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J. J. CASSIDY, M.D., EDITOR.

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VOL. IX. TORONTO, JANUARY, 1901. NO. 1.

Original Contributions.

GASOLINE IN SURGERY.

BY BRUCE L. RIORDAN, M.D.,C.M.(McG.),

Surgeon Toronto General Hospital; Surgeon Grace General Hospital.

I WOULD invite your attention to a new surgical detergent, viz., Commercial Gasoline.

Detergents, abstergents, or abluents, as you know, are medicines or substances which have the property of cleansing wounds. Gasoline is not only useful to cleanse fresh wounds, recent wounds or old wounds or ulcers, but it is most useful in cleansing the field of operation before a surgical wound is made in the integument of the body.

Gasoline is a product of the distillation of crude petroleum. It is one of the lighter oils which pass over before benzine and commercial coal oil. It is sterile in itself, and has been used in the arts for years as a cleansing agent—in cleaning gloves, leather and clothing. It is very volatile and rapidly evaporates, and is cheap—20 cents per gallon.

As the result of some experiments conducted by Dr. Goldie, of Toronto, he sends in the following report:

"I have carried out in part the experiments in regard to the detergent and antiseptic properties of commercial gasoline. Weighed scrapings from the same arm from areas roughly two square inches were plated out, after washing with soap and water for five minutes, and after scrubbing with gasoline for two minutes, also without any preparation.

Unsterilized skin gave	173	colonies.
Soap and water scrubbing	20	"
Gasoline, two minutes' scrubbing	16	"

"Scrapings from skin, scrubbed with soap and water, then dressed with 1 to 60 carbolic acid over night, gave for same weight of scrapings 22 colonies.

"Gasoline poured on skin without rubbing gave 84 colonies; repeated with scrubbing with cotton wipe, gasoline gave only 7 colonies.

"Staphylococcus pyogenes aureus smeared on the skin as a film remain alive at the end of two minutes exposed to gasoline. I shall continue the experiments more fully and let you have report at early date."

This report corroborates my claim that gasoline is a valuable detergent. It may yet be found to be antiseptic.

Microscopic appearance of the skin after scrubbing with soap and water and after wiping off the skin with gasoline, showed that the cleansing effect went much deeper and cleaned our hair follicles, sebaceous glands and sweat ducts much more perfectly than scrubbing with soap and water could do, and prepared the skin so that antiseptics applied would have much greater effect than if applied to skin unprepared, the pores being open. I have been using gasoline for the past four years in cleansing the field of operation, in cleansing traumatic wounds, and in the subsequent dressings of all classes of wounds—not using water or other lotions or solutions. I was led to use gasoline, first, for the purpose of cleansing from injured parts what railway employees call black oil. We all know how black and grimy are the hands of railway employees engaged in shop work and about locomotives. While working in their ordinary occupation an accident occurs—fingers are crushed, for instance. The injured person comes under the surgeon's care. The surgeon's first duty is to see that the injured parts and the surrounding tissues are thoroughly and surgically deterged or made surgically clean. Soap and warm water with a brush has been the usual means employed; also ether, alcohol, etc. I found the process to be slow, painful, and not always thorough, as we understand surgical cleanliness, and the idea of using gasoline as a detergent readily suggested itself.

I find that it does not irritate fresh wounds or granulating surfaces any more than water does. It is best applied by taking an ordinary "wipe," made of cotton batting or sterilized gauze, saturating the cotton in the gasoline and wiping the parts which it is desired to cleanse. The gasoline immediately evaporates and leaves the surface dry, clean, and perfectly free from grease. This will be found an advantage where sectional strapping by adhesive plaster is to be used, as the plaster adheres much more firmly when the skin is free from any oily substance.

My results, as far as early healing and absence of infection are concerned, have been most satisfactory, and include the treat-

ment of all classes of wounds, and I cannot too strongly recommend to the members of this Association gasoline as a detergent for primary cleansing of wounds, and also in all subsequent dressings, as it does away with the trouble and risk of aqueous solutions.

Gasoline applied to the surface of the body rapidly evaporates and gives a pleasant, cooling sensation.

In subsequent dressings of external wounds, you may find the dressings adherent about line of incision or suture. Squeeze a few drops of gasoline on the adherent dressing and you will find that it can be readily detached. If you want to remove sutures from the wound, and they are masked by iodoform and exudations from the wound, gasoline on a wipe, gently applied, will clear your field. It dissolves iodoform and the exudation from the wound and then immediately evaporates, leaving a clean, dry surface. You can readily find your sutures and remove them.

The use of gasoline, not only as a detergent for primary cleansing of traumatic wounds, but also in all subsequent changes of dressings, has been to me original, but I have no doubt that some other members of this Association have been using this substance. But if any of you have only used gasoline as the primary detergent in traumatic wounds, let me urge upon you to use this material for preparing the field for operation, in suitable cases, and the cleansing of wounds in all subsequent dressings.

One word of caution in using gasoline: The vapor from gasoline is highly inflammable. It should not be used in quantity near an exposed light. If it gets into cavities such as the ears or eyes, it is painful as chloroform or alcohol would be.

It is unsuitable only in wounds where it can not evaporate rapidly, and so cannot be used in the abdominal or other cavity of the body, but is useful in cleansing the sutured wound in the abdominal parietes, immediately after operation, and in all subsequent dressings.

I would, before closing, just repeat:

1. That gasoline does not irritate fresh wounds or granulating surfaces.

2. It evaporates immediately, and leaves a clean, dry surface.

3. It is sterile

4. It renders the part to which it has been properly applied surgically clean. I often use a pledget of cotton soaked in gasoline to wipe instruments or needles, if I have any doubt of their being sterile; and now it remains for me to thank you, gentlemen, for your very kind indulgence.

ATHETOSIS, OR MOBILE SPASM.

BY ALEXANDER McPHEDRAN, M.B.,
Professor of Medicine and Clinical Medicine, University of Toronto, etc.

THE following case presents the condition of athetosis, or mobile spasm, in an extreme degree. She came under my care at the Hospital for Sick Children, in September last, and the notes of her case have been kindly made for me by Dr. H. S. Hutchison, my house physician.

FIG. 1.

M.J., aged 3½. Her birth was difficult and lengthy, but no instruments were used. At four months of age she had severe diarrhœa, with convulsion after convulsion; life was despaired of. After this she could not suck her fingers as formerly, owing to not being able to raise either hand to her mouth.

FIG. 2.

Present Condition.—The child is very small and rather poorly nourished. The head is well formed and fontanelles closed. The mental condition is poor; she makes no attempt to speak, and pays little heed to what is going on. Her attention can be attracted, but cannot be held. The pupils are unequal, the right one being the larger. They react to light and distance. She is difficult to feed, as she has little control of the muscles of mastication and deglutition, so that the food has to be placed well back in the mouth. The teeth are poor, the central incisors being short, broad, and with projecting sharp corners. The posterior muscles of the neck are weak, so that the head is maintained in an upright position only if placed a little behind the middle line; if it comes to or forward of that line, it drops suddenly on to the chest. (Fig. 1.) The chest somewhat pigeon shaped; breathing irregular, breath being held in at intervals. The heart is normal. In the arms the muscles are flaccid, but fairly nourished; there are frequent uncontrollable movements of the arms. These movements are most marked in the hands and fingers. (Figs. 2 and 3.) There is very little power in hands. She has

FIG. 3.

more power in the legs than in the arms. Muscles are fairly well developed and generally in a spastic condition, but are sometimes in a flaccid state. She can stand, but requires to be steadied. In walking she lacks the power of co-ordination. The legs participate in the athetoid movements to some extent, the toes chiefly, but to a less degree than the fingers. Knee-jerks are slightly exaggerated: there is no ankle-clonus. The athetoid movements are present sometimes during sleep. Sensation is considerably impaired. Urine and feces passed automatically. The muscles of the arms, back and legs react normally to induced current. Temperature is quite irregular, often rising to 101° F.

Remarks.—Athetosis, or mobile spasm, occurs in a variety of cerebral lesions, but only after a lapse of some months, or even a year or more from the time of the lesion. In this child's case there was, doubtless, injury of the brain at the birth, although no signs of it were observed until after the convulsions, when she was four months old. The movements are bilateral, as is usual in cases of birth palsy. The muscles of respiration appear to be affected also. The spasm does not cease completely in sleep. Her mental condition presents very little more than the vegetative aspect of life.

HYPEREXTENSION OF THE SPINE IN THE TREATMENT OF THE PARALYSIS OF POTT'S DISEASE.

BY H. P. H. GALLOWAY, M.D.,

Surgeon to the Toronto Orthopedic Hospital; Orthopedic Surgeon, Toronto Western Hospital; Orthopedic Surgeon, Grace General Hospital; Member of the American Orthopedic Association.

ALL surgeons who have seen many cases of spinal caries have observed that a considerable proportion of these cases are complicated by paraplegia. The paralysis usually comes on gradually, and as a rule is purely motor, sensation being unaffected. Exceptionally, however, there may be partial or complete anesthesia also. The degree of motor paralysis varies from slight diminution of the normal muscular vigor to complete loss of voluntary power. The reflexes are usually exaggerated, there may be severe muscular spasm, and in bad cases there is loss of control over the sphincters of the rectum and bladder. It is generally accepted that the most frequent cause of the paralysis is compression of the spinal cord due to thickening of the meninges with inflammatory products. Compression of the cord may also result from an abscess, from a sequestrum or from edema. As a rule paralysis is not the result of direct compression of the cord by the softened and collapsed vertebræ, for many cases in which the deformity is extreme have no paralysis, and on the other hand paralysis may precede the appearance of deformity. Nevertheless, direct compression of the cord by the softened and collapsed bones sometimes does occur.

Inasmuch as in the vast majority of cases the paralysis of Pott's Disease is spontaneously recovered from, surgeons have usually contented themselves with expectant measures of treatment, securing as thorough fixation and protection of the spine as possible by rest in bed, accompanied sometimes by the employment of traction and counter-traction. In some cases the various forms of mechanical support, together with such general measures as may be indicated, are depended upon, without confining the patient to the recumbent position. Exceptionally, in cases resisting these conservative measures, relief of the pressure on the cord has been essayed by the operation of laminectomy; or, with the same end in view, attempts have been made to evacuate deep-seated abscesses, loose pieces of bone or masses of tubercular debris. These surgical measures occasionally have realized brilliant results, but more frequently there has been only temporary alleviation of symptoms or no improvement at all, while in not a few instances such operations have proved fatal. When, three or four years ago, Calot made the first report on his attempts at the forcible reduction of the deformity of Pott's Disease, and surgeons in various parts

of the world began to perform the operation, much interest was naturally aroused in the question of the effect of the sudden reduction of the deformity in cases complicated by paralysis. Reports of various operators have made it clear that, however doubtful or uncertain the ultimate results of this somewhat heroic operation may be in uncomplicated Pott's Disease, it is at least a valuable resource in some cases accompanied by obstinate paralysis.

In many cases, however, equally favorable effects on the paralysis may be secured by much simpler and safer means. In 1899, in a paper read before the American Orthopedic Association, Joel E. Goldthwaite described an apparatus for maintaining the spine in a hyperextended position during the application of a plaster-of-Paris jacket. Essentially the apparatus consists of a gas-pipe frame, 6 feet long and 2 feet wide, with such adjustable attachments that a patient can be placed upon it so that practically his whole weight is borne upon the kyphos. Goldthwaite devised this apparatus for the purpose of maintaining the best possible position of the spine after the forcible reduction under ether until the plaster jacket was applied; but it was soon discovered that, in a very large proportion of cases the preliminary forcible reduction of the deformity was unnecessary, and that when the patient was placed in the apparatus the weight of the body in the hyperextended position of the spine induced by proper adjustment in it was sufficient to effect reduction. In pursuing this method of reducing the deformity, it was noted as an almost constant occurrence that in cases complicated by paralysis, even of very severe type, a most remarkable improvement was realized. The return of power to the paralyzed muscles was moreover so prompt, occurring in some cases while the patient was still in the apparatus, that the possibility of the improvement being a mere coincidence was completely ruled out, and there could be no doubt that the relief of the paralysis was due entirely to the altered position of the spine. Similar results were obtained by other observers who adopted the same plan.

Upon examining Goldthwaite's method, it is apparent that in principle it is as follows: The patient is supported on a fulcrum placed directly under the kyphos, and at the same time the spine is hyperextended by allowing the portions of the body above and below the kyphos to sag downward by their own weight until they come in contact with supports placed on a lower plane than the fulcrum; in other words, the body is simply bent backward over a support placed beneath the deformity; in this hyperextended position a retentive plaster dressing is applied. This principle may be employed in certain cases while the treatment of the disease by recumbency is being carried out, and with very gratifying results.

W. F., aged 3 years, was referred to me by Dr. Sherk, of Cheapside, in June, 1899. The child was unusually large and

well developed for his age, but was somewhat anemic. Upon examining the spine, a prominence corresponding to the 8th, 9th and 10th dorsal vertebræ was easily discernible. The deformity had been steadily increasing for some time. There was complete loss of power of voluntary movement of both lower extremities, which had existed for several months, having come on shortly after the first spinal symptoms appeared. Urine and feces were voided involuntarily, but owing to the age of the child it was not possible to ascertain with certainty that this was due to paralysis. The child was admitted to the Toronto Orthopedic Hospital and placed upon a gas-pipe frame about four feet long by 20 inches wide, over which canvas had been tightly stretched. This frame was put into an ordinary hospital cot, and so arranged that the upper end, corresponding to the child's head, was elevated about one foot higher than the lower end, thus forming an inclined plane. By means of a suspension halter grasping the chin and occiput and fastened to the upper end of the bed, the tendency of the child to constantly slip downward on the inclined plane was turned into an efficient extension and counter-extension arrangement. A towel, with a thick pad of felt sewn in the proper place, was then drawn under the body so that the felt pad came directly under the kyphos, thus supplying a fulcrum which elevated the spine at the point of disease and hyperextended the entire spinal column. Loops over the shoulder fastened the canvas, and a towel passing over the anterior surface of the trunk, and secured to the frame, served to keep the child from turning over, or otherwise moving his body so freely as to interfere with that complete fixation which is so essential in the management of a tuberculous spine. On the third day after being thus arranged, it was noticed that the child was moving his legs and drawing them up in bed, and within a month he had so fully recovered the muscular control of his limbs that the nurses not infrequently found him with his feet hanging over the elevated sides of the cot. After a residence of six weeks in the hospital the child was removed to his home, where the same plan of treatment was continued. I saw him two weeks after his return home, and his condition was most satisfactory. The paralysis had wholly disappeared, and the symptoms indicated gratifying improvement in the bone lesion. After several months the recovery was so far advanced that, after applying a steel spinal brace, I allowed the child to sit up, and in a short time he was running around. He is still wearing this brace, which has been modified several times, and everything indicates an early consolidation of the spine at the point of disease, and a good recovery with a relatively small amount of deformity.

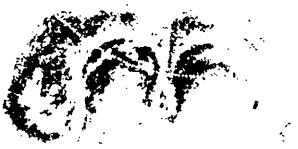
To those unfamiliar with the matter, and especially to the parents of the child, it is apt to appear a somewhat formidable undertaking to impose upon a child for weeks or months such a

degree of restraint in an unnatural position as was practised in this case, but as a matter of fact little or no difficulty is experienced. The marvellous facility with which children adapt themselves to changed circumstances could scarcely have a better illustration. Good nursing is, however, most essential, and it is especially important that the skin covering the prominence in the back should receive the greatest care to prevent its becoming sore or too tender to bear the pressure put upon it, but with proper management no serious trouble will be experienced. Here again Nature comes to our aid, and a bursa soon develops over the kyphos; but the slightly increased prominence caused thereby may at first sight readily be mistaken for an increase of the deformity.

