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SOME RECENT DEVELOPMENTS IN MEDICAL SCIENCE.*

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TORONTO.

IN accepting the honor of delivering the address at this the opening of the tenth session of the University of Toronto Medical College, I am oppressed by the difficulty of choosing a subject which will be at once appropriate to the occasion, instructive to the students, and interesting to the many friends of the university who honor us with their presence on this and other public occasions.

Discarding in turn subjects dealing with aspects in the history of medicine, disquisitions on the relations of teacher and students, of practitioner and patients; panegyrics on the nobility and usefulness of our profession; and eulogies on the advantages which this university offers for the acquisition of a profession, all of which would be befitting the place and

* Address delivered at the opening of the Tenth Session of the University of Toronto Medical College, September 30, 1896.

the occasion, I have resolved at length to bring before you one or two points dealing with the most recent developments in medicine, and indicating the lines along which the medical world looks for advancement being made. In considering these points, may I be allowed to assume that you are quite unacquainted with the subject? My sense of courtesy to our guests requires me to state that I know that they are very far from being ignorant of the broad general principles which underlie present day science, and my instinct of self-preservation prompts me to apologize to my friends the students for this monstrous assumption. But the assumption of this position makes it easy for me to give a brief sketch of the events which have slowly but surely led up to the problems which, among other things, are just now engaging the attention of scientific men.

Until the science of pathology was evolved from the study of microscopy, minute anatomy, and chemistry, nearly all practice was of that character known as empirical. That is, in the treatment of disease, reliance was placed solely on individual experience and observation. The aids of reasoning, analogy and generalization were ignored. It requires but little discernment to see that under these circumstances but little progress could be made. But when pathology began to reveal the causes and nature of disease, the remedies made use of were more rationally chosen with a view to their capacity either to remove the cause or combat the effects of the disease. Accumulated experience, based largely on such scientific grounds, constitutes the bulk of our present knowledge of therapeutics.

Accordingly, when it came to be known that certain minute vegetable organisms called "germs" stood in a causative relation to certain diseases, the energies of investigators were devoted to the problem: What therapeutic agents can we command (1) to prevent such germs from obtaining access to the system, and (2) to dislodge them and, at the same time, neutralize their poisonous effects after they have obtained a foothold in the human organism? The first of these problems was practically solved, as far as surgical cases are concerned, by the introduction of the antiseptic system, with which the name of Sir Joseph Lister is so honorably connected.

SERUM-THERAPY.

The solution of the second problem, viz., the pursuit of the germs and their poisons into the blood and tissues, is the object and ambition of that new departure in therapeutics called "serum-therapy," or the antitoxine method of treating disease.

Having permitted myself to assume, for the moment, your entire lack of knowledge of the matter in hand, I shall now outline the main features of this subject. If we place newly shed blood of any animal in a glass

beaker or bottle, we observe that in a few moments the whole mass becomes of a jelly-like or semi-solid consistence. That is, the blood has clotted, or undergone coagulation. By and by we observe that the clot seems to be squeezing out of itself some drops of yellowish or straw-colored fluid. The contraction continues until the clot appears to be surrounded by a layer of this fluid, which is called the "serum" of the blood, to distinguish it from the cellular elements, *i.e.*, the red and white blood corpuscles which are contained in the clot.

Again, it may not be known to all of you that the minute vegetable germs of which I have spoken are, with few exceptions, much less harmful in themselves than are the products to which they give rise during the activity of their lives. These products are to a large extent due to decomposition of the tissues in which the germs lodge, and are the "toxines" or virulent poisons which exert such a depressing effect upon the vital functions of those attacked by disease. Whether formed originally in the blood or in a local inflammatory or diseased area, such as the abscess, and thence absorbed into the circulation, these toxines are ultimately found to be held in solution in the serum of the blood. If produced in sufficient quantity, and not overcome or eliminated by nature's own powers of resistance, they must, of course, in the absence of treatment, produce death. That is the disease; let us now look at the means at hand for combating its baneful effects. From time immemorial the strongest ally the doctor has had is the *vis medicatrix naturæ*. But it is only now that we begin to have a glimmering of what this healing power of nature really is. We have very good reason to believe that immediately upon the absorption into the circulation of any of these toxines nature excites the cells and tissues of the body to produce some substance which will neutralize or counteract them. The substance so produced for this specific purpose is fitly called the "antitoxine," and it also has its residence in the blood serum. If the antitoxine can be produced with sufficient rapidity the toxines are overcome, and the antitoxine becomes the aggressor, attacking and finally routing and destroying the germs.

During the development of the antitoxines also the resisting powers of the cells and tissues seem to be increased, so that if a fresh crop of germs were implanted they would find the soil so hostile to their presence that the colony would soon die out. This is known as "immunity" to the disease.

Again, it has long been the custom of experimenters to grow the disease-producing germs artificially, outside the body, in such media as gelatine and beef tea. These "cultures," as they are called, are found after the germs have been growing for some time to be rich in toxines, and by subjecting the whole contents of the culture-vessel to a process of filtration

through porcelain under pressure, the toxins can be separated entirely from the germs which produced them. It is found now that if these toxins be injected into the body of an animal, that animal will manifest the same general symptoms as if it were actually suffering from the disease which the germ produces. If the dose be large enough death speedily results. If a smaller dose be given the animal sickens but rapidly recovers. A repetition of the same dose will be followed by less severe symptoms, and it is found that from day to day the dose may be rapidly increased, and that in the course of a few weeks or months the animal may receive with impunity a dose several hundred times as large as would have been a lethal dose in the first instance; and also that the injection of the living germs is followed by no ill results whatever. In short, the animal has been rendered "immune" to the disease. From what has been already said you will readily follow the course of events. Upon the injection of the first dose of toxine the cells of the animal injected bestir themselves to produce the antitoxine required. Additional antitoxine is formed after each injection, until in time the serum of the blood becomes saturated with it, and immunization is complete. If this process be carried on slowly and carefully the animal operated upon continues in robust health, and suffers no pain or discomfort except that caused by the prick of a fine hypodermic needle.

ANTITOXINE TREATMENT OF DIPHTHERIA.

Though perfectly satisfactory as regards the lower animals, it is manifest that this process is too cumbersome and protracted to be applicable to man. In 1890, however, Prof. Behring, of Berlin, found that the serum of a guinea-pig which had been artificially protected against diphtheria was able to confer a similar immunity upon another animal when injected into its veins. This was of course a most important discovery, and it is the foundation of the new treatment of diphtheria by antitoxine injections from which we hope so much.

For the purpose of producing the antitoxine for use in cases of diphtheria, the animal selected is man's noblest friend—the horse. The horse is selected because he is habitually free from disease, tractable under treatment, bears the injection of the diphtheria toxins without showing symptoms of discomfort or illness, and produces large quantities of antitoxine with the same cheerfulness and industry with which he renders so many other valuable services to man. The practice followed at the British Institute of Preventive Medicine is as follows: A healthy young horse is secured, placed in comfortable quarters; and well fed. A few drops—say, three or four (.25 c.c.) to start with—of a filtered culture of the diphtheria bacillus that has been growing a month in beef tea, are injected

under the skin. This first injection is followed by some local swelling and a slight rise of temperature. Next day, however, the animal seems as well as ever. After three or four days a similar dose is given, and is found, as a rule, to produce no symptoms whatever. A larger dose is then given, and if no symptoms arise the dose is progressively increased, until at the end of six weeks the animal receives 100 c.c. as a dose three times a week.

By this time the horse is, of course, perfectly immunized and his blood-serum is heavily charged with antitoxine. The next step is to bleed him, and this process is, in horses, fortunately a simple and practically painless operation. A glass tube or cannula is placed in a small slit made in the jugular vein, and while the horse contentedly munches a turnip or carrot, the surgeon contentedly draws off from six to fifteen quarts of his precious antitoxine-charged blood. It is found that a horse will bear the loss of this seemingly large quantity of blood without showing any signs of weakness or distress. The blood thus withdrawn is left on ice until the serum has quite separated, and when this has occurred the serum is poured off with aseptic precautions into sterilized bottles. A piece of burning camphor is dropped into it to destroy any germs that may possibly have fallen into it during manipulation; it is then corked with sterilized cork and so made ready for shipment.

One cannot too much admire the marvellous ingenuity of man in thus converting the horse into a living laboratory for the production of a precious vital principle which, so far as we know yet, can be produced in no other way. There is a sublimity in the idea of having thus encompassed the subjugation of nature's own healing balm to our own control, the counterpart of which, it seems to me, is rare in life's experience.

It is only some two years since this novel method of treatment was first brought before the profession by Professors Behring, of Berlin, and Roux, of Paris, so that it must be admitted that it is yet on its trial. Very extensive statistics of a reliable character are, however, already available, and these go to show that the mortality has been reduced by its use at least 50 per cent., which means in a disease so prevalent and deadly as diphtheria the saving of thousands of lives every year, besides the abolition of untold sorrow and suffering.

In regard to the immunizing powers of antitoxine I, shall quote a few figures which speak, it seems to me, with no uncertain voice:

Behring quotes 10,000 cases inoculated where diphtheria was raging. Only ten contracted the disease.

Of one hundred and thirty-six children inoculated in an infected hospital none took diphtheria, but a medical officer and a nurse who were not immunized contracted the disease.

Though by far the greatest degree of success has been in the treatment of diphtheria by this method, yet much work has been done, and an encouraging degree of success attained, in experiments in cholera, hydrophobia, tetanus, snake-bite, and tuberculosis. We all remember the bitter wail of disappointment and despair which swept over the whole civilized earth when the failure of Koch's tuberculin had to be proclaimed. Yet who can say that Koch's work was in vain? On the contrary, it gave such an impetus to research and enquiry in the direction in which he was working that the present discovery of antitoxine, if not a result, was at all events a sequence in the direct line of descent.

ANTI-STREPTOCOCCUS SERUM.

From a surgical point of view much interest attaches to the introduction of a serum for the cure of those severe forms of blood-poisoning so frequently met with in practice. Blood-poisoning, or septicæmia, is due to a germ known as the streptococcus. By a process similar to that used in the production of the antitoxine of diphtheria, an anti-streptococcus serum has been obtained which gives promise of being of great use in those acute and rapidly fatal cases which sometimes follow infection from a post-mortem wound or from a virulent surgical case. On the last day of February of the present year this university and this college were called upon to bear the loss of an esteemed professor, in the person of Dr. Laughlin Macfarlane, who died after one week's illness. This was an example of the most malignant type of septicæmia, due to the streptococcus, and following upon a trifling prick of a needle while amputating a gangrenous limb. The onset was sudden and characteristic, and its appalling seriousness was at once recognized by his *fidus Achates*, Dr. Adam Wright, whom he consulted. No need to say that not an hour—not a moment—was lost in instituting the line of treatment which gave the only promise of success. But words are feeble to describe the dreary hopelessness felt by those of us whose sad privilege it was to wait upon our friend in his last days. The pathology of the case was only too clear; but our therapeutic resources were at fault, and we could only fold our hands in bitter helplessness and watch him sink slowly to his end. Such is the intensely personal character of the allusion to this case that I must be allowed to digress for a moment from the main subject in hand. This is the first public meeting of the college faculty and students since the death of Prof. Macfarlane, and it is fitting that we should pause for a moment to think of our loss. Professor Macfarlane was a man singularly dear to the successive generations of students with whom he came in contact. This was evidenced not only by the cordial good-fellowship that always existed between him and his class, but also by the fact that after graduation his old students returned

him time and again for upwards of twenty years as their representative on the senate of this university.

Genial, kind-hearted, true, and honorable, he trod his daily path in simplicity and singleness of heart. He was respected and honored by his confreres, and beloved by old and young, rich and poor, among his patients. Industry and devotion to duty were prominent features in his character, he wore his harness to the last, and died honorably at his post. Of him it might be said, as of the noble Brutus,

" His life was gentle ; and the elements
So mixed in him that nature might stand up
And say to all the world, ' This was a man ! ' "

This sad death took place in February of the present year. In the *British Medical Journal* of July I read of an almost identical case, which most happily ended in recovery under treatment by the anti-streptococcus serum. The feeling of satisfaction with which one reads of such a triumph is somewhat clouded by regret that the discovery was not made six months earlier ; but we rejoice in the progress which science is making, and we look forward hopefully to still greater achievements along the same lines.

Serum-therapy is yet in its early infancy, and it behooves us not to be carried beyond our depths on the crest of the wave of enthusiasm ; but there is strong reason to hope that this discovery may yet prove worthy to be ranked with those of vaccination, anæsthetics, and antiseptics.

ANIMAL EXTRACTS.

There is also another class of diseases not due even remotely, so far as we know, to the action of germs, to which a somewhat novel method of treatment is now being applied. I refer to the exhibition of what are known as "animal extracts" in certain forms of disease, which I shall mention presently. Much as we pride ourselves upon the advanced state of physiology, there are certain organs and tissues in the human body of the functions of which we are still entirely ignorant. It may, however, be taken as an axiom that each and every organ either has or has had some duty to perform in the economy of the human organization.

Strangely enough, where physiology fails us pathology sometimes rallies to our assistance, and we occasionally learn something of the functions of an organ by noting the character of the departure from health which accompanies its disease or removal. It has thus come to be an accepted view by physiologists that each of those enigmatical organs exerts an influence on the general well-being of the individual, either by adding something to, or abstracting something from, the blood which circulates in it.

If, then, through degeneration or failure of development of one of these

obscure organs, the system is deprived of the products of its metabolism or internal workings, a corresponding departure from health must follow. No medical education is required to see that a rational method of treatment of such a disease would be to supply by artificial means the peculiar substance which the organ would itself supply in its normal condition. This peculiar substance, in the parlance of therapeutics, is called an "animal extract."

An example will serve to make this plain. There is situated in the neck, just in front of the larynx, an organ called the thyroid gland. In a positive way we know little of its function. It forms no visible secretion, and is not provided with a duct; yet it is abundantly supplied with blood, and has every appearance to the eye of being an important organ. Moreover, it has been found that when it is removed for disease from an adult there follows a peculiar train of symptoms. The mental powers of the patient undergo great deterioration, so that in a few months the patient becomes quite imbecile; at the same time there is formed beneath the skin a thick layer of mucous material which entirely changes the physical aspect of the sufferer.

A failure of development of this organ in infants is also found to be followed by most distressing results. Though born of healthy parents, and perhaps with robust brothers and sisters, a babe in whom this gland is functionally inactive is mentally an idiot, and physically a dwarf, with scarcely more life than a vegetable, repulsive and bestial in appearance, habits, and instincts.

Experimenting upon monkeys and other animals, it was found that removal of this organ was followed by results precisely in conformity with what had been learned by clinical experience such as I have mentioned. Moreover, a most important point was further discovered, viz., that in a monkey suffering from the effects of removal of the gland all the symptoms might be made to disappear by transplanting the gland of another animal—say, the sheep—into the tissues of the monkey. Subsequently it was found that almost equally good results followed the feeding of the animal with either the glands or an extract made from them by means of maceration in glycerine or alcohol. You may be very sure that it was not long before the human race was given the benefit of the results of these experiments. The class of cases of which I have spoken, in which mental and physical deterioration were known to be due to the absence or disease of the thyroid gland, were early subjected to this treatment, and with most startling results. Dr. Byron Bramwell reports a case of a girl sixteen years old, twenty-nine and one-half inches high, who, under this treatment, in six months grew six and one-half inches (one-fifth of height before treatment). "The skin," he says, "lost its harshness and became soft and smooth, and

the facial expression changed from a striking similitude to a bull-dog to the appearance of human intelligence."

Dr. John Thompson reports a case of a lad aged eighteen years, thirty-three and one half inches high, who in twelve months grew four and one-half inches, "whilst the change of facial expression was most marked, denoting an acquired activity both of mind and body in marvellous contrast to his original state." Many other equally notable cases might be quoted, but I trust sufficient has been said to show that there is a reasonable hope that further researches may reveal therapeutic agents of this character that will prove of inestimable value to the human race.

There are many little organs and so-called glands in connection with the brain—indeed there are vast areas of brain tissue proper—to which we are quite unable to attribute any function in the present state of our knowledge. Who can say that there may not yet be extracted from these tissues some substance which will dispel the clouds that hang over the intellect of those of our fellow-creatures who are afflicted with insanity? This may be far, very far, in the future; but such marvellous and amazing things have happened within the knowledge of all of us that he must needs have much assurance who would dare to place such and such limits, and say that beyond these human knowledge shall not pass.

X RAYS.

It is quite impossible for me to do more than allude to the fact that progress is also being made in physical science which, doubtless, will have a favorable bearing upon matters connected with our profession. Ghastly and gruesome shadow-photographs, anticipating Nature's process of reducing us to skeletons, have glared obtrusively from the pages of all the popular magazines. And even the staid and sober daily press has not been able to resist the demand which the intense interest of their patrons in this marvellous discovery made to be enlightened. Of its value to the physician and surgeon there is no question whatever, but from anything so strikingly sensational more is apt to be expected at first than the nature of the discovery warrants. And, consequently, some good people have taken it as a personal slight when it was explained to them that the X rays would not enable them to *see* a pain which they have felt under their waistcoats after a more than usually "comfortable" meal.

GENIUS OF MODERN PRACTICE.

But interesting and important as are these new discoveries, and great as is the honor and credit which accrues to the discoverer, most of us, in the course of our lives, will find that the bulk of our work will consist in putting into practice the knowledge gained by others.

The relief of pain and suffering and the cure of disease or injury are the sole objects sought by the patient in soliciting the services of a doctor. So that from the standpoint of the patient nothing could be simpler. But the genius of modern practice requires that, before he can prescribe a remedy, the physician or surgeon must be fully seized of all the facts which have a bearing upon the case. In other words, his first concern is to make a diagnosis.

For this purpose he brings to bear upon the case all his clinical experience and his pathological knowledge. But before he can understand pathology, or departure from health, it is obvious that he must be familiar with the phenomena of health, *i.e.*, physiology. This, in turn, presupposes an acquaintance with anatomy, biology, and chemistry. In the scope of knowledge thus brought to bear on a single case the student of medicine will recognize, practically, his whole curriculum of studies. The relative importance of these subjects it is difficult to fix. It has been the habit of those who fashion our curricula, as well as among students, to award premier importance to anatomy and physiology, but the earlier part of my address has shown, I hope, that the greatest advances in recent times have been due to the proficiency which has been attained in chemistry, physics, and biology, which includes, of course, bacteriology. The curriculum of the University of Toronto has, I am happy to say, been recently modified, so that the first year of study may be devoted largely to these subjects, and the facilities afforded by our magnificent chemical and biological laboratories are, I believe, not surpassed anywhere on this continent. While not presuming, then, to give a rating of the importance of these primary subjects, I have no hesitation in reminding you that in practice you will require, every day of your lives, all the knowledge of all these subjects that you can possibly acquire in the time at your disposal, and by what you lack of a perfect familiarity with them, by so much will you fall short of being a perfect practitioner of medicine at the bedside. Therefore diligence and industry must be your watchword throughout your whole course of study. I have often observed that one who has not completely mastered his elementary work as a student struggles on through his life's work under the impost of a heavy penalty. He may labor assiduously to overtake his disadvantage, and often he does do so to a large extent, but that he is always handicapped never ceases to be apparent, and to none more so than to himself.

