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QUEEN'S

MEDICAL SCIENCE

VIDEO MELIORA PROBOQUE

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ORIGINAL ARTICLES.

CYSTITIS.

BY W. BRITTON, M.D., TORONTO; A PAPER READ BEFORE THE
TORONTO MEDICAL SOCIETY, OCT. 16, 1888.

IDIOPATHIC acute cystitis is rarely observed, excepting as a complication of some pre-existing malady. It is said to originate *de novo* occasionally in scrofulous and rickety girls in whom there is manifest a predisposition to vaginitis and other varieties of mucous inflammation. It is found as a complication of pyæmia, typhus fever, and in certain cases of the exanthemata. The gouty and rheumatic diatheses are said to be predisposing causes; although, if cystitis be in progress and a fit of gout supervene, the consequent diminution of uric acid excretion is thought to allay temporarily the bladder symptoms.

Primary acute cystitis, with the few exceptions mentioned, is probably always a traumatic disease, although the injury is often inflicted in a secondary manner. Of the direct injuries may be mentioned, calculus, lithotomy and lithotripsy, the unskilful use of the sound, external blows (especially when the bladder is much distended), the prolonged pressure of the foetal head and some of the mechanical aids to delivery; the irritating effects of ill-advised or too free use of such articles as the balsams, turpentine and cantharides may be included in the category.

All the indirect causes of traumatic cystitis may be narrowed, in their *modus operandi*, to the two elements of over-distention and retention of urine—apparently one and the same thing, but widely diverse in the transition from cause to effect. Over-distention means unnaturally violent efforts to expel and consequent hyperæmia, while prolonged retention is the forerunner of urinary decomposition and irritation—that indefinable some-

thing that is said to underlie the inflammatory process.

The causes of retention may be summed up as follow:—Congenital or acquired narrowing of the meatus, and tumours of that aperture such as frequently are found in the female; stricture, prostatic disease, especially if accompanied by hypertrophy; a calculus lodged at the neck; and atony and paralysis of the bladder, a not uncommon trouble of old people, and a complication of various forms of spinal lesion. In a subacute form, cystitis often occurs at the climax or towards the close of an attack of gonorrhœa; and, indeed, in the female, the almost constant existence of urethritis and its inclination to invade the bladder, are set down as some of the diagnostic features of specific, as distinguished from simple vaginitis. Inflammatory diseases of any of the neighboring organs may, by extension, invade the bladder, but this pertains more especially to its peritoneal covering.

Usually the disease invades primarily the mucous tunic, occasionally the peritoneum, and if it ever attacks the muscular coat, it has its starting point in one of the other two—commonly the innermost; and, indeed, this order of origin is not difficult to account for when the structure and functions of the bladder are taken into consideration. An eminent pathologist says that two-thirds of the diseases to which human kind are subject have their starting point in mucous membrane, so sensitive are its delicate cells to irritation; and in this particular instance we have to deal with an organ which is at once a receptacle for, and an instrument of expulsion of, a fluid ever varying in character and quantity according to the protean conditions of the system and its surrounding influences. It is protected from undue irritation in part by that normal vital principle that exists in healthy tissue, and in part

by the constant secretion of a protective mucous coating normal in quantity and character ; it should not be distended beyond what its muscular fibres can bear without weariness ; and, when expulsion occurs, exit should be so unobstructed as to necessitate only such a subdued contraction as is necessary for dilation of the outer portions of the urethra ; unless it be shown that the longitudinal fibres assist also in opening the sphincter. Any wide divergence from health in the condition of the urine, especially if from retention ; an abnormal quality or quantity of mucus, or want of correlation between the sets of muscles concerned in urination may, separately or conjointly, bring about a state of irritation which, sooner or later, is followed by hyperæmia ; and Rindfleisch says that disordered and hypersecretion are the concomitants of hyperæmia, and that this hyperæmia is a proximate cause of the mal-secretion ; also the more or less remote cause of other disturbances, viz., tumefaction, hæmorrhage, pigmentation, hypertrophy, etc., which, taken together, constitute the anatomico-pathological picture of catarrh of mucous membranes.

It may be asked, why should undue contraction of the muscular wall of the bladder induce congestion of the lining ? The returning venules, as they pass through the muscular coat, are surrounded by a much thinner coat of connective tissue than the arterioles, and are, therefore, in more immediate contact with the muscular fibres ; in consequence of this anatomical arrangement, inordinate contraction compresses the veins more than the arteries ; hence the passive hyperæmia of the mucous coat, induced by such violent efforts as the bladder *per force* must make to overcome all sorts of obstructions to the urinary flow. The same result naturally follows these spasmodic contractions that are excited by the presence of calculus and tumors.

As in other mucous membranes the acute attack may be catarrhal or croupous in character, this latter being the form usually excited by cantharides and other irritants introduced into the system ; and may end in resolution, ulceration, suppuration or gangrene, or may degenerate into the chronic form. After the inflammatory process is once set up, not simply the superficial layers of cells, but all the elements of the mucous membrane appear to be involved ; and, indeed, one pathologist maintains that the trouble lies not in the mucous tissue alone, but in the underlying layer of connective tissue, so uni-

versal is the invasion. At any rate every cell is changed, if not in form, at least in character and ability to withstand undue irritation ; therefore, even after the urine is restored to a healthy condition, the mucous secretion normal, and all symptoms have disappeared ; for a considerable period of time, they must still remain *a locus minoris resistentie* and danger on slight provocation, of re-excitement of the disease ; this interval lasting until a new generation of cells is formed throughout. Hence, also in part, the tendency towards chronicity.

On examination, the mucous membrane is found discolored and softened—seldom universally, but usually in patches, which occur most frequently in the vicinity of the neck. Here and there may be erosions ; or, if the disease has run very high, or lasted long, there may be ragged ulcers laying bare the muscular fibres, or even gangrenous spots ; although these last seldom are seen, excepting in the aged and debilitated, or as the result of severe traumatic causes. The spots of discoloration and erosions are mostly to be found on the rugæ, and may be covered with ropy mucus, sanious offensive fluid, or may be invaded in part by croupous membrane—this often is coated with phosphates. Rindfleisch says, that this croupous membrane, although it has the gross appearance of being fibrous in structure, really consists of corpuscles which have assumed a change of outline ; the protoplasm having arranged itself in an irregularly radiating form by the corrugation of the cell, so that an agglomeration of the cells gives to the neoplasm the appearance of being made up of fibres. Occasionally it happens that the ulcers spoken of extend and cause perforation, which fortunately does not in every instance prove fatal, as the surrounding zone of inflammatory action may bring about adhesions to neighboring viscera.

The disease in the acute form is usually ushered in by malaise and chills, with frequent desires to urinate, followed by high temperature and the general symptoms of fever. The pain at first is not severe unless the peritoneum is involved, but considerable uneasiness is complained of in the hypogastrium and the perineum, perhaps in the glans penis and shooting down the thigh. If the anterior wall is the part chiefly involved, which is rarely the case, tenderness on pressure is felt a good deal in the hypogastric region ; but, as the inflammatory

process is ordinarily confined to, or greatest, near the neck, the perineal and perirectal tenderness are usually found to be the greatest.

In these last cases the vesical irritability is more marked. The chief symptoms complained of are irritability, straining and scalding in urethra as the urine flows in small quantities, and in case the *bas-fond* is much involved, there may be some tenesmus, which in one case I saw was extreme. The pain and uneasiness are alleviated after urination and commence again as soon as urine accumulates, the interval of rest being shortened according to violence of attack, and the closeness of the inflammatory process to the neck of the bladder.

Should resolution set in, these symptoms gradually subside and nothing is left but a condition of occasional irritability, which, as already stated, ends when there has been time for the formation of a new set of mucous elements. But should the inflammation continue, ordinarily, in two or three days, the urine is changed much in character; it is ammoniacal, and contains large quantities of mucus, also pus corpuscles and occasionally blood globules. Ammonio magnesian phosphate is found plentifully and is recognized by the microscope; carbonate of ammonia and amorphous phosphate are present, as also occasionally sulphuretted hydrogen in small quantities. The sediment forms thickly with the pus in an opaque yellowish layer on top, and the clear supernatant fluid having often a yellowish tinge. Later on, if the disease pursues a severe course, the urine assumes a darker color, caused by the disintegration of the blood corpuscles by the carbonate of ammonia, and has a highly ammoniacal and foetid odor.

How the urea becomes converted into carbonate of ammonia does not appear to be decided. There exist two or three theories in the matter. Dr. Rees thinks that secretion being abnormal, on account of diseased and hyperæmic mucous membrane, this degenerated mucus acts as a ferment. Others suppose that some hitherto undiscovered ferment enters from the blood, while it is imagined by the majority of observers that bacteria play an important part in the process. I heard of an incident that occurred before much deference was paid to the pranks of these little bodics, that bears somewhat on this matter. In the good old days, when the rite of initiation, with all its mysteries, was a *sine qua non* in a certain medical school, one of the im-

pressive ceremonies in the chamber of horrors was the passing of the catheter, ostensibly to investigate the physical competency of the timorous candidate. This delicate operation was, I suppose, relegated to the most experienced of the inquisitors, and I believe the instrument used was the gum elastic; therefore it is likely that no undue violence was used towards the victim. The inference was that he had been continent, at least there was no stricture, and the catheter entered the bladder easily; but a magnificent sample of cystitis was the result. Of course it is barely within the limits of the possible that some of the august tribunal may have had an attack of gonorrhœa, and hence the consequence. But at any rate, Niemeyer records cases where the introduction of a dirty catheter has resulted in inflammation. The presence of pus or blood is easily recognized by the microscope and by the tests for albumen.

(To be Continued.)

THE SEWERAGE OF SMALL CITIES AND TOWNS.

BY WILLIS CHIPMAN, B.A., SC.; READ BEFORE THE LINDSAY MEETING OF THE ASSOCIATION OF HEALTH OFFICERS.

IT was with considerable diffidence that the writer consented to prepare a paper to be read before this association, composed almost entirely of medical men; for our special work is the designing and constructing of systems of public water supply and systems of sewers for the removal of the refuse and filth from populous districts, while the work of the medical health officer is the enforcement of statutory enactments, chiefly governing the individual, and the investigation of the causes of contagious and infectious diseases and the means of checking their ravages.

The Province of Ontario is comparatively a new country; our oldest inhabitants can remember when our largest cities were but small towns, our towns villages, and our best agricultural lands forests.

In the older parts of our Province the population of towns and cities is rapidly increasing, while the population of the rural districts shows but little increase. In Great Britain, the continent of Europe, and the United States it is equally true that the urban population is increasing at a more rapid rate than the rural population.

Although for many years the attention of sani-

tary engineers and medical authorities has been devoted, in a certain extent, to the protection of the public health in the thickly populated districts of the civilized world by the removal and disposal of their foul wastes, it is only within the last few years that these matters have been given the attention they deserved.

Newton's first law of motion is a simple statement of the *inertia of matter*. There is a law of life very similar to that of matter, which might be called the "inertia of thought," or "inertia of habit;" although the change of environment may lead to change of thought and change of habit, it is nevertheless true that the habits and methods of life contracted in boyhood will influence, if not control, those of manhood. When we therefore consider that the control of matters pertaining to health and sanitation is to a great extent placed in the hands of those who are wholly ignorant of science and oblivious to statute, and that they have, in many cases, passed their boyhood and perhaps early manhood where lack of sanitary rules was offset by plenty of room, *fresh earth, pure air, and water* in abundance, the charge of "criminal negligence" so often made by sanitary engineers and members of the medical profession against civic authorities is perhaps too strong a term; *ignorant negligence* is more appropriate.

In these sanitary conventions we hear much about food adulteration, especially milk. This is an important matter, one deserving of your deepest consideration, but putrid sewage is more than adulteration, it is *poison, deadly poison*.

This matter is not intended to be an exhaustive treatise on sewerage, but the writer will briefly describe the different methods of sewage removal and attempt to give some practical suggestions based on the latest modern engineering practice, without introducing any formulæ or professional terms that cannot be easily understood.

"Sewage" in its ordinary sense does not include ashes or kitchen garbage, it consists chiefly of water polluted with a variety of matters, some held in solution, some in suspension. It will be so considered in this paper. All other matters that cannot be burned conveniently should be removed in wheel-barrow or cart. There are four tools which, if frequently and regularly used by each householder would soon do very much to improve the sanitary condition of a city or town; they are the pick, the shovel, the hoe, and the broom.

Mr. Gray, city engineer, Providence, R. I., states as follows in his valuable report on the proposed system of sewerage for that city:

"The cardinal principles upon which the sanitation of towns should be based may be briefly stated as follows:

1. "The water supply should be both pure and abundant.

2. "All excretal filth, domestic refuse, and dangerous waste products of manufactures should be completely removed beyond the limits of inhabited districts, and be properly disposed of before any deleterious putrefactive change shall have taken place in them.

3. "The process adopted for the removal of objectionable matter should be such that the apparatus, channels or rivers by which they are conveyed shall not become foul or communicate any gaseous products of decomposition to inhabited places. No system of sewerage is complete until all nuisances from sewage shall have been prevented.

4. "The scavenging of the town shall be complete and thorough.

5. "The storm water shall be conveyed without damage or inconvenience.

6. "The level of the underground water shall be permanently lowered by means of thorough sub-soil drainage to a suitable depth below all habitations.

7. "A code of effective sanitary laws should be enacted and enforced, and an efficient sanitary inspector should be constantly maintained."

Systems of direct removal.—This includes the pail or tub system, the ash closet, and their different varieties and combinations.

In each of these systems the sewage is stored for a certain length of time before removal. From a sanitary standpoint the pail or tub system is least objectionable when contents are removed daily—the earth closet system the least objectionable from an æsthetic standpoint. The earth or ashes used in this last system deodorizes the refuse matter, which may, therefore, be stored for a very long time without becoming offensive. It is yet to be proved by medical science that the compost is disinfected as well as deodorized. The poisonous element of coal gas is perfectly inodorous, and it is now pretty well established that the poisonous elements of the so-called *sewer gas* are in themselves inodorous.

The earth closet and its varieties do not provide for liquid wastes, which exceed the solids by ten fold. This should be a convincing argument against its adoption unless there is a system of sewers to carry away the liquid filth, and then the question arises naturally, why not carry both solid and liquid filth together, using the liquid as a carrier for the solids?

The system of direct removal must always be an offensive and expensive method but it appears to be very well suited for a temporary arrangement for summer resorts, camp grounds, etc., where the value of the refuse as a manure on the surrounding farm lands may offset part of the cost of removal.

