

PAGE

MISSING

Vol 1 - 10

WM. R. WARNER & CO.'S QUICKLY SOLUBLE COATED PILLS

—OF—

IODOFORM

CUM HOC SIGNO

COGNITUS EST



(CHI₃)

AN IMPORTANT THERAPEUTIC AGENT

—AND—

A POWERFUL ALTERATIVE AND GENERAL TONIC,

VALUABLE AS A REMEDY IN

SCROFULA, ANÆMIA, NEURALGIA, CHLOROSIS
AND RHEUMATISM.

Iodoform therapeutically is alterative, nervine, sorbefacient, antiperiodic and anæsthetic. As an alterative it acts with more rapidity than other medicines of that class, in doses of one, two or three grains, repeated thrice daily. As a nervine it is prompt and efficient; while it gives nervous strength, it calms speedily the most severe pains. Its sorbefacient properties are manifested with some degree of slowness. Five to seven grains, given in broken doses in rapid succession, produce a powerful antiperiodic effect.

PIL: IODOFORM ET FERRI.

DOSE—1 to 2 pills three times a day.

Philadelphia, January 10, 1880.

I have used and prescribed the Sugar-Coated Pills of Messrs. Warner & Co., and can testify to their solubility, as far as those which I have used may be mentioned. I find them as prompt and efficient as those prepared by the formula of the U. S. P. and uncoated.

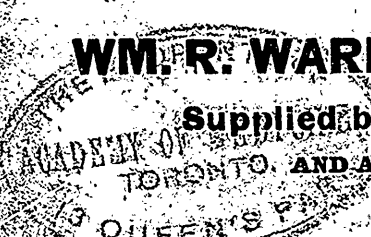
B. HOWARD RAND, M. D., Prof. Med. Dept. University, Pennsylvania.

PREPARED ONLY BY

WM. R. WARNER & CO. - PHILADELPHIA.

Supplied by **KERRY, WATSON & CO.** Montreal.

TORONTO, AND ALL THE LEADING DRUGGISTS OF CANADA.



MEDICAL SCIENCE

VIDEO MELIORA PROBOQUE

EDITORS

P. H. BRYCE, M.A., M.B., L.R.C.P. & S., EDIN.
WILLIAM NATTRESS, M.D., M.R.C.S., ENG.

P. J. STRATHY, M.D., M.R.C.S., ENG.
W. B. NESBITT, B.A., M.D., C.M.

ADDRESS ALL COMMUNICATIONS, EXCHANGES, ETC., TO DR. W. B. NESBITT, COR. COLLEGE & MCCAUL STS., TORONTO

ISSUED MONTHLY
VOL. 1: No. 10

TORONTO, AUGUST, 1888

SUBSCRIPTION, IN ADVANCE
\$2.00 PER ANNUM

ORIGINAL ARTICLES.

THE ETIOLOGY AND SURGICAL TREATMENT OF NASAL DISEASE.

BY C. C. RICE, M.D., NEW YORK.

THE successful treatment of nasal disease is, to-day, essentially surgical. The question, "Can catarrh be cured?" which has so frequently been asked by doubting physicians and anxious patients, has only been answered affirmatively since a more correct recognition of the etiology of catarrhal inflammation of the nasal mucous membrane, has devised proper surgical measures to correct these pathological conditions. Medical men laboring in this particular line of practice have just cause for congratulation in the rapid progress which has been made in the successful treatment of diseases of the upper air passages. I shall never forget the discouragements which were daily encountered in the treatment of nasal diseases no longer than eight years ago, and I have no hesitation in saying that if laryngologists or rhinologists were to-day dependent upon the same therapeutical means which they possessed in 1880, I should immediately direct my attention to some other line of medical study. It is not within the limits of this fragmentary paper to enter into a detailed consideration of the minute pathology of nasal catarrh, nor to review the history of the old methods by which practitioners have endeavoured to control the very common and annoying symptoms which are incident to nasal inflammation. The many progressive steps in the treatment of disturbances of the upper air passages which have finally led to the present surgical methods are well known to the gentlemen present. I would like, however, to be able to state so much of the etiology and consequent pathology of nasal irritations and congestions

as will give to us precise clinical indications for treatment, and then at the risk of showing you apparatus which you may be already familiar with, I should like to present to this Society a few of the latest instruments which are employed in the treatment of nasal diseases.