It is principally for this reason that those interested in medical education have recently been making efforts to lengthen the time to be devoted to the acquisition of a medical profession. I can remember the time when it was possible to get through the course and obtain a license to practise in three years. In fact, a good schemer often managed it in

something less. Now, the Medical Council of this province has established a five years' course. But a "medical year," as understood by the council, really means only six months' study, or thirty months in all. In order to economize the time of the student, and save him the extra year which the Council seeks to add, this University, together with some other bodies, has sought to establish a four years' course, with sessions of eight months each. This will provide for thirty-two months of actual study. It is in my power to delight you by saying that it is not proposed to increase the number of lectures ; but I feel sure that every over-wrought student will appreciate the advantages of being able to work under conditions of less high pressure, of being able to digest and assimilate his mental pabulum with greater deliberation, of having more time for careful laboratory and clinical work, and—a most vital point—of being able to indulge more freely in healthful and manly outdoor sports, games, and recreations. In regard to the question of exercise, I am convinced that it would be an excellent thing if our students could have more regular and systematic exercise of a bracing character. The conventional "walk in the open air" may be all very well for young ladies' seminaries, but lusty young men in the full vigor of early manhood demand some more robust reaction from the physical inactivity incident to attendance on lectures. Of course, we all know that, with time for organization and practice, you could easily win the championships in Rugby and Association football, in baseball, lacrosse, and hockey ; but we would like to add to the pleasure of this knowledge the fuller satisfaction of witnessing the actual attainment of these laurels.

At the opening of each session it is usually considered appropriate and seemly to address a few words of fatherly exhortation to the freshmen. It seems to be always taken for granted that they must inevitably get themselves into trouble at first unless they receive in advance a few easy lessons in morality and deportment. In regard to morals, we, as a medical faculty, have for many years had abundant reason to be proud of our students. They have proved themselves to be, in all respects, worthy of our confidence and esteem, and we have no apprehensions in regard to the present first year class. In regard to deportment, we feel that that branch of study may be pretty safely left in the hands of the students of the senior years. It has always been the policy of the faculty, without relinquishing their authority, to hold that authority in abeyance, and to allow the students, in a large measure, to be their own disciplinarians. And I think that results have shown the wisdom of that policy. I believe that never since the re-establishment of the medical faculty of this University has an abuse of this confidence by the students called for an exercise of authority on the part of the faculty. Among our students such is the high regard for law and

order, such the respect which they entertain for the institution which fosters them, and, in short, so high is the standard of deportment which public opinion among them exacts from each individual, that life would be made intolerable for any turbulent or riotous spirit who dared to offend persistently against any of their unwritten, but none the less valid and stringent, laws.

Tradition says that long, long ago sedate and sober citizens used— unjustly, no doubt—to accuse our guileless students of singing and shouting on the streets at the very hour when they were surely at home burning the midnight oil. They have also been in times past charged with unhinging garden gates, dislocating signs, and other freakish pranks. My advice to any of my young friends in the freshman class who may, in a moment of weakness, be tempted to do any of these things is short and easy to be remembered—“ Don’t.” You can never tell when you may glide gracefully into the clutches of some prowling policemen, where “ cheek ” availeth not. Moreover, our city fathers, with a sinful disregard of the wasteful misappropriation of public funds, have of late years had our “ bobbies ” taught athletics, so that many of them are pretty fair “ sprinters ” for a hundred yards or so. And, besides, you *shouldn’t* do these things. But let not the present first year’s men imagine that because I say these things we expect they may be sinners above all other freshmen. What I have said to you to-night was said in effect last year to the present second year, the year before to the present third year, and the year before that to the—yes, even to the present fourth year, whom we have learned to trust and esteem, to whom we look, and not in vain, to furnish examples to the younger generations of students of dignity, diligence, and good conduct,—even the fourth year men were once freshmen. They have industriously fought their way up, acquiring day by day more and more knowledge, until now even the faculty, humbly conscious of their own limitations and imperfections, cower and quail before the vastness and effulgence of their erudition. Yes, men of the first year, such is the case, and such as they are this day you may, by diligence, thoroughness, and application, hope to be in a few short years, and though my words may sound satirical, I repeat in all seriousness that I have a very high respect indeed for the proficiency of our young graduates. It is true they lack experience, but they have an excellent scientific groundwork upon which to build experience. They have been taught that experience does not consist in mere lapse of time—that the experience which consists in making a mistake to-day and repeating that mistake for the next fifteen years does not avail much to the advantage of one’s patients. They have learned how to observe, and how to draw conclusions from their observations, and these powers, combined with industrious study and constant

reading, will enable them, as the years go by, to increase in knowledge, in clinical acumen, and in proficiency as practitioners.

Young men, I congratulate you upon entering upon a noble profession. I congratulate you upon entering that profession when the curve of its progress as a science shows a startling ascent, and when great and important discoveries seem all but ready to burst upon us. I welcome you in the name of the faculty; on behalf of the students I am sure I may say, "Welcome to our classes, welcome to our games and sports, welcome to our good fellowship and our fraternity."

THE OPERATIVE TREATMENT OF MAMMARY CARCINOMA.*

By W. BURT, M.D.,
PARIS.

THE subject which you have done me the honor to request me to bring before you to-day is one that is now in a most intensely interesting stage.

It has evidently got beyond the hopeless one or one of palliation, and I am more than pleased that surgeons of to-day can supply us with a goodly percentage of cases cured, with a good prospect of increasing that percentage at no distant date. I shall not detain you by quoting statistics. You can read them, if you have not already read them, at your leisure in the valuable contributions of Doctors Bull and Meyer published in the *New York Medical Record* in 1894, of Doctor Halsted in the *Annals of Surgery*, 1894, of Mr. Watson Cheyne in the "Lettsomian Lectures," delivered recently, and others. I can add but little to these. My own statistics are not large, but such as they are they put me in entire sympathy with those who are looking forward to a better condition of things. Surely it ought to be good news to a patient with mammary carcinoma to say to her what Halsted says: "Now we can state, positively, that cancer of the breast is a curable disease, if operated upon properly and in time;" or quote Mr. Watson Cheyne's 57 per cent. of cures as obtained by using the three years' limit. And I might here say that I think it would be well if all surgeons were to adopt the four years' limit, as suggested by Dr. Wm. T. Bull.

It will be my purpose chiefly to-day to lay before this association how this high percentage of cures is brought about. It is so startling, as compared with our former achievements and aspirations, that I might say a new era has dawned upon us. But while I speak so hopefully of the outlook, it behooves us to go cautiously and examine well the ground on which we tread. It is well to have the critic at all times with us, and I have no doubt that he has already censured Dr. Halsted for not basing his statistics on the three years' limit; and while Dr. Meyer eulogizes the

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work of Dr. Halsted, he, too, has been impressed with the fact that a three or four years' limit is advisable in preparing our statistics; for, in a kind letter received from him not long since, he told me that he had not written anything on the subject since his article in the *Medical Record*, already referred to, and that he did not wish to for three or four years to come, wishing to carefully study his cases. But Dr. Cheyne utters no uncertain sound. He bases his statistics on the three years' limit. I think no one will dispute that the good results obtained by Halsted, Meyer, Cheyne, and others have been obtained by doing the complete or wide operation. Now, the "complete operation" of to day may have quite a wide range. Dr. Bull calls the operation "complete" when the breast and the axillary glands, with fat and fascia, are removed in one piece. Dr. Meyer does not think the operation complete unless, in addition, both pectoral muscles are removed from their origin to their termination, with removal of the supraclavicular glands in a number of cases. Others, again, do not think it complete unless the periosteum, to which these muscles are attached, is also removed. Dr. A. Lane further advises the cutting through of the clavicle for the better removal of the glands. So that the word complete, as applied to operations for cancer of the breast, is not a fixed term, and might well be discarded. I will use the word "wide" instead of "complete" in my paper. But while the wide operation is reducing our death-rate, there is no doubt that it will be further reduced if the majority, or all, of our cases are submitted to an early operation, that is, before there is any, or very slight, infection. And here I would just make a few remarks about an early diagnosis; for, after all, it is the most important thing. If the people are once taught that a large percentage of cases of cancer of the breast are curable by an early and wide operation, I feel there is no doubt but that few women will refuse to be operated on, especially when the death-rate, even in the wide operation, is practically *nil*. None at all in Halsted's fifty cases, and only one in Cheyne's sixty-one cases. Now, I ask, how is an early diagnosis to be made? Let those who censure the general practitioner for referring his cases too late help me to answer it. One can be wise when the case is beyond a doubt to the sight, or to the touch; but, in the early stages, many cases are not beyond a doubt unless a pathological examination be resorted to. And I feel that every case upon which we propose to do a wide operation should first be positively diagnosed to be malignant.

We are told that ten per cent. of mammary tumors in elderly women are not cancerous, and I feel that not one of these cases should be looked upon as doubtful, and for that reason operated on as cancerous. I do not think we have as yet proved at all satisfactorily that a benign growth

in an elderly woman will necessarily eventuate in cancer. It is a very easy rule to commit to memory, "after the age of thirty-two or thirty-five remove everything." But is it surgical? Is it logical? I think we are going too far when we say "if it is not cancerous it will become so." It is a salve to our minds and to our patients'. But many a practitioner, I have no doubt, speaks conscientiously this rule to his patients. I feel that under no circumstances should a benign growth be submitted to the wide operation. I cannot agree with Dr. Bull that "exactness in diagnosis should play a secondary rôle." It is a reflection on our precision in a matter of diagnosis when it can be attained. I think it should not be left undecided before we operate. I hold that we cannot censure too much a laxity of diagnosis. No woman will care to undergo unnecessarily a mutilation which, in a measure, unsexes her, and I feel that the operation furore in breast amputations needs as healthy an opposition as it does in the perhaps too general castration of women. No doubt the danger of its happening here is not so great. I think already there must be very few cases on record, if any, where the wide operation has been performed for a non-malignant growth; for as yet this operation is confined to a few. But I have no doubt, from the teaching of the past and the present day, that many a breast has been sacrificed, and women, in a measure, unsexed, when a simple operation would have sufficed. Now, it is against our ideas in operating in mammary cancer to cut into the cancerous mass. All, I think, are pretty well agreed now that the infected region should be removed in one piece for fear of infecting the wound, and that on no account must the diseased tissues be cut into, but surrounded, and to-day I present you two specimens to represent this removal *en masse*, one from a patient of Dr. Taylor, of Princeton, operated on April 20th, last, the other from a patient of Dr. Addison, of St. George, operated on five days later. The former represents the removal of the breast and axillary glands as ordinarily performed—the complete operation of Dr. Bull and others; the other the plan advocated by Dr. Meyer, of New York. These operations and others I will refer to later on. I think it would be well, when we suspect simply an inflammatory hyperplasia or the fibroma of adolescence, or in some tumors due to dilatation of the ducts, to try first the application of the iodide of lead and mercury ointment four times a day for a few weeks, as Dr. Herbert Snow has advised us will disperse them. A cystic tumor can be made evident with the hypodermic needle, but for a solid tumor an exploratory incision and the freezing microtome, or the use of Mixter's punch, will, no doubt, settle the matter; and this may be carried out so that there will be very little or no danger of infecting the wound. If it prove to be a benign tumor, we will remove it by a simple operation; if malignant, by one of the wide operations. But to make a diagnosis in this

way the surgeon will need be an experienced pathologist. Well, it may have to come to this, for it will be impossible to have an experienced pathologist with us always when we operate in the country. There are too many patients who can ill afford any such expenditure. I have felt that we should have a State-paid pathologist as we have State-paid analysts in connection with our boards of health. I do not think it advisable to send patients at all times to a hospital. Our hospital surgeons tell us that their operations in private practice have a better percentage. Hospitals contain unavoidably many septic cases. I would prefer even to operate on a carcinoma in the ulceration stage at the patient's home if the appointments would admit of it. Without doubt, most of our hospitals have an experienced pathologist, who assumes the responsibility of pronouncing a growth mild or malignant. But the pathologist is not necessarily an infallible man, I am sorry to say. While I have no doubt that, as a rule, he may be correct in his reports on mammary carcinoma, still it seems that in cancer of the cervix uteri the pathologist often cannot speak positively at a time when the surgeon feels positive that he has a carcinoma to deal with. Still, the report of an experienced pathologist is the most reliable method of dealing with the diagnosis of mammary growth in the early stages, and in following out this plan we need have no reproach. Here I might just refer to the local origin of cancer, as it has much to do with the percentage of results from a wide operation. The fact that our best surgeons are now doing a wide operation, not only on their own responsibility, but without a protest from the pathologist, in pathological centres such as Johns Hopkins and the New York hospitals, is a sufficient guarantee that pathologists have nothing specially to offer against the aims and pretensions of those who look upon cancer as a local disease to a very great extent. I say in the very centre of pathological research the wide operation is being done, *e.g.*, at Johns Hopkins, Baltimore, by Dr. Halsted, whose co-workers are Professors Osler and Welch. As regards the origin of secondary growths as a local recurrence, I do not think that the mutilation of the knife—that the wound itself is a primary source of them.

Now, as to the operation for the relief of mammary carcinoma, I will first call your attention to what has been known as the complete operation, until Halsted and Meyer taught us that this is insufficient in many cases. I have already referred to the complete operation as the removal of the breast and axillary glands in one piece; and just here I might call your attention to the retrogressive teaching of Dr. Treves, in his operative work, to which many of us have looked for inspiration. Without detaining you too long, I might just say that he has discontinued the practice of cleaning out the axilla where glandular swellings cannot be discovered in that place. Surely, if we were to go and do likewise the light of our

hopes would be extinguished ; but, instead of stopping at the axilla, we go nearly as far as anatomy will allow us. I will not detain you with the details of the ordinary operation—you are all as familiar as I am with them ; and for the details of the wide operations of Halsted and Meyer I will refer you to their respective articles in the *Annals of Surgery* and *Medical Record*, which I now hand you, Mr. President. Those who have not done so may examine them at their leisure. As to the Halsted operation, there may be some points that surgeons may not be able to follow without witnessing the doctor operate. As to Meyer's operation, I think no one will have any difficulty whatever in following him, although it is a still wider operation. The technics of the operations are so fully explained in the articles referred to that I do not feel like taking up your time now with them, except to refer to a couple of incidents which happened in cases that I assisted. In the case of Dr. Addison, referred to, the enlarged glands were so adherent to the axillary vein that in cleaning it off a small branch was torn off at its junction with the vein. A small silk ligature around the hole was sufficient. In a case of Dr. Taylor, of Princeton, the whole of the axillary vein for a distance of two inches at least was involved in the mass. This was removed, and the vein tied above and below. Here the collateral circulation had already become established, and there was no subsequent œdema. There is too great a difference, however, in the modes of operating by surgeons. One will tell us that the axilla can be thoroughly evacuated without any section of the pectorals, simply using the retractor. Others again, while not removing the pectoral muscles, will cut the great pectoral across and sew it up, as Mr. Watson Cheyne has expressed himself in the Lettsomian lectures, delivered recently. My experience is that it is a very difficult matter to clean out the axilla without removing the pectorals or laying open the anterior wall, whether the glands are enlarged or not. I think those who say they can are not sure of their ground, and I do not feel the same confidence that the work is as thoroughly done as when the pectorals are removed or the anterior wall laid open. I think, too, many will prefer a clean dissection with a sharp knife to the use of a periosteum detacher, which Prof. Cheyne recommends for the removal of the glands. Haidenhain has recommended that the periosteum to which the pectorals are attached be removed. Prof. Cheyne has suggested, in cases of involvement of the nerves by masses in the axilla, amputation at the shoulder ; but this he no longer approves of. Dr. A. Lane proposes the removal of the supraclavicular glands, by cutting through the clavicle in every case ; but in this, I think, he is almost alone. Farther than Meyer goes it will scarcely be possible. The procedure of extending the incision upwards of Halsted and Meyer on to the neck, as advised by the latter, is all that

many of us will have courage to follow, and in doing this I feel that we we need not censure ourselves for having done too little. And here I might say that the thermo-cautery should be used in ulcerative cases for the prevention of infection, as done by Dr. McBurney. Dr. McBurney, one of New York's well-known surgeons, is following Meyer's operation in preference to Halsted's. You cannot help seeing that the wide operation has become of great magnitude, and in interest vies with, if not transcends, an appendicitis or a hysterectomy. It is no doubt to the success of the latter, in cancer of the womb, that the general surgeon has been stimulated to do an early and wide operation in cancer of the breast. Now, a few words as to the time taken in performing the wide operation.

Meyer tells us that his operation adds about twenty minutes to the ordinary complete operation, and I think that those accustomed to do the ordinary complete operation, with good assistance, will do Meyer's operation in the time stated. But Halsted's technique is somewhat different. To say that he often consumes from three to five hours in many of his cases is not exaggerating. He does what is known as a dry operation, applying, I understand, upwards of one hundred and fifty ligatures in some cases, and closing the wound without any drainage. This may sound to you like a legend of the Amazons, but, nevertheless, Dr. Halsted has every faith in his method—believes that shock is caused by loss of blood, of which he sheds but little; and the fact is, as I have said, that not one of his fifty cases succumbed to the operation, although the pulse of several was very feeble before commencement. The functional disability, from the wide operation of Halsted and Meyer, is less than one might suspect. By means of the anterior fibres of the deltoid a woman is able to dress her back hair. Where we have no suppuration, as a rule, but primary union, even in these extensive operations the small amount of rigidity or stiffness can be accounted for. When the diagnosis is made in the early stages, with very little or no infection of the axilla, and where there is no suspicion of involvement of the muscles, the operation of removing the axillary glands with the breast, as commonly performed, I think sufficient; but when the extension is further, possible infection of the axillary glands and possible involvement of the pectorals, one of the wide operations should be resorted to. This is a matter, however, which I think should be left to the judgment of the surgeon at the time; but I do not believe that the wide operation, that of Meyer or Halsted, should be resorted to in every case.

And here I will leave the subject, fearing that I have already trespassed on your time at too great length. It will no doubt take the next two decades at least to settle the question of percentages by the wide operations. By that time we should have statistics sufficiently reliable by which this subject may be adjudicated upon.

Selected Articles.

SYPHILITIC RE-INFECTION.

By H. FITZGIBBON, M.R.C.P., F.R.C.S.I.,

Past President Royal College of Surgeons, Ireland; formerly Surgeon and Lecturer on Clinical Surgery, City of Dublin Hospital; Senior Surgeon, Government Lock Hospital.

IN 1888 I publicly stated in the conclusion of an address upon syphilis, which I delivered as President of the Royal College of Surgeons of Ireland, at the opening meeting of the surgical section of the Royal Academy of Medicine—"That we know that syphilis, like other eruptive fevers, can be cured, and wholly eliminated from the system. The proof of this is the fact that it is now no longer impossible for the disease to be contracted a second time by the same individual."

I made this statement with the fullest conviction that syphilis, if uncomplicated and judiciously treated, is capable of being as thoroughly eliminated from the system as variola, scarlatina, measles, or any other eruptive zymotic disease, and that, like these diseases, although one attack affords a certain immunity from a second, yet a sufficient number of undoubted instances of reinfection of syphilis in the same individual had been reported to afford conclusive evidence that under certain circumstances the disease not only becomes entirely eliminated, but that even the protective effect of the first attack dies out.