It is also admirably adapted for isolated houses of the better class with sufficient garden and grounds to utilize the wastes; but it is wholly unsuited to tenement houses in small towns, especially where surveillance of sanitary officers is known. It is found next to impossible to enforce the necessary rules for keeping closets and receptacles clean.

Sometimes we hear the statement made even by medical men that a water closet in a house is always a source of danger and that an earth closet is preferable. This objection to a water closet is generally based upon an acquaintance with some very imperfect system of house drainage and plumbing. With no rules and regulations governing such important matters, it is not to be expected that the best results will follow. Only last year did the great city of Toronto adopt a plumbing by-law.

Pneumatic systems of removal.—The principal pneumatic systems are those of Liernur and Berlier, which consist essentially of a network of air-tight pipes through which excrementitious matter is forced by air pressure to the outfall, a partial vacuum being maintained in the system by the air pump. The pipes being air-tight are generally made of iron. The Liernur system is in use in several cities in Holland, and to a limited extent in a few of the cities in Germany. The Berlier system is in a small district in Paris.

In any pneumatic system the pipes must be not only water-tight but air-tight. This condition it is difficult to maintain. These systems are especially adapted to those towns and cities where from the level nature of the country pumping of sewage must be resorted to in any case.

These systems are expensive in first cost, expensive in maintenance, and certainty of action at all times doubtful.

They would not be suitable for Canadian towns.

Removal by water carriage.—Sewage removal by water carriage has been in use for centuries.

When the sewers are designed to carry not only the sewage proper, but the rainfall as well, the system is known as the *combined system*; when the storm water is excluded, the *separate system*; when part of the rainfall is allowed to enter the sewer, the *restricted system*.

From a sanitary standpoint there is no doubt in the mind of the writer that the separate system is the one to be preferred. This opinion is based upon the following reasons:

1st. Except in the large cities the conduits can all be made of vitrified glazed pipe, which is impervious to liquids and gases under ordinary pressures and offers a smoother surface than any brick or cement surface.

Brick work is not impervious, and any brick or cement surface presents many small projections which collect matters in suspension, thus impeding the current. Fresh running dilute sewage is not dangerous nor even offensive. Not until it becomes stagnant and putrefaction commences is it dangerous. The pipe sewer therefore has a great advantage over any brick or cement sewer.

2nd. In the combined system the sewers are made large enough to carry the maximum rainfall, at which time they run full, while the flow of the sewage only is but a small fraction of the rainfall, so small indeed as to be wholly disregarded in designing the sizes of the sewers.

It therefore follows that these large sewers of the combined system cannot be fully flushed, except during a maximum rainfall, perhaps once or twice a year; consequently the sewer air must become foul, especially in the small branch sewers, during the dry seasons, the flow of sewage proper being but a small, putrid, thickening stream. Only when a sewer becomes offensive is it thought necessary to flush it from a hydrant or tank.

In the separate system the flow in the pipes is comparatively a constant one, the maximum flow being but a few times greater than the minimum flow. To flush the system a flush tank should be placed at the end of every sewer. These tanks work automatically, flushing the sewers copiously

with water. They can be controlled to flush as often as necessary, and work in winter or summer, rain or shine. Where the flow of sewage is least there the flush is greatest.

As you follow upward the current in the sewers of the combined system the sewer air must become more foul, while in a separate system it becomes less foul.

3rd. In the separate system less ventilation is required, the sewers being less foul, and this ventilation is easier accomplished.

The city engineers of the present day are still at work devising methods of ventilation for their sewers. Everything has been tried, and nothing is quite satisfactory. Ventilation through catch-basins caused nuisances at those points close to the buildings. Ventilation through flues, chimneys, etc., were imperfect, only ventilating the sewer which was connected with the flue. Charcoal filters have been used, sulphurous acid and chlorine gas have been tried, to deodorize the effluvia arising from sewer openings.

Perforated manhole covers are now extensively used and generally recommended as a great aid to ventilation of a combined system of sewers. In Ontario during our four months of snow and ice, perforated manhole covers are next to useless as ventilators, but no doubt this is the least objectionable method of ventilating during the remainder of the year. They should also be used as an aid to ventilation in the separate system.

In the combined system the dangers arising from effluvia from sewer openings are great, and the ingenuity of the health officer and engineer has been taxed to invent traps and ventilating pipes to keep "sewer gas," so-called, from finding an entrance into our houses.

The more pipes and traps any system of house drainage has the less efficient must the ventilation be. The Public Health Act of 1884, gives a fair sample of one of these most ingenious, cumbrous, expensive and inefficient methods of ventilation.

In the separate system there is little or nothing to guard against, especially in the upper portions of the system, where the flush is frequent and regular, the flow of clean water displacing any foul air that may be formed and forcing it out at places of least resistance. The sewers in this system can therefore be ventilated safely and effectively by the main soil pipes being carried through the buildings and

above the roof, without placing anywhere in their courses any trap or obstruction to the free passage of air from or to the sewers. This simple method of ventilation also reduces the cost of house plumbing materially.

4th. In the separate system the cellars and basements have no direct communication with the sewers. If a stoppage should take place in any sewer the sewage "backing up" in sewer would probably gain sufficient head to overcome the obstruction, or would flow out on surface from some manhole before finding an entrance into any building through any fixture. This is an important matter and one seldom considered. In the combined system generally a drain leads from the cellar or basement to the street sewer, often of sufficient size to convey the sewage of a town of 5,000 people. This pipe or drain has a filth reservoir placed in its course called a trap, supposed to keep out gases from the sewer. During the summer months the water in this trap is probably evaporated and the sewer air has free, uninterrupted passage into the building. During storms the sudden flushing of the sewer may force the trap. A trap on a cellar drain can never be depended on.

In the separate system cellar drainage is provided for by laying porous agricultural drain tile from the building to the street sewer, and alongside the street sewer is laid a line of agricultural tile drain which carries subsoil and cellar water only. The water in these drain tiles being clean can be given an outlet at the surface either into existing deep drains or into any natural water course.

These drain tiles will lower the subsoil water, an important matter in our climate, where in the winter season the heat in the interior of our houses tends to draw in the damp ground air.

5th. Where the disposal of sewage by pumping, irrigation, precipitation or filtration is necessary, the separate system has every advantage over the combined system, owing to the small volume to be considered.

Cost.—In the family the child naturally tends to imitate the parent or elder children, whether for good or for evil. In the same way a small city or town contemplating sewerage looks to the larger cities for a model. When they find these large cities expanding on their costly subterranean water courses, which they call sewers, sums that would

deter a smaller corporation it is not surprising that these smaller places postpone the construction of a system of sewerage.

It is a great mistake to look to the larger cities for model sewerage. Within the last twenty, within the last ten years, even within the last five years, sanitary engineering has taken gigantic strides, and the best, safest, and cheapest systems of sewerage are those that have been commenced and completed in the smaller cities within the last five years.

In the United States the following towns and cities have constructed sewerage systems since 1880—adopting in each case the separate system: Memphis, Tenn.; Keene, N.H.; Norfolk, Va.; Pullman, Ill.; Stamford, Con.; Chelsea, Mass. (in part); Kalamazoo, Mich.; Omaha, Neb., (in part); Little Rock, Ark.; Birmingham, Ala.; Pittsfield, Mass.; Leavenworth, Kan.; Schenectady, N. Y.; Amsterdam, N. Y.; Green Island, N. Y.; West Troy, N.Y.

In Canada the town of Brockville is now constructing a complete system of sewers, and the town of Cornwall has made a commencement. Both of the towns have also adopted the separate system.

In the small cities, towns and villages the element of cost is often a controlling factor. The writer has given his reasons why he considers the separate system better than the combined system from a sanitary standpoint, and as a system of sewers designed to carry the rainfall will cost from twice to five times as much as a system to carry sewage only, there are few valid reasons for adopting a combined system.

It is often objected against the separate system that additional sewers are necessary to carry the rainfall. This may be true in large cities with large roof area, paved courts and streets, where storm water would do injury if not immediately carried off, but in the majority of towns and cities in Ontario the surface gutters and present drains are quite sufficient to carry the rainfall. In special cases it may be advisable to allow a limited amount of roof water, or even street water in the sewers; all depends upon local conditions.

In moderate earth excavation the average cost of a completed system of sewers built on the separate system should not exceed \$1.50 per lineal foot of sewer constructed. This is a sum that any town not already bankrupt can afford, being at the rate of \$7,500 per mile approximately.

In the system of sewerage designed for the town of Cornwall by the writer, any sewage entering the system at the greatest distances from the outlet will be discharged in less than ninety minutes. In the Brockville system, now under construction, the time required to discharge at the main outlet from buildings farthest removed from the outlet along the line of sewer is also less than ninety minutes. The main outlet at Brockville is a submerged iron pipe 923 feet long extending from shore line out into the River St. Lawrence, the outer end being in 45 feet of water.

Plumbing.—It is a fact well understood among sanitary engineers that the greater amount of the dangerous sewer air that pervades our dwellings is "home-made"—manufactured on the premises—that is, it comes from putrescent matter lodged in the traps, pipes and fixtures in the building itself. It is human nature to remove the cause of a wrong as far as possible, and there is but little doubt that the public street sewer, built by a conscienceless corporation, is blamed for many foul emanations that come from defective plumbing.

The science of plumbing, depending as it does upon a knowledge of some of the laws of physics, hydrostatics, hydraulics and pneumatics, is but little understood by the average citizen, and the ordinary plumber has not kept pace with the requirements of his calling during the last decade of advancement and improvement.

For these reasons all plumbing should be under the control and supervision of the city or town engineer.

In conclusion, the writer is of the opinion that the time has arrived when those *twin relics of ignorance and barbarism*, the "privy vault" and "cesspool," should be abolished in all cities and towns, and some system of direct removal substituted temporarily until a complete system of removal by water carriage is constructed. These nuisances are only tolerated from familiarity, and should be stamped out by sanitary officers, totally out of reach of local prejudice or political influence.

TUBERCULOSIS.

C. W. PURCELL; READ AT FIRST MEETING OF VETERINARY MEDICAL ASSOCIATION IN THE ONTARIO VETERINARY COLLEGE.

DR. T. HENRY GREEN says: "By tuberculosis is understood, an infective disease, which is characterized anatomically by the formation of those small nodular lesions, known as tubercle."

The mucous membranes—respiratory, alimentary and genito-urinary—and the serous membranes, are very commonly affected. Of the organs—tubercles are frequent in the lymphatic glands, lungs, liver and spleen.

Prof. Walley of Edinburgh says: "The insidious nature of tuberculosis, has perhaps had much to do with the comparative slowness with which professional and public opinion has been directed to it, but the strides which it has made, and the hold which it has gained upon our stock, render it one of the most important questions affecting the future wellbeing of the bovine species. Looking at an individual tubercle, we might be led to despise its comparative insignificance, and to ignore its deadly meaning; but when we see thousands upon thousands of these knots existing in the organism of a single animal, a truth is forced upon our minds which we cannot refuse to recognize—that we have to deal with an insidious, implacable, and deadly foe; and independently of its ultimate fatality, I think I may with safety say, that no morbid substance known to the pathologist is so protean as tubercle in the number of functional derangements to which it gives rise."

By common consent it seems to be conceded that Jerseys and Short-Horns are most subject to tuberculosis. Animals that are inbred, of a lymphatic temperament, attenuated figure, light barrels and narrow chests, are undoubtedly predisposed to tubercle more than those in which conformation may be said to be more perfect. The Ayrshires and Holsteins, are, as a rule, quite free from it, but under the influence of a change of climate they become particularly predisposed.

The sombre colored and more hardy breeds, such as the Herefords, Sussex, and Devons, seem to be particularly exempt from disease, and it is claimed that the polled Aberdeenshires never develop it, however closely bred. The bovine tribe, however, is pre-eminently disposed, equally so with man; and next in order is the common rabbit. Pigs are very prone to tubercle and also poultry. It is rarely seen in the sheep, cat or dog, while a tuberculous goat is one of the rarest of curiosities. In the bovine species, tubercle is remarkable for its enormous deposit in the lungs, although other parts are freely affected.

Tubercle may be confined to a non-vascular, gray, semi-transparent nodule, varying in size from

a millet seed to that of a walnut, and may occur either alone or grouped together into irregular masses, these masses consisting of groups of tubercles, forming grape-like bunches in some parts. According to Williams, tubercle is capable of higher development than the grey nodule and is prone to rapid decay, and caseation, formerly called yellow tubercle. The conversion of the grey tubercle to the yellow is the most common retrogressive process, sometimes forming masses the size of a cherry or small walnut, and softer than the grey. In the larger number of cases, these tubercles, soften and liquefy into the lungs, and in this condition, escape through the bronchial tubes which communicate with the trachea; there being left in the lung, in these cases, a cavity, excavation or vomica. These cavities vary greatly in number, and in size range from that of a pea to that of a hen's egg, and even larger in some cases, and are filled with a curd-like puriform fluid, from the process of liquefaction which the caseous mass undergoes. There is always one and there are generally several pervious bronchial tubes opening into these cavities, these tubes having the appearance of having been cut off just where they enter the cavity; occasionally, but of rare occurrence, a considerable blood-vessel, does get laid open during the formation of a vomica, and then fatal and copious hæmorrhage may ensue.

The probable reason why bronchial tubes open into these cavities and blood-vessels do not, is to be found in the anatomical difference in their structure, the blood-vessels yielding readily to pressure, are pushed aside easily, while the bronchial tubes are not so easily compressed, nor do they carry any coagulable fluid, but their open mouths remain where the tubercular matter stopped and a channel is thus formed through which the same matter, after it has liquefied finds its way towards the trachea. According to Niemeyer, the tubercular matter, when once deposited, increases in quantity, until at length it liquefies by a sort of fatty degeneration. The tubercular matter becomes soft, breaks down, and is ultimately expelled through the bronchi, trachea and mouth.

It is a remarkable fact and very important, that tubercles when they affect the lungs, are not deposited at random, but in the upper lobes. It is here also that they first ripen and grow soft and become ready for expulsion, and it is here also that we have the largest vomica. These facts have a

most important bearing upon a correct diagnosis, in cases that otherwise would be doubtful, for the converse of this is true in common inflammation of the lungs. Pneumonia affects by preference the lower lobes, and there is much practical advantage in knowing these points of contrast. In health, the lungs of bovines, weighing only between six and seven pounds, are so buoyant that they float upon the water, while the lungs invaded with tubercular formations, often weigh fifty or sixty pounds, and immediately descend to the bottom when placed in water. The liver is also very apt to undergo remarkable changes. It sometimes enlarges by becoming full of adipose matter, which greases the hands and scalpel when it is cut open, the entire gland becoming soft, and loses its natural red tint, assuming a pale fawn color. Sometimes the cut surface of a liver has a whitish and glistening appearance and is then called a waxy liver.