What changes have taken place in the views held as to the pathology of catarrhal inflammation of the nasal passages? The olden methods of treating nasal catarrh were based upon the belief that this disorder differed not at all in its causation from the catarrhal inflammation of any or of all the other mucous membranes of the body. No allowances were made for the exposed position of the nasal mucous membrane, as compared with other mucous membranes, and no thought was given to the peculiar anatomical structure of the nasal tissue structure, as will be seen, which is peculiar to itself and rendered necessary in order to perform its remarkable physiological function. The methods of treatment that have been employed until within the past few years to check catarrhal inflammation of the nasal mucous membrane have been unsuccessful and have deservedly fallen into bad repute, simply because the nasal mucous membrane has been regarded and treated like other mucous membranes of the body. This error came about naturally because the ordinary phenomena of inflammation of mucous membranes—redness, swelling, and hypersecretion—were always exhibited in the nasal cavities in this most common disease, chronic hypertrophic catarrh; and the vegetable and mineral astringents were relied upon, not only to reduce the congestion and the swelling, but to check the hypersecretion also. The patient called upon his physician day after day for weeks and

months. The nasal cavities were regularly washed with an alkaline spray, and then the prescription of silver, zinc, copper, or tannic acid was swabbed or sprayed generously through the nasal chambers. The result you all know. The effect of the so-called astringent remedy was not to diminish but to increase the congestion and swelling of the nostrils, and then hypersecretion was changed to a copious flow of serum. The patient was as uncomfortable as though suffering from an acute coryza. Relief came only when the distended capillaries and venous sinuses were emptied by the rapid transudation of serum. The nostrils were again open. The patient, who, fortunately for the operator, contrasted this later stage of comfort with his condition of misery immediately after the medication was applied to his nose, gave his physician credit for skilful knowledge, and the drug employed was believed to have some specific effect in the cure of catarrh. That such treatment does, after a time, produce some temporary benefit is, I believe, only because long continued irritation of the nasal mucous membrane, such as is inflicted by daily applications of astringent drugs to it, at length exhausts the nervous irritability of the nasal tissues, and the ordinary irritants to which the nasal mucous membrane is exposed—dirt, foreign bodies in the air, rapid changes in temperature, etc.—are for a time powerless to excite these structures to a state of congestion and swelling. They are exhausted. One carefully selected astringent remedy in weak solution is a stimulant, but as usually applied it is an irritant and nothing more, and yet we have learned men discussing the comparative merits of zinc, silver, or tannic acid as remedies for nasal catarrh. I believe them to be equally harmful if the applications are of the same strength, and we shall see the reason for that in a moment. Cocaine is worth the whole materia medica of the old astringents, but there are some objections to its use. I have already mentioned the two reasons why one astringent did not control catarrhal inflammation of the nose. One is the peculiar anatomical structure of the nasal tissues, and the second, its physiological function.

Before the year 1800, Morgagni had observed and called attention to the peculiar "red thicknesses" of the nose, as he called them, and Toynbee speaks of the nose and observes that it subserves the purpose of a "most excellent respirator."