It seems to the writer that the plan of treatment here described possesses certain commendable advantages. Recumbency has long been recognized as a valuable method of managing even uncomplicated cases of Pott's Disease. Excellent fixation of the spine can be secured by a variety of mechanical means, some eminent authorities to the contrary notwithstanding. It is quite true, however, that the complete removal of the superincumbent weight which helps to crush down the softened vertebræ and increase the deformity can not be accomplished by any mechanical apparatus that has ever been devised. Although it is true that many cases of ordinary severity do very well under efficient mechanical treatment, and that even cases complicated by paralysis may often be brought to a happy termination by the same means, the fact that the paralysis may be due to direct compression of the cord justifies the adoption of extraordinary measures to prevent the increase of deformity or to reduce that already existing. Nearly all surgeons who have tried the operation of forcible reduction agree that the difficulty is not to reduce the deformity but to prevent its recurrence. Goldthwaite reports some relapses after his method, and moreover states that in practically all cases it is necessary to cut a window in the plaster jacket over the deformity to prevent the formation of an ulcer. These facts, together with the inherent advantages of recumbency, incline the writer to believe that the plan here described, which secures the continuous combined action of recumbency, traction and counter-traction, hyperextension and direct pressure on the kyphos, is preferable to one which attempts the difficult task of maintaining the hyperextension and pressure by a plaster dressing. The writer does not claim originality in the arrangement of the patient above described. The object of the paper is to emphasize the importance of hyperextension, secured by simple means, in treating cases of Pott's Disease, complicated by paralysis, and to urge the advantages of maintaining the hyperextension by recumbency rather than by a plaster jacket.

12 East Bloor St.

THREE-COLOR REPRODUCTIONS FROM LIFE, SHOWING THE DEVELOPMENT OF THE DIPHTHERITIC MEMBRANE AND ITS DISAPPEARANCE RESULTING FROM THE ADMINISTRATION OF MULFORD'S ANTITOXIN.



First day of disease
Appearance of Membrane

Six hours after administration of Antitoxin
Showing arrested growth of membrane and beginning line of demarkation

Twelve hours later

Twelve hours after administration of Antitoxin
Course of disease checked

Twenty-four hours later

Twenty-four hours after administration of Antitoxin
Convalescence established

Second day of disease
Showing involvement of tonsils and hard and soft palate
At this stage of disease Mulford's Antitoxin was first administered

Second day after administration of Antitoxin
Showing throat resuming normal appearance

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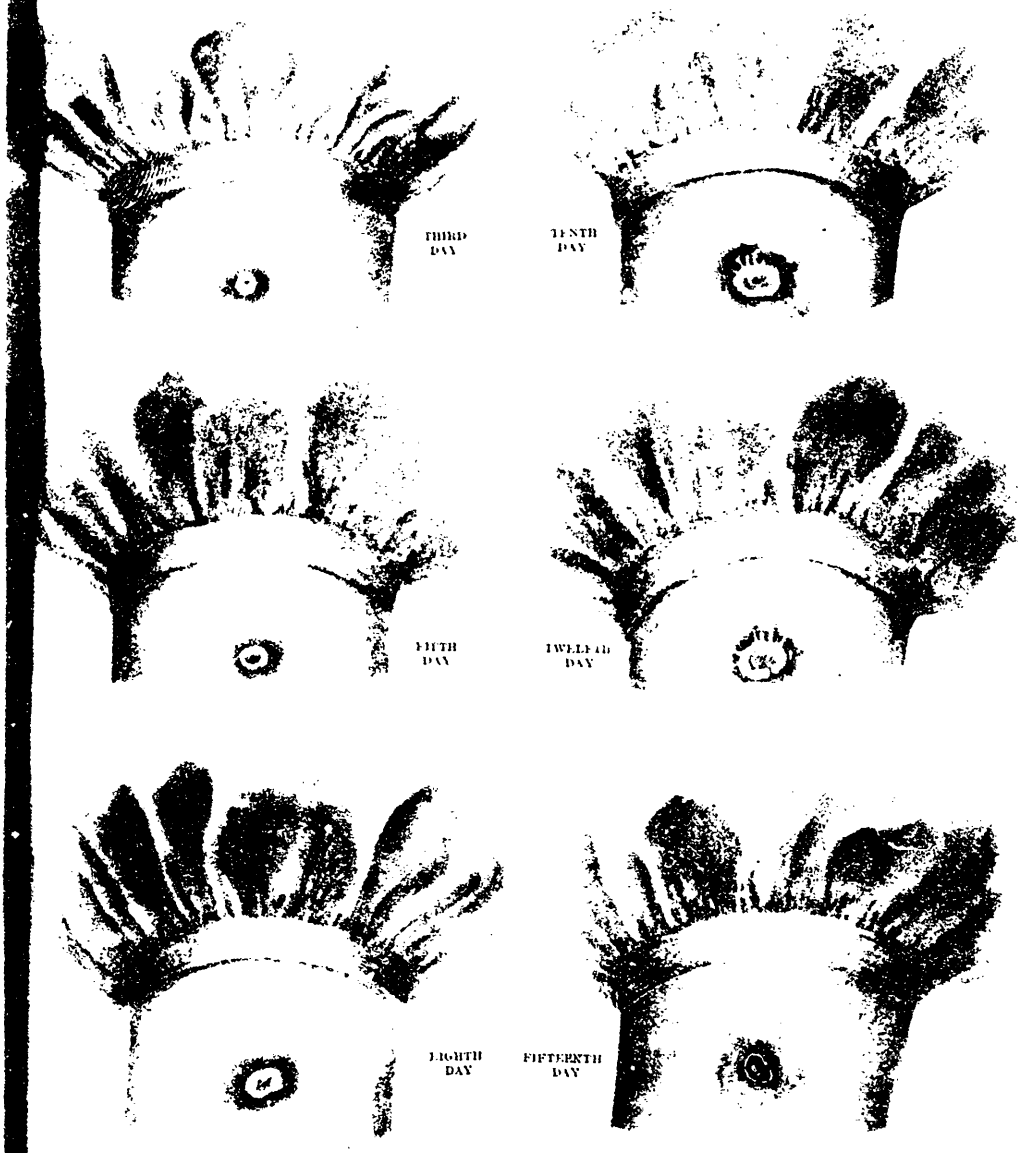
COLOR REPRODUCTIONS FROM LIFE. SHOWING CYCLE OF VACCINATION; TYPICAL VACCINE VESICLES FROM INOCULATION TO CICATRIZATION. FOLLOWING THE USE OF MULFORD'S GLYCERINIZED VACCINE LYMPH.



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Public Health and Hygiene.

. . . IN CHARGE OF . . .

J. J. CASSIDY, M.D., AND E. H. ADAMS, M.D.

HISTORY OF THE PROGRESS OF PUBLIC HEALTH DURING THE CENTURY—1800-1900.*

BY PETER H. BRYCE, M.A., M.D., TORONTO.

Mr. Chairman, and Members of the American Public Health Association.

LADIES AND GENTLEMEN,—It becomes my pleasing privilege as your duly elected President for the year 1900, to express to you my deep sense of the honor conferred upon my country and myself, as her representative, through your generous act. To have been called upon to preside over the deliberations of a Congress, which is engaged in studying questions of vital interest to three nations and to ninety millions of people has, indeed, served to impress me not more with the magnitude of the work we are engaged in than with the limitations of my powers to adequately fulfil the duties and responsibilities which the position involves. Allow me, therefore, ladies and gentlemen, to bespeak for myself your generous indulgence and kindly sympathy while performing the duties of your presiding officer; and for my excuse in those matters wherein I may fail, I must take refuge under that time-honored excuse expressed in the words of the old Latin poet:

> "Si possem sanior essem,
> Sed trahit invitam nova vis, aliudque cupido
> Mens aliud suadet: video meliora proboque
> Deteriora sequor."

With the passing of more than a quarter of a century since the first annual meeting of this Association, many of its earlier members have ceased from their labors; but it becomes my official duty to record the untimely deaths of several members who have passed away while still in the prime of life.

I recall the names of Edward Oram Shakespeare, M.D., of Philadelphia, Penn., of George Edom Coulthard, M.D., of Fredericton, New Brunswick, of Henry Cooper Crouch, M.D., of Denver, Colorado, and of E. A. Guilbert, M.D., of Dubuque, Iowa.

* Annual address of the President of the American Public Health Association.

To mention the name of Dr. Shakespeare is but to present to the mental vision the author of that classical work on cholera, which has supplied us with so comprehensive an outline of the conditions which have governed in the past, and still are largely present in outbreaks of this scourge of former times.

I can well recall Dr. Shakespeare, as he labored at quarantine on the Delaware, associated with state and municipal officers in 1892, to protect his city and country against the threatened invasion of this disease. Since then his kindly and genial presence was with us at our meeting in Philadelphia in 1897. His demise has seemed sudden to many, who knew nothing of his illness until his death was chronicled on June 1st.

Of Dr. Coulthard, the Secretary of the Provincial Board of Health of New Brunswick, it might be said that all who have known him during the last five years, during which he has regularly attended the meetings of the Association, will retain a recollection of him as a gentlemanly but retiring man, but who proved on acquaintance a genial friend and an enthusiastic officer of health. His work was well known and appreciated in his own Province, while his activities as a physician and citizen in Fredericton were spoken of most favorably by the local press. In him the public health service in Canada loses an active and conscientious worker, and this Association a loyal member.

Of others who have passed away, the Association has had less opportunity of learning their worth. The positions, however, which they have held in their own state and city, have marked them as active workers in the field of public medicine, and they have passed *magna cum laude* to their rest with the honored dead.

But while I recall the memory of our dead, I take this opportunity of expressing as their official mouthpiece, the sense of pleasure which the members of this Association may fairly indulge in as they find themselves greeted by the living representatives of this beautiful city in a State in what is rapidly becoming to us the older West. I am not exactly informed as to just at what age an American State attains its majority; but I take it that any State that has presented a President to the nation—and such a President as Benjamin Harrison—must be looked upon as having arrived at years of full maturity.

The Association trusts, however, that even a mature State may still find something of value to be obtained from having its sessions held in its capital city; and in return its members hope to bear away with them memories, not only of kindly welcome and generous entertainment, but also evidences of the application of science to public health problems in a manner often more easily carried out than where the traditions of the hoary past still linger.

The Association feels sure, however, that in a State whose

earliest boundaries, indeed, were embraced in those two wondrously euphonious words, "Ohio, the Beautiful," and "Ouabache, the White," its members will experience from her citizens every kindness which can spring from those who live constantly under the beneficent tutelage of the good deities of two such beautiful streams.

It has become the established custom of past years to summarize in the presidential address some of the more important phases of public health work, which have attracted scientific attention during the year preceding each annual meeting. The past year, like those which have preceded it, has also presented matters of interest, which might with profit be referred to; but as such will naturally engage our attention in the several papers to be presented at subsequent sessions, I have deemed it not inappropriate to attempt a survey of public sanitation as embraced in the history of social and scientific progress during the century just closing; and can only hope that from such we may obtain some idea, however inadequate, of the truth so beautifully expressed by Emerson in his essay on "History," "That there is a relation between the hours of our life and the centuries of time. As the air we breathe is drawn from the great repositories of nature, as the light on my book is yielded by a star a hundred millions of miles distant, as the poise of my body depends upon the equilibrium of centrifugal and centripetal forces, so the hours shall be instructed by the ages and the ages explained by the hours."

In order, then, to obtain any adequate conception of the causes which have brought "Public Health" as a science to the position we find it occupying at the close of the century, we have to inquire into the influences which have been at work during the hours of the century, and of that period just preceding it, the "Renaissance," which may justly be called the birthday of modern science, and of which Carlyle said: "Behold a new era is come; the future all the brighter that the past was base."

Of it, as epitomized in the French Revolution, we may truly say that though its advent was marked by portents, agonies and birth-throes, yet there it stood an indubitable fact, with infinite potentialities, and having stamped upon its, as yet, infantile features the ineradicable birthmark, "The rights of man." For fifty years had France, England, Germany and America been sensible of the pulsations of a new being, and philosophy and science had conceived it and been its sponsors at the christening. Not, however, that in germinal force it had not existed earlier; for had not Copernicus, Kepler, Galileo, and Newton already lived and offered to the world divine gifts? But till now, as of the words of the great Moral Teacher of an earlier age, "The ears of men were deaf that they might not hear." Or as expressed by Carlyle, "Of

a truth the long demonstrated will now be done: the age of revolutions approaches, but then of happy blessed ones. Man awakens from his long somnambulism; chases the phantoms that beleaguered and bewitched him."

To none more than to the sanitarian is it evident that the ethical element or "elevation in the scale of being" must ever be the measure of social progress; and hence it is that sanitary reform is intimately associated with the history of religious, political and social development; for our motto, "*Mens sana in corpore sano,*" is but a terse expression of the fact that the science of public health relates to man in every phase of his being. Hence it becomes necessary that we review the social status of the peoples amongst whom our science took its birth, in order that we may comprehend what progress has been made.

To mathematics, whose development first gave to that oldest study, astrology, a form and meaning, stripping it of its mysteries, and enabling men to establish the first truth of science, viz., the unalterable character of the laws which govern the universe and guide the planets in their course, are we to look for the first evidences of that intellectual development which marked the "Renaissance." As a part of it began those experiments in physics, or natural philosophy, which had especially marked the genius of Galileo, who gave us some of the first crude scientific instruments, making deeper physical investigations possible. Slowly indeed were the swaddling bands of astrology and witchcraft cast off, and the reign of natural law inaugurated. But Bacon, with his marvellous powers, had taught the inductive method, and pressed forward the idea of a Scientific Society, which might give prestige to the work of original experiment, and which resulted in the Royal Society of England being founded in 1649.

By it first were published those discoveries of Newton which made the extension of his marvellous investigations possible to students on the Continent. Their supreme importance may be judged from the fact that in France we find that the greatest scholars among the Encyclopædists were all mathematicians, and that D'Alembert, Lagrange, Helvetius and others won their membership in the Academy of Sciences by theses on some subject of natural philosophy. But with the foundation built on which the superstructure of science became possible, we find the spirit of investigation spreading into every field, and though editor Diderot saw volume after volume of the Encyclopædia seized under royal interdict, yet after years he saw them published even with royal sanction, since in them the royal mistress found the method of making rouge and manufacturing silks, and the King found described the method of making gunpowder. So it came to pass that this marvellous work of twenty-one volumes became a potent

agency in developing the spirit of the New Age over both Europe and America. To it D'Alembert, Helvetius, Turgot, Buffon, Condorcet, Marmontel, Rousseau, and St. Lambert were contributors; while towering above them was patriarch Voltaire, as he was affectionately called, and of whom as philosopher, litterateur, poet and politician, Carlyle has said: "So far as present knowledge enables us to judge, it may be said that to abstract Voltaire and his activity from the eighteenth century, were to produce greater difference in the existing figure of things (1829) than the want of any other up to this day." Indeed, then, the thirst for knowledge may be said to have become a universal passion, and it is stated that at this time the sale of books in Paris was four times as great as in London. Remembering, as Lecky writes, that "In France absolute monarchy had destroyed all liberty and all opposition; and having prevented a school of practical reformers, politics came to be treated like a problem in geometry or ethics, to be worked out on general principles with a complete disregard to the traditions and the special circumstances of the nation," it is little wonder that Rousseau's "Contrat Social" came to be looked upon as a new gospel, and for the influence it exerted we must class it with Adam Smith's "Wealth of Nations." How could it be otherwise when it set forth what were then new ideas, but to us now mere axioms: That (*a*) Society originally was formed for the protection of the lives and property of those composing it; (*b*) That to live in peace and security was the right of individuals; (*c*) To this end certain organizations and laws were necessary; (*d*)That as to do this costs money, equalized taxation was necessary and majorities should rule. The outcome of such teachings to a people to whom science was revealing the marvellous secrets of nature, and teaching a uniformity of laws, and the dominance of intellect is obvious. Of that ever memorable 4th of May, 1789, when Versailles saw the convocation of the States General, which had not met since 1614, in a country where existed "no Habeas Corpus Act, no liberty of the press, no legalized religious liberty, no trial by jury, and no national representation," Carlyle says: "It is the baptism day of Democracy; sick Time has given it birth, the numbered months being run. The extreme-unction day of Feudalism, a superannuated society decrepit with toils, . . . is now to die; and so, with death-throes and birth-throes, a new one is to be born." Amidst all the horrors of that revolution, which advanced with lightning rapidity, there is to be observed the influences that preceded the Renaissance, regarding which Talleyrand remarked: "He who did not live before 1789, has never known the charm of life." As expressed by Lecky: "The study of physiology, botany, comparative anatomy and electricity advanced with gigantic strides; and in the enthusiasm which prevailed, it was imagined

that physical science would soon unlock the secret of the Universe and disclose the mystery of life."