According to Green: "Recovery of a part may occur, with loss of substance, by means of the fibroid change or by the healing of a tubercular ulcer. On the other hand, tubercular processes may directly lead to death, by generalizing, or by exhaustion from profuse and prolonged discharge, coupled with lardaceous degeneration, or indirectly by opening the way for the infective diseases of wounds—pyæmia, erysipelas, etc. Occasionally, the liquefied tubercle is evacuated, by ulceration, through the pleura, into the pleural sac, giving rise to pleuritis with effusion, and allowing the entrance of air, thus causing pneumo-hydrothorax. The adhesions resulting from the successive attacks of dry circumscribed pleuritis, which occur almost invariably, are conservative as regards protecting against this accident, which occurs in only a small proportion of cases."

Prof. Flint says: "The disease proves fatal generally by asthenia, debility, want of strength. It is rare for the deposit to be so abundant, or the destruction of lung to be so great, as to destroy life by apnoea, absence of respiration. The patient is gradually worn out by the protracted disturbance occasioned by the disease, conjoined with progressive emaciation and exhaustion. The development of pneumo-hydrothorax from perforation is apt to prove fatal in a short time, and sometimes by apnoea. Acute peritonitis from perforation has been known to occur, and this affection is likely to prove rapidly fatal."

The symptoms of tuberculosis in cattle are in the earlier stages sometimes involved in more or less obscurity. There is a general unthriftiness, a diminished and capricious appetite, the animal is easily exhausted, there is a weak hoarse cough, that is almost diagnostic; the skin is sensitive and dry and the coat staring, the mucous membranes are pale, the digestive organs are weak, the rumen prone to tympanitis, and diarrhoea sets in, which is generally excessive, the pulse is variable, the temperature increased, the eye bright and lustrous; there is a deterioration in the quantity of milk as also the quality; being blue and watery and contains a larger proportion of alkaline salts; but is less rich in nitrogenous matters and fat and sugar than in health, proving that assimilation is defective. If the animal is compelled to walk quickly, there is labored respiration, which becomes so prominent as to assume the abdominal character, if the pleura is invaded by disease. In herds predisposed to tubercle, they often become lame from some unassignable cause, when the *post-mortem* examination reveals tubercular inflammation of a joint. Pulmonary tuberculosis is characterized from the first by tumefaction of the retropharyngeal glands; the inspiratory movements are irregular; a harsh friction sound is heard on auscultation, resembling somewhat the sound produced by rubbing the thumb over a tambourine. The cough is short and not easily provoked except by sharp percussion on the thoracic parietes, a procedure which evidently causes pain to the animal.

Nymphomania, or excessive sexual desire is also frequent, but the animal is sterile; pregnant cows abort. As the malady develops, the cough becomes more persistent and easily induced and is accompanied by muco-purulent expectoration and the animals become more apathetic and sluggish in their movements; emaciation proceeds more or less rapidly, extreme debility ensues, the eyes are sunken and brilliant, the mouth is open and drawn back at the angles, the spine is arched and tender, and the breath as death approaches becomes cadaverous and fetid.

Percussion gives dullness in some parts of the chest, and in others the normal resonance.

Auscultation reveals an altered respiratory murmur; it is louder in some places than in others, and of a harsh and rushing sound. Instead of the normal vesicular murmur, we find the dry crackle,

which is associated with incipient tubercle, the cavernous or bronchial sounds which occur during the passage of air into or out of the cavity in the lung and the humid crackling or gurgling rales, which are pathognomonic of advanced tubercularization, and heard during the later stages of nearly all cases of consumption.

Large crepitation depends upon the passage of air through liquids but when pus or liquid matter of any kind is collected in a vomica, which communicates freely with the trachea through pervious bronchi, the bubbles produced by the entrance and exit of air, will be still more numerous and large, and a sound is then produced, which the word gurgling well expresses. Whenever therefore we hear gurgling during the act of respiration or during the act of coughing, we conclude we have a cavity. Another constant accompaniment of progressive phthisis, is emaciation, and if without apparent cause, an animal grows thin and weak, with a quick pulse, and labored respiration, these indications are pregnant with meaning that tubercular disease is at work in the lungs and is consuming life.

The detection of the disease is sometimes difficult. It is easy when the tubercles are numerous, large or far advanced; difficult when they are scanty in number, thinly scattered and individually small, and in the latter case would not cause any appreciable deviation from the natural resonance of the chest upon percussion, or from the natural smooth, equable rustle of the breathing.

The disease always terminates fatally if the animal be permitted to linger on and it dies in a state of extreme marasmus.

In 1865 Villemin placed tubercular material beneath the skin of rodents, and general tubercle developed; he believed, therefore, that tuberculosis was a disease due to a specific poison contained in the foci of the disease, and capable of being transmitted from men to animals and from one man to another.

The International Veterinary Congress, held at Brussels, in 1883 to discuss the Influence of Heredity and Contagion, on the Propagation of Tuberculosis, in summing up their labors arrived at the following conclusions:

1st. Tuberculosis has been observed in all warm blooded animals submitted to domesticity or deprived of their liberty.

2nd. Tuberculosis in animals and mankind pre-

sents analogous manifestations, in the living as in the dead creature.

3rd. The course and termination of the disease in mankind and animals is the same.

4th. The masses of tubercle and especially the sputa of the phthisical produce tuberculosis in animals when these matters are introduced through the respiratory or digestive apparatus, or through a deep wound. Tuberculosis inoculated from man to animals, may in its turn be transmitted from one animal to another, and always produces tuberculosis.

5th. Tuberculosis of men and animals is transmitted by heredity.

6th. The disease is contagious in man and animals.

7th. Clinical observations prove the transmissibility of tuberculosis from animals to man by consumption of milk of phthisical animals.

8th. Tuberculosis of animals and man is rare in cold climates. It is most frequent in southern countries; the tracings of the geographical propagation of the disease in man and animals are parallel.

9th. It is evidently proved that a pathogenic microbe, having the same morphological and biological characters, exists in the tubercle of man and of animals. This organism, whether it be developed in man or in animals, may induce tuberculosis when cultivated in a pure state and is conveyed to the animal possessing the necessary receptivity.

The importance of obtaining the broadest knowledge regarding the causes of tuberculosis is emphasized by such pointed, yet true, statements as the following, by Dr. I. Watson, of Concord, N. H.:—"It has no pity for age, sex, education, or wealth; it pursues the mendicant; it is domiciled with the rich. Its terrible reality is so interwoven with civilization that we regard it as a concomitant of every community, scarcely inquiring by what degree it becomes a part of our heritage. Public opinion has already too long ascribed the inheritance to the caprices of a much-abused Providence, or to some other mysterious edict, from which there is no escape. It is time that such views be consigned to the great dump-heap where the carts of superstition are—thank God!—unloading the intellectual garbage of generations, and the true relation of cause to effect be studiously and scientifically examined."

EDITORIAL

L'ENVOI.

"God sends His teachers unto every age,
To every clime, and every race of men:
With revelation fitted to their growth,
And shape of mind."

—Lowell.

THE first year of the life-history of MEDICAL SCIENCE has passed, and with this number Volume the Second is begun. To us the beginning seems but of yesterday; and yet the journal has even now its own little history, and has found a niche unoccupied, wherein to place the chaste symbol of that goddess whose worship it has been our duty and pleasure to celebrate. The field of medical journalism is littered with quarterlies, monthlies, weeklies, reviews, digests, and reports of societies, and yet we do not think ourselves astray when we assert that in the United States and Canada there is a notable lack of medical magazines which strive to indicate the broader outlines and inculcate the deeper truths of a science, noble to the degree that its aims are high. It is not wholly strange that the physician, as we know him, should mainly see the daily task and unremitting toil which are forced upon him in practice; and yet we are more firmly convinced than ever that the solution of medical problems—if ever reached—must be upon the broader lines of which MEDICAL SCIENCE has endeavored to be an exponent. Said Prof. Leyden, of Berlin, recently before the German Congress of Physicians at Wiesbaden, "We all, as physicians, know how much the Medicine of to-day has to thank natural science; we know that she alone has rescued Medicine from the pool of wilful and unreasonable speculation and built it anew on a basis of well-grounded facts. The physician must be a naturalist. He must learn to prove, observe, and sift the causes of disease with a knowledge of the natural sciences." Said Gihon, in that truly brilliant and remarkable address as President of the Section on Climatology and Demography, at Washington last year, "It is a matter of marvel when we look into the medical literature of the day and listen to the proceedings of medical bodies, that we find everywhere the dominating influence of a new philosophy in Medicine. Time-honored tenets have been renounced and venerated authorities dethroned without vio-

lence, without protest, without surprise, insensibly as the darkness fades before the dawn." If "to the outside world Medicine is yet only the mercenary art of healing, at so much apiece, the maimed and the halt and the blind of the human race," it can never again be that, to the searcher after Nature's truths, Medicine shall ever be exemplified by Hecate's bewitched cauldron or Hahnemannian absurdities. Applied to Medicine, we have a profound truth in the words from "The Finding of the Lyre,"—

"O, empty world that round us lies,
Dead shell, of thought and soul forsaken,
Brought we but eyes like Mercury's,
In thee what songs should waken!"

During the year which has gone, with whatever of worth our readers have found in MEDICAL SCIENCE, it has been, perhaps *unnecessarily*, remarked by our confrères that the journal is the special exponent of Preventive Medicine, and that it cannot fairly claim that support from the general profession which those specially devoted to the interests of our two medical schools have a right to expect. We deem this our highest honor, our greatest pleasure

"O et presidium et dulce decus meum."

Said Prof. Flint in his posthumous address on "The Medicine of the Future:"—"The progress of Medicine induces slowly, but surely, changes in popular ideas. The physician of the future will, perhaps, not be better appreciated; but there will be a truer estimate of medical knowledge and of the medical profession. . . . The medical profession will have reached a high ideal position when the physician, guided by the knowledge of diagnosis, the natural history of disease and existing resources may, with neither self-distrust or the distrust of others, heal an acute disease by hygienic measures without potent medications." Said Prof. Gross, the greatest of all American surgeons, but shortly before his death, "The great question of the day is not this operation or that, not ovariectomy, lithotomy, or a hip-joint amputation, which have reflected so much glory upon American medicine, but *preventive medicine*: the hygiene of our persons, our dwellings, our streets, in a word, our surroundings, whatever or wherever they may be,

whether in city, in town, or in hamlet." The history of recent years in Canada, and the enormous advances which Preventive Medicine has made amply attest the truth of these last words of two noble men; and with a consciousness of worthy purpose, we labor and confidently await the verdict of the future.

"All thoughts that mould the age begin,
Deep down within the primitive soul,
And from the many slowly upward win,
To one who grasps the whole."

In the changes which have been made in the editorial staff of MEDICAL SCIENCE, consequent upon the retirement of our old confrères, who have found their professional engagements too pressing to admit of their giving the necessary time to editorial work, it has been found possible to associate with us, gentlemen who have become illustrious in their several special fields of work, and it gives us no common pleasure to present to our readers as collaborators, the names of A. L. Loomis, M. A., M.D., Professor of the Practice of Medicine in the University of New York, and President of the American Climatological Association; James H. Russell, M.A., M.D., President of the Glasgow Philosophical Society and Medical Health Officer of Glasgow; Albert L. Gihon, A.M., M.D., Medical Director United States Navy, Past President American Public Health Association; Andrew Smith, V.S., President of the Ontario Veterinary College; Prof. Victor C. Vaughan, M.D., of the Laboratory of Hygiene, Ann Arbor, Michigan; D. B. Dick, Esq., University Architect, Toronto; Prof. E. E. Grange, V.S., Michigan Agricultural College; John Galbraith, M.A., C.E., Prof. of Engineering, School Practical Science, Toronto.

These gentlemen are ornaments to the branches of Medicine they represent, since in that Medicine of the future which Prof. Gross defines, each of their special branches finds a place; and if the science of Medicine should seem to be broadening its domain beyond the individual grasp, we must remember, as well put by Gihon in the address already referred to, that "it is not that Medicine has itself grown in dimensions, but that we have risen higher out of the slough of ignorance, and with clearer eyes and nearer vision can better discern her grand proportions. No new thing under the sun has been added to her domain, only we no longer see as through a glass darkly."

MEDICAL SCIENCE wishes to become a vehicle for disseminating not only scientific information to those seeking it, but also a medium of news, giving the latest facts with relation to outbreaks of diseases, whether at home or abroad, and of municipal and public health work in all its details, and it looks for that hearty and general support from those even who are outside the medical profession, but who nevertheless feel the importance of extending health knowledge and taking an interest in every means tending to this end. We bespeak for the journal another year even more successful than has been the past.

PATHOLOGICAL EFFECTS OF A NARROW PREPUCE AND OF PREPUTIAL ADHESIONS.

WE offer no apology for discussing this subject editorially, since it is one which has for some years come to have in our minds an increasing importance. Elsewhere has been given an extract from the last words of one of the greatest American surgeons, in which prophylaxy was given that position, which, in Medicine, whether preventive or curative, its importance demands. Next, perhaps, in importance to the question of fresh assimilable food, good air, and cleanliness of children is that attention demanded by the many congenital and hereditary defects, which the more carefully we scrutinize the young child, are found to exist in more or less degree. Of these, that which is the subject of this article is, while almost the last to have been recognized, one of those of primary importance. Specific diseases, scrofulosis, harelip, arched palate, etc., have long been recognized and treated, but not till 1870 in a publication by Lewis A. Sayre, M.D., of New York, under the caption "Partial Paralysis from Reflex Irritation Caused by Congenital Phimosis and Adherent Prepuce," did the subject receive any place of importance in medical literature. The subject was treated more elaborately by the writer in 1875 in paper entitled "Spinal Anæmia with Partial Paralysis and Want of Co-ordination from Irritation of the Genital Organs." Here and there in notes on surgery we have seen the subject referred to, but it is remarkable how slight has been the general attention given to it even there, while we have searched in vain in Gower's great work on

"Nervous Diseases" for any reference to it as a source of spinal irritation or reflex spasm.

Whatever many may say as to what is the normal relationship between the glans and prepuce in a young child, it is certain that in many instances we have the preputial opening contracted to little more than a pin-hole opening, while its mucous membrane is adherent to the glans to such an extent as to make the stripping of it off a matter of some little trouble. Apart from the point as to whether this condition would be provocative of irritation, we have as a result of it the retention of smegma, and even the formation therein of calcareous secretions, either or both of which is certain to create an irritability proportionate to the neurotic factor of the individual.