Other German authors also call attention to this peculiar structure. In 1875, Bigelow, of Boston, wrote a detailed description of the anatomy of the nasal tissues; he had noticed the alternate expansion and contraction of the soft structures overlying the turbinated bones, and he thought the name *erectile tissue* an appropriate one; and because of its resemblance to the similar structure of the penis, he called it the turbinated corpora cavernosa. If we dispute the propriety of calling this an erectile structure, we are forced to admit that we have here overlying the bony structures of the nose a network of venous sinuses, between and around which is fibro-muscular trabeculae. Considering then the anatomical structure of this tissue, is it surprising that applications of silver and tannic acid are of little avail? We understand now why an astringent cannot be depended upon to chain down the expansion of an erectile structure. That this peculiar tissue is placed here for special physiological purposes, no one can doubt. It has long been known that the nostrils sifted out foreign bodies from the atmosphere, and that they still further prepare the air for its reception into the lungs, by raising it in temperature, facts physiological experiments have amply proven. Another function, and perhaps a more important one, is that the nostrils add moisture to the inspired currents of air, and this seems to be accomplished not only by the glandular secretions, but perhaps by exosmosis directly from the venous sinuses of the erectile tissue. As the erectile structure then is needed to warm and moisten the air, the demand upon it varies with every slightest change in the thermometer and barometer scale. It must be as sensitive to the surrounding conditions, which are constantly changing, as is the iris, expanding and exposing a large area of mucous membrane, underneath which are the large, warm venous sinuses, whenever the air is cold and dry, and contracting when moisture and heat are not required. This physiological function is to be remembered, when we examine the anterior ends of the turbinated bones. Not all so-called anterior hypertrophies are pathological. A portion of this apparent hypertrophy is physiological swelling. Of course there is a nicely adjusted nervous mechanism by which this automatic movement of the turbinated corpora cavernosa is regulated. It would seem as though the Creator had not fully realized the amount of

work which this nerve centre would be called upon to perform with the nasal mucous membrane exposed to rapid changes of temperature, dryness, and moisture, and the irritation of dirt and dust. After a period of years of successful physiological action, the frequently engaged sinuses become permanently dilated, with no power to contract, and the physiological swellings having become pathological hypertrophies, and we have the lesion present which is called chronic hypertrophic catarrh. It becomes a nice question, then, to determine when physiological swelling ceases and pathological hypertrophy begins. Up to a certain point swellings in the anterior nasal spaces are desirable, beyond this they unnecessarily occlude the nostrils and give rise to the symptoms of nasal obstruction. One conclusion to be derived from all this is, that the anatomical structure and the physiological function of the nasal tissues are in themselves strong predisposing causes in producing chronic catarrh, or in causing the conditions which are considered symptoms of this disease. Still another point in the etiology of chronic nasal disease, or I might say another strong factor of irritation which is frequently found in the nasal chambers and which furnishes clear indication for surgical treatment, is the contact between the soft tissues of the nose and the cartilaginous and bony septum. This point is disputed by some observers who believe that such contact is not irritative. Even though the septum be symmetrical and its surface smooth, there comes a time when the engaged erectile structure becomes sufficiently expanded to come in contact with it, and contact or friction between these two surfaces is irritating, and when long-continued produces rapid changes in the tissues in the line of chronic catarrhal inflammation. This condition comes about more readily and at an earlier period when contact with the soft structure is invited by the protruding point of a deviating septum. The nostril which is occluded by the convexity of a deflected septum, will always be found to be in a condition of chronic inflammation, the mucous membrane much more reddened than in the opposite side and the secretion more abundant. Other factors besides the irritation of contact enter into the cause of inflammation here, but contact is a very considerable feature of the etiology. One more pathological condition is very common, when instead of deflection of the septum we find