Lavoisier laid the basis of the science of chemistry, and Fourcroy by popular lectures made its study fashionable; Petit taught anatomy, Nollet electricity, and Arago astronomy; while Laplace in his "Celeste Mechanique," gave to the world his nebular hypothesis, which at the end of this century still stands for us as a working theory of the evolution of the Universe. And even though Mongolfier excited the wonder of the people by his balloons, and Mesmer cloaked a scientific fact with charlatanism, while Count Alessandro di Cagliostro, by profession healer of diseases, abolisher of wrinkles, friend of the poor and impotent, Grandmaster of the Egyptian Lodge of High Science, spirit-summoner, gold-cook, Grand Cophta, Prophet, Priest, and thaumaturgic moralist and swindler, exploited the ladies of three courts, only to come to grief at last over the theft of the diamond necklace; yet there is the immanent fact that in the councils of this period of maelstrom ferment, when so many noble men were sucked into the vortex, there was a galaxy of earnest spirits filled with a love of truth, greater probably than was ever before gathered in the parliament of any nation.

It was as the Golden Age of Greece in art, or the glories in literature of the Elizabethan period. Turgot, writer on economics, was Minister of Finance, and Helvetius, the mathematician, was Director of Forests and Farms, and developed scientific agriculture. Laplace was a Secretary of State under the National Convention, while Lavoisier, whom the German, Wurtz, has called the father of French chemistry, was, in the words of Lalonde, "to be found everywhere." And with what good reason amongst a people where the search after scientific truth was at fever-heat in every department of life. It was as when the prisoner comes from the close dungeon into the free air of heaven; he breathes deeply and again for fear he may lose it. The situation is epitomized in the life of Lavoisier, a model of what the man of science may and ought to be. Born in 1743 of wealthy tradespeople, he has had all the early advantages of the schools of his time, studied mathematics, astronomy and botany assiduously, and become so absorbed in Natural Philosophy that at 23 years of age he gained the gold medal at the Academy of Sciences for a thesis on "Lighting of the Streets of Paris." He analyzed gypsum, and is soon found touring France with Guellard and making a geological map, subsequently publishing "Memoires sur couches des Montagnes." At 26 years he was made one of the Farmers General, in order that his resources for advancing scientific study might be increased. Imagine such a possibility to-day! He soon overtook the pneumatic studies of Black, Cavendish, and Priestley, checked their

errors and added to and gave form to their studies on air. Weekly experimental laboratory reviews of work done were carried on by him with Laplace, Mayer, Berthollet, and Fourcroy. In 1778 he gave to Priestley's dephlogisticated air the name of oxygen, meaning thereby the acidifying principle. In 1784 he analyzed water; in 1781 synthesized carbonic acid, thereby making the first advance towards the analysis of organic substances, and in 1787 published "Methode de Nomenclature Chemique," a system of nomenclature which lasted for fifty years, and is the basis of that still in use. In social reform, as a Farmer General, he succeeded in having many oppressive taxes of the people removed, even from the Jews of Metz.

In 1776 he was made the director of powder-works by Turgot, soon quadrupled the output, and improved by one-third its explosive power. It was Lavoisier who made the chemical balance the *ultima ratio,* and hence established the basis of quantitative analysis. He analyzed soils and manures, and even doubled the product of his own farm. In 1787 he was the philosophical statesman of the Provincial Assembly of Orleanais.

In 1789 he reported to the National Assembly on "Caisse d'Escompte," and in 1790 sat on "The Commission of Weights and Measures;" while in 1791 as Commissioner of the Treasury, he established a system of accounts hitherto unequalled; and soon he was asked to write a treatise on taxation, and wrote "De la richesse Territoriale de la France." And now the political eclipse! On 2nd of May, 1794, Dupin, in the National Convention, brought some frivolous charge against Lavoisier, and six days afterwards he, with twenty-seven others, went to the guillotine, the brutal reply to a petition for a reprieve being, "The republic has no need for savants." Well were it for progress if the words of Lagrange regarding Lavoisier, were in these days of political *bouleversements* "writ" large everywhere. "Il ne leur a fallu qu'un moment pour faire tomber cette tete, et cent annees peut-etre ne souffiront pas pour en reproduire une semblable."

But enough has been said to fully illustrate those widespread intellectual and scientific movements, which, springing up so largely in France, spread even to the courts of Germany and Italy, and to the aristocratic throne of the Czars, and which laid the basis of the marvellous progress in practical science of the 19th century. Nor must it be supposed that these influences extended only to the progress of the pure sciences. Foundling and Magdalen Hospitals were founded, Abbe de l'Epee invented an alphabet for the blind, and Houay founded an institution for the deaf and dumb, and asylums were opened for the insane; while Frederick the Great made education almost compulsory in Prussia.

To England must we now look and examine a current of influ-

ences arising from allied but different causes, and productive of a social progress based, perhaps, on a less exact intellectual and scientific foundation, and more on what may be called the practical social needs of a people. The deep-laid religious convictions of their ancestors, who in a previous century had struggled for religious and political freedom at a time when France was under an absolute despotism, and which culminated in the Civil War and the Commonwealth under Cromwell, and the subsequent Revolution of 1688, with the establishment of a new dynasty on the throne, had never been lost or seriously dissipated, especially among the agricultural and industrial classes, whether of England or her great colonies in America. It is true that the parties of the early part of the 18th century exhibited every shade of political corruption; but the idea of the liberty of the subject and of the constitutional limitations of the Crown, growing out of the Witanagemot of the old Saxons, was never lost; while the growth of colonies and of sea-going commerce kept alive a spirit of enterprise and independence of thought, which received added strength from the marvellous industrial progress of the latter half of the 18th century, due to the mechanical inventions which gave England that financial prominence which has marked her course through the 19th century. The French intellectualism of the "Renaissance" found a congenial soil for its growth among the descendants of the Pilgrim Fathers and the Virginian descendants of those emigrants who for two centuries had breathed the free air of a new world; while the outcome of the War of Independence gave to a decadent Toryism in England its *coup-de-grace.*

Such were the influences which enabled the younger Pitt, Premier of England at twenty-five years, to be surrounded by men of unusual intellectual strength, and which carried England safely through the trying years of the French Revolution and the Napoleonic wars; while by France the world was taught very many lessons of what a people once in thrall may become and do, when, imbued by the truths of the "Contrat Social" and the "Rights of Man," they strike for individual and national freedom. England had with the growth of the colonies and the founding of the new empire in India, been developing her commerce during the reign of the first Georges; but this progress became rapidly accelerated from 1750 onward, owing to several remarkable mechanical inventions in manufacturing machinery.

Of these, the inventions for the manufacture of cotton goods were the greatest in their immediate results. The stories have often been told of how Hargreaves invented the spinning-jenny, and Arkwright increased by the use of rollers many times over the amount of yarn made, and of how Cartwright made the power

loom and cylinder presses for printing cotton goods; while the improvements of Watt, once a Scotch watch-maker, in the steam engine, making almost the very machine we see to-day, which enabled Arkwright to run his machines by steam, and engineer Rennie to set the wheels of the great flour mills revolving by the same agency, are familiar to all. If to these we add the improvements made in the manufacture of iron and the extension of the use of coal, and the construction within a few years of miles of canals, making cheap transportation, we may understand some of the principal influences which gave pre-eminence to England in commerce, while entirely altering both her internal economic conditions and her foreign policy. Manchester, Liverpool, and Glasgow sprang from small towns into cities, and agricultural England by the end of the century had become a country of large urban populations, with mercantile fleets upon every ocean. Indian nabobs returned home to spend their millions of rupees, and with the rise of wages were begotten higher modes of living, associated with a sense of educational needs, all stimulated by the intellectual renascence on the Continent. What this industrial expansion means may be gathered from the fact that within the 40 years up to 1840, the number of those engaged in the cotton manufacture in England had risen from 80,000 to 883,000; while the population of Lancashire alone, during the 18th century, rose from 166,200 to 672,000. To-day it is over 4,000,000.

To these causes, briefly summarized, are we to look for the beginnings of what we now call State Medicine, of which England has during the 19th century been the most fruitful field. Up to the end of the century, the sudden expansion of her foreign trade, owing to these discoveries, and the high prices consequent upon the Napoleonic wars, created such high rates of wages and so great general prosperity, that the sanitary evils which were so rapidly growing up with the development of the Factory System, were as yet hardly noticed. But the escape from a calamity such as had overtaken France in the National Revolution, had accelerated what is called the "Evangelical movements" (so large a factor in educating the national conscience in England), to a sense of the truth of the Scripture, "that man is his brother's keeper." Associated with the younger Pitt, the model of the domestic statesman, as a personal friend, was William Wilberforce, whose broad christianity and sound common-sense served to make him the first social reformer, whose energies as a legislator were definitely devoted to the amelioration of the condition of his fellow-men; while being supported outside by the Society for the Abolition of the Slave-trade, amongst whom the Quakers were the most active. Public meetings were held and statistics were carefully collected to show the inevitable horrors of the traffic. Wilberforce presented in 1788, no

less than 13 petitions to Parliament, praying for its abolition; and the first steps were taken in that year to mitigate the horrors of the ocean passage. The opposition was great and the fight prolonged. But that strong practical conscience of England, which time and again has forced Parliament to act, as in the Reform Bill of 1831, and the repeal of the Corn Laws in 1846, had been aroused; and the people proved their sincerity by multitudes refusing to use sugar, as being a product of slave labor. This education of the public conscience by public meetings, was now for the first time becoming a normal instrument of politics, and of such influence under popular government we, in our day, are fully convinced.

This anti-slavery crusade was but another phase of a work, which may be looked upon almost as the first attempt at sanitary reform, viz., the investigations of the prisons of England and the Continent by John Howard. First captured at sea in 1756 by a privateer and sent to a French prison, he had personal experiences of the abuses which existed; and in 1753 as High Sheriff of Bedfordshire, he had ample opportunities of studying the prisoners under his charge. Till his death in 1790, prison reform became his life-work, and to Britain and the countries of Europe he revealed a mass of mal-administration and atrocious treatment, which made the most indifferent assume an interest. Insufficient food and starvation, only prevented by private charity, no sewers, no infirmaries, and no means of warming prisoners, and almost no water, was a rule to be found; while prisoners were crowded "in dark, subterranean dungeons, reeking with pestilential effluvia." In most prisons there was no allowance for bedding or straw to lie on, which, even if obtained, was not changed for months. There was almost no ventilation, owing to the window tax; and so vile was the air "that Howard declared that after visiting the prisons his clothes were so impregnated that he could not bear to drive in a post-chaise with closed windows." Naturally in such a place human life rapidly withered, and scurvy was deadly; while typhus, called gaol fever, raged with such virulence that more prisoners died from it than from the gallows, while prisoners if discharged became sources of contagion wherever they went.

Many gaols were private property, and here, as in too many public ones, evils of even a grosser kind prevailed, for chains, iron collars, and even iron bars removed by brutal gaolers only for bribes were in use; while lunatics were often added, making pandemonium of Tartarus. Old and young, male and female, were indiscriminately huddled together, and prisons for punishment became schools for vice. Such conditions seem to have been worse in England than in some other countries, as Holland and Switzerland, where Howard was told that gaol fever did not exist. Though Pitt recognized the evils and need of reform as pointed out by

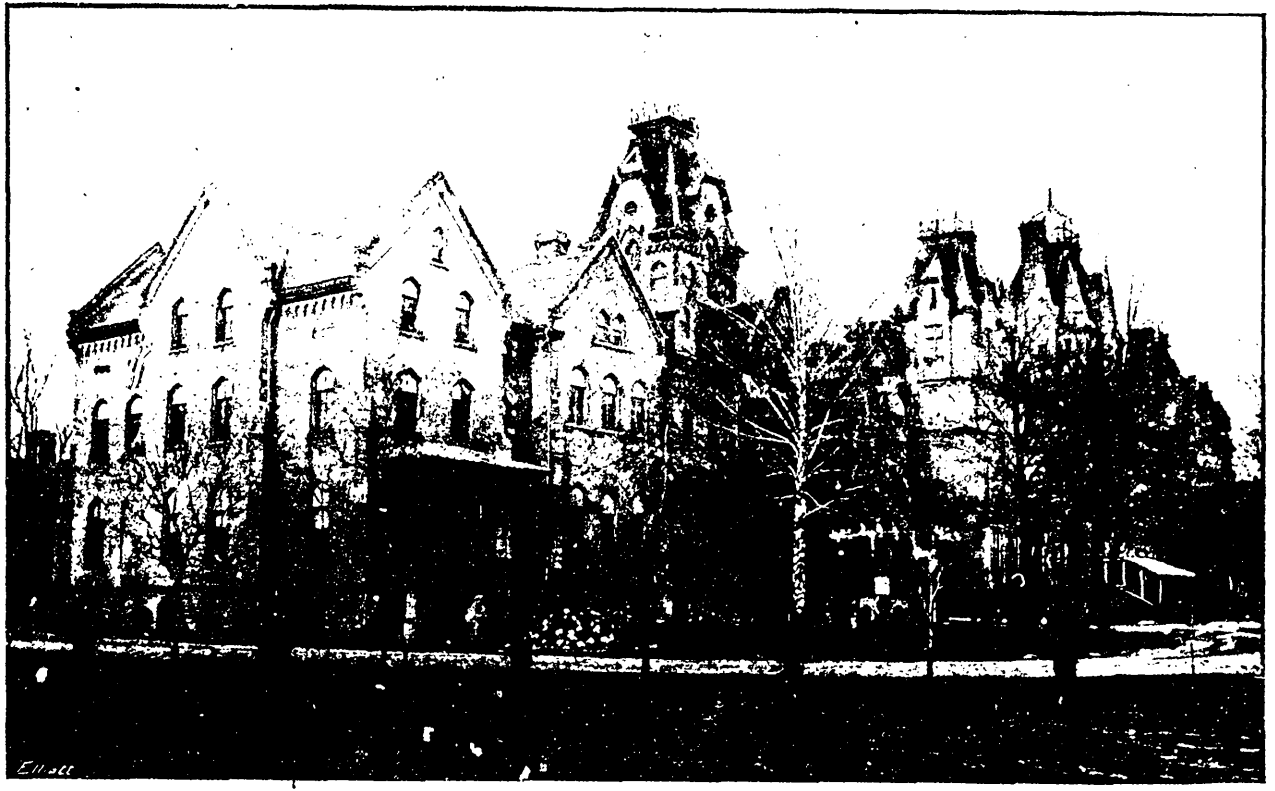
Howard, yet but little was accomplished until the times of the great reforms in the third decade of the 19th century. Reference has been made to the great and rapid development of factories and the aggregation in towns of a population largely rural. One of the greatest evils resulting from this was the employment of cheap child-labor, so many men being drafted away to the continental wars. Indeed, so completely did the great Pitt misconceive the situation, that in speaking about the laboring classes he pointed out how much was got from the industry of children and the advantage of employing them at an early age. Indeed, many were sent out at ages of from six to ten years, from workhouses, and contracted for, commonly working in factories from twelve to even sixteen hours daily, as was proved by Parliamentary inquiry. Curiously, as a result of this industrial development, there took place the immense increase of negro slavery in America, which, as pointed out by John W. Daniel, of Virginia, in his famous oration on Jefferson Davis, had been protested against in 1727 by South Carolina, and prohibited by law in Georgia in 1760, while Virginia taxed every owner $10 per slave. Indeed, as remarked by Lecky, it seemed at the time of Washington "likely to be extinguished by an easy and natural process." How slow, in the face of the growing influence of the great centres of manufacture in England, was the growth of Factory Acts and Public Health legislation, we shall see as we trace the progress of the 19th century.

As regards the evolution and progress of Public Health during the present century, there would seem to be four periods more or less distinctly marking its growth, and that of those sciences which form component parts of it. These are:

1. The period of Investigation, extending to about 1830.
2. The period of Agitation, extending to 1850.
3. The period of Legislation, to 1875.
4. The period of Elaboration and Development.