To appreciate fully what results may be the outcome of this source of irritation, we have to recollect what is meant by reflex action. We have in reflex action an afferent or sensory factor and an efferent or motor factor, with the "reflex centre," and have a cutaneous reflex action, and a "muscle reflex action," or "tendon reflexes." In cutaneous reflex action it is excited by stimulation of the skin, more readily by a gentle than by a violent impression. Such are the gluteal, cremasteric, plantar, etc., reflexes, varying with different persons in some degree. With a part more sensitive than any of those and an accumulating source of irritation, it is not strange that a mucous irritation—really a cutaneous irritation—may become the source of severe and increasing neurotic effects.

Some of the more notable effects which have been produced are referred to by Dr. Sayre. In one, as described by Prof. Gross, the gait of a child of ten years "simulated that of locomotor ataxia," being uncertain, precipitate, irregular and jerking. On the second day after removing a contracted and adherent prepuce the trouble had entirely disappeared." Another case related by Dr. A. R. Mott, Jun., was where very severe epileptoid seizures were completely and at once relieved by cutting a constricting band behind the corona.

Numerous other cases are recorded by Dr. Sayre, and we may add one or two more which have come under our own observation or care. Two years ago a lady patient gave birth to a large healthy boy. Within a few weeks attendance upon the child was requested as it was peevish, restless, crying almost constantly, at which time the con-

traction of the abdominal muscles caused the descent of a right inguinal hernia. Remembering to have noticed a reference to the relation between such hernias in children and contracted prepuce, examination was made and such found. Circumcision cured the child of peevishness and crying; it developed well and the hernia gradually disappeared. Again in a child fifteen months old, unusual irritability and difficulty in obtaining quiet sleep was immediately cured; the prepuce being stripped back with some force, during a period of rigidity. The child almost immediately went into a long and refreshing sleep and has continued to do so since. In another instance, frequent vesical irritability and an unnatural mental irascibility were overcome in a very short period, the child becoming sweet-tempered and affectionate.

Apart from the immediate pleasing results in the cases of children, the necessity for examining into this too frequent abnormal condition is seen in the permanent physical and mental affections which may result from a continuance of such a condition to manhood.

In the discussion of this subject at the Washington International Congress, Dr. F. Willard, of Philadelphia, stated that the enthusiastic advocacy of this operation has led rash and unthinking physicians to advise this operation when it was unnecessary, in cases where central nerve lesions existed. He looks upon subsequent cleanliness as the greatest safe-guard against all reflex irritations and their results. "If the profession will watch more carefully they will find many cases of apparently obscure mal-nutrition that can thus be easily explained," and in most cases we are fortunate in knowing that the trouble may generally be wholly overcome without so serious an operation as circumcision.

SMALL-POX OUTBREAKS.

IT is just three years since the whole northern part of the Continent along the great lakes was placed in a condition of general alarm and excitement, owing to the prevalence of an outbreak of this dreaded disease which had reached enormous proportions in the city of Montreal and suburbs. The recollections of this have not been forgotten, and during the past six weeks the presence of cases of this disease in Buffalo and several places in Canada has aroused the public to a realization

of the fact that this enemy to life, if, though often defeated, only awaits a favorable opportunity to spread its devastations with the same violence as of old. In Ontario the fact that cases occurred first in its metropolitan city, at once gave prominence to the fact of its existence amongst us. Health authorities have thus been forewarned and have in many instances taken measures to be forearmed. The cases which occurred in Toronto, as also those in various other municipalities, have in most instances occurred from sources which as yet are unknown, and we are afraid will so continue. It is probable that some one or more persons who had been recent subjects of the disease and who wore clothing which had become infected were abroad amongst the crowds who visited Toronto during the time of the Industrial Exhibition. That none such have been *located* seems all the more remarkable, as the infection borne on their persons has been intense. Some seven distinct outbreaks in portions of the city of Toronto occurred, not more than one or two of which seem to have been traced to infection in any one place. Similarly the Lambton Mills case, the Stouffville case, the Gwillimbury cases, and last of all the Sarnia cases, have arisen in a manner which cannot be accounted for. The Sarnia first case is peculiar. The patient, a man, had been in Toronto and stayed in a house on Argyle Street, in which, he stated, the family had had chicken-pox. Enquiry by the Toronto authorities did not prove the correctness of this statement. Assuming this case to be varicella, it does not appear that precautions of a thorough character were taken to prevent exposure to it. The result has been two more cases traced to this first case which proved to be small-pox. Promptness had characterized the action of all the Local Boards which have had to deal with the various outbreaks, the moment that their nature had been made plain. Similar activity has been shown in Buffalo, but in several other localities in New York State the same thoroughness has not existed, and danger from such localities may with some reason be apprehended. The outbreak in Granby Township, Province of Quebec, illustrates this point. A girl died in Springfield, Massachusetts, and her trunk with clothing was sent home to Granby without disinfection. It seems almost incredible in this present day that such carelessness can exist. We do not wish to appear unnecessarily severe upon neighboring health authorities, but

we can fairly say that these Canadian Provinces can ill afford to speak calmly with regard to such cases, when we recollect the threats of quarantine and the actual measures taken during the unfortunate epidemic of 1885. Small-pox exists to-day in Massachusetts, in New York State, in Philadelphia, and in Illinois, and with our constant travel and commercial intercourse, we have no alternative but to protect ourselves by internal measures against the possible introduction of cases from these places. Our Local Boards are in most cases well organized, their being nearly 400 Medical Health Officers in our 600 municipalities. But this is not enough. We must continue the work of general vaccination. While many municipalities are at work, especially amongst school children and infants, a very large proportion are not taking advantage of the full powers which are placed in their hands for this internal protection. Most are inclined to wait till cases have occurred. This is not well, for it is just this which gives infection a possible foothold. Our people and physicians are almost to a unit in favor of vaccination, and readily accede to the requirements of the law in spite of the attempts by one or two so-called medical men who wish to gain notoriety and possible attention, whose insignificance as professional men would otherwise maintain them in their native obscurity. It were a waste of energy to discuss the settled facts with regard to the complete protective efforts of thorough vaccination, but we may conclude these remarks with the statement of Mr. Harold C. Browne, writing from Morocco, on August 7th. He says: "A well-informed Moorish official has told us that the deaths have been so numerous as 200 a day. I can well believe it; for in riding about I hear echoing from house to house the plaintive wail that is set by the women when there is one dead within. . . . Could a deputation of anti-vaccinationists be sent out here and see the hideously bloated, scarred, and speckled faces which are to be met with every few paces in the streets and markets, they would, I think, believe and tremble. Strong in our re-vaccination, Thomson and I move about saddened by the misery around us, but without any apprehension for our own safety."

TYPHOID FEVER IN ONTARIO.

THE press has during the past month chronicled almost daily, the existence of typhoid in epidemic form in some one or other municipality in Ontario, and the Provincial Board of Health is being frequently applied to for assistance, in investigating the local causes to which such outbreaks are due, and asked for advice as to how remedies are to be obtained. Our physicians are rapidly ceasing to remain quiescent or adopt the expectant plan of treatment in such outbreaks, and they are in numerous instances demanding that some means be placed at their command for giving strength to their suspicion that water supplies and milk supplies, etc., are in most cases the vehicles for transmitting the poison. Almost every town and village where population is aggregating have been suffering this autumn severely. Everywhere the same story is told, an unusually low well-water, owing to the drought of more than a year, now being followed by a rising well-water with the copious rains of the past month. In other places public water supply is with reason suspected. In Philadelphia, where the Schuylkill river supplies the city, one hundred deaths are said to have occurred within the past month. In Cincinnati seven hundred deaths were reported to have occurred in 1887 from drinking Ohio river water. All will remember the 1,500 cases which occurred in Ottawa in two months of last year. What does it all mean? A few weeks ago we were asked to examine water from a suspected well. The water was perfectly clear and seemed wholesome. By a flask culture we found that in forty-eight hours 97 distinct colonies of a single species of bacillus were present in 15 drops of it, having the qualities of the typhoid bacillus. We doubt not that similar investigations would show that many waters are with reason suspected of having a micro-organism capable of developing with similar rapidity. The method of infection of the water in such instances varies but the result is the same. Commonly, the method is that decomposing organic matter contain-

ing micro-organisms contaminates the neighboring soil. The descending rain through soakage bears these with it to the deeper wells, where free oxygen aids their rapid multiplication in a water containing organic matter. Kingston pumps from a point suspiciously near that of the sewage pollution of her bay; typhoid prevails. Listowel, with a soil rich in organic matter, finds well-water polluted. Tilsonburg, with a sandy soil, makes soakage an easy matter. And thus the chronicle reads. Not a few of our smaller municipalities have introduced or are introducing public water. But let them beware of the head-waters. Local waters are admirable if not polluted with swamp and barnyard soakage, the latter of which is especially dangerous. We must, however, as physicians and Local Boards not be satisfied with general ideas in these matters. The health of two millions of our active population from the economic standpoint, and still more from the standpoint of life, demands that some systematic examinations of these questions be made. Many thousands are being annually spent to promote the prosperity of the country by encouraging agriculture; but to the individual farmer, the prevention, by preserving health, of the loss through time, medical expense, and anxiety are of more direct advantage than any general aid, however well-directed, to agriculture can be. Will our 2,500 physicians demand, and will our 600 Health Boards support the claim that special facilities be supplied by Government for the elucidation of these matters by experiment, in some such manner as is given to the problems of agriculture? Some eight or ten professors give their whole time to the education of fifty students of agriculture and to the study of experiments on animals and plants at our experimental farm. We have, as already stated, several hundred health officers all seeking exact information on health problems, and some six hundred Health Boards ready to put their conclusions into practical effect. The urgency of the case demands the remedy, and we call upon physicians and Boards everywhere to support the claim for Government aid to work of such unmeasurable importance.

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MEDICINE.

A Peculiar Outbreak of Febrile Disease.

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On the evening of Friday, 2nd March, a boy, aged 15, an inmate of St. Mary's Roman Catholic Industrial School for Boys, Abercromby Street, Glasgow, complained of headache, and was sent to bed in his dormitory. Next morning he rose with the other boys and made his bed, but being observed to be very unsteady on his legs was sent to the sick-room, where he died at 8 a.m. On 3rd March another boy, aged 14, complained of headache, and was sent to the sick-room and put under treatment. On the 5th, at 1 a.m., he became very delirious, and had to be held down in his bed. He was chloroformed and an enema of 20 grains of bromide of potassium administered. At 3 a.m. the convulsive movements ceased, and he seemed to fall into a natural sleep, but sunk and died at 4 a.m. At 5 p.m. on the 7th another boy, aged 11, reported himself ill, having vomited shortly before, and was sent to bed in his dormitory. The superintendent's wife found him asleep at 6 p.m. A boy sent with tea could not rouse him, and he died comatose at 8 p.m. On the morning of the 8th, when the occupants of the middle dormitory were being wakened a fourth boy, aged 14, was found to be unconscious, and by a quarter past 6 he was dead. Only the second of these four boys had been seen by the Medical Officer of the Institution. These mysterious events, and the fact that 19 other inmates were more or less ill, led him to report the outbreak at the Sanitary Office on the morning of the 8th March; and 12 of the more serious cases were in the afternoon transferred to a separate ward in the Fever Hospital, Belvidere. On the 9th, 14 new cases occurred; on the 10th, 5; 11th, 8; 13th, 2 boys and two girls. These were the only inmates of the Girls' Department who were seized. They were employed in the kitchen in which the food for both departments was prepared.

Before proceeding to give a short statement of the chief clinical and pathological features of this disease it is only right to remark that the difficulties

in the way of obtaining the facts were great, and were but partially overcome. The arrangements for treating the sick are very defective. No records are kept of the history, symptoms, and treatment of patients. The meagre facts given as to the 4 cases of sudden death were got from casual observers, only in one case supplemented by medical observation. The children are very dull and stupid, and practically contributed nothing to the subjective information. On the afternoon of the 8th March two trained nurses were got from the Glasgow Sick Poor and Private Nursing Association, one or other of whom was always on duty and took temperatures and made short notes of symptoms. The 19 children who are said to have sickened on the 8th means more probably all who took ill along with the fatal cases, and were at that date found ill. The numbers given afterwards are however correctly assigned. The more severe cases, in which the temperature was about 100° at the outset, including 12 of those found ill when the outbreak was reported, were transferred to Belvidere, where careful notes were taken by Dr. W. W. Christie.

Summing up the results of this investigation, we find that the St. Mary's Industrial Schools are situated in a densely populated district of the City; that they are enclosed by surrounding tenements and other large buildings, along with a graveyard which was in 1875 described as "greatly overcrowded with bodies, and kept in a state of rank disorder," in which have since been interred 577 bodies; that the free space attached to both, and available for exercise is small; that the internal air-space in both is deficient; that the inmates are children between 5 and 15 years of age, who are the waifs of a large city, weak in constitution, tainted with a proclivity to scrofulous diseases, and generally of low vitality; that the death-rate is in both higher than that of other Industrial Schools which receive the same class of Glasgow children, and higher than that of children of the same age living in the lowest district of Glasgow; that the proportion of the total deaths caused by pulmonary diseases is enormous, and higher than among children of the same age in the worst district of Glasgow; that, in the words of the Government Inspector, "contagious or infectious

disease is constantly "at their doors," and especially that there have been repeated epidemics of typhus fever, a certain indication of, and attendant upon, overcrowding. This is the sanitary status, and the vital results associated therewith, as regards both institutions; but comparing one institution with the other, we find a marked difference to the disadvantage of the boys' school—a difference of such a kind as to suggest a probable explanation of the event for the cause of which we are in search. The overcrowding is much greater in the boys' than in the girls' school, *i.e.*, the external free space is much less per head; the internal arrangements are more defective, the accommodation and general sanitary condition of the building inferior; the general mortality among the boys is higher; the proportion of the total deaths caused by pulmonary diseases, and especially by acute diseases of the lungs, is considerably higher. The outbreak in March was in its nature a febrile disease, tending to implication of the lungs, and especially to pneumonia. It seems identical with a disease which has been observed in other similar institutions, more or less detailed accounts of which have been given elsewhere, in all of which the observers had a difficulty in assigning it a place in nosology, but in all of which it was associated with insanitary conditions of the nature of aerial contamination. It suggests a specific poison, from family resemblance in explosive character, local limitation, and clinical features, to other well-known typical diseases of the epidemic and infectious class. No specific micro-organism was discovered in this, or has been, so far as is known, in any other like outbreak. The rapid fatality in the fatal cases shows that this poison, though in the cases in which life was not at once extinguished it tended to expend itself upon the organs of respiration, was the cause of the disease. The local disease was the result of a constitutional infection, which was capable of killing without the local disease. The *post-mortem* appearances pointed to a specific poison allied to that of enteric fever. Such as they were, they were distinctly lesions of the mesenteric glands, and of the glandular system of the small intestines. The experience of the Fever Hospital is strongly suggestive of a causal affinity between certain forms of pneumonia and enteric fever. The two diseases are frequently confused, both in their diagnosis and local incidence. This observation, as well as the present

epidemic, raises a strong suspicion that we must enlarge our conceptions of the morbid manifestations which are to be regarded as proof of the influence of air contaminated with organic effluvia. If so, we can no longer hold that the absence of enteric fever warrants us in concluding that known impurity of the air from sewage emanations, for example, is innocuous. The prevalence of acute pulmonary diseases may be the result. The presence of "Pythogenic Pneumonia" and "Epidemic Pneumonia," in nosology, and the circumstances of the well-known outbreak in the East Sheen Boys' School, and other similar recorded outbreaks, give this observation support and established recognition.

