ontario Medical Association, in addition to the address in Surgery by Dr. Crile, of Cleveland, is now able to announce that an address in Medicine will be delivered by Dr. Ravenal, of the Phipps Institute, Philadelphia, on "The Methods of Infection in Tuberculosis." One of the afternoons of the meeting will be given up to a series of papers dealing with the "Relation of the Profession to the Public." These will touch the medico-legal, public health, and psychiatric aspects of the question, and the preservation of water supplies being taken up in a distinct paper. The programme in both the medical and surgical sections is being rapidly filled in in a manner that leaves no doubt about the interest that will attach to the discussions.

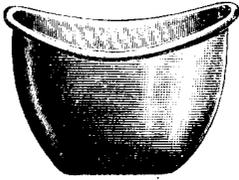
Publishers' Department

FISHING AND SHOOTING.—A new region, known as the "Temagami" (pronounced Tem-mog-a-me) District, is being brought to the notice of the public as one of the finest fishing and hunting confines in Canada. Excellent sport is assured all who take advantage of a trip to this magnificent territory which is 300 miles north of the city of Toronto at an altitude of 1,000 feet above the sea. Black bass, speckled trout, lake trout, wall-eyed pike and other species of fish are found here in abundance, and large game such as moose, caribou and deer abound in the forests. A handsome booklet, profusely illustrated, giving all information, including comprehensive maps, can be had free on application to J. D. McDonald, D.P.A., Union Station, Toronto.

EARLY DECAY OF CHILDREN'S TEETH.—A live question with physiologists is the very general tendency in children to early decay of the teeth and the resultant unfortunate consequences to general health. It is now generally conceded that one of the main causes of the decay of teeth is the general use of white bread and soft, mushy foods. The coming of the teeth marks a period in the child's life when an elaboration of the all-milk diet is required. The amylolytic function is gradually developing and it is, therefore, necessary to provide food which will not tax these new powers and yet will afford gentle exercise so as to promote normal development. The whole-wheat food, Egg-O-See, contains soluble starch (maltose) and even before the child can chew the food this starch (practically pre-digested) is made available by straining the milk through Egg-O-See flakes. When a little later the molars appear they must begin the work of mastication and trituration if the teeth are to develop physiologically and grow into objects of personal adornment. The partial digestion of Egg-O-See makes it acceptable to the stomach of the child at this age; the dry, crisp flakes encourage proper exercise of the teeth, while the phosphates, nitrates and other salts of wheat (absent in white bread and similar forms of food) furnish the mineral food required by the teeth and the bony framework of the body. Readers of this journal will receive a full size package of Egg-O-See on application to the Egg-O-See Cereal Co., Chicago.

A STERILE EYE BATH.—An eye bath fashioned from a single piece of aluminum has been introduced by the Kress & Owen Company. That this little device

GLYCO-THYMOLINE



EYE BATH

will be well received by the medical profession is not to be questioned when one considers the many points of advantage this metal cup has over the old style glass contrivance. It is cleanly, unbreakable, and can be sterilized instantly by dropping into boiling water. The surgical bag in the future will hardly be complete without one of these cups, which will give happy results in many an emergency. It will be found invaluable for treating ophthalmia, conjunctivitis, eye strain, ulceration, and all inflammatory conditions affecting the eye.

Directions.—Drop into the eye bath ten to thirty drops of Glyco-Thymoline, fill with warm water; holding the head forward, place the filled eye bath over the eye, then open and close the eye frequently in the Glyco-Thymoline solution. No pain or discomfort follows the use of Glyco-Thymoline. It is soothing, non-irritating, and reduces inflammation rapidly.

THE TREATMENT OF COUGH.—Cough, regardless of its exciting cause, is a condition that every physician experiences more or less difficulty in relieving. While the agents designed for its relief are numberless, it is a matter of common knowledge that but few of them are of general utility, for the reason that although they may be capable of effecting relief, in doing so they either derange the stomach, induce constipation, or cause some other undesirable by-effect. The ideal cough cure must combine sedative and expectorant properties without exhibiting the slightest system-depressent, gastric-disturbing, constipation-inducing, or palate-offending action. Nor should it contain any ingredient the prolonged use of which would cause a drug-habit. Then, too, it must be of sufficient potency to produce the desired effect with the utmost promptness, for in many instances the patient has indulged in self-drugging to a certain extent before consulting the physician; hence it is directly to the interest of the practitioner to demonstrate his skill by immediately relieving the disturbing condition. It is now universally conceded that Glyco-Heroin (Smith) is the ideal cure for coughs

of all varieties. This product embraces the most active sedatives and expectorant agents in the exact proportions in which they exhibit their greatest remedial potency. It matters not what the exciting cause may be, the effect of this preparation is always immediate, pronounced and extremely agreeable. The cough is almost instantly suppressed, the expulsion of the accumulated secretions is stimulated, respiration is rendered free and painless, and the inflammation of the lining of the air-passages is speedily allayed by its use. Glyco-Heroin (Smith) may be administered for an indefinite length of time without any depreciation in its curative properties and without the induction of a drug-habit. It is of especial value in the treatment of pulmonary phthisis. It is pre-eminently superior to all preparations containing codeine or morphine.