We shall refer briefly to each of these.

(To be continued.)



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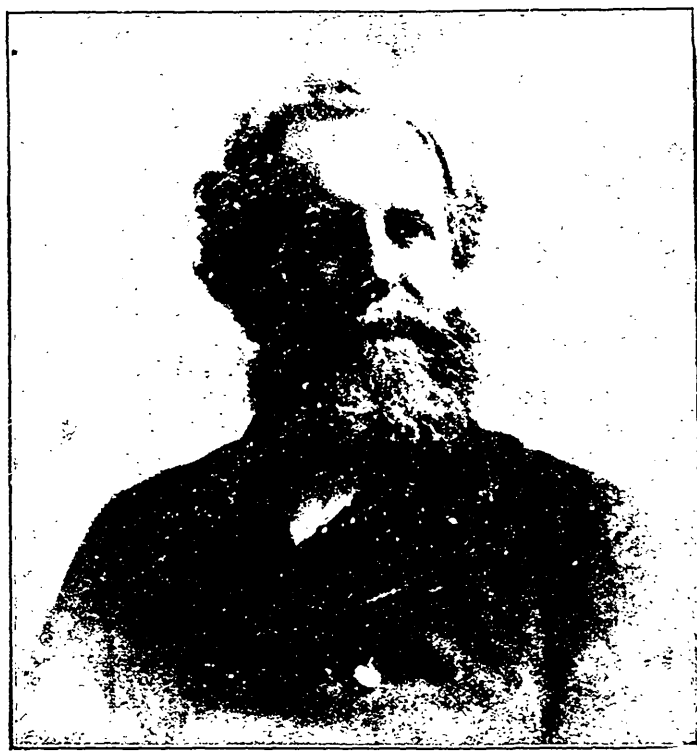

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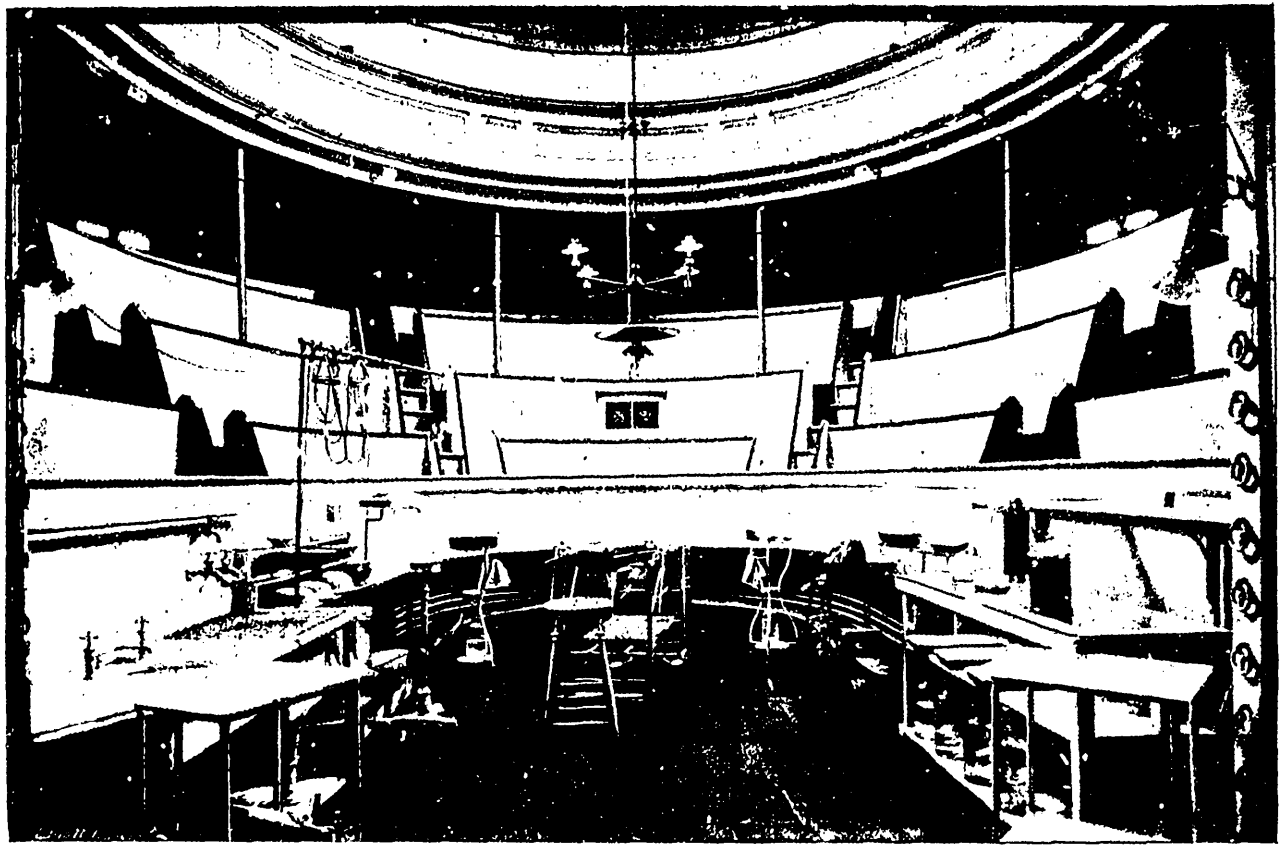

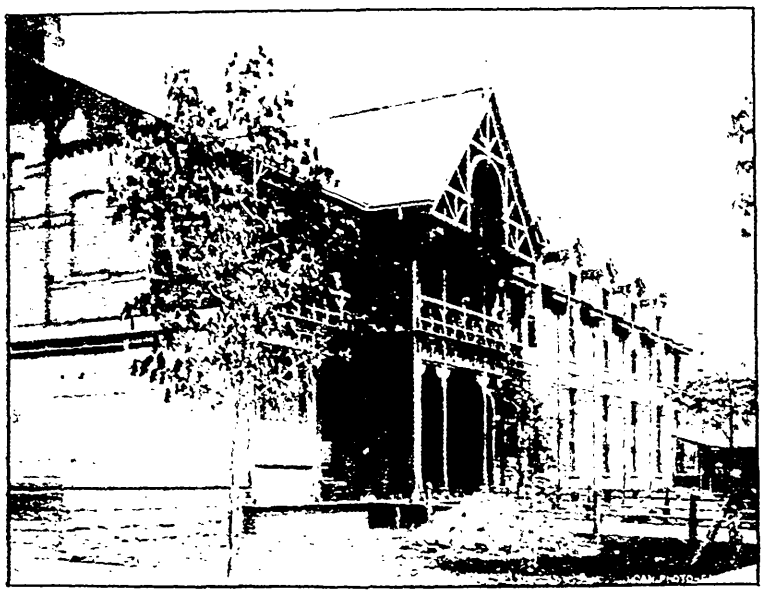

THE PAVILION FOR DISEASES OF WOMEN, TORONTO GENERAL HOSPITAL.

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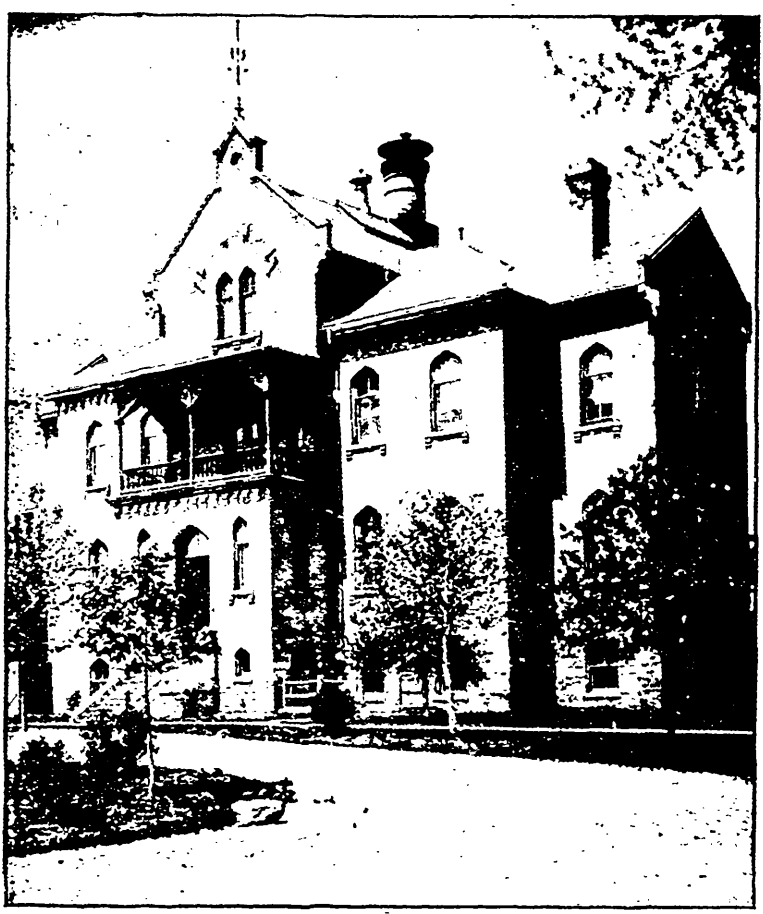

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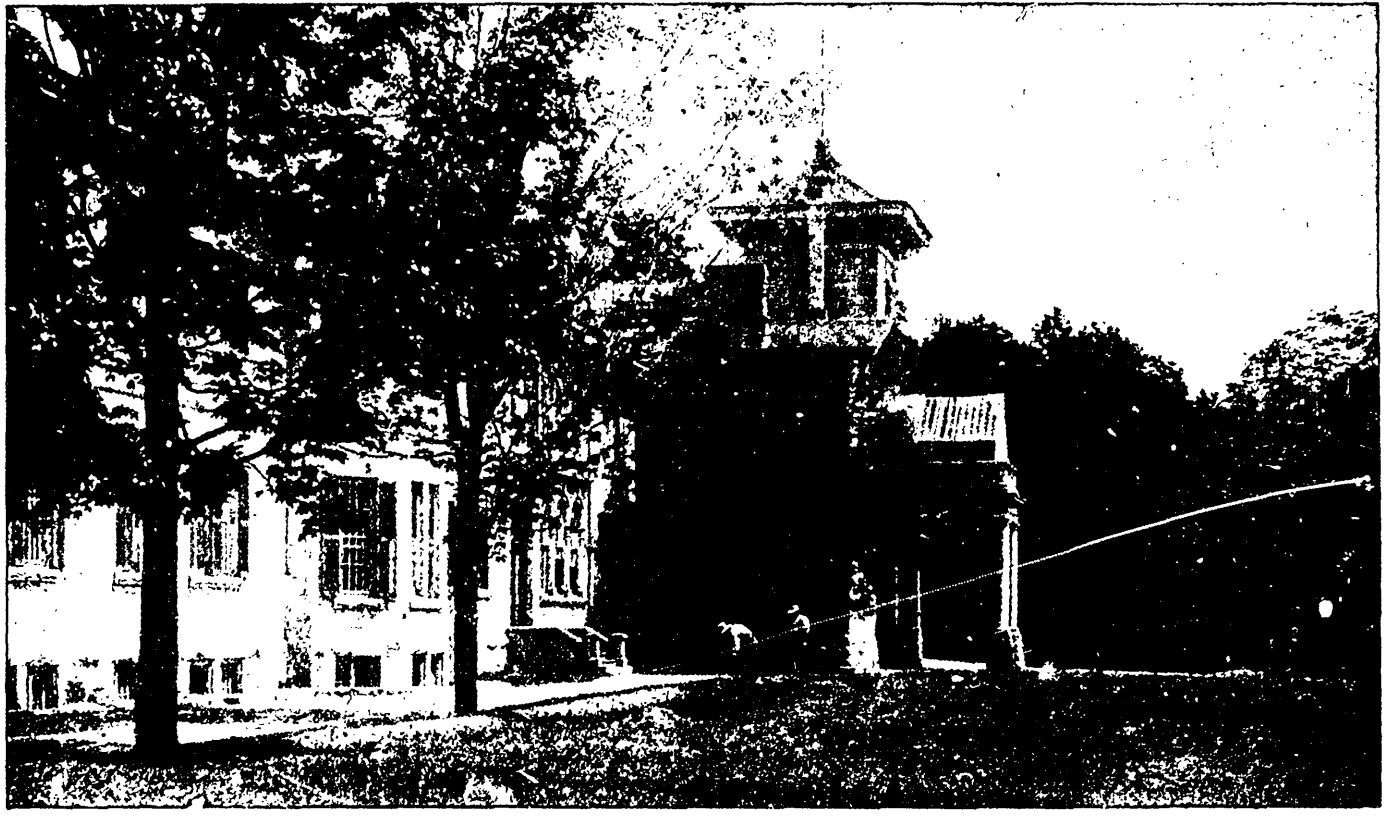

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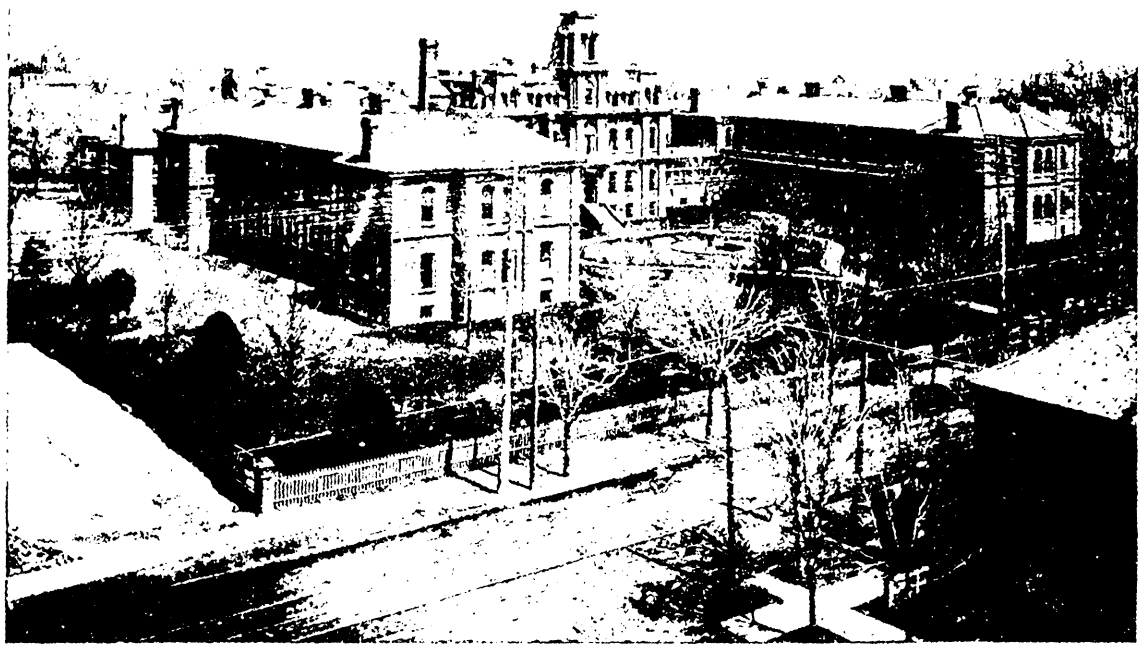