The law which Ricord proclaimed in 1831, "la unicite de la syphilis," was accepted almost universally as unimpeachable, on the faith of his then justly pre-eminent reputation as the greatest living authority upon the subject. It may reasonably be doubted whether Ricord ever intended to assert the absolute impossibility of reinfection, for as early as 1845 he expressed the belief that exceptions to the law of the unicity of syphilis might be found, and he hoped that it might be so, as he believed it would be proof that the effect of syphilis was not necessarily life-long; subsequently he met two cases which he regarded as conclusive. In 1863, in an article "de la reinfection syphilitique," published in *Archiv. gen. de Med.*, Diday reported over twenty cases which he believed to be instances

of second infection. At this epoch there was a widespread belief among men whose experience best qualified them to express an opinion on the subject, that one attack of true syphilis did not give immunity to the individual from a repetition of the disease. For example, of thirty-three witnesses who were examined before a special committee appointed by the Secretary of State for War in 1867, to make a report upon venereal diseases as affecting the British navy and army, twenty-three were of opinion that one attack afforded no immunity from a second, while only sixteen adhered to the doctrine known as Ricord's law. In the edition of "The Pathology and Treatment of Venereal Diseases" published in New York by J. Freeman Bumstead, in 1883, the author says: "Before we can admit a second attack of syphilis we must have an undisputed history of the first infection; we must have proof beyond doubt of a second chancre, which is followed by well marked enlargement of the inguinal ganglia, and later on by secondary manifestations of an undoubted syphilitic nature. Without this succession of lesions we cannot admit the claims of any case of syphilitic reinfection." Bumstead, having thus defined the evidence upon which a case may be admitted to be one of reinfection, adds: "I have seen and treated three well-marked cases of reinfection with syphilis." It was not only upon the faith of such unquestionable evidence as I have quoted that I declared myself convinced in 1888 that syphilis can be wholly eliminated out of the system, and that the possibility of re-infection is a proof that such is the case. I happened to have under my own observation at the time a case which, even if no other case had ever been recorded, and if all the world denied the possibility of a second syphilitic infection, would have alone justified my conclusion, on the principle that "seeing is believing." As I never yet published this case, I will give it here in detail:

J. W., æt. 21, an officer in the post-office service, with a previous history of exceptionally good health, presented himself to me in March, 1880, having a typical solitary indurated chancre close to the frænum, beneath which a perforating process of ulceration had commenced. I divided the undermined frænum, and applied a saturated solution of nitrate of copper to the sore, which was then dressed with black wash. At this time there was no manifestation of constitutional syphilis except the local induration. The patient was fairly definite as to the time he contracted the disease, being about four weeks previous to my seeing him. One week later multiple adenitis of the inguinal glands appeared, and the nuchal glands became perceptibly enlarged; the submastoid gland lying in the space between the anterior margin of the trapezius and the posterior margin of the sterno-mastoid muscle was well marked. This particular lymphatic I have observed to be almost constant in cases of recent syph-

ilitic infection ; the enlargement of it is not symmetrical, being frequently unilateral, and when bilateral is always more conspicuous on one side than the other. The appearance of this multiple adenitis in the inguinal and nuchal glands is characteristic of recent syphilitic infection, and the common prodrome of the first skin eruption, as was the case with this patient, who developed a profuse roseolar syphilitic eruption about a week after the development of the adenitis. He was treated by inunctions and baths, and remained under my care and observation during the whole course of the disease. He had no unusual complication, although he had recurrent manifestations of syphilis in various forms during the first year. He made a good recovery, and in October, 1881, just one year and ten months from the time he contracted the disease, I advised him to discontinue all treatment, as I believed him to be perfectly cured.

His health continued good until October, 1886, when he again presented himself for advice, having contracted a sore underneath the foreskin. It had all the appearance of a large Hunterian chancre lying in the sulcus, and involving both a portion of the glands and foreskin. There was some difficulty, owing to the presence of slight inflammatory phimosis, in exposing it, but when brought into view it was found indurated and commencing to break down in the centre, where a gangrenous slough was forming.

The inguinal glands, which had been quite free for four years, were again enlarged and matted together ; there was a considerable number of nuchal glands enlarged, and the submastoid gland on the right side was fully as large as a bean. At no time during his previous attack were the lymphatics as extensively engaged as they were at this time. I applied strong nitric acid to the sore, and directed him to dress it with black wash on lint.

He was quite candid and fairly definite in his statement as to when he was exposed to contagion, and in this instance he believed it was in the last week in July, or about eleven weeks previous to my seeing him. He felt no discomfort after the application of the nitric acid, but the inflammatory phimosis increased the next day, so that he was unable to draw back the foreskin in order to dress the sore ; he postponed coming to me until the second day after the cauterization, when I found it necessary to split up the prepuce. Having done so, I found that the chancre had become phagedænic, and had already destroyed a considerable portion of the glans penis. The inguinal glands softened and broke down rapidly, assumed a burrowing phagedænic character, which was only checked by the application of nitric acid and the internal administration of opium and quinine, while mercurial inunctions were resorted to. He developed no skin eruption until the first week in November, when a well-marked dis-

crete pustular eruption of an indolent character appeared upon his face, head, body, and thighs, the arms and legs, from the knees down, having no spots. This patient made a tedious recovery ; he developed periostitis, syphilitic lepra, chronic sore throat, gumma, and various other obstinate syphilitic affections, which extended over a period of four years. He ultimately made a good recovery, and is now well, having had no relapse or reappearance of any syphilitic phenomena since 1893.

I have endeavored to supplement this case by obtaining notes of other unpublished ones, if possible, from members of the profession holding positions which afford exceptionally wide fields of observation. The result of my inquiries has been, for the most part, negative. Mr. Armand Bernard, Surgeon to the Liverpool Lock Hospital, writes : " I have had very few cases of reinfection of syphilis ; I have no recollection of attending a patient twice after a long interval in whom a reinfection occurred." He, however, cites one case of a patient who had syphilis in 1876, who came to him in May, 1890, after a long interval of perfect health, with " a large indurated sore upon the inner prepuce, glands in right groin slightly enlarged (doubtful). July 1st the sore was healed, suspicious eruption on forehead, excruciating pain in brow. July 12th, eruption on forehead papular ; no doubt of its specific character now." It is unnecessary to go further into the details of this case beyond recording the fact that it proved a protracted and severe one, with complications, such as ulceration of the hard palate ; but ultimately it made a complete recovery. Mr. Frederick Lowndes, Senior Surgeon to the Lock Hospital in Liverpool, and Medical Officer of the Liverpool police, kindly furnished me with notes of some cases which occurred in his practice, which were probably instances of reinfection, but in which the positive evidence was wanting. In his very wide experience he had not seen a case where reinfection had taken place after recovery from complete syphilis. Mr. Edward Hamilton, Senior Surgeon to Steevens Hospital, in Dublin, where there is a special syphilitic ward, in reply to my request to let me have notes on any cases of re-infection which had come under his observation, writes : " I do not think that I have seen any cases in which re-infection of syphilis has been established by proper proofs. I think we at Steevens have an abundant field for observation ; we have the care of the constabulary, conducted under military regulation ; the men are under our constant supervision during their entire service. We must have very decided evidence of the two attacks before we can admit their occurrence. I do not say it is impossible, judging from the natural history of bacillus and the statements of military surgeons." Sir Thornley Stoker, ex President R.C.S.I., has kindly furnished me with particulars of two cases which he regards as instances of second infection of syphilis : Case 1.

H. J., æt. 30, had been treated in 1880 and 1881, by Ricord, for secondary syphilis, by mercury, and believed he was cured. Consulted Sir Thornley Stoker in 1888 for typical hard chancre, which came on fourteen days after connection; it refused to heal until mercury was persistently given. No secondaries followed. Case 2. R. B., æt. 40, in 1882 had a primary, solitary hard sore, followed by secondary eruption and iritis, took mercury interjectionally for some years, and was treated at Aix-la-Chapelle for five weeks in 1888. On October 10th, 1895, he had a solitary sore, with some doubtful induration, which had existed for two weeks, and had appeared a week after connection. The inguinal glands were enlarged and hard. As the sore was, in Sir Thornley's opinion, evidently an indurated chancre, he put the patient upon a mild course of mercury, by the mouth. October 31st, induration marked, mercury increased. November 26th, no improvement; iodide of potassium added to mercurial treatment. December 4th, induration disappearing, the sore was healed by January 24th, 1896, and no mercury has since been taken. R. W. Taylor, of New York, in his very exhaustive work on venereal diseases (which is an enlarged and revised edition of Bumstead's work, to which I have before referred), states that of about 160 published cases of supposed re-infection of syphilis, it is safe to say that not thirty of the whole number are really authentic. He refers to the rigid analysis of these cases made by Hudalo, "De l'immunité Syphilitique," *Annales de Derm. et de Syph.*, 1891; as a result of this analysis Hudalo rejected all published cases as uncertain, except those reported by Delastre, Gascoyne, Caspary, R. W. Taylor, and Hutchinson. Another comparatively recent case, which appears to be a genuine one, was published by an observer named Budugoff Budugian. A man, æt. 41, got a chancre in November, 1893, which was followed by roseola. This patient had hard chancre in 1868, followed by sore throat and roseola. He continued under treatment until 1887, from which time he continued well until his present trouble. *Vratch*, No. 13, 1894, *Provincial Medical Journal*, June 1st, 1894.

Since this analysis was made Mr. Hutchinson has published in the *Archives of Surgery* no less than fifty-four cases of second infection of syphilis which he met with in his own practice; of these thirty-two are based upon evidence which appears to be beyond dispute, but of the whole series there is hardly one in which any reasonable doubt can be entertained. With such a record as this, upon the authority of such a careful observer as Mr. Jonathan Hutchinson, it appears unnecessary to seek further evidence as to the possibility of syphilitic re-infection.

Bearing upon the question of the possibility of a second syphilitic infection, and of the importance which may be attached to the establishment of the fact, there are points of interest yet unsettled. In the first

place, is syphilis to be classed among the exanthemata as an infectious eruptive fever, such as small-pox, scarlatina, or measles? It has so many attributes in common with the recognized zymotic fevers, that in my opinion, it may be properly included in the same class. It is produced by the transmission of a specific infection from one individual to another. There is a fairly definite period of first incubation between the inoculation with the virus and the local manifestation of its presence by characteristic appearances at the point of inoculation. Then supervene headache, general malaise, pains, characteristic adenopathies, accompanied by an abnormally high temperature ranging from 100° to 101.5° F., generally followed by a characteristic eruption, upon the appearance of which the temperature falls, and the constitutional disturbance abates. To these characters, in common with the recognized exanthemata, may be added the fact that one attack is followed by a period of greater or less duration in which the same individual is insusceptible of re-infection.

It may almost be assumed that this disease, which has so many characters in common with other zymotic fevers, has also a distinctive bacillus of its own; but if this is the case it has yet to be demonstrated. Lustgarten believed he had succeeded in doing so, but as his method was unsuccessful in the hands of such expert microscopists as Sabourand and Currier, it must still remain a subject for further research. The syphilitic virus contrasts remarkably in some of its properties with the infectious principle of most other infectious fevers. It is capable of lying, as it were, dormant, in some instances, for almost an indefinite length of time after its introduction into the system; sometimes there is a local induration at the seat of the inoculation, which is the only indication of the disease; in other cases even this disappears, with or without treatment, and there is no evidence that the person has contracted syphilis until something occurs to produce a constitutional disturbance, by which the dormant syphilitic virus is, as it were, stirred into activity. This property of syphilis is well illustrated by the frequent effect of vaccination upon the children of syphilitic parents, who are often born free from any evidence of the disease and remain so until they are vaccinated, shortly after which not only does the seat of the vaccination pustule assume a syphilitic character, but general syphilitic phenomena are developed. I saw a remarkable example of this property of syphilis when I was a student, in 1864. A fellow-student of mine got a sharp attack of simple fever. On the fourth day of the fever he developed a macular eruption over his back and trunk; on its appearance the case was pronounced by the late Dr. William Stokes, one of the highest authorities upon fever that has ever lived, to be one of maculated typhus. Upon the ninth day there was a crisis by sweating, and the fever left him, but the maculæ remained. Dr. Stokes promptly recognized that

the fever had only been an attack of simple synocha, and that the eruption was syphilitic. It then transpired that the young man had a venereal sore a considerable time previously which had disappeared without any but local treatment, and he had not suspected that he had contracted syphilis from it.

A somewhat similar case came under my observation recently : A gentleman consulted me about a small hard chancre on the body of the penis. It was the fourth week after contagion, and there being slight infiltration of the inguinal and nuchal glands, I put him promptly upon a mercurial treatment, under which the local induration rapidly disappeared. For four months he developed no syphilitic phenomenon whatever, and I regarded it as an instance in which what has been termed by Mr. Hutchinson as "suppression treatment" was likely to be successful; suddenly he developed a sore throat, which was accompanied by high fever, temperature, 105°, headache, and sick stomach, and a tongue white and thickly coated, more like the tongue in small pox than anything else. On the second day a macular, subcuticular mottling was visible all over his body, together with a general redness of the skin, which increased until the redness became so intense as to mask the macular eruption altogether. I had never seen such a complication before, but it was obvious the gentleman had a bad attack of scarlatina, which had stirred into activity the syphilis which previously was quiescent. With the exception of baths, all treatment for syphilis had to be suspended until after the period of desquamation was over, the syphilitic maculæ remaining distinct, and also a redevelopment of inguinal and nuchal adenitis occurring. The resumption of mercurial inunctions and vapor baths was followed by a rapid disappearance of the eruption, and the patient was soon free from any apparent evidence of syphilis.

I met recently another notable instance of dormant syphilis in the case of a medical man. He had contracted an undefined local sore fifteen years ago, which was followed by a sore throat. Both the sore and the throat got well without any treatment except the application of iodoform to the one and an astringent gargle to the other. He developed no secondaries, and married two years after the contagion. His first child was born about two years after his marriage; a few weeks after its birth it got snuffles, and threw out an unmistakable syphilitic eruption, for which it was treated with mercury, and made a complete recovery, being now twelve years old, and healthy. His wife has since had two premature confinements, and one healthy child. She never developed any symptoms of syphilis, nor has her husband since two years previous to his marriage.

Another point upon which I have no doubt is that the character of a primary chancre and its subsequent constitutional sequelæ are greatly influ-

enced by the condition and stage in which the infecting sore or lesion is in at the time that the infection is transmitted from it. Syphilitic infection transmitted by the blood, the secretion of a mucous patch by a chancre in its early stage, or any other syphilitic lesion where the virus is purely syphilitic and unmixed with inflammatory products, such as pus, dirt, or septic matter, as in the case of chancres in an advanced stage where the induration has commenced to break down and become gangrenous, will give rise to a mild, uncomplicated type of the disease, as compared with that which will result from what may be termed inoculation with impure or septic syphilitic virus. This explains how one individual may contract a mild, uncomplicated disease from the same source from which another person in a short time afterwards may get a most virulent disease, with all the characters of blood-poisoning superadded to syphilis. The case is quite analogous to that of vaccination from a vaccine pustule after the lymph has become semi-purulent and contaminated with inflammatory products, the result of which is to produce sometimes obstinate pustular eruptions, affections of the lymphatics, and other troublesome and persistent sequelæ. Not only does it appear that the type of individual cases depends upon the purity or impurity of the inoculated virus, but it seems more than probable that the epidemic constitution of the disease at different periods has been determined in this manner. For example, the most virulent outbreak of syphilis on record was that of 1495, when, during a European war, through the overcrowding of camps, neglect, and want of cleanliness and medical attendance, the disease assumed an epidemic constitution of unparalleled severity.

I have been for seventeen years surgeon to the Government Lock Hospital for Women in Dublin, during which period I have had about 9,000 cases of venereal disease under my observation; about half of these were syphilitic, and many of them re-admitted after long periods of freedom from symptoms; yet having regard to the fact that the hospital is conducted upon the voluntary system, and that the patients seldom remain under treatment until they can be regarded as cured, I have discarded all these cases as open to doubt as to their being, any of them, instances of re-infection.

Conclusions.

(1) Syphilis is a specific fever of the same class as the other major exanthemata.

(2) That if uncomplicated by pre-existing constitutional cachexia, or co-existing septic influence, it runs a definite course, by which it exhausts in the system of its recipient the elements upon which its virus can feed. Thus, like variola, vaccinia, etc., the first attack is followed by a period during which the same individual is insusceptible of re-infection.

(3) That the effects of syphilitic infection are no more necessarily lifelong than the effect of any other zymotic eruptive fever, but that the process by which it is eliminated is more tedious, and is liable to interruptions and complications which are not common to it with the other exanthemata. There is abundance of evidence that by far the majority of persons who contract syphilis recover completely from it, and there is also indisputable proof that, after the lapse of a period of over five years, not only has the disease disappeared from the system, but that even the protective influence of it may die out, and the elements which it had exhausted be re-established.

(4) Too much importance has been attached to the question of the possibility of second infection with syphilis as the only reliable proof of complete recovery from the disease. The experience of all those who have much knowledge of the treatment of the disease in the present day is that, with few exceptions, complete recovery takes place within three years from the date of infection, and that the subject develops no subsequent evidence of the disease, either in his own person or by transmission to his offspring. It may happen, as it does in small-pox or vaccinia, that the protective influence remains, but this is no evidence that there is any syphilitic taint left. It would be equally rational to assert that a person was still suffering from small-pox, vaccina, scarlatina, or typhus fever, because he was still under the protective effect of an attack of one of these exanthems and insusceptible of re-infection.

(5) From reported cases it would appear that when second infection with syphilis takes place, the disease is more likely to be of an aggravated type than in first attacks. From this I should conclude that the re-infection is more apt to be communicated by contact with the impure or septic source of infection than from pure or less virulent syphilitic virus. In illustration of this I may refer to the case I have myself reported and also to those reported by R. W. Taylor, of New York, two of which he states "ended quite promptly in death." Such a consequence is more suggestive of acute sepsis than re-infection with purely syphilitic virus.—*Medical Press.*

TREATMENT OF MALIGNANT TUMORS WITH THE TOXINS OF ERYSIPELAS AND BACILLUS PRODIGIOSUS.

BY WM. B. COLEY, M.D.,

Attending Surgeon to the New York Cancer Hospital, Assistant Surgeon to the Hospital for Ruptured
and Crippled.

THE cases reported extend over a period of upwards of four years, and they embrace nearly every variety of sarcoma and carcinoma. In practically all the cases the diagnosis was confirmed by microscopic examination made by the most competent pathologists. In addition, the majority of the tumors had been pronounced inoperable by leading surgeons, and in many cases still further evidence of malignancy was furnished by a history of repeated recurrence after operation.

It would seem possible from this large series of cases to arrive at some scientific opinion as to the value or worthlessness of the toxins in malignant tumors. The fact was emphasized that this method of treatment had been advocated only in inoperable cases which were entirely hopeless, not only from a surgical standpoint, but also as regards any other hitherto known method of treatment. The author expressed the desirability of having these results subjected to the severest criticism. If they were able to stand this they would be of the greatest importance, not only as bearing upon the future treatment of malignant tumors, but also as throwing some light upon the unsolved problems of the etiology and pathology of such tumors.

An attempt was made to show that the method of treatment rested upon a rational basis, namely, the considerable number of cases of undoubtedly malignant tumors that had been permanently cured by attacks of accidental erysipelas. The writer's own observations covered the whole field from the accidental erysipelas to the mixed toxins. He was led to take up this line of investigation from having observed a small, round-celled sarcoma of the neck, five times recurrent, and given up as hopeless, cured by an attack of accidental erysipelas, patient having been found alive and well seven years afterward. His first series of ten cases were treated with repeated injections of living bouillon cultures, with the view

of producing erysipelas. The unmistakable improvement that followed the repeated injections, even when no erysipelas was produced, especially in sarcoma, suggested that a portion, if not all, of the beneficial influence was due to the toxins instead of the living germ, and this led to experiments with the toxins alone.

The first experiments were conducted with bouillon cultures that had been subjected to 100° C., and were used without filtration. The reactions following the injections of this solution were similar in character to those obtained from injections of the living germ, although less severe. In order to increase the virulence of the cultures, the writer made use of the fact demonstrated by Roger, that the bacillus prodigiosus, a non-pathogenic organism, had the power of intensifying the virulence of the streptococcus of erysipelas. The toxic products of the two germs were prepared separately and mixed at the time of using.

This mixture produced a much more severe reaction than when the erysipelas was used alone, and the beneficial influence upon the tumor was likewise more marked. Later on, at the suggestion of Mr. B. H. Buxton, the two germs were grown together in the same bouillon, the erysipelas being grown alone for ten days and the bacillus prodigiosus added, and the two allowed to grow together for another week or ten days, at the end of which time they were passed through a Kitasato filter. This appeared to be a still greater improvement in technique.