In the course of the outbreak the patients at Belvidere were seen by several eminent professional friends at my request. Professor Gairdner was inclined to regard them as cases of "Influenza of a malignant type;" Dr. Finlayson had no doubt that they were examples of what has been called "Epidemic or Infectious Pneumonia." Dr. Samson Gemmell had the advantage of seeing all the cases, having accompanied me repeatedly in my visits to the School as well as to the Hospital, and seen the cases at all stages, within an hour or two of seizure as well as subsequently. I have therefore asked him to give me in writing his general impression, which he has done in the following short memorandum:—

"It seems to me evident that in the recent epidemic in St. Mary's School we had to deal with a disease allied to the acute specific fevers. The sudden onset with headache, sickness, shivering, and other signs of profound constitutional implication point decidedly in this direction. Moreover, the speedy issue in the four fatal cases (three of them dying after a few hours' illness), finds its closest analogue in the so-called malignant forms of epidemic disease, which terminate in some instances so rapidly that they would baffle diagnosis were it not for clear association with cases having more ordinary manifestations. The two *post-mortem* examinations revealed no specific lesions, but the extremely fluid character of the blood in one case, and the general tendency to enlargement of the spleen and mesenteric and intestinal glands in both, are quite in keeping with the idea of acute specific poisoning, although the microscopic examination of the blood and organs revealed no micro-organisms.

"In view of the frequent occurrence of inflammation of the lungs among the patients, the question of the disease being 'infectious' or 'epidemic' pneumonia early suggested itself. This is a disease apt to arise under insanitary circumstances, such as overcrowding, deficient ventilation, and other hygienic errors apt to induce infectious diseases in general. And no doubt in this School the sanitary conditions, especially with regard to air space, as indicated both by the Government Inspector and Dr. Russell, are defective; and pneumonia, not, however, as an epidemic, has been a frequent visitant in recent years. But it must be borne in mind that out of the 66 cases comprised in the epidemic only 16 had decided pneumonia. Other 8 were doubtful cases (some of them very doubtful, the temperature being the only suggestive fact), but the majority of the patients presented no traces of pneumonia at all. No doubt in many of these the disease was of short duration and unattended by high fever, but the general symptoms otherwise were such as to reveal clearly a close ætiological affinity, if not absolute identity, with the more severe cases. They seemed all the victims of the same poison, although in some, owing probably to personal idiosyncrasy aided by favorable atmospheric conditions, it issued in pneumonia.

"It is to be remarked also that the clinical features of the pneumonic cases do not strengthen the idea of the disease being 'epidemic' pneumonia arising from insanitary surroundings. There was no prodromal stage; the local lesion revealed itself early; the disease was unassociated with typhoid phenomena; terminated in crisis, in every instance, within a week; the convalescence being rapid, and the restoration of the lung speedy and complete. In no instance did death occur. Such are not the characters of the infective type of pneumonia; and indeed, apart from their epidemic association, any of the cases might have been selected as exhibiting most of the typical characters of acute pneumonia as it occurs sporadically.

"It is impossible with our present light to dogmatise regarding the exact nature or genesis of the disease. The question as to whether it might not be an anomalous manifestation of enteric or typhus fever was suggested, but nothing transpired to encourage such an idea. The circumstances pointed clearly, of course, to a local origin of the disease, and it is no matter for wonder that it told with such

severity among boys of low constitutional vigour living under unwholesome circumstances."

Diphtheria: Its Specific Origin.

On the discussion which followed a paper by R. W. Parker, M.R.C.S., East London Hospital for Children, on "Moot Points in the Surgical Treatment of Diphtheria," Dr. Ranke, Munich, referred to the researches of his colleague Dr. Rudolph Emmerich, who had examined bacteriologically, not only diphtheritic membranes from the living, but also the different organs of children who had died, immediately after their death. He always found a combination of infection. Of seven cases examined immediately after death, he found by Koch's method, in five cases, a very short bacillus always combined with streptococcus or staphylococcus pyogenes aureus. The short bacilli were found not only in the mucous membranes of the larynx, the trachea, and the bronchi, but also in the pneumonic infiltrations, wherever such occurred. A few times they were found in blood taken from the head. Histologically he found upon the membrane and in its superficial layers a number of different bacteria, among which was Loeffler's bacillus. On the deeper layers of the mucous membrane were streptococcus or staphylococcus and the short bacillus, not Loeffler's; by inoculation with the short bacillus in the mucous membrane of the larynx of rabbits, a true membrane was formed. It was remarked by Ranke as noticeable that in Munich where typhoid has almost disappeared through the great sanitary reforms which have been introduced within recent years, the diminution of diphtheria is relatively very little. Further, Ranke affirmed that in every instance, close examination revealed a case of diphtheria in the same relation to every case of membranous croup. He further remarked that in treatment of tracheotomy he prevented sloughing by iodoform, and used only as an inhalation, water vapour.

Specific Gravity of the Urine.

Dr. Chas. W. Purdy arrives at the following conclusions:—

1. That all structural diseases of the kidneys cause a decrease in the quantity of salts excreted in the urine.
2. That if measured by the normal quantity of urine, fifty ounces, the specific gravity of the urine is decreased by all structural

diseases of the kidney, *i.e.*, the specific gravity of the whole twenty-four hour's urine. 3. That the decrease of both the solids and the specific gravity bears a direct relationship to the extent of each and every lesion of the kidney. He says it gives more trusty information than does the presence or quantity of albumen as to the existence of renal lesion, also as to its extent, progress, probable chronicity, and final progress toward recovery or death. The specific gravity of the urine in functional albuminuria is never below the normal standard. The only exception to this is in complication of chronic Bright's disease with diabetes, when the sugar so raises the specific gravity as to more than balance the lowering of the specific gravity due to renal disease.

Physical Training.

There has been recently formed in London an Association, office 72 Lancaster Street, Borough Road, S. E., known as the Lloyd Association of Great Britain and Ireland, with the Earl of Meath as President and Sir John Lubbock, Vice-President, for the purpose of extending the advantages of the Swedish-Lloyd system of physical training in schools. It is said to be an excellent system of gymnastics; it calls the muscles into play and offers a great variety of movements, so that no one set of muscles is unduly strained. It is arranged to exercise both sides of the body. Planing, sawing, filing, etc., can be done with both hands, so both sides of the body are developed evenly and harmoniously. No other kind of manual work as a school subject has ever combined such training of the hand to general dexterity with due exercise of the whole body.

SURGERY.

The Treatment of Intestinal Obstruction.

Our readers will remember that in the report of the American Medical Congress held at Washington in September, an important and animated discussion on the above subject was introduced by a paper by Prof. N. Senn of Milwaukee. The following is the series of conclusions to which the researches of this illustrious American surgeon point, as given in the *Medical Reporter*.

1. Traumatic stenosis from partial enterectomy and the longitudinal suturing of the wound becomes a source of danger from obstruction or per-

foration in all cases where the lumen of the bowel is reduced more than one-half.

2. Longitudinal suturing of wounds on the mesenteric side of the intestine should never be practiced, as such a procedure is invariably followed by gangrene and perforation by intercepting the vascular supply to the portion of bowel which corresponds to the mesenteric defect.

3. The immediate cause of gangrene in circular constriction of a loop of intestine is due to obstruction of the venous circulation, and takes place first in the majority of cases at a point most remote from the cause of obstruction.

4. On the convex surface of the bowel a defect an inch in width, from injury or operation, can be closed by transverse suturing without causing obstruction by flexion. In such cases the stenosis is subsequently corrected by a compensating bulging or dilatation of the mesenteric side of the bowel.

5. Closing a wound of such dimensions on the mesenteric side of the bowel by transverse suturing may give rise to intestinal obstruction by flexion, and to gangrene and perforation by seriously impairing the arterial supply to, and venous return from, the portion of bowel corresponding with the mesenteric defect.

6. Flexion caused by inflammatory and other extrinsic causes gives rise to intestinal obstruction only in case the functional capacity of the flexed portion of the bowel has been impaired or suspended by the causes which have produced the flexion, or by subsequent pathological conditions which have occurred independently of the flexion.

10. The immediate or direct cause of gangrene of the intussusception is obstruction to the return of venous blood by constriction at the neck of the intussusception.

11. Ileocæcal invagination, when recent, can frequently be reduced by distention of the colon and rectum with water; but this method of reduction must be practiced with the greatest caution and gentleness, as overdistension of the colon and rectum is productive of multiple longitudinal lacerations of the peritoneal coat.

12. The competency of the ileocæcal valve can be overcome only by over-distension of the cæcum and is effected by a mechanical separation of the margins of the valve; consequently, it is imprudent to attempt the treatment of intestinal obstruction beyond the ileocæcal region by injection per rectum.

13. Resection of more than six feet of the small intestine in dogs is uniformly fatal; the cause of death in such cases is always attributable to the immediate effects of the trauma.

14. Resection of more than four feet of the small intestine in dogs is incompatible with normal digestion, absorption, and nutrition, and often results in death from marasmus.

15. In cases of extensive intestinal resection the remaining portion of the intestinal tract undergoes compensatory hypertrophy, which microscopically is apparent by thickening of the intestinal coats and increased vascularization.

16. Physiological exclusion of an extensive portion of the intestinal tract does not impair digestion, absorption, and nutrition as seriously as the removal of a similar portion by resection.

17. Fecal accumulation does not take place in the excluded portion of the intestinal canal.

18. The excluded portion of the bowel undergoes progressive atrophy.

19. A modification of Jobert's invagination suture, by lining the intussusceptum with a thin, flexible rubber ring, and the substitution of catgut for silk sutures, is preferable to circular enterorrhaphy by the Czerny-Lembert suture.

20. The line of suturing, or neck of intussusceptions, should be covered by a flap or graft of omentum in all cases of circular resection as this procedure furnishes additional protection against perforation.

21. In circular enterorrhaphy the continuity of the peritoneal surface of the ends of the bowel to be united should be procured where the mesentry is detached by uniting the peritoneum with a fine catgut suture before the bowel is sutured, and the modification furnishes a better security against perforation on the mesenteric side.

22. In cases of complete division of an intestine, if it is deemed advisable not to resort to circular enterorrhaphy, one or both ends of the bowels should be closed by invagination to the depth of an inch, and three stitches of the continued suture embracing only the peritoneal and muscular coats.

23. The formation of a fistulous communication between the bowel, above and below the seat of obstruction, should take the place of resection and circular enterorrhaphy in all cases where it is impossible or impracticable to remove the cause of obstruction, or where, after excision, it would be

impossible to restore the continuity of the intestinal canal by suturing, or where the pathological conditions which gave rise to the obstruction do not constitute an intrinsic source of danger.

24. The formation of an artificial anus in the treatment of intestinal obstruction should be practiced only in cases where continuity of the intestinal canal cannot be restored by making an intestinal anastomosis.

25. Gastroenterostomy, jejuno-ileostomy and ileo-ileostomy should always be made by lateral apposition with partially or completely decalcified perforated bone plates.

26. In making an intestinal anastomosis for obstruction in the cæcum or colon, the communication above and below the seat of obstruction can be established by lateral apposition with perforated approximation of the ileum into the colon or rectum.

27. An ileo-colostomy, or ileo-rectostomy by approximation plates, or by lateral implantation, should be done in all cases of irreducible ileo-cæcal invagination, where the local signs do not indicate the existence of gangrene or impending perforation.

28. In all cases of impending gangrene or perforation, the invaginated portion should be excised, both ends of the bowel permanently closed, and the continuity of the intestinal canal restored by making an ileo-colostomy or ileo-rectostomy.

29. The restoration of the continuity of the intestinal canal by perforation approximation plates, or by lateral implantation, could be resorted to in all cases where circular enterorrhaphy is impossible on account of the difference in size of the lumina of the two ends of the bowel.

30. In cases of multiple gunshot wounds of the intestines involving the lateral or convex side of the bowel, the formation of intestinal anastomosis by perforated decalcified bone plates should be preferred to suturing, as this procedure is equally, if not more safe, and requires less time.

31. Definitive healing of the intestinal wound is initiated only after the formation of a network of new vessels in the product of tissue proliferation from the approximated serous surfaces.

32. Under favorable circumstances quite firm adhesions are found within the peritoneal surfaces in six to twelve hours which effectually resist the pressure from within outward.

33. Scarification of the peritoneum at the seat of coaptation hastens the formation of adhesions and the definite healing of the intestinal wound.

34. Omental grafts, from one to two inches in width, and sufficiently long to completely encircle the bowel, retain their vitality, become firmly adherent in from twelve to eighteen hours, are freely supplied with blood vessels in from eighteen to forty-eight hours.

35. Omental transplantation, or omental grafting, should be done in every circular resection, or suturing of large wounds of the stomach or intestines, as this procedure favors healing of the visceral wound, and affords a protection against perforation.

Operative Treatment of Pulmonary Abscess.