ANEMIA AND ITS RELATION TO CATARRHIAL INFLAMMATION.
—No disease is more common than chronic inflammation of the mucous membranes. Doubtless many causes contribute to the prevalence of this malady which spares neither the young nor the old, the rich nor the poor, the high nor the low. Prominent in its etiology, however, are sudden climatic changes, the breathing of bad or dust-laden air, bad hygiene in personal habits, and bad sanitary surroundings. These factors all singly or collectively tend to lower the vitality of the whole human organism, and as a consequence the cells throughout the body perform their various functions imperfectly, or not at all. The quality of the blood becomes very much lowered, with the result that tissues that have important work to perform, do not receive sufficient nourishment and so falter from actual incapacity. The red blood cells are reduced in numbers and the hemoglobin is likewise diminished. Because of the blood poverty the digestive process is arrested, nutritive material is neither digested nor absorbed; and a general state of inanition ensues. It is not surprising under these circumstances, therefore, that chronic inflammation of the mucous membranes is produced. These highly organized structures with very important duties to perform naturally suffer from insufficient nutritional support, and the phenomena of catarrh follow as a logical result. Perversion and degeneration of the cells in turn takes place, and more or less permanent changes are produced in the identity and function of the tissues. Appropriate treatment should consist primarily in correcting or eliminating all

contributing factors of a bad hygienic or insanitary character. The individual should be placed under the most favorable conditions possible and every effort made to readjust the personal regime. Local conditions of the nose, throat, the vagina, or any other part, should be made as nearly normal as possible by suitable local applications or necessary operative procedures. Then attention should be directed immediately to improving the quality of the blood and thus increase the general vitality. For this purpose vigorous tonics and hematics are desirable and Pepto-Mangan (Gude) will be found especially useful. Through the agency of this eligible preparation the blood is rapidly improved, the organs and tissues become properly nourished and accordingly resume their different functions. Digestion and assimilation are stimulated and restored to normal activity, and the various cells and organs start up just as would a factory after a period of idleness. In fact, Pepto-Mangan (Gude) supplies the necessary elements that are needed to establish the harmonious working of the whole organism. When this result is achieved, the catarrhal condition is decreased to a minimum and distressing symptoms are banished, a consummation that is highly gratifying to every afflicted patient and every earnest practitioner.

OUR CONFIDENTIAL FRIENDS.—We would not banish opium. Far from it. There are times when it becomes our refuge. But we would restrict it to its proper sphere. In the acute stage of most inflammations, and in the closing painful phases of some few chronic disorders, opium in galenic or alkaloidal derivatives is our grandest remedy—our confidential friend. It is here, also, that the compound coal-tar products step in to claim their share in the domain of therapy. Among the latter, perhaps, none has met with so grateful a reception as “Antikamnia and Codeine Tablets,” and justly so. Given a frontal, temporal, vertical or occipital neuralgia, they will almost invariably arrest the head-pain. In the terrific fronto-parietal neuralgia of glaucoma, or in rheumatic or post-operative iritis, they are of signal service, contributing much to the comfort of the patient. Their range of application is wide. They are of positive value in certain forms of dysmenorrhœa; they have served well in the pleuritic pains of advancing pneumonia and in the arthralgias of acute rheumatism. They have been found to allay the lightning, lancinating pains of locomotor ataxia, but nowhere may they be employed with such confidence as in the neuralgias

For COUGHS and
THROAT IRRITATION

PINOCODEINE

“FROSST”

Each fluid drachm contains:—Codeine phosphate $\frac{1}{8}$ gr. combined with Pinus Strobilus, Prunus Virginiana, Sanguinaria Canadensis, Populus Balsamifera and Chloroform.

As a routine expectorant, it is the same reliable product that has had the support of the profession for the past eight years.

**STOPS COUGHING,
ALLAYS IRRITATION,
ASSISTS EXPECTORATION**

Perfectly safe with patients of any age.