A still further change was made with a view of utilizing whatever of value might exist in the insoluble products remaining in the dead germs; the cultures were heated in a temperature sufficient to render them sterile, which was found to be 58-60° C. for one hour. By the addition of a little thymol the fluid could be kept indefinitely in glass-stoppered bottles. This preparation was much stronger than those before described, and experience proved it to be much superior to the others in its action upon the sarcoma. An analysis of the cases treated showed that 48 were round-celled sarcoma, 13 spindle-celled, 7 melanotic, 2 chondro-sarcoma, 3 mixed celled, 14 sarcoma, special type not known. Total number of cases of sarcoma, 93; carcinoma and epithelioma, 62 cases; sarcoma or carcinoma, 10; tubercular, 2; fibro-angioma, 1; mycosis fungoides, 1; goitre, 2; keloid, 1. Of the cases of sarcoma, nearly one-half showed more or less improvement; the variety that showed the greatest improvement was the spindle-celled; that which showed the least, the melanotic. Next in order of benefit was the mixed celled—round and spindle; then round-celled, while osteo-sarcoma closely approached the melanotic in showing but little change. In a series of nine cases of melanotic sarcoma, no improvement was noticed in six, very slight in three. Most of the cases of osteo-sarcoma failed to respond to the treatment, many showed

slight improvement, and one case, a very large osteo-chondro-sarcoma of the ilium, apparently disappeared, and the patient remained well for nearly a year, when a recurrence occurred. One case of round-celled sarcoma of the neck, of very rapid growth, showed very marked decrease during the first week's treatment, after which time it continued to grow in spite of large doses of the toxins.

REPORT OF SUCCESSFUL CASES.

The most worthy of especial note were the following :

CASE 1. A twice recurrent inoperable sarcoma of the neck with large secondary sarcoma of the tonsil.

Last operation performed by Dr. Wm. T. Bull, March, 1891. The tumor was so extensive that only a portion could be removed; the general condition of the patient, May 4, 1891, was so bad that he was expected to live but a short time. He could swallow no solid food, and liquids with difficulty. He was treated from May 4 until October 8, 1891, with repeated local injections of living cultures of streptococcus of erysipelas; decided improvement followed the injections, and whenever they were discontinued for a short time the growth increased in size. On October 8 a severe attack of erysipelas was produced by using a new and more virulent culture. During this attack the tumor of the neck nearly disappeared, the tumor of the tonsil decreased in size; general condition of the patient rapidly improved, and he had soon regained his usual health and strength. He has had no treatment since. He was last seen in September, 1895, four years later, at which time the tumor of the tonsil, though still present, had greatly shrunk in size; there was a small mass at the site of the old scar in the neck, apparently made up of cicatricial and fibrous tissue.

MICROSCOPIC REPORT.

(Copy from Records, N. Y. H. Laboratory.)

Operation: A piece of tumor, about the size of an orange, was removed, but a portion yet remains, being too deeply seated for extirpation.

Microscopically, the tumor is composed of fibrous tissue and spindle cells, the fibrous tissues predominating in places and in others the spindle cells.

There are many areas of cells resembling mucous cells, and not to be differentiated from myxomata; vascular supply abundant, and vessel walls formed by tumor tissue.

Diagnosis, "myxo-sarcoma."

FARQUHAR FERGUSON, M.D.,

Pathologist to the New York Hospital.

CASE 2. Large recurrent sarcoma of the back and groin; entire disappearance of both tumors; patient in perfect health, without recurrence,

four years after the beginning of the treatment, and more than three years after the cessation of the treatment.

Patient, male, aged 40; sarcoma of the back and lower lumbar region 7x4 inches, with a secondary tumor the size of a goose-egg in the groin. The groin tumor was removed by operation, January, 1892; it rapidly recurred. Patient was examined by Dr. Wm. T. Bull and several other surgeons, who all regarded the case as inoperable. Diagnosis of sarcoma was made and confirmed by Dr. Farquhar Ferguson's (pathologist to the New York Hospital) examination of a portion removed under cocaine.

Treatment by repeated daily injections of living bouillon cultures of erysipelas was begun in April, 1892. At the end of two weeks a severe attack of erysipelas was produced. At the end of three weeks both tumors had entirely disappeared. Recurrence followed in July, and the tumors, both in the back and the groin, grew more rapidly than before. The injections were resumed, and between October, 1892, and January, 1893, the patient had four additional attacks of erysipelas; they were milder in character, and the effect upon the tumor was less striking.

In January, 1893, the tumor in the back was removed, but that in the groin left undisturbed. At the end of three weeks there was an apparent recurrence in the back, and the injections with the mixed toxins of erysipelas and bacillus prodigiosus were then begun. Both tumors quickly disappeared. Treatment was discontinued in March, 1893; patient has been in perfect health, free from recurrence since.

PATHOLOGICAL REPORT.

(Copy from Records N. Y. H. Laboratory.)

The tumor is a sarcoma, in which the cells are round, oval, and spindle, in which everywhere there is seen a stroma of fibrous tissue, apparently the remains of a subcutaneous tissue, which has not been completely destroyed during the development of the tumor. Yellow elastic fibres are quite abundant throughout the tumor, but the vascular supply is not very abundant.

FARQUHAR FERGUSON, M.D.,

Pathologist to the New York Hospital.

CASE 3. Large inoperable sarcoma of the abdominal wall and pelvis; entire disappearance of the tumor; no recurrence three years after.

The patient, a boy of sixteen years of age, had a tumor 7x5 inches in extent, involving, apparently, the entire thickness of the abdominal wall, attached to the pelvis, and, judging from the symptoms and position, evidently involving the wall of the bladder. A portion of the tumor was removed, and pronounced spindle-celled sarcoma, by Dr. H. T. Brooks, pathologist of the Post-Graduate Hospital. The case was regarded as inoperable by Prof. L. Bolton Bangs, and referred to Dr. Coley for treat-

ment with the toxins. Patient was admitted to the N.Y.C.H., January, 1893; treated for three months with the mixed filtered toxins. At the end of that time the tumor had nearly disappeared, and the remainder was gradually absorbed after the injections were discontinued; there was no breaking down of the tumor tissue; patient has been in perfect health up to the present time, more than three years after cessation of treatment.

PATHOLOGIST'S REPORT.

Spindle-celled sarcoma.

H. T. BROOKS, M.D.,

Pathologist to the Post-Graduate Hospital.

CASE 4. Large inoperable sarcoma of the abdominal wall; entire disappearance; no recurrence two and one-half years afterward. The patient, a woman, twenty-eight years of age.

Exploratory operation had been performed in August, 1893, by Dr. Maurice H. Richardson, of the Massachusetts General Hospital. The tumor was too large to be removed; a portion was excised for microscopic examination. The diagnosis made by Dr. W. F. Whitney, pathologist to the hospital, was fibro-sarcoma. The patient was sent to Dr. Coley by Dr. Richardson for the erysipelas treatment. The injections with the mixed toxins were begun in October, 1893, and continued for ten weeks; the tumor entirely disappeared. The patient is still in perfect health, with no trace of recurrence.

PATHOLOGIST'S REPORT.

August 31, 1893.

The specimen from the tumor of the abdominal wall (Mrs. L.) was a small, dense, ill-defined, whitish, fibrous-looking mass, which, on microscopic examination, was found to be made up of large numbers of small cells, with a tendency to form fibres. This latter condition was more marked in some places than others. The diagnosis is fibro-sarcoma.

W. F. WHITNEY, M.D.,

Pathologist to the Massachusetts Hospital, Curator Warren Museum,
Harvard Medical School.

CASE 5. Spindle-celled sarcoma of the leg. Popliteal region. Three times recurrent. Disappearance. Recurrence in gluteal region after one and a half years.

The patient, a girl, 15 years of age, had undergone three operations by Dr. Wm. T. Bull, for spindle-celled sarcoma starting in the metatarsal bone. In January, 1894, a tumor the size of a child's head was removed from the popliteal region. The one in the stump, the size of a hen's egg, was left to test the value of the toxins. Complete removal of the tumor in the popliteal region was impossible. The toxins were administered at the New York Hospital, under Dr. Bull's direction, for about two months;

treatment was continued at the New York Cancer Hospital by Dr. Coley. The indurated mass in the calf slowly disappeared ; tumor in the stump also disappeared.

Patient remained well for one and a half years. At the end of that time there was a recurrence in the gluteal region. The toxins were again administered ; the tumor diminished in size, and in February, 1896, was removed.

PATHOLOGICAL REPORT.

Tumor the size of a child's head, measuring $9 \times 7 \times 4 \frac{1}{2}$ centimeters, is partly surrounded by a smooth capsule, but presents many freshly incised surfaces ; whitish in color ; very firm ; of little vascularity, and presenting the appearance of fibro-sarcoma.

Microscopic examination of the tumor shows the typical structure of a fibro-sarcoma, with sarcoma elements predominating ; vascular supply fairly predominant.

F. FERGUSON, M.D.,

Pathologist, New York Hospital.

CASE 6. Extensive spindle-celled sarcoma of the scapula and chest-wall ; entire disappearance of the tumor under three months' treatment ; patient at present in perfect health ; no trace of recurrence twenty-three months later.

The patient, a girl, aged 16 years, was admitted to the "incurable ward" of the New York Cancer Hospital on June 20, 1894. The tumor apparently started in the region of the left scapula four months before, and extended to the vertebral line behind, and in front to the edge of the sternum ; it was fixed to the chest-wall, measured 13 inches behind, 7 inches in front. The left arm was bound down by the new growth so that it could not be raised to a horizontal position ; the skin was normal ; there were no general or local signs of inflammation. A portion of the tumor was removed for microscopic examination, and a diagnosis of typical spindle-celled sarcoma was made by Dr. H. T. Brooks, pathologist to the Post-Graduate Hospital. The patient was treated for three months with daily injections of the mixed unfiltered toxins ; improvement was immediate, and the tumor very rapidly disappeared by absorption. Patient remains in perfect health at the present time.

PATHOLOGIST'S REPORT.

Typical spindle-celled sarcoma.

H. T. BROOKS, M.D.,

Pathologist to the Post-Graduate Hospital.

CASE 7. Intra-abdominal round-celled sarcoma of mesentery and omentum ; disappearance ; patient well, without evidence of recurrence one and a half years later.

The patient, female, aged 23 years, was operated upon by Dr. Willy Meyer, at the German Hospital, in August, 1894. A small tumor involving the mesentery, omentum, large and small intestine, was found and removal considered impossible. Portion was excised for examination and pronounced by Dr. Schwytzer, the pathologist of the German Hospital, "round-celled sarcoma." Patient was referred to Dr. Coley for treatment with the toxins. Injections were given in the gluteal region and abdominal wall for about six months, with occasional intervals. In February, 1896, an attempt was made to close the sinus in the abdominal wall which had persisted since Dr. Meyer's operation. The sinus was found to lead into the gall bladder and several impacted gall-stones were removed; careful exploration of the abdomen failed to reveal the presence of any tumor. Patient perfectly well, August 7, 1896.

CASE 8. Epithelioma of the chin, lower jaw, and floor of mouth; entire disappearance; patient perfectly well two years later.

The patient, a woman, 34 years of age, was admitted to the Methodist Episcopal Hospital in May, 1894. A rapidly growing tumor was found, involving lower jaw, floor of mouth and soft part of the chin, extending over an area about the size of a silver half-dollar, presenting the appearance of a typical epitheliomatous ulcer. The patient was regarded as inoperable by Dr. George R. Fowler; a portion of the growth was excised and diagnosed as epithelioma, by Dr. Wm. N. Belcher, pathologist to the hospital. The patient was treated at the New York Cancer Hospital from June, 1894, till September, 1894, with the mixed unfiltered toxins. There is no trace of the tumor to be found at present and the woman is in perfect health (July, 1896).

PATHOLOGIST'S REPORT.

Material from chin and lower jaw, May 20, 1894. Sections were not entirely satisfactory, but from the gross appearance of the materials, and those revealed by the microscope, the diagnosis of epithelioma is offered.

W. N. BELCHER, M.D.

CASE 9. Enormous osteo-chondro-sarcoma of the ilium; tumor disappeared; patient regained his usual health and remained well for seven months, at which time a recurrence occurred. The tumor has resisted further treatment; the patient, although alive, is in a hopeless condition.*

CASE 10. Spindle-celled sarcoma of the hand, six times recurrent; remained well for one year, then recurred.

CASE 11. Very large, twice recurrent angio-sarcoma of the breast; treated for six months with the erysipelas and prodigious serum; marked

* Patient died, July, 1896.

reduction in size, making the tumor easily removable ; excision, September, 1895 ; no recurrence, February 8, 1896.

The patient, a woman aged 59 years, was admitted to the New York Cancer Hospital on January 20, 1895 ; had a very large recurrent tumor in the region of the left breast, extending from the sternum to the mid-axillary line ; the tumor was fixed to the chest-wall, and entirely inoperable ; patient was extremely weak. She improved slowly under the local injections of the erysipelas serum, and in September the tumor had become so much reduced that it was easily excised.

MICROSCOPICAL REPORT.

I have examined a large number of sections from different parts of the tumor of breast of No. 207, and although there is considerable diversity in detail of the new growth in different parts, I think that the structures are all referable to the type of angio-sarcoma, which accordingly is the anatomical diagnosis.

T. MITCHELL PRUDDEN, M.D.

CASE 12. Large inoperable round-celled sarcoma of the iliac fossa ; treatment was begun in June, 1893 ; tumor almost entirely disappeared ; patient was in good health, August, 1894, after which time he was lost sight of.

CASE 13. Probable sarcoma of the sacrum ; disappearance of tumor ; complete restoration to health.

The patient, male, 38 years of age, began to lose flesh and strength in February, 1895. Later had severe pains in lower portion of the spine and sacrum, shooting down the legs. April 1, began to get lame in the right leg ; soon after in the left ; all of the symptoms progressively increased, and on the 2nd of May his weight had fallen from 175 to 134 pounds. He was admitted to Dr. Kinnicutt's service at St. Luke's Hospital ; rectal examination showed a tumor, hard in consistence, attached to the anterior portion of the sacrum, the lower portion of which only could be reached with a finger. Clinical diagnosis of Dr. Kinnicutt and the others who saw the patient in consultation was inoperable sarcoma. No microscopic examination was made. A two to three weeks' trial with the erysipelas toxins was advised by Dr. Coley. The improvement was almost immediate ; injections were made into the buttocks ; treatment was repeated daily, and at the end of one week the excruciating pain had almost entirely subsided, the lameness improved rapidly, and at the end of six weeks the patient had gained 28 pounds and was able to resume his work. Examination March 8, 1896, showed the patient to be in perfect physical health ; his lameness had disappeared ; no trace of a tumor could be detected on rectal examination ; his weight at that time was 175 pounds.

Several other cases in which very marked improvement had followed the use of the toxins were reported.

Attention was further called to nine successful cases in the hands of other surgeons who had used this method. The most important of these were the following :

CASE 1. A large spindle-celled sarcoma involving almost the entire palate and pharynx. This case, it was stated, had already been reported in the *New York Medical Record*, November 17, 1894, but its value was greatly enhanced by the fact that there had been no recurrence two years afterwards.

CASE 2. Extensive inoperable intra-abdominal sarcoma, reported by Dr. Herman Mynter, of Buffalo, in the *New York Medical Record*, February 9, 1895. In this case the tumor disappeared, and up to April, 1896, there had been no recurrence.

CASES 3-6. Drs. L. L. McArthur and John E. Owen, of Chicago, had had three successful cases, although sufficient length of time had not elapsed to determine whether or not they could be classed as cured. All of the cases were recurrent, and in two amputation of the leg had been advised ; in a third, amputation of the arm.*

CASE 7. Czerny, of Heidelberg, who has used the method in four cases of sarcoma and in four of carcinoma, has reported one case of rapidly growing, inoperable, round-celled sarcoma of the parotid, which nearly disappeared under the influence of eighteen injections. The case has been more recently referred to as cured, by Glueckmann.

CASE 8. Dr. Judson C. Smith, of the Post-Graduate Medical School, had a case of small round-celled sarcoma of the neck, the size of an orange, disappear entirely under eight weeks' treatment with the mixed toxins. Microscopic examination was made. Patient gained 25 pounds in weight, remained well for a number of months, at the end of which time a recurrence took place.

CASES 9-10. Two other successful cases were briefly reported, both of which were confirmed by microscopic examination ; both cases were recent, and, therefore, could not be classed as permanent cures.

The writer stated that he did not expect the profession at large to accept without question and criticism such remarkable results as he had reported, and for that reason he had related with some detail the successful cases in the hands of other surgeons who had employed this method. He was of opinion that a series of upwards of twenty successful cases of inoperable sarcoma (four of which had remained well upwards of two and a half years), the diagnoses of which had been established beyond question according to accepted methods of diagnosis, ought to be sufficient to

* In two of these cases there was a suspicion of recurrence in April, 1896.

demonstrate the real and positive advance that had been made in a field which, up to this time, had been regarded as absolutely hopeless. He did not doubt that there were those who would still remain skeptical about the value of the toxins in spite of the evidence presented. Such persons must either fail to see any logical connection between the accidental erysipelas and the toxins, or they must go even farther and deny that there are any authentic cases of malignant tumors that were cured by accidental erysipelas. The only explanation they can have to offer for the results which cannot be questioned is, that in all the successful cases there must have been an error of diagnosis.

Such an explanation might be entitled to some consideration were a single case only involved, but those who would seriously propose it as a satisfactory explanation, in view of the results in more than twenty cases, could not claim to be guided by scientific principles. The writer stated that he had carefully examined the literature of the subject of spontaneous disappearance of tumors supposed to be malignant, but had failed to find a single instance in which the diagnosis had been confirmed by the microscope. It would appear remarkable that these cases should be the first on record with a clinically and microscopically confirmed diagnosis to disappear spontaneously, and it would seem more remarkable still that this disappearance should be coincident with the beginning of the treatment with the toxins.

Furthermore, it would be clearly unfair to rule out these cases on the ground of error in diagnosis, without ruling out the cases of cure following operation for the same reason.

The writer then briefly referred to the various theories that had been offered in explanation of the action of the toxins. He still adhered to his opinion, expressed in his earlier paper, published in December, 1892, that the micro-parasitic origin of malignant tumors furnished the only rational explanation of this action. His conclusion were, (1) that the mixed toxins of erysipelas and bacillus prodigiosus exercise an antagonistic and specific influence upon malignant tumors, which influence in a certain proportion of cases may be curative. (2) That the influence of the toxins is very slight in most cases of carcinoma, including epithelioma, most marked in sarcoma, but that it varies greatly with the different types, the spindle-celled form being by far the most responsive to the treatment. (3) That the action of the toxins is not merely local in character, but systemic. (4) That the toxins should be reserved for use in clearly inoperable cases of sarcoma, or in cases after primary operation, to prevent recurrence.

DISCUSSION.

DR. WELCH.—I have been very much impressed by this personal statement from Dr. Coley, and I see no way of gainsaying the evidence which he has brought forward, that there is something specifically and genuinely curative in his method of treatment. A single undoubted cure of a demonstrated cancer or sarcoma by this treatment would be enough to establish the fact that the treatment exerts some specific curative effect, for the spontaneous disappearance of undoubted malignant growths of this character is almost unknown. Dr. Coley has, however, presented to us positive proof of the cure, not of one only, but of several cases of malignant tumor by his method. Although I suppose that in any given case the chances of cure by this method are at present not great, still the demonstration that cure is possible gives every encouragement for perseverance in this line of investigation and work, and for efforts to perfect the method of treatment.

It is interesting to learn that the most strikingly beneficial results have been obtained in the treatment of spindle celled sarcomata. There are certain kinds of sarcomata which some pathologists are inclined to rank rather among the infectious tumors than among the genuine tumors, in the sense in which these terms are used by Cohnheim ; but it is rather certain sarcomata of the lymphoid type than the fusiform-celled sarcomata which are thus believed to be possibly outside of the class of genuine tumors, according to Cohnheim's classification.

As Dr. Coley suggests that the variations in his results may depend in part upon variations in the virulence of his cultures, and as it is well known that streptococci vary notably in virulence, I would like to ask if he has as yet utilized the methods of Marmorek in order to obtain cultures of uniformly high degrees of virulence. Dr. Livingood, in my laboratory, has confirmed the results of Marmorek and succeeded repeatedly by his method in transforming streptococci of low virulence into those of very exalted virulence.