Says *The Lancet* in an editorial, "The success which has so far attended the treatment of abscesses in the lungs by operation constitutes the latter a legitimate department of surgery." Dr. Quincke, of Kiel, reports two cases thus successfully treated during the past year, making with two previous cases, four in all reported. Taking this latter pair of cases first, in one, a young man had a chronic abscess in the lower lobe of the left lung, apparently due to acute pneumonia ten years previously. The abscess was opened, resection of the ribs being performed, and the man recovered so far that he was able to work and feel quite well, but a permanent fistula remained. The inconvenience of this the man himself obviated by making a small tin receptacle, attached to his side holding a little carbolic acid. When examined three years after the operation the lungs expanded equally and the chest was symmetrical except for a slight depression over the site of the operation. There was no expectoration. The importance of obtaining adhesion of the pleural surfaces is shown by the next case, treated in 1877. Here the patient, a woman, aged 26, presented all the clinical signs of a large pulmonary abscess, including the expectoration of a large quantity of foetid pus. An attempt was made to set up an adhesive pleuritis by the injection of iodine into the pleural cavity. This caused pain, and a friction sound was soon heard; but the adhesions gave way soon after the abscess was opened, and purulent pleuritis caused death in three weeks, in spite of incision and injections. The author with his present experience would resect the ribs at the site most convenient, and re-

open the abscess in such a case. It is more difficult to induce firm adhesion of the pleura, than in the case of the peritoneum, owing to greater disturbances during respiration; and the adhesions must be really firm, in Dr. Quincke's opinion, so as to withstand the elastic retraction of the lungs from the chest wall. Complete success was obtained in two cases treated last year. In the first of these a man, aged 32, after symptoms of apparently an atypic pneumonia of a chronic character, suddenly expectorated a very large quantity of foetid pus, and the clinical signs left no doubt as to the existence of a pulmonary abscess, and not an empyema communicating with a bronchus. Radical measures were adopted; the eighth and ninth ribs were exposed on the right side, by the use of chloride of zinc, after preliminary adhesion. They were then resected for four or five centimetres, and next day chloride of zinc paste was again applied to the bottom of the wound; after a week a capillary thread was introduced, allowing the escape of foetid pus, and the canal thus formed was gradually widened by the thermo-cautery till a proper drainage tube could be passed and the pus evacuated. Within three weeks expectoration ceased altogether, and the man, who had improved daily during this time, convalesced steadily. The right side did not expand quite as fully in the four months after operation, but the patient had gained 46 pounds in weight and felt quite well.

THERAPEUTICS.

Antipyrin in Whooping Cough.

From the action of antipyrin in the calmative influence it exerts on the irritability of the nerve centres, thereby lessening the motive power of the spinal cord, it has, as might be expected, been used with good results in various forms of inco-ordination and spasm, and in none with more notable results than in whooping cough. Dr. Genser of Vienna, to whom seems to belong the credit of the use of this drug in whooping cough, says that he has treated whooping cough by insufflations of benzoic acid, but apart from the difficulty in using it, its principal use was to suppress vomiting; while the average length of treatment was forty-three days. In the remainder of 200 cases, antipyrin was used with results going to show that this remedy not only diminishes the number of spasms, but also their duration and intensity. In most cases

the period of treatment did not last more than twenty-four days. The average dose was $1\frac{1}{2}$ grains daily for each year of age, or fifteen grains for a child of five years, given in syrup. Dr. Labor-derie's results are even more favorable. He gives it in somewhat larger doses in Vichy and raspberry syrup; the spasms are rapidly calmed and the period of decline occurs within a few days. Dr. Geffrier similarly and more recently publishes similar satisfactory experience from its use. Opinions have been advanced as to its *modus operandi* in this tedious affection, some claiming that as the disease is due to the presence in the system of micro-organisms, the drug acts as an antiseptic. Assuming that such is to some extent true, we can fairly conclude that its action is similar here as in typhoid cephalalgia and various forms of severe irritation, as in the hacking cough of bronchitis either from irritating secretions in the bronchi, or from localized congestions due to amenorrhœa, cardiac insufficiency, etc. In all those instances it acts by lessening or removing the arterial contractions due to vaso-motor irritation, whether peripheral or central. This action which simulates that of aconite, jaborandi, and other so-called depressants, would appear to be the most marked primary results, of the exhibition of this drug, and if to these results in some ways more powerful with antipyrin, we attach an antiseptic property, we have in large measure arrived at the *rationale* of its established favorable action.

Ganglionic Tuberculosis.—(Translated.)

According to M. Duret of Lille, the tuberculosis of ganglia comprises three forms: (1) the fibro-caseous; (2) the caseo-tuberculous; (3) the ulcerative or fistulous; each is treated differently. For the first there is only careful extirpation; for the second, if the tuberculous ganglia are arranged in chaplets, each is treated by igni-puncture; if in compact mass one makes with a red-hot iron deep incisions in the form of a cross; and in the third, a fistulous form, the red-hot iron even though deforming cicatrices result, ought not to be abandoned. These deformities are much less serious than those which would finally result by the ulcerative process.

Tuberculosis of Salivary Glands.—(Translated.)

Says M. Valude, "If we only think of the extent of the surface for contamination which the mouth

presents, and of the infinite number of micro-organisms which live in this organ and on the tongue, we must be surprised at noticing the relative rarity of tuberculosis of this organ. How comes it that the microbe of tuberculosis does not develop in a situation where it lodges every day? Whence is it that one knows of almost no case of tuberculosis degenerating the salivary glands? It is probable that, as with the conjunctiva, it is in the number of other micro-organisms contained in the mouth that it is necessary to search for the reason of this immunity. Bacilli of tubercle cannot either evolve or produce specific lesions, thanks to the micro-organisms of the saliva." M. Valude has instituted, in order to verify this hypothesis, a series of experiments, trying to prove the inoculability of the salivary glands by a pure tubercle culture with the following result: That the saliva or that of each gland can very largely neutralize the effect of tuberculosis virus. If then tubercle shows this great difficulty of engrafting itself on the surface of the mouth, or in the salivary glands, we can therefore only explain this by the accumulation of various micro-organisms which oppose themselves to the germinative action of the bacillus of tuberculosis.

GYNÆCOLOGY.

Ureteritis: Its Diagnosis and Symptomatology.

Of the many papers read before the recent American Congress, that of Dr. Howard Kelly of Philadelphia, was one of the most interesting, introducing to the section a matter which as gynæcologists, must frequently come under their notice. The following is an abstract of the paper from *Medical Journal and Examiner* :—

Catheterization of the ureters is a proceeding which is very useful in the diagnosis of disease of the ureters, the pelvis and of the kidneys. Ureteritis is probably more common than has usually been supposed. While this method of procedure is of comparatively recent date, the disease—ureteritis—was recognized years ago by Rayer and by Cruveilhier. It may be either descending or ascending; perhaps it is more commonly secondary and descending. It may also be ascending, following gonorrhœa and other diseases which affect the bladder. The ureter may also be diseased from the passage of renal calculi, and as a complication of many forms of disease of the uterus and its surroundings. Hence it is important that the func-

tions and the condition of the ureters should be carefully ascertained in any suspicious case. These and other facts suggest that more careful study of renal and bladder troubles is now in order for scientific gynecologists.

Examination of the ureters may be made by inspection, by palpation, and by catheterization. The first may be practised by splitting the vesicovaginal septum at the proper level, then turning the opening into the vagina, as suggested by Dr. Thomas Addis Emmet. This may be done by pressure from without, or by pressure through the rectum, as suggested by Dr. Polk. By palpation the course of the ureter is to be followed by delicate touch, compression being exercised both through the abdominal wall and the vagina. If the urethra is dilated, its course may not infrequently be traced by this means. The method of catheterization, is however, the most practical, and the method of Pawlik, that of freehand catheterization, is believed to be the most applicable.

In three cases of pronounced bladder trouble he found that it was the diseased ends of the ureters which were causing trouble, the trouble disappearing when these were cured. Other cases were also narrated to prove the value of this method of procedure. The literature of this subject is not extensive and includes, in addition to the papers of Pawlik and Simon, the theses of Bonnet and Chaumont, and the recent paper of Silbermann.

Dr. Polk found the subject one of great interest, and had given much time to its consideration, both upon the living and the dead subject. The method of examining the ureters which was commonly referred to was Pawlik's. He had made many trials of it, but usually without much success. He had found more satisfaction in making a button-hole fistula at the base of the bladder as recommended by Dr. T. A. Emmet, and then by suitable pressure the ends of the ureters could be made accessible. In palpating for the ureter it is to be remembered that it is between the line of the uterus and the brim of the pelvis. For a catheter he preferred one of broad curve like a prostatic catheter, and after this had been entered another instrument should be passed into the rectum, with which the onward course of this instrument in the ureter could be traced.

Dr. Ba che Emmet had found that as good results as by any method could be obtained as to deter-

mining the position of the ends of the ureters, by making a fistula in the base of the bladder, then pressing in the median line of the abdomen, then varying the pressure to one and then the other side. He believed that ureteral trouble complicated various uterine troubles, and that a diagnosis of pelvic disease could hardly be considered complete until the condition of the ureters was known. He did not believe that disease of the ureters was a very common complication of bladder disease.

DISEASES OF CHILDREN.

Diarrhœa in Infants, and its Bacteriological Relations.

Escherich has proved the common belief to be true that the meconium of a new-born child is entirely free from micro-organisms. Numerous, however, are the bacteria found in fœces, introduced doubtless with air, food, water, saliva, etc. It appears, however, that two species are constantly present, even in healthy milk-fed infants, viz., the bacterium lactis aerogenes, and bacterium coli commune. They have been called obligatory milk-fœces bacteria in contra-distinction to the inconstant bacteria, called facultative or potential bacteria. The bacterium lactis prevails in the upper intestines, but diminishes greatly in the colon. The bacterium coli on the other hand greatly increases in the lower bowel. These two are capable of growing without oxygen and produce fermentation. The first produces lactic acid, carbonic acid, and hydrogen. To it is probably due normal fermentation. The potential or inconstant bacteria are mostly aerobic (requiring oxygen), and are commonly more numerous in infants fed with cow's milk. The limited amount of oxygen in the bowel doubtless explains how anaerobics are much more common in the bowel than aerobics.

Escherich's work is thus of value as teaching that, with the alteration of food, as also of its quality, we may fairly expect disturbances of digestive functions. Thus the species are found to vary in milk fœces, meat fœces, a meat diet, etc. In summer diarrhœa there are abnormal changes in the contents of the stomach and of the intestines, in consequence of morbid secretions, peristalsis, and fermentations. In a paper by William Booker, M.D., Baltimore, are given some results of a biological examination of fœces. A sterilized glass

tube was introduced into the rectum and cultures made on agar-agar plates. The investigation of fermentative properties of the organisms was carried on chiefly in milk. Seventeen children selected from those sent to the Thomas Wilson Sanitarium outside Baltimore were studied; a perfectly healthy child taken as a control experiment. Some were fed on breast-milk and some on condensed milk. Eighteen different varieties of bacteria were isolated, the differentiation being made by their morphology, characters of the growth in different media by feeding inoculated milk, and by hypodermic injections. All but one were bacilli. *Bacterium coli* (Escherich) was found in all but the two with dysentery. It was present in smaller numbers in the most serious cases, especially in cholera infantum. One was found very similar to *B. lactis aerogenes* (Escherich), not positively identical. A liquefying bacillus with marked pathogenic properties was found in four cases of cholera infantum. The single variety of micrococcus found was present in three cases of cholera infantum and three of catarrhal enteritis.

In plate cultures the healthy feces always showed a greater number (immense numbers) than did pathological feces; but there was always a greater number of varieties in pathological feces.

Two varieties especially produced marked pathological effects in feeding and inoculation experiments on animals. A liquefying bacillus which was found frequently but not constantly in cholera infantum effected changes in albuminous compounds which proved rapidly fatal when injected in small quantity into the veins of rats, and milk cultures of the same when fed, usually resulted in death to man and Guinea-pigs. None were found capable of multiplying in ordinary hydrant water, and cultures could not be obtained from it in any case 48 hours after it had been inoculated. All thrived in milk, some producing coagulation with acid reaction, some rendered milk sour with coagulation, some rendered it alkaline with coagulation, some no apparent effect, and one coagulates it with alkaline reaction.

NEUROLOGY.

Multiple Neuritis (Peripheral).

In no direction has the study of nervous diseases advanced more satisfactorily during the several past years, than in the study of peripheral neuroses.

The practising physician is so accustomed to associate dermal hyperæsthesia with hysteria and other functional disorders on the one hand, or central lesion on the other, that disturbances owing to diseases of the nerves themselves have been largely overlooked. There have been studies published occasionally, but to Jaccoud, Grainger, Stewart, Duplaix, and Starr, we owe our principal knowledge of the subject. Of it there are several forms; (1) a perineuritis, affecting solely or principally the sheath of the nerves; (2) a parenchymatous or degenerative neuritis in which the connective tissue between the nerve fibres is chiefly attacked; (3) a diffused neuritis in which all parts of the nerve bundle are more or less affected. A clinical distinction between these forms has not yet been found possible. In parenchymatous inflammation the myelin is gradually absorbed and the cylinder axis disappears, leaving but an atrophied tube deprived of its contents. Erb and others consider with much show of reason that these atrophic changes are secondary and due to spinal changes. The difference vainly must be considered as a true inflammation, as might readily result from local injury. Segmental periaxillary neuritis has been noticed by several writers as associated with lead poisoning, diphtheria, and alcoholism. The change seems to be interstitial. As to causes, as may be expected, we have (1) idiopathic, (2) infectious, (3) toxic, (4) epidemic, as in *beriberi*. Of the more important are those doubtless resulting as complications of or sequelæ of local inflammations as of pharyngitis, diphtheria, scarlatina, syphilis, puerperal infection, etc., and to these we may add rheumatism and gout.

Some of the symptoms noted are motor paralysis, anæsthesia and abolition of the reflexes and electro-contractility. Fatal results may rapidly supervene, if the larynx, œsophagus, etc., are involved. In alcoholic cases, there may be a history of gastric catarrh, tremor, sleeplessness, and erratic pains, numbness, etc. We have other abnormal sensations referred to different nerves, as tingling, burning, boring, tearing, etc., cramps, girdle-feet, coldness, etc. Skin reflexes may be excited or depressed, and great alterations in the reflexes may occur. Vaso-motor changes vary much in amount, from a deep purple to extreme lividity. Treatment must vary in some degree with the history of causation; the usual list of drugs is re-

corded; but perhaps the use of strychnia, diuretics, massage, and galvanic currents is the most applicable to those arising as secondary results to local inflammations, while diaphoresis and other remedies would properly be exhibited in gouty or rheumatic cases.

BACTERIOLOGY.

Ptomaines.—(Translated from a lecture by Dugardin-Beaumez, at Hospital, Cochín.)

Messieurs,—In my first lecture I told you the new results in prophylactic hygiene which have been derived from the knowledge of pathogenic microbes on the one hand, and on the other, from the discovery of poisons which the economy is elaborating at every moment, ptomaines and leucomaines. This prophylaxy, indeed, ought to place us not only under protection against the diseases which come from without and of which the pathogenic microbes are the factors, but also furnish us with the means of expelling from the system the poisonous matters which tend to accumulate there, for, as Bouchard has very well said, "this organism is in the normal as in the pathological state, a receptacle and a laboratory of poison."