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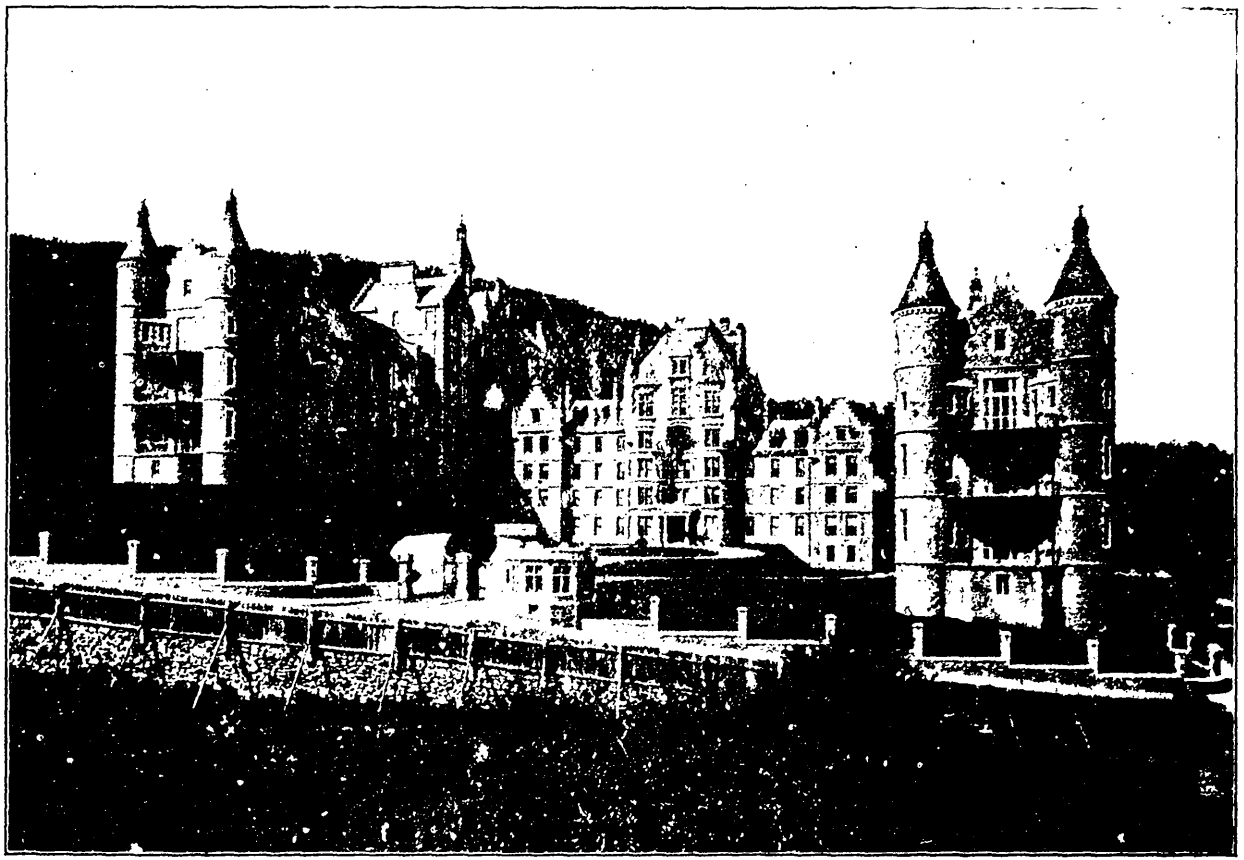

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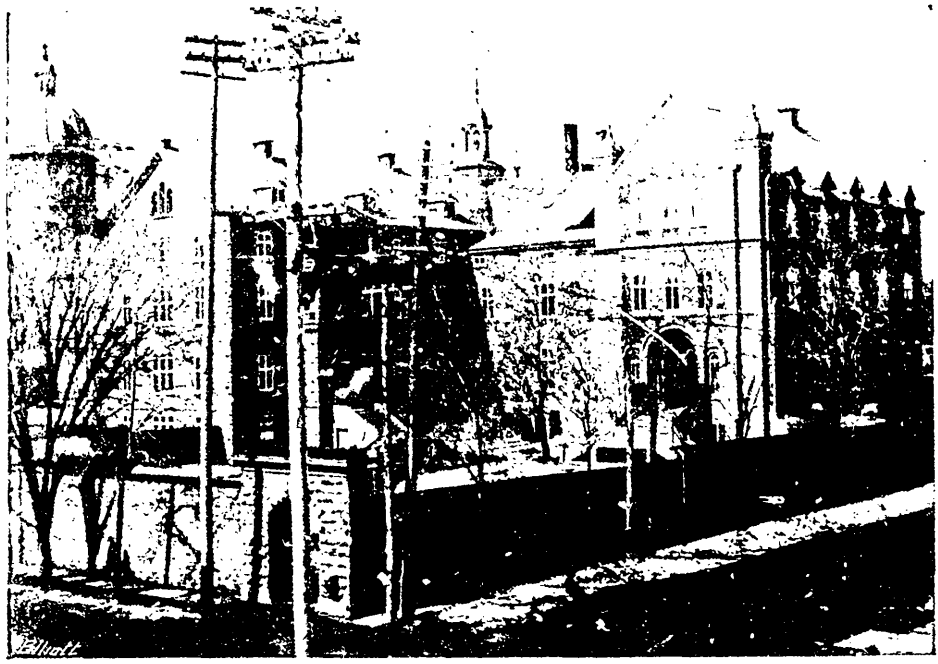

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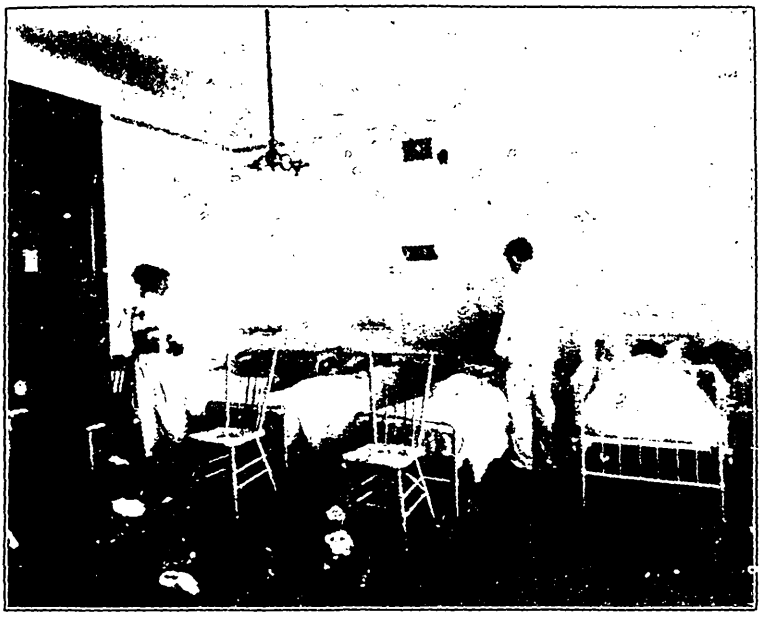

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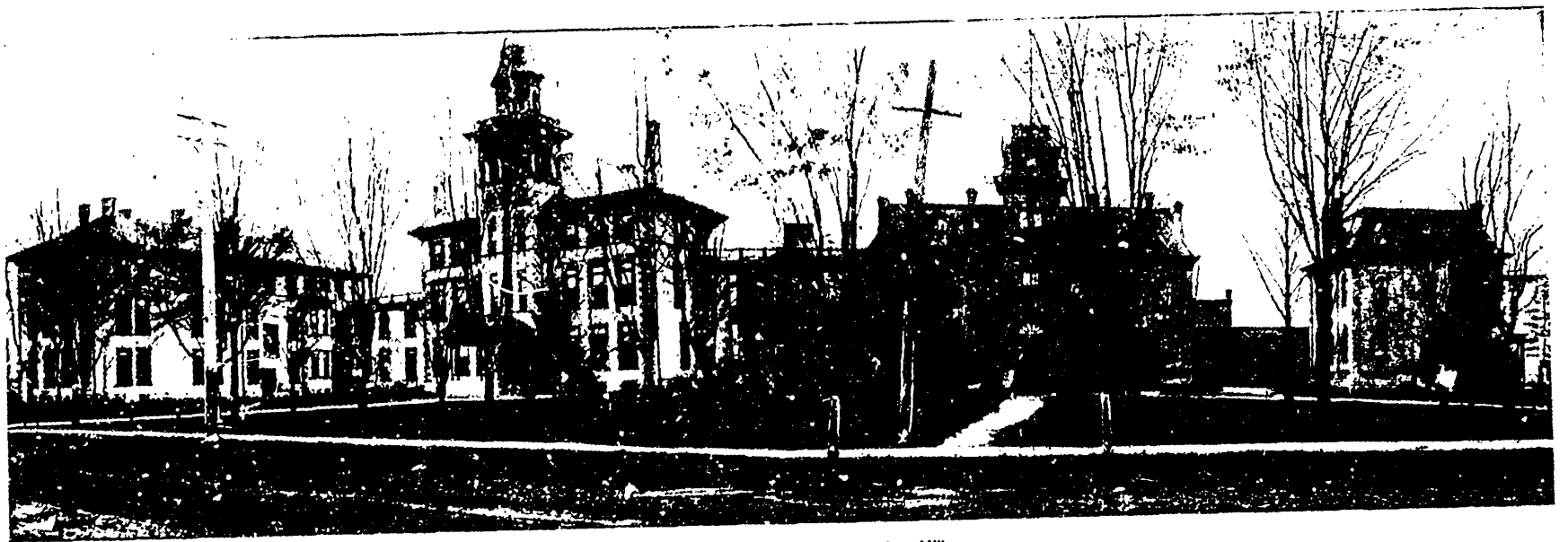

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Editorials.

RETROSPECT OF MEDICINE DURING THE NINETEENTH CENTURY.

Now that we must say far well to the era of light and look forward to the unknown, a brief review of important discoveries in medicine during the last hundred years is in order. And as the field is very large, we shall confine ourselves to indicating some of the more notable discoveries and improvements in the domain of internal

medicine. But, even at the start, it must be acknowledged that medical science is under heavy obligations to men who were not physicians. Thus, at the dawn of the century, an English chemist, Humphrey Davy, discovered nitrous oxide, electrolysis, the metals potassium and sodium, and the miner's safety lamp, while in 1819 the laws of the phenomena of electro-magnetism were discovered by Professor Oersted, of Copenhagen, and shortly afterwards fully developed by a French chemist, M. Ampere. Later on, in the last half of the century, we shall see that the discoveries of another French chemist, Louis Pasteur, completely changed our notions of the origin of disease.

Though the remark may seem trite, it should not be forgotten, that in a paper published in 1798, Edward Jenner first made known the value of vaccination, and in the century that has passed since the first vaccination by Jenner, there has practically been little change, either in the method or the vaccine used—the only improvements being, that it has been found necessary to revaccinate from time to time, and that bovine virus has been substituted for the human variety.

The discovery of percussion belongs to a Viennese physician, Avenbrugger, who published a treatise about it in 1761. This new method of diagnosis was in advance of the age, and made no progress among physicians until it had been popularized in France through the advocacy of Corvisart (Napoleon's physician), who translated Avenbrugger's book into French, with additions of his own, in 1808.

In 1815, Laennec, a physician of the Necker Hospital, Paris, discovered that the sounds of the heart could be distinctly heard through a cylinder of paper held to the ear, and against the patient's chest. Later on he substituted a hollow cylinder of wood, which he named the stethoscope, and in 1819 published his remarkable work on mediate auscultation.

The influences of these new methods of physical diagnosis, together with the efforts of the experimental physiologists, Marshall Hall in England, and Francois Magendie in France, led to important changes in the treatment of disease, such, for instance, as the abandonment of blood-letting. To this end, also, the "statistical method" of Louis contributed, the idea gaining ground that the chief object of therapeutics is to assist nature in combating disease, and that heroic measures are often the least effective

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LAENNEC, INVENTOR OF THE STETHOSCOPE, AT THE NECKER HOSPITAL, PARIS

means of accomplishing that end. As an evidence of the lack of ordinary accurate observation in medical study, which prevailed during the early part of the nineteenth century, it may be stated, that in 1833, the cause of itch (scabies) had been declared in a published medical treatise "to be unknown." In the following year (1834) Renucci, a Polish medical student, demonstrated to his master Alibert, a physician of Paris, the itch mite; but, in so doing, he was merely revealing to an educated physician the findings of uneducated Polish peasants.

In 1833, James Paget, interne in St. Bartholomew's Hospital, London, when dissecting the muscular tissues of a human subject, found little specks of foreign matter, which, when examined microscopically by Prof. Owen, proved to be the cocoon of a small and hitherto unknown insect, which was afterwards named by Owen trichina spiralis. The full story of trichina came long afterwards, when Leuchart, Virchow, and Zenken proved that this parasite enters the human system through the ingestion of infected pork, and that it causes symptoms which had erroneously been ascribed to typhoid fever, rheumatism, and other diseases.

In 1831, chloroform was discovered by Dr. Samuel Guthrie, of Sackett's Harbor, N.Y., and about the same time by Liebig, in Germany, and Soubeiran in France. Liebig also discovered chloral, and made important contributions to organic chemistry, showing the changes of food in the body, and what kinds of food are converted into fat, muscle, blood or sugar in the human system.

In 1835, Graves of Dublin recognized the connection between acceleration and violent action of the heart and enlargement of the thyroid gland, two of the great symptoms of exophthalmic goitre. Graves claimed that disturbance of the heart's action is not necessarily associated with organic disease of the heart. In 1840, Basedow, a German, published a more elaborate and more complete account of the clinical features of this disease. In 1837, a young American physician, Gerhard, showed the difference of the two fevers, typhus and typhoid fever After much discussion, this question was finally settled in England by Sir W. Jenner in 1849-50.

In 1839, Dr. R. G. Hall, an English physician, published lectures on the management of asylums and treatment of the insane. He argued that in a properly constituted building, with a sufficient number of suitable attendants, restraint is never necessary, never

justifiable, and always injurious to all cases of lunacy whatever. Similar views were expressed in 1854 by Conolly of London, and were adopted by leading alienists in Europe and America. The important subject of medical jurisprudence made great progress during the past century. In England, A. S. Taylor, chemist and jurist, was appointed in 1831 lecturer in medical jurisprudence at Guy's Hospital. His inaugural course was the first given in England, and was attended by many leading counsel and some judges.

Parkes, appointed a physician of University College in 1842, may be regarded as the founder of scientific hygiene in England, and a great factor in its development elsewhere. As an organized department of administration, State medicine is entirely of modern growth, and may be considered as the peculiar property of the nineteenth century. Two centuries ago, the annual mortality of London is stated to have been 80 per 1,000; now it is under 20. A century ago ships could scarcely keep the sea for scurvy, while gaols and hospitals were, in many cases, hotbeds of fatal diseases. Now these conditions are rectified or, at least, the means of rectifying them are known.

In 1845, Hughes Bennett described leucocythemia and, simultaneously, Virchow gave a full explanation of the peculiar alteration of the blood, which is the essential characteristic of leucocythemia. In 1832, Hodgkin, who was pathologist to Guy's Hospital, described the morbid anatomy of the spleen and lymphatic glands. In 1837, the pathology of the kidneys was described by Richard Bright, the physician of the same hospital. In 1855, Thomas Addison described the relations between anemia and disease of the supra-renal capsules. These diseases are known all over the world as Hodgkin's disease, Bright's disease, and Addison's disease. To give other less important examples, the diagnosis and cure of favus, by J. L. Schoenlein in 1831, the discovery of the blue line round the edges of the gums in chronic lead poisoning, announced by Burton in 1840, and the treatment of lead poisoning with iodide of potassium, which was first noticed by Melsens in 1849, are instances of distinct advance on scientific lines during the past century.

The glorious discovery of anæsthesia, a word which, by the way, we owe to Dr. Oliver Wendell Holmes, belongs entirely to America. However, when one reflects on the ever-

recurring need of a pain-dispelling remedy in dentistry and surgery, together with the historical facts that sulphuric ether (ol. vini dulce) had been discovered by Val Cordus in the sixteenth century, nitrous oxide gas by Humphrey Davy in 1800, and chloroform simultaneously by several chemists in 1831-32, the wonder

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WILLIAM T. G. MORTON

grows that the application of these agents to anesthetic purposes should have matured at such a leisurely pace. The first experiment in anesthesia was made in 1844 by Wells, a dentist of Hartford, Conn., who used nitrous oxide. His pupil, Morton, experimented successfully with sulphuric ether, and in 1846 anesthetized in Boston Hospital a patient upon whom Dr. Warren performed a

surgical operation. It is, however, true that Dr. Long, who practised in a small town in Alabama, had used ether successfully in several minor operations two or three years previous to Morton's final demonstration; but, neglecting to publish his discovery, was anticipated. A few months after Morton's demonstration the use of ether became general, and Simpson, of Edinburgh, chose chloroform as the more suitable drug. Opinions differ still as to this point; but of the transcendent value of anesthesia there is but one opinion.