It seems to me that it would be practicable and most interesting, and possibly demonstrative of the specific effects of the treatment, if Dr. Coley, in carrying out his researches, would occasionally cut out small bits of tissue from the tumor, and by their examination endeavor to determine the details of the process of cure.

It does not seem to me absolutely necessary to adopt the hypothesis of the parasitic causation of these malignant growths in order to explain their disappearance under this treatment. It is conceivable that the peculiar biological properties of the tumor cells—and peculiar they unquestionably are—may render them particularly susceptible to the toxic substances injected. The evidence that the curious bodies often seen in malignant

tumors are genuine parasites is, in my opinion, far from conclusive at the present time.

DR. FINNEY.—I have had the opportunity of observing the action of both the erysipelas organism and the toxin in a number of cases, both in hospital and private practice. One point which Dr. Coley has not mentioned to-night, but which he has referred to previously, I will speak of, because I think it of great value. It is the influence of the treatment on cases which may not finally result in a cure. The first case in which I used the erysipelas occurred about the time Dr. Coley began to make his observations in New York. It was a case of a woman with inoperable carcinoma of both breasts. Against my will, but at the urgent request of herself and her husband, I inoculated with a pure culture of the erysipelas streptococcus. She had at the time a very distressing and severe cough, with intense pain, evidently from involvement of the pleura. She had also evidences of internal metastases. After the first reaction from the erysipelas the pain almost entirely disappeared, and did not reappear with severity while the patient lived. She had been almost constantly under the influence of morphia up to the time of the inoculation, and after that time she had only a little codein from time to time to relieve her cough, which persisted after the pain had disappeared. I observed a similar action in another case. I think this patient lived three months after the inoculation. She gradually wasted away, more from inanition resulting from the internal metastases.

I had one case of inoperable carcinoma of both breasts, in which it was impossible to produce any reaction from the erysipelas. I injected it under the skin, I scarified and dressed the wounds in pure cultures in large amounts in very virulent erysipelas without getting the slightest reaction. Of course there was no result from this case.

I would like to ask Dr. Coley whether he has ever observed any cumulative effect of the toxins? In one or two cases it seemed as if that had happened. After a number of injections with gradually increasing doses, without any reaction, a sudden tremendous explosion would take place which slowly subsided, and then for a varying length of time there would be no reaction, even with larger doses than were used previously.

I have observed no cases up to the present time where there has been a cure. But, unfortunately, all the cases in which I have used it, except one under treatment at the present time, have been either carcinoma or cases of sarcoma that were beyond hope from any source.

DR. COLEY.—I have been very much interested in the discussion, and I think I have gained as much from it as anyone. I was particularly interested in the remarks of Dr. Welch. I did not mean to make quite so strong a statement in regard to the parasitic theory; I should have said that that was the way it appeared to me.

I have used the streptococcus from all sources, but the streptococcus from a virulent case of erysipelas seems to have a better effect than a streptococcus from an abscess.

I have used Marmorek's method somewhat. Mr. Buxton has repeatedly passed the cultures through rabbits, and he had been doing it for some time before Marmorek's paper came out. This is the way, I believe, in which improvement in technique is to come, along the lines which Marmorek has shown us, in increasing the virulence of the cultures.

I will say, in answer to Dr. Bloodgood's question regarding metastases, that the patient with sarcoma of the back and groin was a case of marked metastases, the tumor being the size of a goose egg and also recurrent in the groin. That case has remained well over three years since the cessation of treatment.

A case which I published a year ago, treated by Dr. Rungold, of San Francisco, was one in which a round-celled sarcoma reappeared eight times in the breast. It disappeared under the mixed toxins, but the patient died a few weeks later. Autopsy showed very extensive metastatic deposits in the internal organs. In this case the external growth had been cured, but the internal growths were too far gone to be influenced.

About removing specimens during the course of the treatment, as suggested by Dr. Welch, I will say that I have done that in a considerable number of cases. In many of these cases a marked fatty degeneration and necrosis of the malignant cells were clearly visible under the microscope. I shall try to show these changes in micro-photographs of the sections.

In regard to intra-orbital sarcomata, I have not had an opportunity of treating such cases before removal of the eye. I have had four or five cases of recurrent tumors in the orbit after the eye had been enucleated. The effects were very slight, if any. They were all melanotic or round-celled sarcomata.

As to the safety of the treatment, I think that if the cases are selected with some judgment the injections can be used with almost perfect safety. I have had three cases in which I am sure death was hastened by the use of toxins. In one case I ought not to have used the treatment. There was an enormous sarcoma of the scapula and chest wall. The patient was so much emaciated that he could not have lived more than a couple of weeks, but with two very minute doses of the weaker solution of the toxins he lived only three days.

The differences obtained by the same doses at different times is best explained, I think, not by cumulative action, because that is not clearly proven, but by the fact that the reaction is greatly increased when the injection is made into a more vascular part. A patient can stand perhaps

five to ten times as much injected subcutaneously remote from the tumor as he can into a vascular tumor. Sometimes we inject into a part that is more vascular than others, and to this is to be attributed the difference in reaction. I always caution anyone to begin with the minimum dose and increase it very gradually. One half a minim of the unfiltered mixed toxins is sufficient for the initial dose.—*Johns Hopkins Hospital Bulletin.*

Clinical Notes.

VENTRO-FIXATION OF THE MESO-RECTUM IN A CASE OF PROLAPSUS RECTI.

REPORTED BY W. J. CHAPMAN, M.B.,

THETFORD, ONT.,

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MISS X—, æt. 30, entered the Toronto General Hospital in March, 1896, under care of Mr. I. H. Cameron, for treatment of prolapsus recti.

The condition is reported by relatives to have been noticed subsequent to a fall in patient's third year. The eversion occurred frequently each day, and followed any strain, as in coughing, dancing, etc.; if tired, even walking produced it. The everted mass measured seven inches in length; reduction was usually easy, though occasionally difficult, when hæmorrhage would follow. Patient had not freedom from pain for years past. The condition became worse each year, markedly so after a fall in November, 1895. The anal muscles were so atonic that an enema flowed away as freely as supplied.

Adopting the suggestion made in 1888 by Mr. Herbert Allingham, and put into effect in 1894 by Mr. Caddy, of Calcutta, Mr. Cameron made a cœliotomy in the left inguinal region in April, 1896, and, assisted by Dr. Teskey, attached the meso-rectum to the anterior abdominal wall.

The result of the operation is all that could be desired, with gradual improvement in the tone of the anal musculature. (October, 1896.)

Progress of Medicine.

OBSTETRICS

IN CHARGE OF

ADAM H. WRIGHT, B.A., M.D. Tor.,

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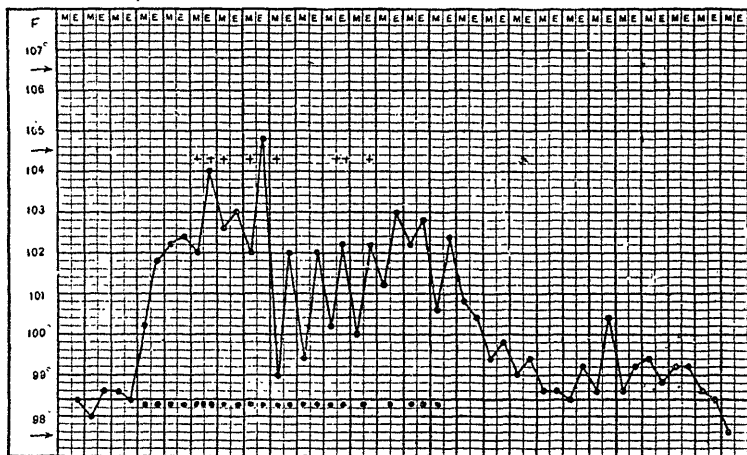
THE EXAMINATION OF THE ABDOMEN DURING THE PUERPERIUM.

In the *British Medical Journal*, 1896, No. 1,856, McCann gives his results in the study of involution. His method consisted in measuring with a tape-line from the middle of the fundus uteri to the pubes, taking this at the same hour and with the bladder and rectum of the patient empty. Septic cases were excluded. In 37 primiparæ the uterus was found in the true pelvis in 29 before the thirteenth day. In 21 multiparæ the womb had entered the pelvis in 13 before the thirteenth day.

Conditions which favored prompt involution were full-term labor, involution being delayed after premature labor; normal or excessive length of labor; and the parity of the patient, as after repeated labor involution is slower. Contrary to what is commonly held, McCann could not find that lactation furthered involution, but rather predisposed to anæmia, which delayed it in many cases. Women who had no secretion of milk whatever often had the most complete involution. Prolonged lactation produced super-involution, a distinctly pathological condition. He also observed that involution proceeds most rapidly during the first week of the puerperium. After-pains, in these cases, had no effect on involution, but are abnormalities in involution, caused either by retained clots or placental remains, or without known cause, resembling dysmenorrhœa.—*American Journal of the Medical Sciences.*

TREATMENT OF PUERPERAL INFECTION.

Dr. Barton Cooke Hirst, of Philadelphia, in a paper on "Modern Methods in the Treatment of Puerperal Infection," published in *The American Journal of Obstetrics*, August, 1896, thus speaks of serum and therapy and treatment by the artificial production of hyperleucocytosis: After an earnest study of this subject—for it is of transcendent importance to a man engaged in work like mine—it seems to me that our judgment on the serum therapy of streptococcus infection must run as follows, in the light of our present knowledge: It requires a long time and especially virulent inoculations to obtain a serum with antitoxic and germicidal properties. It should be prepared, therefore, with great care, and should be obtained from a thoroughly reliable source. There is a possibility that



Bar and Tissier's case of serum therapy for streptococcus infection. Woman died from a toxemia. + represents serum injections; • represents intrauterine irrigations.

this serum may contain dangerous toxins, and that the treatment may be more dangerous than the disease. There is a streptococcic infection so virulent that the antitoxin will be of no avail, no matter how strong it may be. There is an undeterminable time in streptococcic infections when the serum will be used too late. The antistreptococcic serum has no antagonistic power over other pathogenic micro-organisms. It is not easy to determine during life whether the infection is pure or mixed, though the majority of the puerperal infections are due to streptococci. Therefore, the use of the serum must be more of less empirical. Finally, the clinical results of the serum therapy for puerperal infection have not been as yet at all encouraging.

The Treatment of Septic Infection by the Artificial Production of a Hyperleucocytosis.—A large and influential school of pathologists regard phagocytosis as the agency by which an infectious disease is spontaneously cured. It is logical, therefore, in those holding this belief, to attempt the treatment of septic infection by stimulating the production of white blood corpuscles that shall serve as phagocytes. There are several agents administered internally that have leucotaxic powers, such as pilocarpin and nuclein. The former, however, is not advisable in sepsis, on account of its depressing action.

Hofbauer,* from Schauta's clinic in Vienna, reports the results of employing Horbaczewski's nuclein in seven cases of puerperal infection. The cures effected in some of these cases certainly warrant a further trial of the method. To my mind this plan of treatment gives greater promise of practical results than does the serum therapy.

THE THIRD STAGE OF LABOR.

A. H. F. Barbour says, from the study of uteri removed by Porro's operation, that the placenta does not separate until the commencement of the third stage of labor; that its texture is such that it can accommodate itself to the shrinking of its side until the uterus contains nothing but placenta without separation taking place; that there is no empty space in the uterus into which the placenta could bulge; and that there is not sufficient evidence to support the view that retroplacental hæmorrhage is a factor in its separation. This view is borne out by the frozen sections of Pinard and Tarnier, the chief points of interest being the great diminution in area of the internal surface of the uterus with non-separation of the placenta, even at the lower segment. The thickening and moulding of the placental tissue shows how the placenta accommodates itself to the reduction of its site. At the commencement of the third stage we have the placenta yet unseparated, although the site may be but one-fourth of the area it covered in pregnancy, and the uterus embracing the placental mass on all sides, there being no empty space in the uterus.

Clinical Importance.—1. It explains the well-known fact that patients do not bleed until the third stage has begun, refuting the theory that separation occurs during the second stage.

2. It gives us a rationale of the arrest of hæmorrhage, viz., that the process of retraction means a complete rearrangement of the muscular network through which the vessels pass, implying constriction or ligation at various points. As this retraction and constriction have taken place largely before the placenta has separated, shown by its shrunken and bulged condition, the vessels are, therefore, ligated before the placenta is amputated.

*Centralblatt für Gynakologie, No. 17, 1896, p. 441.

3. Shrinking of the placental site beyond which the placenta can follow it, a limit which must be reached during the third stage of labor. The contractions of the uterine wall force the placental mass onward toward the point of least resistance, as it forced the foetal mass onward in the second stage of labor.—*American Gynecological and Obstetrical Journal*.

PRURITUS VULVÆ.

The Medical Record gives the following prescriptions for the treatment of pruritus vulvæ, recommended by Bartholow :

℞ Chloral camph..... ʒ ii.
 Bismuth subnit..... ʒ ii.
 Aquæ rosa..... ʒ iv.

M. S. Apply to the parts.

Or

℞ Argenti nitratis..... gr. xx.
 Aquæ..... ʒ i.

M. S. Paint over affected parts.

EFFECTS OF LACTATION ON MENSTRUATION AND IMPREGNATION.

Dr. L. Remfrey, in a paper read before the Obstetrical Society, London, concludes as follows: (1) Of nursing women, fifty-seven per cent. only have absolute amenorrhœa. (2) Forty-three menstruate more or less, but twenty per cent. have absolute regularity. (3) Impregnation does not take place so readily during lactation as at other times, but this is not true to such an extent as has been imagined. (4) If absolute amenorrhœa is present during lactation, the chances of impregnation occurring are only six out of one hundred. (5) If menstruation occurs during lactation, the chances are sixty in one hundred. (6) The more regular a woman is during lactation the more likely is she to become pregnant. During a menstruating lactation the changes in the uterus are presumably similar to those connected with the ordinary monthly periods, and the mucous membrane forms a nidus for the ovum. (8) In the woman who does not suckle at all, the menses appear, as a rule, some time in the first six weeks after delivery.—*N. Y. Medical Record*.

SURGERY

IN CHARGE OF

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REMOVAL OF ONE-HALF OF THE KIDNEY FOR TUBERCULOSIS; FAVORABLE PROGNOSIS IN RENAL MALIGNANT DISEASE.

How important has become the application of surgery to the kidney is shown by the fact that a single operator, J. Israel, of Berlin, is able to report (*Deut. med. Woch.*, May 28, 1896) 126 cases so treated by himself. Eleven times the kidney was extirpated on account of tubercular disease. In a twelfth case, the lesions were situated so evidently in one end of the organ that Israel decided to remove only the upper half of it. Hæmorrhage was avoided by digital compression of the renal artery during the cutting away of the diseased portion. Then a compress was held against the cut surface for some minutes; upon its removal there was no bleeding, but, for safety, a piece of gauze was stitched by catgut against the cut surface. Recovery was prompt and complete, and the patient has remained in good health for over a year.

This operation is recommended only in exceptional cases, as tubercles too small to be observed at the operation usually extend beyond the area of the gross lesion.

Another encouraging feature of this report is the chapter on malignant tumors of the kidney. There were seventeen such cases—six carcinomata, ten sarcomata, and one so-called struma renalis. Complete nephrectomy was performed in each case. Two patients died from operation; one a year later, of acute peritonitis, without recurrence of the cancer, and six were well at the time of report, no recurrence having manifested itself in periods ranging from fifteen months to nine years.—*Medical News.*

CONTRACTION OF THE ARTERIES OF A LIMB THE PROBABLE CAUSE OF
MUSCLE ATROPHY IN TUBERCULAR JOINT DISEASE.

My object (says Dr. A. G. Miller, in *Edinburgh Medical Journal*) will be to show that in all probability the muscle atrophy which accompanies tubercular disease of a joint is due to diminished blood supply caused by contraction of the main blood-vessels of the limb.

Two years ago, in two papers read before this society, I mentioned that I had frequently noticed, when amputating for tubercular joint disease, that the main blood-vessels were unusually small, and I associated this with the atrophy which is so characteristic of tubercle. I was all the more inclined to take this view of the matter because I have been unable to find any satisfactory explanation of muscle atrophy, and that the atrophy is caused by a reflex influence acting through the anterior horns of the spinal cord. In regard to the exact way in which this reflex acts there seems, however, to be a difference of opinion among physiologists and pathologists. Some believe that there are special trophic nerves supplying the muscles along with the motor nerves. Others consider that the vaso-motor nerves are the true trophic nerves. I will not, however, enter upon a discussion of this subject. I do not consider myself qualified to do so, and I do not at present think it necessary to establish proof one way or another. I will merely say that to my mind it seems highly probable that vaso-motor influences govern muscle nutrition, *vaso-dilatation* causing increase of growth, and *vaso-contraction* causing atrophy. I employ these terms in a general sense, viz., increase or diminution of vascular calibre from any cause.

Supposing, therefore, for the sake of my argument, that the vaso-motor system controls muscle nutrition, I suggest that probably the cause of muscle atrophy in tubercular joint disease is *a diminution of the blood supply from contraction of the main artery or arteries*. In support of this I would point to the following facts :

1. Contraction of the arteries exists in cases of tubercular joint disease. This I have frequently seen, and I show you a leg recently amputated which exhibits the condition very markedly.

In my paper on Bier's method of treating tubercular joint disease by congestion, referred to above, I use the following expressions : " There is a condition associated with tubercular joint and bone disease which I have observed, but which, so far as I know, has not received much attention, viz., that the arteries supplying the limb are unusually small." In my paper on the " Diagnosis of Tubercular Joint Disease " I say also : " The atrophy is of the limb as a whole, muscle and bone alike, and it tends to persist. What is the explanation ? I believe that the cause is a reflex contraction of the arteries of the limb, which interferes with nutrition. I

have been led to that opinion by observing, when I have had occasion to amputate for tubercular joint disease, that, though there may be many active vessels in the neighborhood of the disease, the main arteries are always very small. I have often observed the latter about half the size one would expect them to be under ordinary circumstances—in a primary amputation, for instance.” I conclude, therefore, that contraction of the main blood-vessels exists in tubercular joint disease.

2. This brings me to my second point, which is the co-existence of arterial contraction and muscle atrophy, not only in cases of tubercular joint disease, but also under other circumstances. For instance, it is proved by Thoma to occur in stumps after amputation. I shall refer to this again. In the meantime I turn to the question, If these two co-exist (as they certainly do), which is the cause and which the effect, or are they both the result of a common cause?

It seems to me that muscle atrophy is not likely to be the cause of diminished blood supply. It is much more likely to be the result. They are both symptoms of the same disease, viz., tubercular joint disease, but they may be so because the one depends upon the other, and, as I have already said, diminished blood supply is more likely to be the cause than the result of muscle atrophy.

In speaking of atrophy generally, Thoma gives three causes or explanations: 1, Want of use; 2, vaso-motor disturbance; 3, possible trophic nerve influence. All of these influences may, I think, imply diminished blood supply. For instance, “want of use” means lessened demand for blood; vaso-motor disturbance that produces atrophy is likely to be of the nature of vaso-contraction; and we have seen that the true trophic nerves may be the vaso-motor system. I think, therefore, that arterial contraction, and, consequently, diminished blood supply, is a cause, and a very likely one also, of atrophy. I have recently come across statements which tend to support this view. Mr. W. G. Spencer, in his Erasmus Wilson Lectures on the Pathology of Bone, says, “A diminution in the arterial blood supply checks the formation of bone whilst absorption continues, so that eccentric atrophy is brought about.” And again he says, “Atrophy from disuse, and, consequently, diminution in the blood supply, suffices to explain the changes in bone without the need of supposing a loss of an efferent trophic influence.”