For GRADUAL or
SUDDEN HEART FAILURE

Elixir Digitalin Co. “Frosst”

Each fluid drachm contains:—Digitalin 1-100 gr.
Nitroglycerine 1-100 gr. Strychnine 1-50 gr.

The original product that has created the demand for this energetic stimulant.

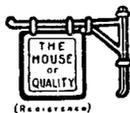
CHARLES E. FROSST & CO.
MONTREAL, CANADA

effects of Codeine on the alimentary canal are remarkable, in that it assuages pain as well or better than morphine and, nevertheless, does not check the secretions or peristalsis notably, unless the latter is excessive, as in dysentery." In view of these facts it would seem that Antikamnia and Codeine Tablets are a remedy which should find a wide field. Prof. Schwarze (Therapeutische Monatshefte), in writing upon the treatment of the different forms of dysmenorrhea, and the different forms of congenital deformity of the uterus, states that the salicylate analgesics are of much use, as well as the preparations of iron and sodium salicylate. In many cases it is necessary to administer Codeine in small doses, and the tablets of "Antikamnia and Codeine" would seem to have been especially prepared in their proportions, for just these indications.

SOME of the indications for Sanmetto are: Vesical irritation and atony; enuresis due to atony; incontinence of urine in children due to a weak bladder; dribbling of the urine in the aged, not due to paralysis or growths; urine expelled upon exertion, as coughing; cystitis; catarrhal discharges from bladder or genitalia of male or female; seminal emissions; prostatitis, enlarged prostate and pre-senility.

OPPIUM.—This is the condition we are most often called upon in a hurry to relieve. Our therapeutic measures employed will be gauged by the cause, location, severity, etc. A hot water bag should always be accessible. Hypodermics or morphine should be used as sparingly as possible. Papine is an excellent pain-reliever that is devoid of the danger and unpleasantness of ordinary opiates. It relieves pain promptly, but does not produce narcosis, constipation, etc.—W. T. Marrs, M.D., in the *Medical Herald*.

SPINAL CORD COMPLICATIONS OF ANEMIA.—With increased knowledge of the anatomy and physiology of the brain and spinal cord, there is a growing opinion among careful clinical observers that many of the nervous phenomena accompanying general anemia can be directly attributed to resulting changes in the nervous system. The spinal cord complications of pernicious anemia have been recognized for some time, and it is no uncommon thing in these cases to find pronounced degenerative areas



Distinctive Styles in Fur Garments

Our success in the creation of distinctive styles in Fur Garments for men and women contains no element of luck.

Our stock of manufactured furs is the production of a staff of the ablest work-people and the most expert labor the country offers.

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throughout the cord. The posterior columns and occasionally the lateral are most often involved, the nerve fibres being chiefly affected, without, however, the extreme shrinking usually observed in locomotor ataxia. While there can be no doubt that these conditions depend to a certain extent on the blood changes incident to the anemic process, it is more than probable that the toxins resulting from the attending hemolysis exert direct injury on the nerve cells. Fortunately the ordinary anemias are not attended by such extreme changes, and the resulting symptoms, with their speedy control under appropriate treatment, point to a functional rather than an organic origin. These symptoms, while extremely variable, usually consist of constant and pronounced backaches, especially in the cervical and dorsal regions, sensitive areas along the spinal column, variations in the spinal reflexes, paresthesias generally, and oftentimes irritability of the anal or vesical sphincters. Headache is frequently complained of, though the patient is usually able to sleep. The symptoms referable to the sexual function are also extremely variable, especially in the female, and range all the way from absolute frigidity to positive nymphomania. Frequent reference is made to the heart by these anemic patients, and while their symptoms may be somewhat due to the changes in the blood current, there can be no question that the sympathetic nerves suffer in the general involvement of the nervous system, and may therefore be directly responsible for the arrhythmia, tachycardia, etc., so often complained of. The great therapeutic value of Pepto-Mangan (Gude) is well shown by its rapid and pronounced action in these cases of anemia complicated by nervous derangements. With the rise in hemoglobin and the blood count which immediately follows the administration of Pepto-Mangan (Gude), the backaches and headaches cease, the sensory disturbances disappear, and the patient's nervous system rapidly returns to the normal. The comparative ease with which these cases are restored to health when thus treated will be exceedingly gratifying to the zealous practitioner. He, more than anyone else, realizes the danger of letting young females thus afflicted drag along indefinitely, for he knows that the psychic influence of long continued sensory disturbance is extremely prone to develop and magnify any hysterical tendencies however latent. Early and efficient treatment is therefore not only desirable but urgently necessary, and Pepto-Mangan (Gude) will never prove disappointing.