In the preceding lecture I have shown you as briefly as possible the principal pathogenic microbes; it now remains to me to take up this great and important question of organic alkaloids. The question which I am going to take up is most complex, so I ask your very kind attention in following me in the developments in which I am about to enter, and in order to systematize my subject I shall divide it into two parts: in the first I shall study ptomaines, in the second, leucomaines.

The name of ptomaines (*ptoma*, dead body) is given to the alkaloids furnished by putrefaction; their discovery belongs to the year 1872. Already had been observed the virulence of certain cadaveric extracts. It was in this way Gaspard and Stich had set forth the very great hurtfulness of these extracts; thus also that Panum obtained in 1856 from putrefaction, a poison which he compared to the venom of the serpent; thus also that Dupré and John Bens in 1856 extracted from corpses an alkaloid which they compared to quindine, and to which they gave the name of *quindine animale*. Similarly in 1868, Bergmann and Shmiedeberg discovered in the wort of putrefied beer, then in the blood, a morbid poison which

it was formerly thought played an important part in the origin of septicæmia, sepsin.

Again, in short, was it that in 1869, Sonnenschein and Sulzer, studying from a chemical standpoint anatomical macerations, found in them an alkaloid having an action analogous to atropine and hyoscamine, until we arrive at the discoveries of Gautier and Selmi, which thus bring us up to the years 1870 and 1877.

It was Gautier who first discovered that the fibrine of the blood exposed during the summer under a layer of water produced complex alkaloids fixed or volatile. At the same time, Selmi, professor of Legal Medicine in the University of Bologna, in making medico-legal examinations or reports had proved by analysis the presence of alkaloids which were distinct from those already known.

In 1872, Selmi communicated the result of his first researches in announcing that there were in the stomachs of persons having succumbed to a natural death, substances analogous to the vegetable alkaloids, and which were neither creatine, nor creatinine. To answer the numerous objections which were made to him, and which bore especially upon the possibility of the introduction of these alkaloids in the food, Selmi then reproduced in 1877 the experiments of Gautier, and announced to the Academy of Bologna at their *séance* of the 6th December, that in submitting to putrefaction pure albumin protected from the air he had obtained two alkaloids. From this time forth researches increased with great rapidity.

Nencki proves that the digestive action of the pancreas on gelatine produces a special alkaloid, which is given the name of collidine ($C_8H_{14}A_5$) and isolates it in a state of purity. Then Gautier and Etard find in the putrefied flesh of the *scombre* and of the horse several other bases and especially hydro-collidine $C_8H_{14}A_5$. In 1883 Guoreschi and Mosso proved the presence of a pyridic base $C_{18}H_{15}A_5$, in the fibrine of putrefied beef. Gabriel Pouchet again finds two bases having for formulas $C_7H_{18}A_5O_6$ and $C_6H_{12}A_5O_4$. Brieger has studied successively the ptomaines of peptone, then those of meat, and putrefied fish, and lastly those of cheese. Tanret proved in 1882 that peptones give most of the reactions of alkaloids, and Brieger showed that by acting on moist fibrine with pepsin, a poisonous alkaloid, peptotox-

ine, was obtained; he has further obtained from altered flesh, neuridine (not poisonous) and neurine (very toxic). This is nearly identical in action with muscarine and neurine normally found in the brain. The ptomaines from fish most poisonous are hydro-colline, ganidin, parvalin, and ethylene-diamine.

These discussions are most important, since we will find gastric disturbances, as indigestion, intestinal trouble and such fatal phenomena as follow putrefied foods, have a special cause in the presence in the intestinal tube in a greater or less degree of the alkaloids already mentioned. It is equally important that we should know the alkaloids produced in the dead human subject. We have choline, neuridine, cadaverine, putresine, saprine, trimethylamine, mydaline, and others, each specially marking some stage of the putrefactive period, the most poisonous being those forming after the seventh day of death. Guereschi's classification gives up to date some twenty-eight ptomaines, which number is being almost daily added to. Unfortunately these do not in many instances present distinct chemical reactions, or reactions distinct even from the vegetable alkaloids. These ptomaines are in fact diamines belonging to the fatty series. Those salts are very oxidizable and endowed with great reducing power, are all soluble in alcoholic ether and most dissolvable in chloroform and amylic ether.

While important from the legal standpoint, it is yet more interesting to know that gastric indigestion, whether acute or chronic, results most probably from the absorption of ptomaines, whether introduced with food, or whether the stomach proves powerless to prevent the putrid fermentation of organic substances. Recall the symptoms caused by ptomaines and you will recognize those of colic, diarrhoea, intestinal hypersecretion, and the various troubles which mark intestinal disorders.

[We propose in our next number to present the study of leucomaines by the same author.—Ed.]

HYGIENE.

Heating and Ventilation of Belvidere Isolation Hospital.

The recently opened Belvidere Isolation Hospital, Glasgow, for small-pox and fevers, is heated by hot water. The heating is by hot water circu-

lating in pipes which are led around the walls above the floor. This is derived from two hot water tanks heated by steam, and placed beneath the entrance hall of each ward, to which access is obtained from the outside by a stair leading to the basement. There are also open fires at either end of each ward. Pavilions with numerous windows and open to the roof are very difficult to warm sufficiently during winter. Experience at Parliamentary Road soon showed that it would be necessary to check radiation by the large glass area, and accordingly the device of double glazing each pane with an interval of three-quarters of an inch of air space was adopted. The wards at Belvidere are kept at 55° to 60° in the coldest weather. There are heating coils in the vestibule and bath-room.

Fresh air is admitted by direct openings beneath the windows, which are numerous, so that it passes over the heating pipes. These openings are controlled by an arrangement which admits of graduation and cannot be interfered with except by the nurse. There are skylights on opposite sides of the slope of the roof, Boyle's ventilators fixed on the ridge, and ventilating shafts alongside the chimneys, with openings controlled by movable louvres at the apex of the roof.

The principles kept in view in furnishing are simplicity, smooth surfaces, and facility of removal and cleaning. The bedsteads are wrought iron, the tables and chairs hardwood varnished. In children's wards, iron cribs are provided, and pigmy forms and tables suited to their size. All cupboards, presses, etc., are movable on iron rollers like American trunks. The mattresses are stuffed with straw, the pillows with chaff. They are renewed whenever soiled. Wood wool was recently tried as a substitute for straw, but was found speedily to break down, and on account of the consequent expense and larger quantity and more frequent renewal, was not adopted.

Air Currents in House Atmospheres.

The following is an extract from an article on "House Atmospheres or Artificial Climates," read by Dr. P. H. Bryce at the Washington International Medical Congress:—

Perhaps there is no one feature which so well illustrates the difference between external and internal air, and can be appreciated so readily by the ordinary observer, as the difference between the

practically inappreciable currents of house atmospheres and their universal presence in out-door air. Yet, in nothing does the startling susceptibility of many systems to external influences show itself so much as in the effects of such currents. The maximum changes in the air of a room without creating injurious currents are usually stated at six times per hour, while the average rate of the wind in Britain is twelve miles per hour. Galton elaborates this difference by supposing a person placed in a box 6 feet by $1\frac{1}{2}$, and assumes the air to move at the rate of 6 feet per second, when in one second 54 cubic feet, in one minute 3240 feet, and in one hour 196,400 feet would flow over the person.

Evidently, then, in the very nature of things there are radical differences between the two airs as regards their movements. We naturally ask, however, why is it that we cannot permit of more rapid movements in house atmospheres without injurious draughts? According to Pettenkoffer: "The unpleasant sensations from draught arise from a one-sided cooling of the body or some part of it; this frequently is caused by a corresponding motion of cold air, but also in other ways, as by increased one-sided radiation, which causes a local perturbation in our heat economy and thus produces local consequences." In some instances, if the passing air be of abnormal dryness, the disagreeable sensations of cold will be increased, as in the case of a warm, dry air from a furnace register. This question of draughts in a room stands in intimate relationship with the point already discussed, viz., that of unequal temperatures in different parts of a room, as at the floor and the ceiling, as compared with that five feet above the floor. Remembering further, the ordinary construction of windows and doors, we need hardly recall the open spaces around them referred to by Longfellow, when he sings:—

"They sat within the farm-house old,
Whose windows looking o'er the bay,
Gave to the sea-breeze, damp and cold,
An easy entrance 'neath and day."

Manifestly, we have in these unequal currents a condition as opposed to health as it is different from that of out-door air. In the latter air, the body, being equally exposed and the feet well protected by overshoes or heavy boots, does not experience cold to an extent comparable with the difference between the two temperatures; while in

the house, the body, being unprotected by overgarments and over-shoes, the feet, of all parts the most liable to suffer from cold, are exposed to a temperature often much below that considered normal for the whole body.

Not only, however, are there cold floor currents, but there are also in many rooms with much outer-wall surface chilly descending currents. A notable difference is often to be found between the air of cities and that of the open country. High buildings obstructing the sun's rays make marked differences in the temperature on the north and south sides of streets, and even between the east and west sides at certain hours of the day. With a diathermanous atmosphere, as in high altitudes, this effect is very marked, and I have been informed by a gentleman living in Colorado for his health, that the change from one side of the street to the other is often more noticeable in its effect on the respiratory tract than the change from day to night.

Koch's Laboratory of Hygiene.—(Communicated.)

BY DR. WILLIAM LEHMANN, TORONTO.

In these days of the germ theory, when almost every disease can be shown to depend upon the introduction and rapid multiplication and development of bacteria in the system, and many can be produced at will by inoculation with bacteria of artificial culture, nothing can be more interesting and profitable to the student of medical science than to obtain as thorough a knowledge as possible of these microscopic forms of plant life; both as to their cultivation including the kind of soil, atmosphere, and temperature best suited to their growth, their manner of reproduction, and also the best methods of destroying them. I believe that at the present time Koch's Bacteriology Course, given in the large laboratory of the Hygienic Institute, Berlin, offers the best facilities for such study. The course lasts one month and with one or two exceptions a course is given every month in the year. There are places for between thirty and forty students, and all the civilized nations of the world are represented among them. Cultures are made by several different methods and in different materials such as potato, bouillon, gelatine, agar-agar, etc., of all the known species of pathogenic and nonpathogenic bacteria and moulds; and every part of the work even to washing and cooking of the potatoes,

preparing and sterilizing vessels, test-tubes, knives, scissors, and needles, is done by the student himself. Each species of bacterium is examined microscopically, in colonies, and individually, and in stained and unstained preparations. Animals are inoculated with different kinds of pathogenic bacteria, and after death, both fluid and solid parts of the body are examined for the bacillus or micrococcus that sets up the disease. Cultures are made by planting some of the blood or serum in a piece of solid tissue and the result compared with the original with which the animal was inoculated. There is no end to the work. Still if one spends all his time at it, a very good practical knowledge of the subject can be obtained in the month. And for those who wish to go on and make further researches, extending over a second or more months, a separate room is provided. Amongst the more practical benefits may be mentioned the easy methods of preparing specimens of the sputa of consumptive patients for diagnosing the tubercle bacillus. After trying in vain, perhaps repeatedly, to get a pure culture of a certain kind of bacterium, but instead, always getting a mixture of different varieties, the cause of the mixture being due either to carelessness in sterilization, or exposure to the atmosphere of the room for a few seconds, long enough for spores of other kinds besides the one planted to drop into the prepared soil, one learns how exceedingly careful and thorough he must be even to the slightest detail, in order to make antiseptic surgery a success.

Shoulder Braces.

The latest opinion is that of Dr. Bernon Roth, F.R.C.S., London, Eng., to the effect that shoulder straps, braces, etc., are wholly useless. If effective in preventing stooping, they injure by preventing the action of the muscles passing from the spine to the scapulae. Similarly we open our eyes when we read what Lydia E. Bicker has to say in *Sanitary Record* on Stays and Dress Reform. She says; "I hold that in both of the propositions in which the proposals are made, viz., that the weight of the clothing should be raised to the shoulders, and that there should be no support or girdle around the waist, the dress reformers preach a false doctrine, both physiologically and aesthetically, and that the authors of the Bath paper are right when they affirm, 'If not laced too tight, the modern corset,

by clasping the waist and supporting the bosom and back, constitutes a convenient combination of the different forms of girdle which have been found useful by the women of all civilized nations.'"

STATE MEDICINE.

THE following interesting particulars regarding the health of the troops serving in the United Kingdom is taken from the report of the Army Medical Department for 1887. The total strength during the year was 92,601 men. The number of admissions to hospital was 78,089; there were 632 deaths. The average number of daily sick was 4360.31; the average sick time to each soldier 17.18 days, and the average duration of each case of sickness 20.38 days. The ratios per 1,000 strength are, for admission 843.3, for mortality 6.68, for invaliding 17.64, and for constant inefficiency through sickness 47.08. Amongst other facts it is interesting to note that in a body of men, kept systematically vaccinated, and who from their habits are likely to be much exposed to contagion, there were only 11 admissions to hospital on account of small-pox, while not a single death occurred, the virulence being in all cases thus lessened on account of vaccination. The total vaccinations during the year were 715 primaries, and 40,824 secondaries. Of enteric fever there were 145 cases and 43 deaths, or a deathrate of .46 per 1,000 and a percentage of deaths to cases of 29.6. There were 8,226 admissions for primary syphilis; 3,097 with 5 deaths from tertiary syphilis, and 10,632 for gonorrhoea, making a total of 21,965 admissions or a ratio of 23.1 per centum. To this must be added 3 per cent. of admissions for single venereal ulcers. The number of men constantly sick during the year from this disease was 19.2 per 1,000. The deaths from tubercular diseases amounted to 1.17 per 1,000.

Degrees of Sanitary Science.

Degrees of Sanitary Science are now being instituted in many Universities. Cambridge has been the first in Britain, and now the University of Madras has instituted a degree of sanitary science. The candidate must have passed his M.B. and C.M., and must present certificates of having attended courses in hygiene (fifty lectures), general pathology (fifty lectures), analytical chemistry (six months' course), and one course in sanitary engi-

neering. The candidates are examined in chemistry, experimental physics, vital statistics, bacteriology, hygiene, sanitary engineering and sanitation, and drawing and mensuration.

AN outbreak of smallpox recently occurred in St. Joseph's Industrial School, Manchester, through a girl being admitted from York, while apparently in the incubative stage, and resulted in the infection of 67 inmates.