3. My next point is that the muscle atrophy which is found in connection with tubercular joint disease is simple. This I have referred to in my former papers, but may here quote two extracts from Charcot—“In joint disease the muscle atrophy is simple.” “There is no reaction of degeneration.” Indeed, he dwells strongly and frequently on the muscle-atrophy from joint disease differing from that due to nervous causes or

want of use. Others have specially examined the muscles atrophied in tubercular disease, and have found no degeneration, fatty or fibroid. I have had the reaction of degeneration tested for in tubercular joint muscle atrophy, and have found it absent. Now, this is just the kind of atrophy that we would expect to find as the result of deficient blood supply from contracted blood-vessels. Before leaving this point I must say that muscle degeneration is found in far-advanced and old-standing cases of tubercular joint disease, in which the whole limb is atrophied. But this is only what one would expect, seeing the nerves probably share in the atrophic changes after a while, and the functions of all the various parts and tissues are more or less interfered with.

4. My fourth point is that muscle atrophy in tubercular joint disease is *progressive* if the disease be not checked, and *permanent* if the disease be permitted to go beyond a certain point. This can be abundantly proved from ordinary clinical experience. Everyone knows how rapidly progressive muscle atrophy is in tubercular and in some other joint diseases. Unfortunately, the atrophy does not limit itself to the muscles, but extends to the bones and to the limbs as a whole. Now, this is just the result one might expect from diminished blood supply and consequent deficient nutrition. That such atrophy is apt to persist is also easily proved from ordinary clinical experience. Do we not see everywhere shrunken and distorted limbs, the result of untreated and neglected tubercular joint disease? Such atrophy is apt not only to persist, however, but to progress, as in the case of the limb which I show you, in which the femur and tibia have become (from tubercular disease of the knee joint) about half the size (in bulk) of the corresponding bones of the other limb, whilst their length remains much the same; and this change has taken place in twelve months, showing that the comparative alteration in size cannot be the result of mere want of growth on the diseased side.

Now, it seems to me that we have hitherto had no adequate explanation of such a state of matters as this. Why should such a simple atrophy steadily, and sometimes rapidly, increase? Why should it persist, and sometimes go on to permanent and progressive wasting of a whole limb?

That such an arterial contraction exists in stumps after amputation has been proved by Thoma. He has in such cases found a permanent and progressive arterio-stenosis, which is due to two causes—(1) Concentric atrophy of the media; and (2) thickening of the intima by deposit of connective tissue. If this or something similar could be found in connection with tubercular joint disease, it would abundantly explain and clear up the cause of the progressive and permanent muscle atrophy.

Dr. Bruce has kindly examined for me specimens of the popliteal

artery and a portion of muscle from the limb which I have shown, and he reports that he has found slight sclerosis of the intima in the artery and no degeneration in the muscle. There has not been time, however, to make an exhaustive examination, but Dr. Bruce promises to carry out the investigation more fully if I can supply him with material, which I hope to be able to do.

5. I would now go a step further, and say that it is probable that tubercular joint disease causes muscle atrophy by producing anæmia of the muscle through contraction of the arteries.

In support of this statement I would mention one or two facts which I think bear on the subject :

(a) Tubercle is associated with anæmic conditions. The so-called cold abscesses are known to be tubercular, and they have very little vascularity or inflammatory action about them ; hence their name. Again, tubercular joint affections are so bloodless that they used to be called "white swelling." As one more surgical illustration, I would point to the tubercular necrotic areas which we find in bones, which are absolutely bloodless and apparently brought about by destruction of the blood supply. I do not say that all these conditions are due to arterial contraction, for I do not know ; but I point to the association of these anæmic conditions with tubercular disease. I have often thought that in this local anæmic condition of tubercular parts there is an illustration of nature trying to produce a cure by shutting off the blood supply ; in some cases succeeding, in others failing, through falling into a Scylla in avoiding a Charybdis. In other words, the anæmia, whilst checking the inflammation, possibly fails to cure the disease by not supplying sufficient blood to destroy the bacilli.

(b) My next point is that irritation, especially a slight but constantly acting irritation, causes contraction of blood-vessels. Now, tubercular irritation is of this kind, and Charcot says that diseased joints cause rapid and early muscle atrophy, because the irritation is continuous.

(c) Another point is that congestion is unfavorable to tubercle. Rokitsansky stated long ago that "a congested lung possesses an immunity against tuberculosis," and it is admitted that there is some truth in this statement. Page suggested that Koch's tuberculin acted in the same way ; and Bier founded his method of treating tubercular affections by congestion on this dogma of Rokitsansky's.

(d) My next point I submit with considerable deference, because it is a mere fancy of my own. It is that possibly the products of the tubercle bacilli tend to cause vaso-contraction, just as the products of pyogenic organisms cause vaso-dilatation and diapedesis. Ogston, Watson Cheyne, and Treves hold that tubercular abscesses contain no true pus and few

leucocytes. My friend Mr. Stiles tells me, however, that more recent investigations show that there is very little difference between the contents of a tubercular abscess and any other collection of pus. That may be so, so far as the microscope is concerned, but my clinical experience tells me that there is a considerable difference. And I still think that some variation in the vascularity may account for this difference.

6. I now come to my last point. When I first thought of a definite relation between the muscle atrophy and the arterial contraction which I saw in cases of tubercular disease of joints in the way of cause and effect, I realized that there must be some definite connection between the vessels and the muscles, either directly or through the nervous system. It occurred to me also that the tendency of tubercular joint disease to pick out certain muscles for the manifestation of atrophy would, perhaps, help me. I found, however, that whilst in some joints (the shoulder, for instance) association of the diseased joint and the atrophied muscles could be made out quite easily, both through the nervous and the vascular systems, in other joints (the knee, for example) the relation was round-about and difficult to trace. Arguing, however, from the joint disease as the primary cause, I could see how arterial contraction could be produced quite easily, provided the influence passed through the vaso-motor system, for the vaso-motor system is freely and copiously connected with the spinal system of nerves.

Next came the connection between the vessels and the muscles, and that, of course, was easily made out. But, as I have already indicated, in this connection a very significant fact cropped up as likely either to support or destroy my line of proof—viz., the constant and prominent selection of certain muscles for the exhibition of the atrophy in connection with tubercular joint disease.

Ferrier tells us that extensor muscles atrophy much more quickly than flexors, because they are weaker. One might suppose, therefore, that, given a general atrophy from contraction of the main artery of the limb, the extensors will manifest the change first and most. But there is something more. There is always a close relation between the special vessels supplying a given joint and those supplying the muscles that atrophy most. (See Appendix.) From this intimate relation I gather, therefore, that the special atrophy of certain muscles can be explained on the diminished blood supply theory.

Now, I am quite aware that there are other possible ways of turning the argument, according as one looks at it. For instance, it might be said that whilst the joint disease is, as before, the primary factor, the vaso-stenosis is not the cause of the muscle atrophy, but its result. This would be in keeping with Thoma's theory that the demand creates the supply,

and I thought at one time that this might be the true explanation—viz., muscle atrophy first, then arterial contraction and general progressive atrophy of the limb; but I had two difficulties: (1) This theory left the muscle atrophy unexplained, except by a vague and mysterious trophic nervous influence. (2) The muscle atrophy has been shown to be simple, and not such as occurs in connection with nerve causes. In other words, the facts known fit in better with the explanation that the arterial contraction causes the muscle atrophy than with any other theory I know of.

I would sum up my argument as follows:

(1) Muscle atrophy is a constant and prominent symptom in tubercular joint disease.

(2) No explanation of this atrophy has been suggested hitherto, except a vague and mysterious reflex influence.

(3) Contracted arteries have been seen and proved to exist.

(4) The muscle atrophy is of a kind likely to be caused by deficient blood supply rather than by nerve influence.

I assume, therefore, that arterial contraction and consequent diminished blood supply is the cause of muscle atrophy in tubercular joint disease.

APPENDIX.

RELATION OF ARTERIES SUPPLYING JOINTS TO MUSCLES WHICH ATROPHY.

Shoulder. Posterior circumflex and supra-scapular arteries supply joint and also deltoid and scapular muscles.

Elbow. General arterial anastomosis round elbow, formed by branches of superior profunda, inferior profunda, and anastomotica. Triceps, brachialis anticus, and coraco-brachialis supplied by superior profunda; biceps by special branches from brachial artery; it sometimes holds out well.

Hip. Branches from gluteal and sciatic arteries supply the joint, and also muscles of hip. Artery to round ligament comes from internal circumflex of profunda; hence the thigh muscles atrophy also.

Knee. Free anastomosis between articular branches of popliteal, branches of profunda, and anastomotica magna. Quadriceps supplied by various branches from superficial femoral, profunda, and anastomotica, and also branches from superior articular arteries.—*Edinburgh Medical Journal.*

GENITO-URINARY AND RECTAL SURGERY

IN CHARGE OF

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TREATMENT OF PROLAPSE OF RECTUM BY TORSION.

This procedure is based on that proposed by Gersung for urethrocele in women and Vreden has used for rectal prolapse. He proceeds as follows: A circular incision is made around the anus half a centimetre outside of the limit of pigmented skin. The rectum is separated from the surrounding tissues to the level of levator ani. All prolapsed parts are replaced, twisted to an angle of 180° , so that the external opening will only permit of the passage of a single finger, and fixed in this position by some silk sutures. Union takes place quickly, and the cure is rapid and complete. The author, who has used this method in two cases, explains the favorable results of this simple and almost bloodless operation by (1) the tension caused by twisting on all the layers of the rectal wall; (2) the even diminution in calibre of the lower portion of the rectum from the level of the levator and by its spiral direction, which prevents the recurrence of prolapse.—*Gazette des Hopitaux*.

A NEW APPARATUS FOR IMMEDIATE AND PERMANENT DRAINAGE OF THE URINARY BLADDER AFTER SUPRAPUBIC CYSTOTOMY.

Joseph C. Bloodgood, M.D., in *Bulletin of the Johns Hopkins Hospital*, describes the apparatus, which consists of a rubber bag reservoir, holding about three hundred and fifty cubic centimetres of urine. Sealed to the upper and central portion of the bag is a thicker piece of rubber with a small opening in the centre, into which the head of the tube is inserted. The ends of an abdominal belt are also fastened to the centre piece. The abdominal belt carries the entire weight of the bag, so that there is no dragging on the tube. Two rubber tubes lead from the bag, the lower one being used to draw off the urine, and the upper one to wash out the bag; both are provided with stoppers. When the apparatus is used for immediate drainage, it is not necessary to change the position of the

patient to empty the bag, and when the patient is up the bag can be emptied with no more than the usual unfastening of the clothes. The tube used for immediate drainage is made of hard rubber, and consists of three pieces : one piece is shaped like a bolt, the head of which is inserted into the hole of the bag, the elasticity of the rubber making a snug fit. The second piece is screwed on to the bolt so that the rubber bag is held very tightly between the head of the bolt and this piece, and leakage is prevented. The straight portion of the tube has a shoulder 1.5 centimetres from the bladder end, which is pierced by four holes. The tube is first fixed in the bladder, and then the bag armed with the bolt and second piece is screwed into the end of the tube. After opening the bladder, four silk sutures are passed through the wall, not including the mucous membrane, the inner piece of each suture being passed through the corresponding hole in the shoulder of the tube. The tube is inserted into the bladder and the sutures are tied. Gauze is packed down to the bladder about the tube, filling the suprapubic wound. The object of the gauze is to abort any leakage which might take place during the first few days. It may not be necessary, yet it is a safeguard against infection by extravasated urine and aids in holding the tube in place. The tube for permanent drainage is not provided with a shoulder. It should be long enough to extend at least one centimetre into the bladder. The bladder end should be slightly bulbous, and the tube should be curved or straight, according to the direction of the sinus. The second piece rests on the abdominal wall. The apparatus for immediate drainage will work perfectly for eight days ; at this time the sinus leading into the bladder will be lined by firm granulations, the bladder will be fixed by adhesion, and the wound will be in an excellent condition for the introduction of the tube for permanent drainage. For two or three days, until the sinus has contracted about the new tube, some leakage will take place, but most of the urine will be collected in the rubber bag.

PÆDIATRICS AND ORTHOPÆDICS

IN CHARGE OF

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AND

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THE BACTERIOLOGY OF INFANTILE DIARRHŒA.

The British Medical Journal for September 12, 1896, contains an abstract of a report by Allan Macfadyen, on the bacteriology of infantile diarrhœa.

After pointing out the difficulty experienced in investigating the nature of bacteria present in the upper portion of the alimentary canal, owing to the predominance of putrefactive bacteria in the colon, the writer considers the subject under three heads:

- (1) The bacteria present in health and in the course of the disease.
- (2) The easily-decomposed food—milk.
- (3) The susceptible organism of the child, predisposing to such complaints.

Escherich found that in the milk fæces two organisms predominated, viz., the bacterium coli commune and the bacterium lactis ærogenes. They especially attack the milk sugar, and the chief products of their action are acetic and lactic acid, and CO₂ and H. gas. The process is a fermentative and not a putrefactive one. The results agree with what we know of the action of bacteria in the adult's small intestine. The investigations of Macfadyen, Nencki, and Sieber show that the bacteria of the small intestine primarily decompose carbohydrates, with the result that the contents of the small intestine have an acid reaction. This acidity will be a main factor in preventing the development of a putrefactive decomposition under normal conditions.

Escherich did not find in cases of infantile diarrhœa any organisms that might be called specific. He supposes that in the upper intestine a main factor in the causation of diarrhœa is abnormal acid formation by

bacteria, and that in the lower intestine the decomposition is of proteid matter.

The action of the bacteria does not take place through a direct invasion of the organism, but through the absorption of poisons formed by them. It is probably through their action on the milk, and not on the body, that the bacteria acquire their dangerous properties. In the child, toxic effects may result from substances that produce little or no effect on the adult.

Baginsky examined forty-three cases of summer diarrhoea, but did not find any organisms of a specific character. The general conclusion he comes to is that several kinds of saprophytic bacteria may produce the disease under favorable conditions. The severe cases of diarrhoea seem to be due to poisons developed by bacteria from the proteid constituents of the food. Booker isolated, altogether, thirty-three forms of bacteria from cases of infantile diarrhoea. There was great variety, but no constancy in the types found.

Jeffries and Baginsky were not able to confirm Lesage's statement that the green diarrhoea of children is associated with the presence of a specific organism. The determining factor is the milk and the decomposition products arising from it. The researches of Vaughan in this connection are of first-rate importance, and deserve careful consideration and confirmation. Vaughan has isolated from poisonous milk a crystalline body, called by him tyrotoxinon. The symptoms of tyrotoxinon poisoning resemble those of cholera infantum. Vaughan also obtained toxic bodies from cultures of Booker's bacteria, which produced vomiting, purging, and sometimes death in dogs. This observer believes that there are many bacteria which may produce diarrhoea in children by an action on the milk inside or outside the body.

There can be little doubt that in hot weather the milk undergoes a profounder decomposition than the ordinary lactic acid fermentation, by which its proteid constituents are attacked. These changes are due to bacteria, and may occur without visible alteration in the appearance of the milk. The milk, therefore, furnishes a more fruitful field for investigation than the intestine. If the living agents at work in the milk were accurately known, we would be in a position to determine the best methods for their extinction, and in such diseases it is their prevention that should be the main object of our investigation. Flügge emphasizes the fact that milk sterilized by the usual methods is not without danger. A number of resistant forms are not destroyed, and three were found to produce a profuse, and sometimes fatal, diarrhoea in young dogs.

Though our knowledge is imperfect regarding the specific agents at work, everything points to this disease being due to changes produced by

bacteria in the milk. It remains for future research to determine more accurately the nature of the toxic products, and of the bacteria that produce them.

TUBERCULOUS ABSCESS OF THE THYMUS, WITH THROMBOSIS OF THE LEFT INNOMINATE VEIN.

Carpenter, of London, reports a case of this somewhat rare condition in *Pædiatrics* (July 15, 1896).

The patient, a child of two years, whose father had recently died of phthisis, had been ill for the last year; had cough and diarrhoea. When seen by the writer the plump, swollen condition of its face contrasted strikingly with the emaciation of the body.

The following abnormalities were noticed when a physical examination was made:

Lungs. On the right side in front there was dullness as far as the third rib, and behind it was limited to the area of the chest corresponding to the upper lobe, as also in the axilla.

Over the dull area there was a vesicular murmur, but occasionally the expiratory murmur was rather hollow, and tubular breathing could be detected when a laryngeal noise was made; it was then heard with expiration, and was quite loud.

On the left side in front, over the second interspace, there was a small patch of tubular breathing, but no dullness. The sternum from the level of the third rib upwards was dull—to the right it merged into the lung dullness, below it ran into the cardiac dullness, and to the left it slightly encroached beyond the margin of the sternum.

Autopsy. In the anterior mediastinum, on removing the sternum, a fluctuating tumor was seen. Its surface was non-adherent to the sternum, and smooth. It overlapped the base of the heart and the great vessels, and was continued into the pericardium. Its extreme lower limit was on a level with the third rib, its upper the top of the sternum, and its diameter about that of a tangerine orange. No trace of the thymus could be found. On opening the pericardium a small quantity of serum escaped, in which floated small flakes of lymph, and both the visceral and parietal layers of the pericardium gave evidence of an early pericarditis. The aorta, pulmonary artery, and superior vena cava were seen to disappear behind the tumor, and on cutting into this pus escaped. When this was evacuated a cheesy membranous lining came in view, and when this was stripped the underlying tissue was found to be smooth and of a rather bright venous blood color, and just like the cavities found in the right apex. Across the abscess cavity passed the obliterated left innominate vein; the right innominate vein was outside the sac. The arteries were situated behind the abscess, and were unaffected.

FORMIC ALDEHYDE IN THE TREATMENT OF RINGWORM OF THE SCALP.

In the *British Medical Journal* (Sept. 12, 1896), Salter, of Guy's Hospital, directs attention to the excellent results obtained in the treatment of ringworm of the scalp by formalin, or formic aldehyde. This substance has intensely bactericidal properties and also remarkable powers of penetration. It is destructive to bacteria when used in solution, and also when vaporized. The failure of the ordinary remedies is attributed to the fact that the fungus is so encased and protected by the sebaceous secretion and the fibrilla of the hair that the germicides do not come in contact with it.

In the case of formalin, pure cultures are killed by a short exposure merely to the vapor. With hairs dipped for five minutes in 40 per cent. formalin, and kept under the fluid by manipulation with a needle, no subsequent growth could ever be obtained. Similar treatment for an equal time with carbolic acid, 1 in 20 (aqueous), glyc. acid. carbol. B.P., aqueous solutions of hydrarg. perchlor., 1 in 1,000, 1 in 200, 1 in 50, and alcoholic solutions, 1 in 250, seldom or never had the slightest effect in sterilizing the hair, as evidenced by successful culture.

FORMALDEHYDE CLINICALLY.

Experience in actual practice has amply justified the expectations raised by such experimental results. Dr. Perry kindly allowed me to treat forty cases of ringworm of the scalp from his out-patient department at Guy's Hospital. The preparation most used was Schering's "formalin" in full 40 per cent. strength, though in the later cases formaldehyde of English manufacture was employed. The fluid was vigorously rubbed in with a largeish brush or mop for ten minutes, the hair having been shaved round the margin of the patches. The application was repeated every other day on four occasions and then entirely discontinued. In some patients the head was painted every day for four successive days. Of the forty cases, only five required repainting from non-eradication of the disease, and in these the fault lay not with the remedy, but in the fact that, owing to the struggles of the child, no proper application could be made. The ages of the children treated ranged from 4 to 12, and the extent of the disease varied from a small strictly localized patch to areas which were practically co-extensive with the whole scalp. Microscopical examination was always made before commencing the treatment, and the actual presence of the trichophyton verified, whilst before pronouncing any case cured microscopical examination was again made. In thirty-eight of the cases the fungus presented the characters of trichophyton microsporon.

PICRIC ACID IN THE TREATMENT OF SUPERFICIAL BURNS AND SCALDS.

In a note to the *British Medical Journal* (September 12, 1896), D'Arcy Power testifies to the excellence of picric acid in solution as a dressing for burns and scalds. The method is well known in France, where it has been extensively used.