For the demonstration of the truth that the etiology of disease is due to micro-organisms, the palm belongs to France. About 1830 great enthusiasm was manifested by physiologists in the minute forms of life described by Leeuwenhoek and other early workers. Prominent among these men were Cagniard Latour, a Frenchman, and the German of cell-theory fame, Theodor Schwann. Working independently, they had reached the conclusion about 1837 that the specks which make up the substance of yeast are living vegetable organisms, and that the growth of these organisms is the cause of fermentation. They also held, in a tentative way, the opinion that the micro-organisms to be found in all putrefying matter, animal or vegetable, had a causal relation to putrefaction. In France, the botanist Turpin supported similar views. On the other side, in 1839, Liebig promulgated his famous doctrine of fermentation, in which he opposed any "vitalistic" explanation of the phenomena of putrefaction, alleging that the presence of micro-organisms in fermenting and putrefying substances was merely incidental, and in no sense causal. In this conception he was upheld by his compatriot, Helmholtz. Louis Pasteur, a French chemist, however, in 1857 and the succeeding half decade, showed that all the familiar processes of decay in organic tissues are, in effect, forms of fermentation, which would not take place were it not for the presence of living micro-organisms.

Incidentally it may be remarked that the French surgeons of that day made no application of Pasteur's discoveries to their art. Even in 1870 the soldiers of Paris died of hospital gangrene. Dr. Lister (the present Lord Lister), then of Glasgow, began in 1860 to apply Pasteur's discoveries to surgery, and in 1867 published results showing that, if means are taken to prevent the access of microbes to abraded surfaces, and to destroy

those that had already found lodgement there, putrefaction would not take place.

Pasteur's studies also stimulated progress in pathology, leading Davaine to proclaim his belief in 1863, that anthrax was, as he said, caused by a "bacterium." Koch, in Germany, confirmed Davaine's views. But the convincing experiment was given to the

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CRAWFORD W. LONG

world in 1877, when Pasteur, with the aid of his laboratory assistants, Roux, Chamberland, and Duclaux, demonstrated that anthrax is due to the introduction into an animal's system of a specific germ, a microscopic plant, which develops there.

Since that epochal demonstration, microbiology has advanced rapidly, and the old-fashioned explanations of disease, viz., "hu-

mor," "miasm," "virus," etc., are no longer used. It is true that the microbe of every disease has not been discovered; but few of them remain unknown, and strange to relate, the failures have so far been noted in diseases whose infectious nature is undoubted, and in which contagion is best established. For instance, the ex-

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THEODOR SCHWANN

anthems—measles, scarlatina, small-pox, chicken pox, vaccinia—infectious diseases of the skin, such as zona, and polymorphous erythema, and diseases which are never transmitted except by direct contact, such as syphilis and rabies.

When Pasteur produced, in 1880, an attenuated virus of chicken cholera, capable, if used on poultry, of protecting them

from the infection of that disease, he stated that this method was susceptible of generalization, that is to say, of application to other diseases than chicken cholera. In 1881, he announced to the Academy of Medicine that he had produced an attenuated virus of the anthrax microbe, by the use of which he could protect sheep and presumably cattle against that fatal malady. The truth of this claim he demonstrated in the most public and convincing

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LOUIS PASTEUR

manner. He made the application of this principle to the human subject, although the method of attenuating the virus was different, when in 1883 he applied anti-rabic virus to the treatment of hydrophobia.

The cultivation of a virus within the animal organism, suggested by Jenner's method of securing small-pox vaccine, was a step in the direction of a new therapeutic procedure—serum-therapy. This is the treatment of a disease with the blood-serum

of an animal that has been subjected to protective inoculation against that disease. Facts observed in laboratories suggested the theory that the blood of resistant animals might contain something directly antagonistic to the virus, and that this *something* might be transferred, with curative effect, to the blood of an infected, susceptible animal.

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RUDOLF VIRCHOW

Definite results were announced by Behring in 1892 regarding two important diseases, tetanus and diphtheria; but serum therapy received its greatest impulse when Roux, of the Pasteur Institute, Paris, read his famous paper on diphtheria at the International Congress of Hygiene in 1894. He fully explained the laboratory methods of preparing the serum, and reported the clinical results obtained from its use in the hospitals of Paris. Since then serum-

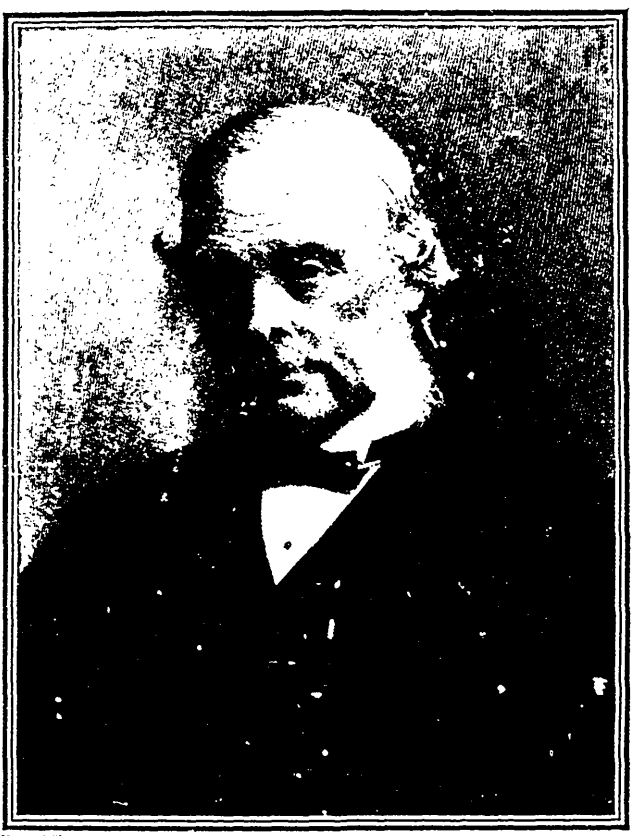
therapy, especially in diphtheria, has been successfully practised all over the world. The antistreptococcic serum is also employed in the treatment of erysipelas and allied conditions. The anti-tetanic serum is regarded as a valuable accessory in the treatment of acute tetanus; but does not obviate the necessity for surgical and other modes of treatment. Ample proofs are to hand of the efficacy of Haffkine's prophylactic serum. Thus the use of this serum in the Khoja Mussalman community of Bombay caused a reduction of the mortality from plague amounting to 86 per cent. in the average. Calmette also speaks highly of Yersin's plague serum, as now prepared, and with it he claims to have reduced the mortality from plague at Oporto to almost nil.

Glandular therapy is also a notable addition to modern therapeutics. Thus thyroid extract has been admitted into the British pharmacopeia, and is a recognized remedy for myxedema, cretinism, psoriasis, and obesity. The supra-renal capsule comes next in importance, and although there may be some doubt as to its value in the treatment of Addison's disease, it has, in some cases, yielded very good results. It is the most powerful astringent known. The other members of this group, such as the thymus, pituitary substance, cerebral and spinal cord substances, are still on their trial, and it is difficult, in the present state of knowledge, to say what their future may be.

The rise and progress of pharmacology, which was founded by Bichat, early in the century, has made it apparent that all correct appreciation of the mode of action of drugs must be based on physiology and pathology. Fortunately for humanity, however, useful discoveries in pharmacology have been utilized, long before science has succeeded in adequately explaining the reason of their efficacy. Peruvian bark was received with disfavor by the profession, when first introduced to their notice in the seventeenth century, though subsequently its native merits caused it to be generally employed in malarial and typhoid fevers. In 1820, Pelletier and Coventou gave to medicine quinine and cinchonine, enabling physicians to employ the South American remedy in a more compendious and effective form. Yet the use of quinine in malaria was just as empirical as that of bark, and it is only recently that, owing to the labors of Machiafava, Celli, Laveran, Golgi, and others, the true cause of malaria has been discovered, and the action

of quinine in destroying the plasmodium malariæ in the blood of a malarial patient properly explained.

It is a long step from cure to prevention. Yet it did not require medical observation to prove that malaria ceased to appear, in certain localities, after the neighboring swamps and ponds had been drained. The brilliant work of Manson in England, Mc-



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SIR JOSEPH LISTER

Callum in America, and Ross in India, by which the mosquito has been shown to be the bearer of malaria and the principal agent in its diffusion, showed also that land drainage prevented malaria, because mosquitoes disappear from a locality where they find no ponds or quiet water stretches in which to deposit their ova. The prevention of malaria even in tropical countries will result to a

greater extent than ever from the application of the simple deductions which flow from this great medical discovery. Other useful methods for quelling malaria will also be invoked. Thus in Greece it has been observed that the spraying of grape-vines with sulphur washes reduces malaria among the inhabitants, probably because sulphur is inimical to mosquitoes. For a similar reason malaria does not appear in a severe form in parts of Algeria, where intensive cultivation of a calcareous soil is practised, and, moreover, the application to the soil of manure rich in lime has been found to weaken the malarial virus.

These discoveries, so glorious to medicine, so useful to humanity, will doubtless prove the harbingers of still greater advances in the coming century. In concluding this sketch, a regret will intrude that Canada has not carved a name among the medical discoverers of the nineteenth century though we must congratulate our confreres on the fact that they keep well to the front in scientific knowledge, which they cull with avidity both at home and abroad.

May the Editor of THE CANADIAN JOURNAL OF MEDICINE AND SURGERY, whose happy lot it shall be to write the pean of scientific medicine at the close of the twentieth century, feel it incumbent on him to enumerate, in a special article, the achievement of Canada's sons in scientific medical discovery during that period.

J. J. C.

TYPHOID FEVER AND FOUL WELLS.

AT the fourth quarterly meeting of the Provincial Board of Health of Ontario for 1900, the Secretary read reports of the analyses of water supplies, taken from wells in different parts of the Province. The reports were of a very unsatisfactory nature, very few of the samples having been pure, and many of them having given evidence of fecal pollution.

According to Section 13, Schedule B (O. H. A.), "All wells in this municipality which are in use, whether such wells are public or private, shall be cleaned out before the first day of July in each year, and in case the Board of Health certifies that any well should be filled up, such well shall be forthwith filled up by the owner of the premises."

Although the above enactment is in force in every municipality

of the Province until repealed, it is "more honored in the breach than the observance," since contaminated wells appear to be so common. Even the most civilized men and women seem to require strong object lessons, to impress them with the necessity of cleanliness in the storing of food, and its subsequent preparation for the table. Putridity has its compensating advantages, in preventing people from using what is offensive to the senses. Well water, beneath its benign glimmer, often conceals a world of sanitary iniquity; but, if it should make no strenuous appeal to the senses, it is swallowed without objection. Occasionally water from a well becomes offensive, and the source of supply, on examination, yields results that are ludicrous and even alarming. Thus, *Le Memorial des Deux Sevres* (September 24th) reports: "After the prolonged drought of last summer, Mr. ——— resolved to have his well cleaned, the water being no longer good. Accordingly, a laborer went to the bottom of the well, and found there two hundred and ten toads (this number being verified by credible witnesses), which of course would explain the spoiling of the water." In this case, it goes without saying, that Mr. ——— did not require a legal enactment to oblige him to give an order for the removal of the mortal remains of the batrachian intruders. There are doubtless wells in France and Canada, which are badly constructed or not kept in repair, and rarely cleaned, and yet, only the presence of decaying filth or some sensible spoiling of the water, will call for an investigation.

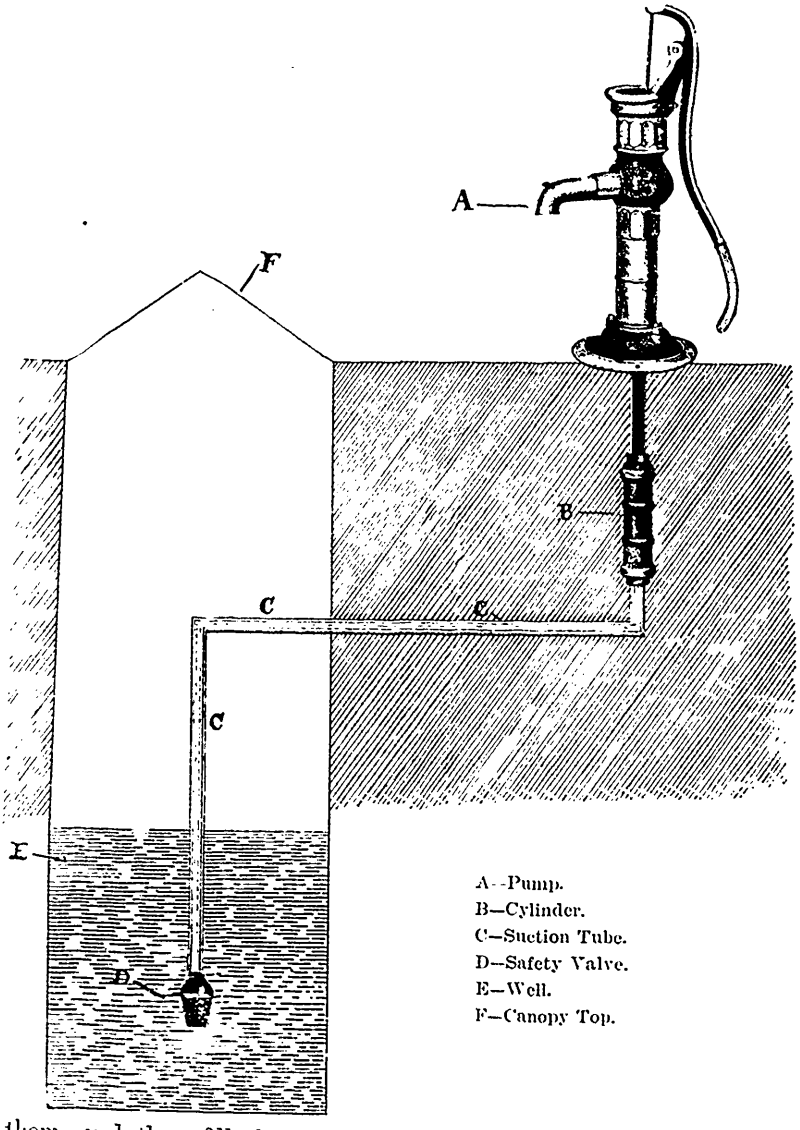
Many wells, particularly in the country districts, are to some people at least, invested with a halo of romance, and an investigation into the purity of their water seems like positive desecration of something holy. After typhoid fever has attacked the members of a household, a sample of the water supply is sent to a laboratory, with the request that the typhoid bacillus be looked for. More easily said than done. The Eberth bacillus, which is recognized as the efficient cause of enteric fever, has been sought for in the sewage of London by competent bacteriologists, and not found. It is, however, an easy task to identify the colon bacilli, which inhabit the intestinal tracts of man and animals, and, when found in a sample of water, they indicate fecal pollution of the well, from human or animal ources. The presence of colon bacilli in a sample of well water, together with a relatively large proportion of chlorine, indicates a source of constant animal pollution, such

as may be derived from a privy or a barnyard, and in order to properly estimate its influence in causing typhoid fever, the source of its contamination should be traced. In another sample, the presence of colon bacilli, associated with a proper proportion of chlorine, indicates a source of occasional animal pollution, such as may trickle through the open joints of the platform of a well, much frequented by people wearing shoes soiled by manure, or perhaps by animals. A supply like the latter might simply require a cleaning of the well, and a refitting of the platform, with the addition of a layer of blue clay or cement placed around the top of the well. A well, plainly contaminated with fecal matter, should however, be closed, and the reason for taking such action may be illustrated by an example, which also throws light on the evolution of typhoid fever among near neighbors.

At S——d, a town in Ontario, several families lived on adjoining small lots, each lot being provided with a well and a privy pit. The top soil was clay, beneath which was a layer of water-bearing gravel, and at a depth of eight or nine feet, a substratum of blue clay. The privies were near the wells, in some cases about twenty feet away. With such a substratum the wells would be shallow, and intercommunication would take place between privies and wells. This was subsequently proved to be the case, a chemist who examined four different samples of water from these wells reporting that "they all contained sewage matter, and were unfit for drinking purposes." Consumption of such water had, however, continued all summer, and yet no case of typhoid fever occurred. In September, a member of one of the families, who had contracted typhoid fever at his last residence, returned home and fell ill in one of the above-mentioned houses. His excreta were thrown into the privy pit belonging to the house, and doubtless soon found their way by percolation into the water-bearing stratum of earth above the blue clay which supplied the neighboring wells. Typhoid fever appeared in the following month (October) among the inmates of these houses, and in a short time became endemic, several deaths occurring.