THE Hoagland Laboratory of the Long Island College Hospital, Brooklyn, has been completed and is ready for work. Special facilities are offered to those who desire to prosecute original research. For this purpose private laboratories have been provided, and histology, physiology, bacteriology, pathology, and photography can be studied. The building will cost \$100,000 when completed, and has been erected at the expense of Dr. Cornelius Hoagland. Dr. George M. Sternberg, of the United States Army, is Director, and will have as assistant George J. Kemp, Ph.D., Johns Hopkins' University. Dr. J. H. Raymond, Editor Brooklyn *Medical Journal*, is Secretary.

PRINCIPAL WALLEY, in the discussion on "Communicable Diseases Common to Man and Animals and their Relationship," at the Glasgow Meeting of the British Medical Association, stated that of 13 animals killed in an Edinburgh slaughter-house on account of pneumonia, no fewer than six were affected with tuberculosis, thereby illustrating the extent to which this disease existed amongst dairy animals, and further stated that probably a greater number of deaths was produced in the animal creation by this disease than by all other zymotics together. Of 18 animals slaughtered at a later date the same proportion of tuberculized animals was shown. The disease likewise exists in poultry, in which it ran a more rapid course than in other animals and is in Prof. Walley's opinion capable of being transmitted through eggs. Dr. Farquharson, M.P., stated that with such facts proven they ought not to rest till they had tuberculosis included under the Contagious Diseases (animals) Act. He had already brought the question before the Hon. Mr. Ritchie in the House of Commons; and further stated that the question of including tubercle amongst scheduled diseases,

was now under consideration. Dr. Brown, of Carlisle, referred to an outbreak of typhoid in March last year, and that from March 2nd, the date at which a death from typhoid took place at a dairy and milk-shop in the district, to May 15th, a period of nearly two months, altogether 20 cases of the disease were brought under notice, and on enquiry it was ascertained that with one doubtful exception, all the affected individuals had derived their milk supply from the infected dairy. There was no traced introduction of the disease to the dairy, but it had been ascertained that a febrile disorder having a very striking resemblance in its symptoms to typhoid, had existed amongst the cows at the dairy on several occasions during several preceding years, the last of these being about the beginning of March, 1887. He stated that in Carlisle, typhoid was very fatal, and persistently lingered in the immediate vicinity of cow-sheds, slaughter-houses and tripe factories. Prof. McCall, Glasgow, stated a case, in which he had investigated an outbreak of cattle-fever near Eaglesham, where he found two cases in a separate house with an eruption on the teats and with desquamation of the skin. They were a new purchase and the date of their being brought to the dairy was simultaneous with the appearance of scarlatina in Glasgow. He fed a first, and thereafter a second, both of which died, but being very young he did not attach thereto much importance. But a third calf was brought and fed upon the milk. Febrile symptoms rapidly appeared, and the post-mortem examination disclosed micrococcus similar to those in the udder of the cow.

IN a paper on "Village Sanitation," by R. Domenicheth, M.D., in the *Sanitary Record*, various illustrations of the sewerage of villages are given. At Ashwell, Rutland, a system of six-inch tile pipes had been laid connecting with all the houses at a cost of £250. The sewage was conducted to a filtering-bed constructed of masonry with three compartments for charcoal, sand, and gravel, and automatic flushing was arranged by conducting the water through a syphon into a receptacle which could be discharged at pleasure, thus flushing the drainage system. The expenses attending the supervision are trifling and highly satisfactory.

PROF. BEDSON, Durham College of Science, has recently, under the direction of the North-Eastern

Sanitary Association, made experiments on the air of public buildings. He estimated the carbonic acid by Pettenkofer's method. The examination shows the almost universal need of some system for extracting the foul air. Such a system being in use in the Assize Courts, the air at 3.30 p.m. on a crowded day showed only 6.6 parts per 1000. While in buildings as chambers, not being occupied, something is gained by tall ventilating shafts, yet, the really good results can only be got by a good mechanical system. Tobin's tubes and Boyle's valves are of use in schools if the numbers in a room are small. He points out that every system must provide for the fresh air being warmed.

At Buxton, a successful precipitation process is carried on by iron water. Water impregnated with iron, 3-4 grains per gallon as carbonate, with alumina sulphate and other crystalline sulphates as constituents, is taken from a disused coal-mine and conveyed to a tank where it is mixed with milk and lime. This is added to the sewage tank, and the purified sewage water is passed into a succession of filter beds and finally discharged into the river of higher purity than that of the river itself. The sludge is carried away at a remunerative rate for manure; and although it is carried on at a rate of 1 1/2 d. on the pound of ratable value, it is nevertheless the most satisfactory method of dealing with sewage yet introduced.

REPORTS OF SOCIETIES.

Toronto Medical Society.

STATED MEETINGS, Oct. 16th, 1888.

Dr. Machell in the chair.

Minutes of previous meeting were read and adopted.

Cases in Practice.—Dr. Carveth presented for examination a man brought before the Society last May, when he showed extensive ulceration of the nose, cheek, and throat; some discussion followed at the time as to whether it was a case of syphilis or rodent ulcer. Under specific treatment the man has progressed favorably.

Dr. Smith presented a young man aged 22 years. When nine years old he fell on the ice; striking his elbow; no pain was experienced till next day; abscess appeared and was opened, but did not heal. Others appeared for four years, but old ones did not heal kindly. At present has trouble with forearm. He goes to bed quite well, and is suddenly awakened by severe pains in arm, the elbow swells; this lasts a week and disappears; has had ten such attacks in two years. Two years ago a lump appeared on inner side of arm, then disappeared, and part around began to soften. He played base-ball all summer, when the arm did not trouble him, but since he has stopped the trouble has appeared again.

Dr. Bryce was inclined to think it due to a neuritis.

Dr. Atherton would try pot. iodid. for general or possible specific effect.

Dr. Britton then read a comprehensive paper on cystitis. Idiopathic acute cystitis frequently occurs as a complication, occasionally originates *de novo* in scrofulous and rickety girls; but, with these exceptions, it is usually of traumatic origin, either direct, as from instruments, calculi, or indirect, as overdistension and retention. The disease invades primarily either the mucous tunic or the peritoneal covering, usually the former, the inflammation being either catarrhal or croupous in character. On examination, the mucous membrane is discolored and softened, usually in patches; here and there may be erosions, or, if disease has run a severe course, ulcerations or even gangrenous spots. In acute form of disease the symptoms are malaise, chills, frequent desire to urinate, with scalding urine, pain in hypogastrium and sometimes tenesmus, high temperature and general symptoms of fever. After a few days the urine becomes ammoniacal, and deposits phosphates with mucous and pus corpuscles. If the case proceeds unfavorably, the patient lapses into a *quasi* typhoid state, manifested by hebetude, subsultus, vomiting, purging, and the disease invading the ureter, pelvis and secreting structure of the kidneys, ends fatally in coma.

The treatment in the acute form is from the early stages antiphlogistic. Absolute rest, both for patient and bladder, saline cathartics, opiate suppositories, hot fomentations, demulcent drinks and milk diet; alkalies to correct acidity, and in the latter stages benzoic acid to counteract alkalinity.

Buchu, cubebs, uva ursi, hyoscyamus, copaiba, lupulin and belladonna have all been used for their specific effects.

Treatment: irrigations of nitrate of silver, $\frac{1}{4}$ gr. to an ounce of warm water have been used, also carbolic acid, where there is fetor, pot. permanganate, borax, boracic acid and sulphate of zinc. The plan of puncturing bladder for purpose of drainage was also spoken of.

Drs. Bryce, Atherton, and Spencer took part in the discussion.

It was moved by Dr. Reeve, seconded by Dr. Bryce, that the Executive Committee be empowered to collect subscriptions for a large portrait of the Society's first President, Dr. Workman.

C. CUTHBERTSON, *Sec.*

Toronto University Medical Examiners for 1889.

The following is a list of the examiners appointed:—Pathology, H. A. Macallum, M.B.; Physiology, A. B. Macallum, B.A., M.B., Ph. D.; Medicine and Therapeutics, J. A. Mullin, M.D.; Materia Medica, O. R. Avison, M.D.; Midwifery, W. Digby, M.D.; Descriptive Anatomy, H. M. Aikins, B.A., M.D.; Practical Anatomy, J. Ferguson, M.A., M.D.; Surgery and Surgical Anatomy, W. T. Aikins, M.D., LL.D.; Clinical Medicine, A. McPhedran, M.B.; Clinical Surgery, C. O'Reilly, M.D.; Sanitary Science, H. P. Yeomans, B.A., M.D.; Forensic Medicine and Medical Psychology, W. W. Odgen, M.D.; Gynæcology, A. Baines, M.D.; Chemistry, A. McGill, B.A.; Biology, J. J. Mackenzie, B.A.

GENERAL NOTES

PRESIDENT HAULTAIN, of the Engineering Society of the School of Practical Science, delivered on Oct. 9th his inaugural address on the objects of the Society.

THE numerical strength of the various Medical Faculties of the German Empire is, according to Dr. Ascherson, 212 ordinary Professors, 163 extraordinary Professors, and 223 private-docenten.

THE College of State Medicine was incorporated in London in 1887, and is presided over by Sir Joseph Fayrer. The course of lectures during the coming winter session will be given in the rooms of the Chemical Society. Among the lecturers will be Professors Klein, Fleming, Fayrer, Brudenell Carter, Seely and Sir Robert Rawlinson. The regular professor of Hygiene and Public Health will be Dr. Wm. Robert Smith. The Public Health Laboratory connected with the College will be open throughout the session.

BRIQUET has found that in France of 1,000 cases of hysteria 50 were in males, while other authors fix the proportion at 15 to 1. In males the symptoms lasted longer than in females, and they were more likely to occur in small and effeminate subjects. Lasegue had been led to employ the term peripheral hysteria from the fact that any form of irritation in a subject predisposed to hysteria might act as the exciting cause. For instance, a foreign body in the cornea might prove sufficient to set up the whole train of nervous symptoms resulting in hysterical blindness.

A SOLUTION of the woes of Ireland, from the dawning of a new industry, may be found in the fact that Dr. Jacob M. Shmülenich, Russia, emphatically draws attention to dried potato as an important article of food, possessing very valuable qualities in comparison with potato in the fresh stage. While dried, the potato, which in fresh state readily decays, may be kept a long time good, and being thus much less bulky has a great importance as being readily transported, especially in time of war.

SAVS F. Vacher, F.R.C.S.: One quarter of the children who die in England and Wales are under one year of age, and the proportion of infant deaths to births is upwards of 14 per 100. The total number of deaths of children under twelve months is about 129,000 a year, of which "79,000 are due to hereditary diseases or neglect, or both, many being obviously due to homicide." The causes conducing to this mortality are (1) early improvident marriages, (2) hereditary disease communicated by parents, (3) illegitimacy, (4) insurance on the lives of infants, (5) drunkenness of parents and guardians.

THE Local Government, Great Britain, have just issued, date April 23rd, Dr. Bruce Low's report on the Investigation of the Epidemic of Diphtheria in the Enfield Urban Sanitary District. The disease had for some time been epidemic; but about the end of December well-to-do houses having be-

come invaded, something like a panic occurred. Most, as usual, blamed sewers and public water, and pooh-poohed the idea of milk supply being the vehicle. A careful enquiry into the cases in every house showed that 14% of the total persons consuming a particular milk, took the disease; while only ½% of the people within the panic district, who had not used it, had the disease.

WE have been honored by the receipt of "The Medical and Surgical History of the War of the Rebellion," Part 3, Vol. I., edited by our old friend Surgeon Major Chas. Smart, M.D., of the army. The task of collating the mass of clinical and statistical memoranda in his hands has been enormous, and to have given it form and compactness has been almost more than could have been deemed possible. Of the 304,369 deaths in the northern armies, only 44,208 were caused by death wounds on the battle-field, while the enormous number of 186,216 resulted from disease. As has elsewhere been said by a reviewer: "No more eloquent comment could there be on the inexperience in camp life, and the ignorance of sanitary conditions which existed in the early days of the rebellion, while very nearly the same proportion of deaths from similar causes occurred in the Confederate army." A similar statement was made by Sir Robert Rawlinson who, speaking on the enormous fatality during the earlier years of the Crimean war, stated that no fair conclusion could be arrived at regarding the influence of climate on the death-rate, as the unsanitary conditions were so numerous as to make any such deductions quite impossible.

THE October number of *The Journal of Comparative Medicine and Surgery* gives a very full account of the rise and progress of the Ontario Veterinary College, with a fine wood-cut of its founder, Andrew Smith, V.S., the President. In 1859 the members of the Board of Agriculture became convinced that some steps should be taken to provide veterinary instruction for young men. In the Board were the late Hon. Adam Fergusson, the late Hon. David Christie, and the late Prof. Buckland. To this Board Prof. Dick, the head of the Edinburgh College, recommended Mr. Andrew Smith, who came to Toronto in 1861. The first course of lectures was given in 1862, and in 1865 the Ontario Veterinary College, with a full course of lectures, was established. The first graduating

class numbered three students. Amongst the lecturers were Dr. Bovell, J. J. Meyrich, V.S., of the Royal Artillery, and Prof. Buckland. To these was added in 1872 the late and lamented Dr. Barrett, who lectured on physiology. In 1885 a hall large enough to accommodate 350 persons was required, and in 1887 over 400 students attended. There are now as Professors, Dr. J. J. Duncan, Dr. G. Richardson, Dr. J. Caven, and Dr. G. Peters. The graduating class of 1888 numbered 125. Prof. Smith, justly considered the founder of veterinary science in Canada, now adds to his several high local positions, that of Foreign Associate of the Royal College of Veterinary Surgeons, and a Fellow by examination of the same body.

WE are inclined to accede to the position that ladies who have studied Medicine and become registered practitioners should enjoy equal rights and privileges with other regular practitioners; but we do not think that gallantry demands of us that we should allow to pass uncriticized the following advertisement, taken from a daily paper. What is stated in the first part of the announcement is true, but it might be equally in order to announce that soothing-syrup is good for infants and ergot of use in certain female complaints:—

"The benefit of Electricity, as a therapeutic agent, is now fully recognized by the profession, and, in view of its value as such, Dr. Emily H. Stowe, 111 Church street, Toronto, has opened a department in connection with her office-practice, specially devoted to its use and application, where not only her own patients, but other ladies desirous of a course of electrical treatment, can secure it under a skilled and experienced lady electrician. The appliances of the department are numerous and the best in use—methods adopted are the most approved by our scientific authors. A lady masseuse connected with the department."

FROM Dr. William Osler we learn that he has been offered and accepted the position of Professor of the Principles and Practice of Medicine in Johns Hopkin's Hospital. He will retain his connection with the University of Philadelphia till the end of the present session. It seems as if our American friends are determined to show the warmth of their affection by sending our old friend to a hotter clime, and that, too, not in a metaphorical sense.