The solution of picric acid is made by dissolving a drachm and a half of picric acid in 3 ounces of alcohol, which is then diluted with two pints of distilled water, or, more accurately: Picric acid, 5 g.; alcohol, 80 g.; dissolve; add 1,000 g. of distilled water. This is a saturated solution of picric acid.

The clothing over the injured part should be gently removed, and the burnt or scalded portion should be cleaned as thoroughly as possible with a piece of absorbent cotton-wool soaked in the lotion. Blisters should be pricked, and the serum should be allowed to escape, care being taken not to destroy the epithelial surfaces. Strips of sterilized gauze are then soaked in the solution of picric acid, and are so applied as to cover the whole of the injured surface. A thin layer of absorbent cotton-wool is put over the gauze, and the dressing is kept in place by a light linen bandage. The moist dressing soon dries, and it may be left in place for three or four days. It must then be changed, the gauze being thoroughly well moistened with the picric acid solution, for it adheres very closely to the skin. The second dressing is applied in exactly the same manner as the first, and it may be left on for a week.

The great advantages of this method of treatment are: First, that the picric acid seems to deaden the sense of pain; and, secondly, that it limits the tendency to suppuration, for it coagulates the albuminous exudations, and healing takes place under a scab consisting of epithelial cells hardened by picric acid. A smooth and supple cicatrix remains, which is as much superior to the ordinary scar from a burn as our present surgical scar is superior to that obtained by our predecessors, who allowed their wounds to granulate.

I have used this method for more than a year in hospital practice, both amongst out-patients and in-patients, and I have every reason to be thoroughly satisfied with the results I have obtained. It is not an ideal method, for it stains the clothes and discolors the hands of the surgeon, but it is a great improvement upon anything else I know of.

HYGIENE AND PUBLIC HEALTH

IN CHARGE OF

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AND

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SEATS FOR EMPLOYEES.

The New Hampshire Legislature has enacted a law compelling every person, firm, or corporation employing females in any manufacturing, mechanical, or mercantile establishment in the state to provide suitable seats for the use of females so employed, and to permit the use of such seats by them when they are not necessarily engaged in the active duties for which they are employed. A fine of not less than \$10 or more than \$30 for each offence is the penalty prescribed for a violation of the law.—*Boston Medical and Surgical Journal.*

NEW HEALTH LAWS DESIRED IN INDIANA.

Dr. J. N. Hurty, secretary of the State Board of Health, says the *Journal of the American Medical Association*, has sent out a letter to the doctors of the state, outlining a proposition of the board to bring about at the next session of the legislature the enactment of a new health law, the present one being considered inadequate. It is proposed to have a State Board of seven members appointed by the Governor, with no salaries attached except for the commissioner chosen by the board, who shall be experienced in sanitary matters, chemistry, and bacteriology. A sanitary laboratory shall be established where all necessary sanitary analysis and bacteriologic examinations and all health work may be done for the people without charge. A modern health board without a sanitary laboratory in charge of skilled and learned specialists would be almost helpless. County health boards shall consist of two physicians and a lawyer or business man, appointed by the commissioners. One of the physicians to be made secretary and county health officer. Secretary to be paid \$10 a year for each 1,000 of population, except in counties of over 100,000. The

other two members to receive no salary. Expenses to be paid by the county. Duties and powers to be carefully defined.

METEOROLOGY AND HEALTH.

The meetings of the Newcastle Congress maintained their interest up till the end. An address of special value was delivered by Mr. Dines, Fellow of the Royal Meteorological Society, on the various causes that produce climate, and the influence which it exercises on health and the average length of life. This is a study of great practical importance, to which not so much attention has been given as it deserves; and it will be well if Mr. Dines' paper leads to a more careful consideration of the whole subject in its relation to sanitary science and practice. In recent years the science of meteorology has made wonderful advance, and we know a vast deal more than our fathers and grandfathers did about the atmospheric environment in which we live, and the changes that take place therein. But the relation of these to health is still a comparatively untrodden field. Climate and weather, in their effect upon habit and the conditions of life, and upon the preservation of the body against disease, have not at all been studied as they might be; for we are satisfied that an adequate study of these important factors, extending over a sufficient length of time, and fairly comprehensive as regards geographical position and topographical features, will yet yield results of the highest value. Earl Percy, the president of the Congress, contributed to the discussion that followed Mr. Dines' address the curious fact that the greater the rainfall of a district the greater would be the amount of drunkenness in it; and if this observation be substantiated by a sufficient number of instances, it would be interesting to trace the relation between cause and effect. Much yet remains to be done in the direction of collecting facts, and of observing their bearing on the extremely complicated problem of the maintenance of health.—*Sanitary Record.*

A NATIONAL QUARANTINE AND A NATIONAL DEPARTMENT OF PUBLIC HEALTH.

The Supervising Surgeon-General of the Marine Hospital Service, Walter Wyman, M.D., in his annual report for the fiscal year 1895, invites attention to the fact that there appears to be a growing sentiment in several sections of the United States for the undivided control of all the quarantine service of the national government. According to this report, since the passage of the act of February 15, 1893, the subject of turning over the local quarantines to the national government has been favorably dis-

cussed by the authorities of Portland (Me.), Savannah, Charleston, and Mobile. Two states, viz., Pennsylvania and North Carolina, have practically surrendered their quarantine functions to the government. A bill was introduced into the last legislature of Florida, turning over the quarantine system of the state to the general government, and many communications were printed in certain Florida papers favoring this change. The leading daily journals of Texas have advocated a like change with regard to the quarantine of their state, and, as previously stated, the national government now exercises quarantine control over the whole of the Pacific coast, the Gulf coast east of Louisiana to Mobile Bay, in Georgia, North Carolina, Virginia, Delaware, and Pennsylvania.

The Marine Hospital Service, possessing, as it does, much of the machinery for carrying on such a work, should be elevated to the dignity of a national department of public health, and the chief of that bureau should be made a cabinet officer. Whatever is necessary to the work not already possessed by the department should be added thereto in the way of laboratories, etc., and its functions should be enlarged to include, in addition to quarantine, the examination of foods and drugs, earth, air, water, etc., all of which affect the health of the public. Such a department could do much to aid the physician and pharmacist in controlling the patent medicine evil, by teaching the public how to avoid the cause of disease, among which the promiscuous dosing with secret nostrums is an important factor.

Quarantine between localities affected by disease and healthy localities is an effectual method of preventing the spread of local maladies of a contagious nature, and is just as essential as it is to protect the country from abroad. This work is usually left to state and city boards of health, but in a number of instances appeal has been made by the local authorities to the Marine Hospital Bureau for aid in suppressing smallpox, cholera, and yellow fever. Under the Act of Congress, approved February 15, 1893, interstate quarantine regulations have been promulgated to prevent the spread from one state to another of cholera, yellow fever, smallpox, typhus fever, leprosy, and plague, and when state or local authorities fail to enforce them the Marine Hospital Service will do so.

But prevention is better than cure, and here is where a department of public health could be of the greatest value to the American people. Adulteration and fraud are rampant in the land in regard to what we eat and drink, and what we take as medicine. Efforts to protect the public in the way of food and dairy laws have been enacted in several of the states, and commissions appointed to carry their provisions into effect. We all know with what unfortunate results these measures have been met. Political scandal and blackmail too often follow this class of legislation.

Not until the entire subject can be taken out of politics and placed in the hands of some responsible department of the government which cannot be influenced for furthering the schemes of wire-pullers and lobbyists may we expect relief from robbery by fraudulent dealers in the commodities referred to.—*Ex.*

Editorials.

MEDICAL EDUCATION IN GREAT BRITAIN.

THE standard of medical education in Great Britain is regulated by the General Medical Council, which, in some respects, is similar to the Ontario Medical Council, but really possesses much less power than the latter body. The British Council (*British Medical Journal*, September 5) "lays down the minimum standard of school knowledge which must be possessed by a student before he commences his professional study, and the minimum number of years during which such study shall be carried on, and at the same time enumerates the examining bodies, the possession of whose degrees and diplomas shall entitle the holder to be registered as a medical practitioner. . . . So long as the various universities and medical corporations comply with the general instructions of the General Medical Council they are permitted to arrange their examinations pretty much as they like, and to grant to their successful candidates such titles, degrees, and diplomas as their charters may prescribe."

When our council was established in Ontario the various universities in the province were deprived of the right to confer a degree which carried with it a license to practise. The degree of M.D., or M.B., is therefore purely honorary, as its holder must go before the central examining board and pass the examination before he obtains a license. The universities and various medical corporations in Great Britain united in their protests against any curtailment of their powers when certain proposed amendments to the Medical Act were being contemplated and discussed a few years ago; and, as a consequence, the General Medical Council, at that time established, was only empowered to regulate the standards as described above. It is generally conceded by outsiders who have studied our regulations in Ontario that we have an admirable system, and a standard of medical education that is very creditable to our young country.

In the same issue of the *British Medical Journal* we have some interesting particulars as to the cost of a medical course in London, from which we extract the following estimate. The expenses may be itemized as follows:

Composition fee for school and hospital.....	\$570	to \$ 780
Diploma fees (conjoint board).....	180	180
Special fees, laboratory, "parts," etc.....	45	50
Clubs.....	25	40
Instruments and books.....	100	100
Five years of forty weeks at \$7.50 to \$10 a week	1500	2000
Five years' clothing.....	500	500
Total.....	\$2920	\$3650

To this *modest* total, the *Journal* says, must be added the expenses of at least two vacations a year, with the necessary railway fares. To our Canadian students who examine these rather startling figures it will be some consolation to know that a good medical education can be obtained at home at a much smaller cost.

ANTITOXIN IN LARYNGEAL DIPHTHERIA.

WE publish in this issue a communication from Dr. Northrup, on behalf of the American Pædiatric Society, respecting the treatment of laryngeal diphtheria by antitoxin, which has been forwarded to us by Dr. A. D. Blackader, of Montreal. The results of the antitoxin treatment of diphtheria, so far as published results show, have been decidedly satisfactory; but the information thus far furnished has not been sufficiently definite to enable us to lay down any fixed rules on the subject which will be generally accepted by the profession. A goodly number of physicians of Toronto have given this treatment a fair trial, and the results have been not altogether favorable. Some are more than satisfied; some are doubtful; a few consider it useless—if not worse than useless.

In using the antitoxin it is of the utmost importance that the greatest possible precautions should be taken to avoid the selection of serum which is not absolutely above suspicion, and, at the same time, faulty methods in its use. We are glad to know that reliable preparations of the serum may now be easily obtained. We have been informed by many physicians in various parts of Ontario that they have used the serum with most gratifying success; but we are sorry to say, at the same time, that they have not, as a general rule, given to the profession generally any details as to their results. We hope that all physicians interested in the subject will send their records to Dr. Northrup.

THE INDISCRIMINATE USE OF COCAINE.

THE topical use of cocaine is attended with a degree of danger at all times. Serious consequences more frequently follow its use in the deep urethra, nares, or the gums, than when injected into the body or at the extremities. At no time is a solution of high percentage necessary, and the percentage should always be known. Many dentists use cocaine in a very reckless manner, and take no consideration of dosage whatever. They, as a rule, take no account of its constitutional effect, only thinking of its local action. Three cases of cocaine poisoning having come under our observation within the past five months in the service of two prominent dentists prompts the note of warning here given. In one case, on enquiry, the percentage was not known—possibly ten or twenty, he said. He just took some crystals and added some water, and injected a few drops into the upper gum over a canine tooth; poisonous symptoms were noticeable in less than three minutes; the collapse was severe, and only by energetic measures, freely used, was the patient's life saved. In both of the other cases ten per cent. solution was used, but the degree of poisoning was not alarming in one instance, while in the other it was exceedingly so. A very prominent dentist in the city told us that he frequently applies the pure crystal to the exposed nerve. We feel justified in calling attention to this very dangerous method of using a powerful poison. None of the active alkaloids should be used except in a solution of known strength, and then not in any indefinite quantity.

SHANNON v. AIKINS.

WE desire to offer our hearty congratulations to Dr. H. Wilberforce Aikins, of Toronto, on the happy issue of the iniquitous suit which was brought against him in the Assize Court, October 14. The doctor commenced his treatment of plaintiff's infant daughter in April of last year. The patient had a virulent form of ophthalmia, from which she lost the sight of one eye, and had impaired vision in the other. It was one of those deplorable cases, which are quite too common, where the most vigorous and skilful treatment is frequently of no avail. The defendant described his plan and treatment, which medical witnesses on both sides declared correct. The evidence, apart from this, referred altogether to facts as to treatment, *i.e.*, Did the defendant neglect his patient in any way? The case went to the jury, and a verdict was given in favor of the defendant. This means that in the opinion of the jury there was no evidence to show that he was negligent or unskilful.

Dr. Aikins is well known as a thoroughly competent physician and

surgeon. He happens at the same time to be exceptionally careful and attentive to all patients who come under his care. It seems the hardest sort of luck that such a man should be subjected to so much annoyance and worry absolutely without cause. It unfortunately happens in a large proportion of such actions at law, that, as in this instance, the doctor has been put to considerable expense although he has won the verdict. It is generally conceded that in such vexatious cases the plaintiff should be compelled to give security for costs before entering action; but our governing powers are so *sensitive* about the rights of the "poor man," and the members of our profession are so stupid about their individual rights where the lofty game of politics is concerned, that the blessed poor man always wins. In the eyes of the law the doctor is never poor, and, therefore, he is never worthy of much consideration when there are any competitors. This, in a way, should be satisfactory to the doctor; but it doesn't always make him feel rich because he is technically not poor.

These so-called poor men have certain qualities of statesmanship which are highly appreciated by our lawgivers in this "free" country. They form brotherhoods with high aims in the interest of "humanity"—which means their dear selves. They go to our legislators generally shortly before an election, and make their demands. They get their answer: We are in your hands, you are the bone and sinew—you are the people of this country. The doctors also form associations—they meet and pass great, strong resolutions—they disperse with a glow of enthusiasm, they feel that it's all right now. The secretary, in accordance with his instructions, sends the resolutions to the legislators, who graciously acknowledge the receipt of the same. In due course of time the election comes on. The country is in danger—at least, generally. The doctors rise equal to the occasion, and become active and influential politicians. During the delirium of their fever the rights of physicians are forgotten amidst the more pressing interests of Gritism and Toryism. After the elections the doctors in time get down to the plains of routine work in a somewhat dazed condition, and in their bewilderment wonder why the profession always "gets left"—while the legislators quietly smile.

SARNIA GENERAL HOSPITAL.

A LITTLE more than a year ago the corner-stone of a new hospital was laid in the flourishing town of Sarnia. The structure is now completed, and was formally opened by the Lieutenant-Governor of Ontario, Saturday, October 3. The hospital, which is one of the best equipped institutions of the kind in Canada, contains forty beds, and cost

about twenty-five thousand dollars. Among those present at the opening ceremonies, in addition to Lieutenant-Governor Kirkpatrick, were Dr. Charles O'Reilly, Superintendent of the Toronto General Hospital ; Dr. Bucke, Superintendent of the London Asylum for the Insane ; Dr. Welford, of Woodstock ; Dr. Lindsay, of Port Huron ; Dr. D. Maclean, of Detroit ; Captain Arthur Kirkpatrick, private secretary to His Honor ; and many physicians and laymen of Sarnia and the surrounding country.

Shortly after the arrival of the Lieutenant-Governor and his party luncheon was served, after which the building was carefully inspected. Dr. Maclean, the secretary of the Hospital Board, then read an address of welcome to the Lieutenant Governor, which closed with a request to His Honor to declare the Sarnia General Hospital open for the reception of patients. The Governor graciously complied, and, at the same time, delivered an appropriate address, in which he extended his hearty congratulations to Dr. A. S. Fraser, the chairman of the Hospital Board, and all others who had assisted in the erection of such a magnificent edifice, with its superb equipments, for the benefit of suffering humanity.

Dr. Fraser then called on a number of others, who delivered congratulatory speeches. Dr. Bucke, of London, referred to the fact that he was, in his younger days, a practising physician in Sarnia, and at that time did not expect to see such a building erected there. He said he had visited a great many hospitals, but had never seen one as perfect in equipment and appliances as the one opened on that day. People point to the advancement made in science, engineering works, railways, telegraphs, telephones; but, to his mind, none of these can compare with the great advancement made in philanthropy, the love of one for another, and the care for friends and neighbors, whether poor or rich.

Dr. Charles O'Reilly, of Toronto, complimented the committee on the great success of the opening ceremonies, and expressed himself as much pleased with the internal arrangements and the sanitary condition of the new hospital. He reminded the audience that in 1896 we are celebrating the hundredth anniversary of Dr. Jenner's crucial experiment in inoculation with smallpox, and also the fiftieth anniversary of Dr. Morton's first application of ether to surgery in Boston. By a happy coincidence the Sarnia General Hospital is opened this year, and in the future its centennial and semi-centennial celebrations will be held during the same years as similar celebrations in honor of the discovery of vaccination, and the first administration of ether for surgical purposes. He then made some humorous remarks regarding self-sacrificing physicians, who did all in their power to prevent disease—much to their own *financial* disadvantage. In conclusion, he congratulated the citizens of Sarnia upon having such a grand hospital, with magnificent equipments, and all facilities for asepticism and

antisepticism in the practice of both medicine and surgery, with all the possibilities for good work in the direction of preventive medicine and conservative surgery.

Many others—both physicians and laymen—gave interesting addresses, after which the doors of the hospital were thrown open to the public for a general inspection of the premises.

Meetings of Medical Societies.

TORONTO MEDICAL SOCIETY.

REGULAR meeting held October 8, 1896, the President, Dr. W. J. Wilson, in the chair. Minutes read and adopted.

Present: Drs. J. N. E. Brown, W. Oldright, J. E. Graham, A. Primrose, R. L. Langstaff, H. H. Oldright, Fletcher, Foriar, H. Hamilton, Rudolph, Webster, Russell, F. Oakley, T. MacMahon, G. A. Peters, H. Anderson, B. McKenzie, R. Reeve, Carveth, Adams, A. McPhedran, F. Starr, J. Hunter, Weir, Graef, and Galloway.

Dr. Oldright presented pus tubes, ovaries, and a small fibroma which he had removed the day of the meeting.

Dr. Primrose showed some calculi he had removed from a child three years old. Probably they are oxylate of lime; he had not examined them yet. The boy presented the usual symptoms; he adopted the method of continuous hydrostatic pressure through a catheter passed into the bladder and connected with an irrigator two feet above the patient. It worked admirably. It was not inflated until the abdominal incision was made. This appliance is better than a syringe, as it makes an equal pressure; if the child vomits it gives. Further, after the incision it floats up the edges of the bladder into the wound. Warm boric solution was the solution used.

STENOSIS OF LACHRYMAL DUCTS.

Dr. Reeve presented a case of stenosis of the lachrymal ducts and extensive dilation of the lachrymal sacs. The sac on the right side was double. The probes which he introduced before the members were four mm. in diameter. Some members of the profession considered this form of treatment brutal, preferring to use small tubes. One of the probes was aluminum, the other was silver. The aluminum may be passed with greater ease to the patient than the other. Small probes only produce temporary results. There is a thickened ledge. The main point in the treatment is to break down this constricting band, which large probes will do. The epiphora in this case began seven years ago, and for seven years

there was a condition of mucocele. For a year a fœtid discharge has passed through; 1-3000 perchloride was used to flush out the cavity.

Dr. Anderson asked if there was danger of recurrence.

Dr. Reeve said there was always that tendency. He had used the word cure only in a sense. Some cases required a probe passed occasionally afterwards.

TREATMENT OF ADVANCED TUBERCULAR DISEASE OF THE HIP.