There was good reason to think, therefore, that the shallow wells used by these families drained the privies, and that the water, though polluted by this sewage, had not caused typhoid fever until it was contaminated by the dejecta of a case of that disease. Therefore, the cleaning of these wells would not have removed the

danger of infection as long as the drainage from the privies found an entrance into the wells. The principal recommendations given to arrest the outbreak were: "to empty the privy pits, disinfect



A—Pump.
B—Cylinder.
C—Suction Tube.
D—Safety Valve.
E—Well.
F—Canopy Top.

them, and then fill them with earth, substituting the dry earth closet; that pure water be obtained for drinking purposes; and that, until it has been obtained, the water used for drinking purposes be boiled and filtered."

The tubular or driven well has certain obvious advantages over the open well, in not occasioning accidents to children or animals. A perforated iron tube, with a sharp, hard point, is driven into the ground, other lengths of tube are then attached and driven down, and the process is repeated till water is reached. A pump is attached, and around the pump there should be a close, tight-fitting platform.

Such a well, pump included, can now be had for ten dollars. It should be emptied at frequent intervals and the pump kept clean. To remove all danger of infection of the water supply a good plan is to substitute the earth closet for the privy pit, or better still, to provide sewers for the removal of the sewage. If the well, whether it be a tubular well or a pit well, is sunk into a stratum where the water is free from pollution, the consumer will be saved from a domestic source of typhoid fever. The convenience of his family will be enhanced, at only a small increased outlay, by placing the pump of the well in the dwelling instead of out of doors at the well. This will be seen in the accompanying diagram. J. J. C.

EDITORIAL NOTES.

The Smoke Nuisance.—The following directions to stokers, to be found at page 59 of Mapother's Lectures on Public Health, indicate in a practical way the means which must be adopted if the smoke nuisance from factories is to be effectually prevented. (1) No black smoke ought to issue from the chimneys of the furnaces. (2) To prevent this, when charging the furnace push most of the red coal to the back of the furnace, and spread the remainder evenly to a depth of not less than three inches, and place the fresh fuel upon the red fire nearest the door. (3) The pieces of fresh fuel must not be larger than the fist, nor added in such quantities as to choke the furnace, as this prevents a sufficient quantity of air from entering, and thereby wastes the fuel and causes smoke. (4) If black smoke issues from the chimney of the furnace, it must be your fault, and a fine will therefore be inflicted. When however, it does occur, open the furnace door, stir up the black coal, and bring it in contact with the red fire." We commend these excellent rules to the consideration of the civic authorities of Toronto. From a parliamentary investigation of the smoke nuis-

ance in England, it appears that when soft coal is burned, special care on the part of the stokers will prevent the black smoke nuisance. The use of anthracite will prevent it altogether. The devices which have been introduced to the notice of the public with the object of preventing or mitigating the black smoke nuisance do not find favor with the stokers, and are not methodically used.

An Acknowledgment.—We take pleasure in acknowledging the loan, for use in this number of the JOURNAL, from Messrs. Harper Bros. & Co., of New York City, publishers of that very excellent magazine, *Harper's Weekly*, of the seven half-tone cuts which appear in connection with the editorial, "A Retrospect of Medicine during the Nineteenth Century." We feel sure that our readers will appreciate the courtesy on the part of Messrs. Harper Bros., the illustrations certainly enhancing the value, as also the general appearance, of the article in question. We notice that just recently Harper Bros. published a most interesting book, "The Story of Nineteenth Century Science," which touches upon all the important branches of science, explaining their most complex developments in a manner that, while being thorough, is within the comprehension of the average layman. It not only brings one up to date in all the marvels of electricity, medical and physical science, and natural phenomena, but it gives us an inkling as to how the savants were led to experiment, and adds most interesting sketches of the men who have made themselves famous by their researches. No other work has made so thoroughly scientific a study of the scientific achievements of the century, and stated the results in so lucid and convincing a manner. The many portraits, reproductions, diagrams, and original illustrations in the volume make it additionally valuable.

A Biological Laboratory at Ottawa.—From time to time disquieting reports in the daily papers show that bubonic plague is hovering about this continent. For instance, the subjoined extract was recently culled from the Ontario correspondence of *The Globe*: "The weekly official health reports of the United States just received recognize for the first time the existence of bubonic plague in San Francisco. Nineteen cases have been reported since March last, the most recent being October 5th, 10th, and 14th. The authorities appear unable to learn of the cases until after

death, as all the recent cases are so reported." We learn from *The Sanitarian* that the New York City Board of Health has provided a special laboratory, built for, and wholly devoted to, the study of the germs of plague. We hope that the Director General of Public Health for Canada will deem it his duty to make such representations to the Canadian Government, that a laboratory of this kind shall be established at Ottawa.

A Free Sanatorium for Consumptives.—At the time of writing it seems quite likely that the ratepayers of Toronto will not be asked to vote for a by-law to raise $50,000, wherewith to provide a free sanatorium for consumptives. The National Sanitarium Association offer to establish, in proximity to their present sanitarium for consumptives at Gravenhurst, a free institution for the treatment of curable cases of consumption, leaving for subsequent arrangement the location of a receiving hospital to which advanced cases may be admitted for tentative treatment, as well as providing a home for incurable cases. The Gravenhurst free sanitarium would then be available for the poor consumptives of Toronto, on the payment by the city corporation of the usual hospital allowance, viz., 40 cents a day, which, being supplemented by the Provincial grant of 30 cents a day, would make a total of 70 cents per capita.

Our Colored Supplements.—We are greatly indebted to the firm of H. K. Mulford & Co., of Philadelphia, Pa., for the beautifully executed colored plates which appear in this issue of our journal. We feel certain that everyone will admit that, for delicacy in coloring, beauty of execution, and absolute correctness in even the minutest detail, the illustrations could not be improved upon. The gradual disappearance from day to day of the diphtheritic exudate under the influence of diphtheria antitoxin, is certainly only true to fact, and but illustrates what occurs in the every-day experience of the physician who resorts to the use of what is now looked upon as the *sine qua non* in the treatment of this otherwise terrible disease. The three-color reproduction illustrating the "Cycle of Vaccination," is also most beautiful. We are glad to have the opportunity of presenting these plates to our readers, as they will appear in no other journal in the Dominion.

Inoculation Against Typhoid Fever.—Owing to the wide prevalence of enteric fever during the South African campaign, great efforts have been made to protect military men against that disease by inoculation. We notice in the *British Medical Journal* that two special Commissioners sent to Africa to investigate dysentery and its relation, if any, to enteric fever, were inoculated against typhoid previous to their departure. We have not heard that preventive inoculation has been attempted in Ontario; but seeing that the disease in question is fairly prevalent in this Province, it would be a useful scientific work to practise inoculation against typhoid of the class of young men who graduate each year from Toronto University and Trinity University.

Employment for Consumptives.—While a good deal of attention is devoted to the treatment and cure of consumption in sanatoria, and while some progress is being made in Ontario in that direction, no public provision is made for dealing with patients who have been cured or partially cured of consumption, after they leave the sanatorium. To find suitable employment for these people will be a matter of great importance, if their former conditions of life and labor were unfavorable to health. Agricultural work of all kinds, and out-door occupations, would be unobjectionable. As land in Ontario is cheap, the establishment of a fund to provide the cured consumptives with the means of gaining a livelihood by market gardening or farming, is worthy of the consideration of philanthropists.

Dr. Adam Wright is still improving.

Dr. B. E. McKenzie visited New York last month.

Dr. Chas. Hodgetts has removed from College Street to Spadina Avenue.

Dr. D. C. Meyers has given up his office on Simcoe Street, and has decided to concentrate his work at his Sanitarium in Deer Park.

Dr. W. H. B. Aikins made his usual fall trip to New York in the interests of *The Canadian Practitioner and Review* last month.

Congratulations are in order. Dr. Geo. A. Peters assumed the serious responsibility of becoming a dad on the 12th ult. Unto him a child was born.

Dr. Montizambert, Director General of Public Health, has returned from an extended trip to the West in the interest of the health of the Dominion.

Selected Articles.

BRONCHITIS—ITS TREATMENT.

Acute bronchitis is best treated by rest in the house, preferably in bed, and the use of diaphoretics. Thus, an acute cold may be often cut short by 10 grains of Dover's powder at bedtime, or by a grain of opium in any other form. Diaphoresis is often pleasantly and profusely excited, simply by warm drinks, especially if preceded or followed by a warm bath. Common green or black tea taken hot and in quantity is a diaphoretic as effective as any of the nauseating teas or infusions of the materia medica. In the acute bronchitis of childhood the warm bath plays the most important role if given three or four times in the course of twenty four hours. It is nearly always followed by peaceful sleep. Should diaphoresis fail, the treatment becomes purely symptomatic. In relief of the cough, appeal is made to the expectorants. Chief among the expectorants in our day ranks apomorphine. A good prescription for a child is:

℞ Apomorphinæ hydrochlorat..... gr. ss. to gr. j.
Acid. hydrochloric. dilut..... gtt. x.
Syrupi..... f ℥ ss.
Aquæ menthæ piperitæ..... f ℥ iss.—M.

Sig.—A half to one teaspoonful every two hours.

Apomorphine is a very soothing expectorant, which acts like an anodyne, and, as has been proved by experiment, has real virtue as an expectorant. In bad cases of cyanosis and dyspnea, the remedy is best used subcutaneously in doses of 1-12 grain, increasing the dose if necessary. Ipecac, in wine or syrup, is a time-honored remedy, and especially in the form of the compound mixture, has a wide range of use. One grain of tartar emetic dissolved in a glass of cold water, of which a teaspoonful may be taken every hour, is an old and useful remedy. When the cough becomes more severe, and especially if it be associated with much pain, the necessity arises for the use of morphine, which may be incorporated with the apomorphine in the prescription above cited. Or the opium may be given in tincture, simple or camphorated;

under no circumstances, however, should morphine be given to children. For an adult a prescription might read:

℞ Morphinæ sulphatis..... gr. j.
Aquæ lauro-cerasi..... f ℥ ij.
Aquæ ..... q. s. ad f ℥ ij.—M.
Sig.—A teaspoonful every two, three, or four hours.

The same relief, without risk, may be reached in children by the substitution of belladonna, which may be given in the form of a tincture, in a dose of one drop for every year of the child's age. A few dry cups applied to the surface of the chest give great relief from pain at any age. Wet cups succeed when dry cups fail. Flying synapisms often suffice. Where pain is very severe, in exceptional cases, especially in childhood, a poultice may be put about the chest. For fever, there is no remedy as good as quinine, which supports the heart, while it attacks the fever. Many individuals learn to cut short a cold by a single dose of ten grains of quinine, fortified with a drink of hot whisky, and whisky or brandy is always a safe remedy to give to a child, with a small dose of quinine—not over five grains. Relief from fever is also given by the other antipyretics, such as antipyrine, which may be given to an adult in a dose of from 3 to 5 grains; to a child, 1 to 2 grains; antifebrin, in the same dose, or phenacetin in double the quantity. Phenacetin is the safest remedy. None of these drugs act so well in childhood as the warm bath, and where bronchitis has become capillary, or dyspnea assumes prominence, or actual cyanosis has occurred, no remedy ranks in value with the hot or warm bath and cold affusions to the head and chest while in the bath. Juergensen has shown that a small stream of cold water directed to the nape of the neck will cause deep inhalations. A debilitated child will require an additional stimulation in the form of senega, carbonate of ammonium, caffeine, or digitalis. One drop of the tincture of digitalis every hour or two is at times invaluable.

The treatment of chronic bronchitis varies more with the intensity than with the character or form of the disease. It is usually made a very long chapter, but the remedies which are of real value are few. Prophylaxis is the subject which merits discussion first. As has been remarked already, bronchitis is the most frequent of all diseases, and the greatest contingent of cases occurs in childhood. When we regard the manner in which children are reared in closed apartments, with defective ventilation, too warmly clad, for the most part not regularly bathed, in the ill-heated, ill-ventilated habitations that constitute what is known as the house-climate, it cannot be wondered at that bronchitis, a disease which results from inhalation of contaminated atmosphere, is so frequent.

We have also to regard here, as well as in the case of adults,

the frequency of tuberculosis, which has bronchitis as its forerunner for months, and as its companion for life. Rickets, too, is a disease which belongs to childhood, and which has bronchitis as one of its prominent and more or less constant symptoms. These three causes—vitiated house-air, tuberculosis, and rickets—account for the large majority of cases of bronchitis. In children, bronchitis belongs, therefore, to those who are debilitated or diseased, and the factor of supreme importance in childhood is prophylaxis. It is needless to say at this age that a house can be well ventilated, that sunlight and fresh air may be freely admitted, that the temperature may be regulated, that the house may be kept dry. It goes, also, without saying that children affected with tuberculosis, rickets, and syphilis, must be treated for these diseases. Phosphorus, iodine, creasote, cod-liver oil, iron, quinine—these agents belong as much to prophylaxis as to treatment. Then comes the cold bath. Weak and debilitated children and adults are best inured by baths which should be warm at first, then tepid, cool, and even cold, with brisk friction to the skin until the surface is brought to a glow, the perfection of the reaction being the indication of the grade of temperature for the next bath. Fresh air, exercise, a shorter stay in school, a better ventilated school-room,—here is a subject which requires a chapter of itself. The regulation of clothing, the avoidance especially of heavy underwear, of mufflers and comforters about the throat, the exposure of the body until it becomes hardened like the face—these are means which must be adopted gradually, that the body may become finally inured and, as it were, insured against bronchitis. A subject which deserves continued emphasis is the destruction of the sputum, which often conceals the most dangerous parasites. Old men are best protected by avoiding vicissitudes of temperature, especially as connected with moist or windy days. On cold, wet days the old man should remain at home in his room—in the chimney corner if not in bed. The circulation of the old man is to be sustained by another meal if necessary, later in the night, by wine, brandy, or an extra cup of coffee or tea. Senile bronchitis may be avoided also by change of climate. Individuals whose circumstances will permit should seek the warm, moist climates of Florida, Southern California, the Bermudas, Nassau, or the dry, warm climate of Central Florida, Georgia, Aiken, Asheville, and the Carolinas. Chronic bronchitis requires more continuous treatment. In the dry form of chronic bronchial catarrh, exudation may be furthered or forced by inhalations. The agent of most value in these inhalations is steam, and it is best generated by a steam atomizer. Simple atomizers without heat are of no value. The steam is given more additional solvent powers by the use of common salt, more particularly the bicarbonate of sodium in satur-

ated solution, or disinfectant properties with carbolic acid, thymol, or boric acid. In capillary bronchitis steam is a necessity. Where the discharge is excessive, in bronchorrhea, the best remedy is turpentine, which should be given in the form of capsules, containing from 5 to 10 drops.

Capsules of turpentine are swallowed without taste in milk, or five to ten drops of turpentine may be dropped into a wine glass of milk. Finally, turpentine may be smoked for a long time in a pipe. Here, however, there may be evidences of idiosyncrasy, such as slight cerebral disturbance and vertigo. A good substitute in these cases, or in any case, is terpin hydrate, which may also be given in capsules, 5 to 10 drops, or in pill, 1 or 2 grains, three or four times a day. The balsams of Peru, tolu, copaiba, and sandal wood, have virtue in individual cases. Cod-liver oil is food as well as medicine. The great trouble, however, with this otherwise valuable medicinal agent is the fact that it is, as a rule, not long before the patient's stomach becomes upset and refuses to digest any more of the oil, the appetite being interfered with in a manner which very soon, instead of building up the patient, has the opposite tendency and effect. There is a preparation which has recently been largely used by the profession with success, Angier's petroleum emulsion. It has been found to be very useful in relieving the cough and diminishing the expectoration in cases of chronic bronchitis. It is a smooth, cream-like emulsion of purified petroleum, combined with the hypophosphites. It is pleasant to take, has no disagreeable taste or odor, and is frequently, therefore, accepted by the most delicate stomach. This emulsion acts as an intestinal antiseptic, preventing fermentation, and under its action the patient frequently shows a gain in weight and strength.

Many cases yield only to the prolonged use of iodine, which is best given in the form of the iodide of potassium or sodium, in peppermint water, or in the ounce-to-ounce solution, beginning with from 10 to 20 drops three times daily, largely diluted with milk. Its action is best suited to the cases complicated with asthma or dyspnea. The best prescriptions for chronic bronchitis owe their virtue chiefly to the iodine they contain. Putrid bronchitis requires antiseptics, which may be inhaled from the atomizer, as suggested above. Terpin hydrate is here also of value internally. A most excellent remedy recently recommended is myrtol, which should be taken internally in doses of 5 or 6 grains. Myrtol acts through the blood; it may also be inhaled. It lessens the excessive quantities of sputum in putrid bronchitis or bronchiectasis, diminishes the offensive odor or destroys it altogether, and often in the course of a few days puts a new phase on a disease which has hitherto assumed alarming gravity. Bronchiectasis has no special therapy.

No drug can restore tone to or contract the dilated bronchial

walls. The treatment is the same as that for chronic bronchitis, and more especially for putrid bronchitis, whereby disinfectant inhalations, more especially of terpin hydrate, menthol, and myrtol play important parts. As has been intimated, the diagnosis of bronchiectasis, or its differentiation from cavities in the lung from tuberculosis is by no means easy. Moreover, inasmuch as these cavities are scattered throughout the lungs, there is none of that hope from surgical intervention which might be entertained were the affection local. In all cases of chronic bronchitis, especially where chronic organic changes have occurred in the bronchial walls, such as excessive hypertrophies, atrophies, decompositions of their contents, and ectasias, there is necessity for support with alcohol. Senega and serpentaria are considered good substitutes for squill, ipecac, and antimony in the debility of age. The carbonate of ammonium, best given in milk, is a remedy of value in advanced life or *in extremis*. The Germans have an anisated solution of ammonia, which is a good preparation. Apomorphine is safe, quick, and pleasant. A remedy which is of signal virtue in the chronic bronchitis of the aged, in the capillary bronchitis, which may not be separated from catarrhal pneumonia at either end of life, more especially in the chronic bronchitis of old age associated with heart failure and kidney suppression, is nitro-glycerin, of which 1 or 2 drops of a 1 per cent. solution may be given every hour or two; or, to bridge over a sudden collapse, subcutaneously in doses of 1 to 5 drops.

To sum up the therapy of bronchitis, the best remedy in treatment of the bronchitis of childhood is hydrotherapy; the best remedy in the treatment of the acute bronchitis of maturity is diaphoresis; for chronic bronchitis, the discovery and treatment of its cause, whether tuberculosis, emphysema, heart disease, or disease of the kidney; the best remedy for senile bronchitis is support and change of climate.

CHLORETONE A SAFE HYPNOTIC.

BY W. M. DONALD, M.D.,
Lecturer on Practice, Detroit College of Medicine.

Of the making of new drugs and new pharmaceuticals there is no end. The graduate of twenty years ago has to learn his materia medica over again. It is true that we have the old standards with us yet—iron, quinine, mercurials, bitters, etc.—but the refinement of pharmacy is bringing into the field a host of elegant and palatable compounds of which our forefathers never dreamed.

The busy chemist, too, like the busy bee, improves each shining hour, and makes, not honey, but synthetic compounds which grow

in number in an ever-widening circle. Hypnotics and analgesics, anesthetics and antiseptics, have received much attention from these industrious gentlemen, and a number of compounds of considerable value have been evolved and placed before the medical public.

One of the latest candidates for popular favor is a compound which is manufactured in the laboratory of Parke, Davis & Co., and which is said to contain within itself the qualities of a hypnotic, analgesic, anesthetic, and antiseptic, and which bears for its baptismal name Chloretone, or trichlor-tertiary-butyl alcohol. This substance is made by the addition of caustic potash to equal weights of chloroform and acetone, and occurs in white crystals with the odor of camphor. It is but slightly soluble in water, though easily dissolved by the stronger solvents—alcohol, ether, etc. It is consequently recommended that for internal administration it be given in tablet form.

While possessing the qualities of which we have spoken, the discoverers specially recommend it as a hypnotic and local anesthetic, claiming for it freedom from depressing after-effects, and a high degree of safety even when administered in large doses.

The writer has experimented with this drug as a hypnotic in a number of cases with varied pathological conditions, and has found it to be of considerable value in well selected cases and with moderate doses—ten to fifteen grains, repeated in the same doses within two hours if necessary. While it has been found of considerable value, as has been said, sufficient time has not yet elapsed to determine its true value relatively with the other hypnotics, nor to give it its true place in the materia medica.

Were it not for a case of exceedingly large dosage which recently came under the author's observation, it would not have been deemed advisable as yet to publish any of his inexact and incomplete experiments. This case, however, seems to demonstrate so well the harmlessness of the drug in large doses that it has been considered advisable to publish a report of the case.

A short time ago the writer had under his care a young man of brilliant parts, who had become a victim of the morphine and alcohol habits. He had indulged secretly in both drugs for a number of years, and was fast becoming a physical and mental wreck. An effort was made to cure him of his habits by placing him in a suitable environment and by withdrawing the drugs as rapidly as the case would permit, his strength being maintained in the meantime by a tonic and dietetic regimen. Considerable difficulty was experienced in producing sleep, and resort was had to the bromides, trional, and chloretone, all of which acted fairly well.

While progressing satisfactorily in regard to the drug habits, numerous abscesses developed in different parts of the body, which on evacuation freely discharged thick, fetid pus. These were no

doubt primarily caused by old indurations following the use of infected hypodermic needles, but seemed to become metastatic later on in the course of the case. They were exceedingly depressing to the physical organism of the patient, and naturally very discouraging and disheartening to him in his unstable mental condition. To the pre-existing difficulty in sleeping was added that consequent upon the pain and depression of the abscesses. In a moment of great discouragement the patient secured a liberal supply of three-grain chloretone tablets, and determined to have sleep and rest at any cost.

On Saturday night, August 10, he took twenty-four grains, which gave a fair night's rest. He breakfasted Sunday morning, returned to bed, and during the day took four doses of twelve grains each, or forty-eight grains in all. After a day of almost steady sleep he awoke and drank a glass of beer, although showing evidences of being under the influence of some narcotic. He immediately returned to bed and took twenty-four grains more within an hour and a half. One hour afterwards, being now delirious, he took another twenty-four grains, making a grand total of 120 grains taken during the twenty-four hours! The following morning he was so profoundly asleep that he could be roused with great difficulty. He would articulate a word or two and then immediately drop off into deep sleep again. All food was refused, but water was taken greedily, the patient rousing at intervals sufficiently to walk to the bath-room for a drink and also to secure a movement of the bowels and passage of the urine. During the night he vomited considerable bilious matter, soiling his bedding and clothing. The next day (Tuesday) found him still more profoundly asleep, with involuntary passages of feces and urine, and with absence of the thirst of the day previous.

He was walked about the floor by an attendant, and while his power of locomotion was good, his co-ordination was badly impaired, so that he was with difficulty prevented from falling. During the night his condition was unchanged, but on the following morning (Wednesday) he showed symptoms of improvement. He could say a few words in answer to questions upon being thoroughly shaken, and was able to go to the bath-room alone to evacuate some watery stools. He drank a pint of coffee and milk during the day, and was given an alternating shower of hot and cold water during the evening. The cold water aroused him sufficiently to plead for a discontinuance of it, and yet he was at this time, as he had been since Sunday evening, unresponsive to mild pain, such as pin-pricks, pinching, etc. In other words, he was under the influence of a general anesthesia of a mild nature.

During this time an abscess was opened upon his leg without any evidence of sensation on his part.

The patient slept soundly Wednesday night, and on Thursday

morning was roused with ease, although he immediately fell asleep again if conversation was stopped. He talked with great difficulty as if the muscles of the tongue and larynx were paralyzed. The articulation was so bad that at times he could be understood only with an effort. He took some light nourishment in the morning, and then dressed himself, but immediately lay down again upon the bed and slept the greater part of the day. In the evening he took a hot bath alone, ate some light refreshment, talked and joked for an hour, and then went to bed and to sleep for the night. On Friday morning he ate breakfast and dressed, but felt very weak, and lay dosing most of the day. During the night he slept poorly, and by Saturday morning began to crave something as a nerve sedative again. His stomach was irritable, and refused all but the lightest food, this symptom being prominent during all his period of narcosis.

From the time observations were begun—viz., on Monday morning—till he regained full consciousness on Saturday morning, there were absolutely no untoward symptoms except the gastric irritability mentioned before. The pulse ranged from 85 to 104, and was at all times of fair quality, except when toward the end of his long sleep he showed the irritable pulse of exhaustion. The respirations seemed somewhat deepened, but were normal in number, quality, and rhythm; temperature became, toward the end of the sleep, subnormal from exhaustion, the last record being 97.6 degrees F.

Sleep lasted almost continuously from Saturday evening till the following Saturday morning. During all this period, except when roused for nourishment or for a bath, etc., there was complete oblivion. When aroused the patient became partly conscious of his surroundings, and afterwards referred to incidents happening during these periods of intermission of his hypnosis.

The gastric irritability was undoubtedly caused as much by the fasting as by the drug, although the latter must be blamed for its fair proportion of it.

That chloretone is a hypnotic, five or six days' sleep from the administration of the drug will testify; that it is a *safe* hypnotic this period of sleep from the use of 120 grains of the drug, with no bad nor untoward effects, should be ample evidence.

I must acknowledge in conclusion valuable notes and observations of the case made by my student, Mr. W. R. Hanes.—*Thera. Gazette*, January 15th, 1900.

A CASE OF URETHRAL FISTULA CURED WITH MERCUROL.

BY B. A. ARNOLD, M.D., FREEPORT, ILLINOIS.

It is generally conceded that the salts of mercury, particularly the corrosive chloride and the red iodide, are the most powerful antiseptics and germicides that we possess. An effective germicide, as Bartholow says, "is destructive not only of the organism, but of its ova. Experience has demonstrated that the germ—the microbe—may be killed and yet the ova resist the action of the germicide, and hence pullulation goes on as actively as before. No antiseptic is entitled to be so designated, unless its power is equal to the destruction of the organism, and of its ova also."

Unfortunately, the use of mercuric chloride and mercuric iodide is attended with a number of objectionable sequences that are practically insurmountable. The chief of these are the decidedly irritating effect of both salts upon the living tissues, and their well-known coagulating effect upon the albumins. The former difficulty may be partially overcome, it is true. by excessive attenuation, although at the risk of sacrificing germicidal power: the latter cannot be so lightly disposed of. It is probable that the first effect of mercurial chloride upon a microbe is coagulation of its albuminous cell-wall, for structurally a microbe is only a tiny cell of special form. In that manner the microbe becomes invested with an impervious coat of coagulated albumin, which effectually protects its self-contained spores from the destructive effect of the germicide.

That was an auspicious mental effort which gave birth to the most available mercuric germicide yet produced—I refer to the combination of nuclein with mercury, known as mercurol. Nuclein is found in the leucocytes; it is intimately associated with vital processes; and is in some way a natural means of defence of the human organism against germ invasion. Mercurol is perfectly soluble in water; it does not coagulate albumin, and it therefore penetrates more deeply into the tissues than substances which have that effect. Mercurol is being used with success in the treatment of inflammations—simple and specific—of the mucous membranes of the eye and urethra. In the treatment of gonorrhea I regard it as almost a specific.

It is not my desire to present a lengthy paper upon this topic, interesting though it may be, but I will merely refer to a case which I have had under treatment for the past ten days, which has impressed me deeply with the value of mercurol in handling such

ordinarily intractable cases. This was a case of neglected gonorrhea of two months' standing, complicated by the formation of two large urethral fistulæ which perforated the inferior urethral wall. Under the systematic use of mercurol, not only has the discharge almost entirely ceased, but the fistulæ have healed completely, during the short period of treatment.

Mercurol solutions may be used in varying strength—from one-quarter or one-half of one per cent. to two, three, or even five per cent. in certain cases. It is best to begin the treatment of any case with a weak solution, gradually increasing the proportion of mercurol if improvement is not soon apparent.—*St. Louis Clinique.*

THIOCOL.

Thiocol (Potassium Guaiacol-sulphonate) was used by Dr. J. A. Goldmann, of Vienna, in twenty-four cases (nineteen children and five adults) of chronic bronchial catarrh complicated with recurrent febrile attacks, very severe cough-irritation, and at times very difficult expectoration. In all satisfactory results were obtained; the fever in at most five days being entirely banished, expectoration greatly facilitated, the cough-irritation lessened, the respiration rendered more free, and the entire course of the disease rendered less disturbing, so that at the end of four, or at the latest seven weeks, convalescence, without any complications whatever, was well under way. All the patients took the remedy eagerly, and without any objection; it was very well borne by them, and in not a single instance were any disagreeable by-effects, such as diarrhea or vomiting, caused. The thiocol was used in the form of a ten per cent. syrupy solution, which was given to adults in doses of one dessertspoonful after each meal, three times a day; children received a teaspoonful thrice daily, with milk or coffee diluted with water. In every case it was remarkable to observe how rapidly the appetite was increased, and the general appearance and condition improved, and weight increased—from 4 1-2 to 10 pounds being gained in a period of scarcely two months.

According to the author's report, equally decided and satisfactory results were obtained with thiocol in eight cases of acute and chronic pulmonary catarrhs in various stages; and special attention is directed by the writer to the unmistakable antiseptic action of the preparation, evidenced by the rapid reduction of the fever. Already after the first few doses of the thiocol solution a constant diminution was observed; and in cases where the fever had, with other remedies, always recurred, it completely disappeared after six days' treatment with thiocol, and remained absent. In a very short time, besides, the general symptoms of the disease

were much improved, the annoying cough, difficult expectoration, dyspnea, sense of weight and pressure on the chest, and general lassitude, diminish day by day, the appetite increases, the subjective condition is gradually improved, and physical examination after a time shows evidence of complete cure. Albuminuria was not noted in any of the cases treated. The results in these cases lead the author to the conclusion that the remedy is to a certain extent a prophylactic.

Finally, the syrupy thiocol solution was also employed in nine cases of tuberculosis, three of which were young subjects, 14 to 23 years old, and six from 34 to 59 years old. Among the latter there were two of the most severe form, with cavity formation and repeated hemoptysis. In the milder cases the remedy afforded complete cures within a comparatively short time—four to six months; in moderately severe cases complete cures in from six to eleven months, and in two such cases very decided improvement, the cough rendered less frequent, the expectoration less viscid and reduced in quantity, the night-sweats entirely relieved, the appetite and appearance improved, and the weight increased, and the sputum, on examination, found to be entirely free from bacilli. The two very severe cases were improved by the thiocol, in so far that the night-sweats were lessened, the fever reduced, the appetite improved, and the severe and annoying cough-irritation lessened to a certain extent—results which are all that can be expected in such cases.—(*Wien. Med. Presse*, Nos. 13 and 14, 1900.)

H.R.H. The Grand Duke of Hesse has conferred upon Dr. Louis Merck the distinction of "Geheimer Commerzienrat" (Privy Councillor), in recognition of his great services to the chemical industry of Germany. H.R.H. has further conferred upon Dr. E. A. Merck the distinction of "Medicinalrat" (Medicinal Councillor), in recognition of his services rendered in connection with the chemical exhibition of the World's Fair of Paris, 1900.

It affords us much pleasure to learn of the election of Dr. T. D. Crothers, of Hartford, Connecticut, to the chair of Diseases of the Mind and Nervous System, in the New York School of Clinical Medicine. Dr. Crothers has a world-wide reputation as a pioneer in the study of inebriety and diseases of the brain and nervous system resulting therefrom; moreover, he ranks among our most eminent living authorities on mental alienation. Hence, we regard his promotion to a professorship in this well-known institution of post-graduate instruction as a richly deserved recognition of his services to his profession and humanity.