This was the title of a paper by A. Primrose. Opinion varied as to amputation in these very bad hip cases. He pointed out that each case must be carefully weighed. In some cases the only hope of saving the patient's life was by amputating. The history of a case was then given which illustrated the sort of case in which amputation should be performed. The first treatment was by fixation of the joint. The disease progressing, incision was made, and an attempt to remove the diseased parts. This failing, the same operation was repeated. This also failed, and as the patient grew worse and showed marked signs of amyloid disease and a continued destruction of the tissues in the neighborhood of the joint, including the acetabulum, amputation was decided upon, although some of the consulting physicians were opposed to this procedure. The essayist then stated that the mortality in these cases was not nearly so high as the text-books lead us to suppose. From statistics he had been able to gather, he found that the rate was about ten per cent. A case was then described in which, after a successful operation, the patient subsequently died from tubercular meningitis. It was a question whether the operation precipitated this attack. The technique of the operation was then described. One of the greatest difficulties to contend with was the hæmorrhage. In the cases described digital compression was used. He pointed out how the tourniquet acted in an unfavorable way in producing subsequent hæmorrhage.

Dr. McKenzie pointed out how difficult it was to say when one should operate. When did this advanced stage begin? He alluded to the improvement of other tuberculous lesions in the system after the removal of a diseased joint. Cases were reported in evidence of this statement. There was a difference of opinion among surgeons as to the propriety of operating by amputation. So good an authority as Watson Cheyne, in 1895, said that he had never seen a case where amputation was necessary. Marsh had performed only fourteen, with a mortality of fifty per cent. That operator had described cases where operation was recommended, but where recovery took place. The speaker reported three cases he had seen where tubercular meningitis had ensued. He thought Dr. Primrose's case was not accelerated by the amputation.

Dr. McPhedran pointed out that when tubercular disease was discovered in one part of the body, it was very often present in some other part. An explanation of the tubercular meningitis following the operation might be given; the poison might be absorbed from the freshly cut surface.

Dr. Hunter reported a case he had just seen. The patient was a young woman with a tubercular family history. Both lungs were involved as well as the larynx. The trouble manifesting itself in the toes, she had consulted him as to the advisability of having them amputated. He would like an opinion from the reader of the paper.

Dr. J. E. Graham asked if patients suffering from amyloid disease following operation by amputation recovered. He asked what evidence there was in the cases reported that this condition was improved.

Dr. Primrose replied that the liver and spleen, which were much enlarged, were diminished in size, as well as a disappearance of other symptoms. In Dr. Hunter's case, operation, perhaps, would be inadvisable. In such cases the wound would not heal kindly.

STRICTURE OF URETHRA-SACCULATED BLADDER.

Dr. H. B. Anderson presented some pathological specimens. He said that the patient from whom they were taken was a male, aged seventy seven. Had had gonorrhœa when young. This was followed by stricture of the urethra. This stricture gave him very much trouble and necessitated external urethrotomy, and afterward frequent dilatation. Subsequent enlargement of the prostate led to the use of a catheter. This was followed by a purulent cystitis, which lasted for some years. Symptoms of calculus appeared and the other symptoms grew worse. The temperature remained normal. Was operated on by Dr. Teskey for stone in the bladder, and two large phosphatic calculi removed. The case ran on for some two weeks, when the patient died. Autopsy showed a stricture in front of the membranous portion of the urethra. Behind this the urethra was sacculated. The mucous membrane at this point was discolored and showed signs of chronic inflammation. The bladder was markedly thickened in all its coats, and presented a sacculated condition. In two places the mucous membrane had protruded through the muscular coat and sacculated. In one there had been an abscess which had burst through into the peritoneum. It had not set up any inflammatory reaction in the peritoneum, the patient having probably died before time enough had elapsed for that to take place. Phosphatic flakes were found in these saccules. The contents of the abscess showed the presence of streptococci and another bacillus which he had not identified, but which probably was the colon bacillus. The ureters were dilated and showed signs of

inflammatory change. The pelves of the kidneys were dilated with a purulent fluid, and there was beginning atrophy of the parenchyma of the kidney substance.

MITRAL DIASTOLIC MURMUR.

Dr. J. E. Graham reported a case. The patient, a dentist, consulted him for heart trouble. He complained of being annoyed by a peculiar sound emanating from that organ, particularly when he bent over his work. It was so loud that his patients noticed it. At times it could be heard across the table at which he was eating. An examination in the recumbent position revealed what appeared to be a mitral diastolic murmur, not very loud. Then the patient sat up, leaned to the left, and the murmur could be heard two or three feet away. The murmur was loudest over the apex. A well-marked thrill could be detected. The quality of the sound was disagreeably musical.

Dr. Reeve said in those cases where the carotid ruptures in the sinus behind the apex of the orbit the patient at first notices a musical note high in pitch. After a time this is succeeded by a loud noise and other signs of aneurismal varix. As the cases improve the noise subsides and the musical note returns.

Dr. Rudolph reported having seen a case where the patient had an aortic systolic murmur which could be heard six feet away. It had come on after a severe strain. An explanation had been offered that it was due to a doubling up of one of the cusps of the valve.

Book Reviews.

PRESCRIBERS' PHARMACOPŒIA. A synopsis of the more recent remedies, official and unofficial, with a therapeutic index. Third edition. Kemp & Co., Ltd., Wholesale and Manufacturing Chemists, Bombay. London: 84 Leadenhall street, E.C., 1896.

Messrs. Kemp & Co. have issued a most useful book. The matter contained therein is of the greatest service to the physician when prescribing. Many a time a prescription would have its usefulness enhanced by the addition of some ingredient whose properties or preparation have escaped our memory. Any aid to our memory in this direction is of great use to our patients. The references are brief, but up to date.

The book also contains a chapter on urinary testing which is in itself of more than ordinary value, since it describes the preparation of many of the reagents used. A most voluminous index concludes the volume. The price is not stated, but no doubt may be found out by communicating with the publishers.

A MANUAL OF VENEREAL DISEASES. By James R. Hayden, M. D., Chief of Venereal Clinic, College of Physicians and Surgeons, New-York; Professor of Genito-Urinary and Venereal Diseases in the medical department of the University of Vermont, etc. In one 12mo. volume of 263 pages, with 47 engravings. Cloth, \$1.50. Lea Brothers & Co., Publishers, Philadelphia and New York, 1896.

The first part of this work treats of gonorrhœa and its complications, every part of it being well up to date. Most attention is paid to stricture of the urethra, its diagnosis and treatment, the author advocating urethrotomy where the usual methods of dilatation have not met with success. He uses the internal method where the stricture is within four or five inches of the meatus, and the external where it is beyond this, or where vesical drainage is necessary for chronic cystitis and urethritis.

The cutting in the internal operation is done by one of the ordinary urethrotomes, after washing out the bladder and urethra with boric acid solutions, and he keeps the stricture open by dilating every second or third day with a steel sound while necessary.

The patient is put in the lithotomy position for external urethrotomy, and, after the usual preliminary preparations, the author passes either a Gouley's catheter or a Wheelhouse's staff into the bladder, or as far as the stricture will permit, and cuts down on this in the median line, just above the stricture. The stricture is then divided, and a Teale's gorget passed into the bladder. By using a steel sound the operator ascertains that there is no further obstruction, and after putting in a perineal drainage tube he stitches up the wound. Dilatation will also be necessary here for some time after the operation.

The articles on chancroid and syphilis are reprints of the ones in Culver and Hayden's Manual of 1892, and, therefore, need no remarks.

The book is well illustrated, and in a compact and readable form.

A MANUAL OF MATERIA MEDICA AND PHARMACOLOGY. Comprising all organic and inorganic drugs which are and have been official in the United States Pharmacopœia, together with important allied species and useful synthetics. For students of medicine, druggists, pharmacists, and physicians. By David M. R. Culbreth, M.D., Professor of Botany, Materia Medica, and Pharmacognosy in the Maryland College of Pharmacy, Baltimore. In one handsome octavo volume of 812 pages, with 445 illustrations. Cloth, \$4 75. Lea Brothers & Co., Publishers, Philadelphia and New York, 1896.

The above work is most comprehensive in its scope, and written in an easy and concise style. It is essentially a student's book, and the arrangement makes it superior to any of the existing materia medicas known to the writer. There is no unnecessary waste of time in describing drugs—the main points are immediately mentioned, briefly, but thoroughly. The information accompanying each drug embraces its genus, habitat, synonyms—English, French, and German—description, constituents, preparations, and properties. The arrangement of the drug descriptions is made so as to associate “as nearly together as possible those substances, organic and inorganic, which have a common or allied origin, allowing those related next in order to follow in regular sequence.” The metric system is omitted from the text, and the apothecaries system adhered to. This is in accordance with the common usage of to-day in this country, and prevents the necessity of figuring doses and what-not back to the system in vogue. The metric system will one day be adopted; then it will be time to utilize it in constructing our books.

The illustrations are a great credit to the work, and of undoubted value in aiding the text. Botany can be more easily studied from well-illustrated text-books than from those whose illustrations are infrequent and not true to nature. Their profusion is remarkable, nearly every plant described being accompanied with one or more illustrations.

Part I. of the work embraces 557 pages and twelve tables of recapitulation, which will be found of great aid to the student in reviewing his work before examination. In these tables the natural order, botanic source, official part, habitat, etc., etc., are so clearly tabulated that reviewing is made easy, and yet they could not be utilized for examination purposes without a knowledge of the work from deeper reading.

Part II., embracing thirty pages and recapitulation table, deals with drugs derived from the animal kingdom.

Part III., inorganic drugs from the mineral kingdom.

Part IV. is devoted to organic carbon compounds, and considered under two heads: The fatty and aromatic series.

The synthetic remedies are treated of in Part V. The formulæ are graphically shown where one atom or a group of atoms are exchanged for others, and different substances invariably produced. These compounds are of so universal use at the present time that the addition of this part to the work makes it an exceedingly valuable one.

The appendix embraces such useful information as poisons: treatment and antidotes; a table showing the number of drops in a fluid drachm of various liquids; a table of popular medical abbreviation; Latin used in prescribing and directing, the whole concluding with a voluminous index.

The work will, undoubtedly, be adopted freely as a text-book, and the author should be congratulated on producing a work which so exhaustively deals with the subject in hand. The publishers have, as usual, spared no pains in presenting a well-printed and bound volume.

FOOD IN HEALTH AND DISEASE. By L. Burney-Yeo, M.D., F.R.C.P., Professor of Therapeutics in King's College, London. New (2nd) edition. In one 22mo. volume of 592 pages, with 4 engravings. Cloth, \$2.50. Lea Brothers & Co., Publishers, Philadelphia and New York, 1896.

Medical Items.

DR. GEORGE L. MILNE, of Victoria, B.C., Registrar and Secretary of the British Columbia Medical Council, spent a few days in Toronto early in October.

DR. A. H. GARRETT, of Bay street, and Dr. Harris, McCaul street, have returned from London, England, where they spent a very pleasant and profitable four months.

DR. H. P. H. GALLOWAY, formerly of Euclid avenue, Toronto, has gone to New York, where he will spend some months in special work connected with orthopædic surgery.

DR. J. T. DUNCAN, of Toronto, returned from Europe in September and resumed practice. He delivered the opening lecture for the winter session at the Ontario Veterinary College, October 14.

DR. GEOFFREY BOYD, of Bloor street, Toronto, was seriously ill with appendicitis during the summer. A section was made and the appendix removed, October 14. At the time of writing a speedy restoration to perfect health is confidently expected by his medical advisers.

AT the recent meeting of the American Association of Obstetricians and Gynæcologists, held in Richmond, Virginia, during the last week in September, Dr. James F. W. Ross, of Toronto, was unanimously elected president. The next meeting will be held at Niagara Falls, in September, 1897.

MR. J. ROSS ROBERTSON, M.P., proprietor of the Toronto *Evening Telegram*, early in October gave two thousand dollars to the Hospital for Sick Children, Toronto. This added to previous gifts makes a total of \$50,000 which he has presented to this institution.

ONTARIO HEALTH OFFICERS' ASSOCIATION.—At the recent meeting of this association, held in September at Niagara, the following officers were elected: President, Dr. C. Sheard, Toronto; vice-presidents, Dr. McCrimmon, Palermo, and Dr. J. J. Cassidy, Toronto; secretary-treasurer, Dr. J. J. Mackenzie, Toronto; council, Dr. Wardlaw, Galt; Dr. Griffin, Brantford; Dr. Coventry, Windsor; Dr. Hutchinson, London; and Dr. Bowman, Berlin.

THE fifteenth annual announcement of the New York Post-Graduate Medical School and Hospital has just been issued. Five hundred and forty-two physicians from all over this continent have attended the courses at the institution during the past year. Recent discoveries have revolutionized medical and surgical methods, and a man whose medical education ended fifteen years ago is not a physician or surgeon within the present meaning of the term. Post-graduate medical instruction is for the purpose of furnishing to these graduates in medicine a means of refreshing their knowledge.

THE NIAGARA DISTRICT MEDICAL ASSOCIATION.—The regular quarterly meeting of the Niagara District Medical Association was held in the Welland House, Welland, October 14, Dr. King, of St. Catharines, in the chair. Dr. Schooley read a paper on "Appendicitis," which was intelligently discussed by Drs. Merritt, King, and Armour. Dr. Merritt read a paper on a case of fracture of the base of the skull. Several other subjects of interest to the profession were discussed at length. The next quarterly meeting of the association

will be held in the St. Catharines General Hospital on the second Wednesday in January, 1897.

MEDICAL COUNCIL EXAMINATIONS.—At the supplementary examinations of the Ontario Medical Council, held in September, the following candidates were successful: Final: Geo. S. Cameron, Petrolia; J. J. Downing, Kingston; W. F. Gallow, Toronto; J. S. Goodfellow, Sudbury; W. S. Harper, Madoc; J. S. Honsberger, Jordan Station; D. Jamieson, Barrie; E. B. Moles, Arnprior; G. B. Mills, Fergus; D. McEwen, St. Elmo; D. C. McKenzie, Durham; J. B. McMurrich, Toronto; E. G. Quesnel, Alfred; A. F. Reynar, Bolton; R. D. Rudolf, Toronto; W. W. Sands, Sunbury; C. H. Sills, Picton; Emma L. Skinner, Davisville; W. H. Taylor, Toronto; Adelaide Turner, Gananoque; E. C. Weeks, Glencoe; T. W. H. Young, Toronto. Primary: W. E. R. Coad, Toronto; C. C. Fissette, Brantford; W. F. Gallow, Toronto; J. S. Honsberger, Jordan Station; W. S. Harper, Madoc; E. A. P. Hardy, Toronto; R. McKenzie, Toronto; T. B. McDonald, Ripley; W. W. Sands, Sunbury; F. L. Thompson, Mitchell; R. W. White, Hamilton.

ANTITOXIN COLLECTIVE INVESTIGATION (SECOND)— AMERICAN PÆDIATRIC SOCIETY.

To the Profession:

The American Pædiatric Society are encouraged to ask the co-operation of the profession in a further collective investigation. Laryngeal diphtheria is believed to furnish a crucial test for antitoxin; the present aim is to ascertain (1) what percentage of cases of laryngeal diphtheria recover without operation under antitoxin treatment; (2) what percentage of operated cases recover.

The society asks for records of cases of *diphtheria involving the larynx whether operated on or not, occurring in private practice in the United States and Canada, treated with antitoxin*. It is expected that the cases occurring this year will be treated with reliable preparations of the serum, will be treated early, and will be given efficient doses. The second report is designed to be a study of cases occurring between the closing of the first report, May 1st, 1896, and the closing of the present collective investigation, April 1st, 1897.

In order to secure data which shall make the tables complete, circulars containing blanks for ten cases have been printed and are now ready for distribution. It is desired that physicians shall fill out circulars, blanks, as cases occur, not trusting to memory, and shall urge their friends having similar cases to do the same. Circulars can be had by applying to the committee (address below). Several groups of cases in the first investigation arrived too late, and were lost to the report. It is desired that circulars, as soon as filled (ten cases), be returned to the committee. The collection of cases must close at the end of March, 1897.

For extra circulars (blanks), for returning circulars (filled), and for further information, address the chairman of the committee:

October, 1896.

W. P. NORTHRUP, M.D.,
57 East 79th Street, New York, N.Y.

THE ACTION OF THE SOCIETY UPON THE FIRST REPORT.

(1) *Dosage.* For a child over two years old the dose of antitoxin should be, in all laryngeal cases with stenosis, and in all other severe cases, 1,500 to 2,000 units for the first injection, to be repeated in from eighteen to twenty-four hours if there is no improvement; a third dose after a similar interval, if necessary. For severe cases in children under two years, and for mild cases over that age, the initial dose should be 1,000 units, to be repeated as above if necessary; a second dose is not usually required. The dosage should always be estimated in antitoxin units, and not of the amount of serum.

(2) *Quality of antitoxin.* The most concentrated strength of an absolutely reliable preparation.

(3) *Time of administration.* Antitoxin should be administered as early as possible on a clinical diagnosis, not waiting for a bacteriological culture. However late the first observation is made, an injection should be given unless the progress of the case is favorable and satisfactory.

OBITUARY.

CHARLES HENRY COOKE, M.D.—Dr. Cooke died at his late residence, Simcoe street, Toronto, October 11, aged fifty-four. His illness lasted only about ten days, and the immediate cause of death was acute nephritis. Dr. Cooke graduated in McGill College in 1866, and for some years thereafter was a surgeon on one of the Allan ocean steamships. He settled in Toronto about the year 1878.

WILLIAM BURNS CHALMERS MURRAY, M.D.—Dr. Murray died at his home, Bryanston, county of Middlesex, October 14, aged forty. He graduated in the universities of Trinity College and Victoria College in 1890, and also received his diploma and license from the College of Physicians and Surgeons in the same year. He at once settled in Bryanston, and soon established a large practice, which he retained up to the time of his last sickness.

LORENZO CLOSSON, M.D.—Dr. Closson, of Toronto, died September 13th, 1896, after a long illness, aged sixty-eight. He was a licentiate of the old Licentiate Board of Upper Canada, 1851, and received the degree of M.D. from the Jefferson Medical College of Philadelphia in 1873. He left a widow and a son and daughter. His son, Dr. John H. Closson, who graduated in 1892, entered into partnership with his father shortly after he received his degree.

JOHN ERIC ERICHSEN, F.R.S., LL.D., Hon. M. Ch. and Hon. F.R.C.S., died at Folkestone, England, September 23, aged seventy-nine. At the time of his death Mr. Erichsen was Emeritus Professor of Surgery and consulting surgeon to University Hospital, and to many other medical charities. He has been president of the Royal College of Surgeons of England, of the Royal Medical and Chirurgical Society, and of the surgical section of the Great International Medical Congress of 1881. He was Surgeon-Extraordinary to the Queen, and has been president of University College, London, since 1887. Mr. Erichsen was one of England's best surgeons—and probably England's best teacher of surgery.

HON. JOHN FERGUSON, M.D., SENATOR.—Canada lost one of her most gifted sons through the death of the Hon. Dr. Ferguson, Senator of the Dominion of Canada, which occurred September 22, 1896. He graduated in Victoria University in 1864, but only practised his profession for about four years. He then engaged in business ventures, and was very successful—soon acquiring wealth and influence. In politics he was an active and strong Conservative, and was for some time a member of the Commons. Afterwards he was made a Senator, and was one of the most influential members of that body. He lived for many years in Welland, but during the last few years was a resident of Toronto. His death was caused by Bright's disease.

HENRY T. RIDLEY, M.D.—Dr. Henry T. Ridley died on the steamer *Bonavista*, September 22nd, in the St. Lawrence river, from apoplexy. He was seized on the evening of the 21st, at 10 p.m., and died the following morning at 5 o'clock. He was born in Belleville in 1827, and was sixty-nine years of age. He was a son of Dr. George L. Ridley, who practised in Belleville for many years. Dr. Ridley received his preliminary education in Upper Canada College, and his medical education at McGill College, where he graduated in 1852. He at once located in Hamilton, where he soon acquired a large practice, which he retained up to the time of his death. He was beloved by his patients and highly respected by his brother practitioners. He was essentially a gentleman of the old school, and a most lovable man in all respects.