either cartilaginous or bony ridges, or both together, extending along the sutural lines, the most frequent location being at the junction of the vomer with the perpendicular plate of the ethmoid behind, and with the triangular cartilage further to the front. This is the suture that runs horizontally along the floor of the nostril. Excrescences here which touch the soft parts are apt to be overlooked during an examination, if the patient's head is tipped backward. These ridges are composed of cartilage along their supra margin and the lower border of the triangular cartilage, and of bone below the vomer they occur very commonly, less commonly at the other sutures. Early in life there are probably congenital causes which lead to this overgrowth at the sutural line; and later the overgrowth is due to exposure to the usual irritants. It is a pathological condition sufficient to keep the entire nostrils in a condition of chronic catarrhal inflammation. The irregularities of the septum which have been mentioned, usually occur opposite the inferior turbinated bone. Sometimes, however, the bend in the septum is higher up opposite the middle turbinated bone, and the contact here, which is sometimes discovered with difficulty on account of its concealed position, will be found to fully account for the chronic condition of irritation which is found in the nostril. This can be demonstrated by removing the convexity of the septum, when all irritation will subside. It will be seen that nasal obstruction is the broad term which covers the pathological conditions which have been mentioned; and I venture to make the prophecy that the name "chronic nasal catarrh" will not long be in fashion. The symptoms of this disease are those which naturally follow the stoppage of a channel which is intended for the passage of air. Occlusion of the nostril anteriorly causes a rarefaction of air behind the obstruction, and with diminished atmospheric pressure, we have immediately venous congestion and passive swelling of the lining membrane of the channel. Such swelling is in no sense inflammatory, and should not be designated a chronic catarrhal process, any more than hypostatic pneumonia should be likened to a catarrhal pneumonia. A little further back it stood near by, to speak of the so-called acute coryzas which patients suffer from so frequently during the winter months, "A cold in the head all the time," as they express it. They are not acute coryzas, properly

speaking, but sub-acute exacerbations of the chronic disorders, symptoms produced by contact between the hard and soft tissues; "anterior hypertrophies," that is, over distended venous sinuses, caused by paralysis of the fine adjustment of the nervous mechanism or vaso-motor paralysis. An extra stimulant or irritant has brought the anterior swelling against the septum, and a cold in the head, or symptoms which come under that nature, are the result. Now, as to this matter of hypersecretion, which has been perhaps the most annoying of all the symptoms common to nasal disease, the symptom which brings the patient to the physician, and which the physician tries in vain to check by astringents, it is quite possible, as has been suggested by a number of writers, that in many instances there is no hypersecretion present, or that there is perhaps the normal amount of mucous present. How do we reconcile apparent hypersecretion with a diminished nasal flow? By remembering that with partially occluded nostrils in front, the current of air is too feeble to carry along the mucus and distribute it over the general surface? It remains where it first comes to the surface, or is carried to the posterior nares, the watery portions disappear by evaporation, the remaining inspissated portions are gotten rid of by hawking and nose-blowing. We are unconscious of normal bland nasal secretion, but are made unpleasantly aware of this altered mucus. Another explanation which is not very old, and which may account for this apparent hypersecretion, is that the lymphatic tissues within the nostrils, and especially the group of lymph follicles at the vault of the pharynx, known as the third tonsil or Luschka's tonsil, becomes disorganized by the long-continued passive congestion incident to nasal obstruction; and these lymphatic glands do not re-absorb the nasal secretions, when it has reached the post-nasal pharynx. This conjecture is based on the known physiological functions of the intestinal lymphatic absorbents. It is possible to believe, therefore, that as in the case of hypertrophy of chronic hypertrophy catarrh, the apparent hypersecretion is not altogether, or in most part, one of the phenomena of a chronic catarrhal process of mucous membrane, but a normal secretion retained in the post-nasal cavities because of the closure to the air current in front. These are pathological data which have strong clinical significance, and they indicate one, and only

one, line of treatment. Enlargements of the turbinated structures at the posterior ends of the bones, or posterior hypertrophy are also mainly due to anterior nasal obstruction. These soft swellings behind are secondary to the ones in front and are dependent upon them. Remove the anterior ones and admit atmospheric pressure, and the posterior ones will immediately diminish in size, and will usually disappear altogether.

Two or three short sentences to sum up what we have tried to say in regard to the pathology of nasal disease. 1. The turbinated enlargements, the most common lesion of hypertrophic catarrh, are made up not of connective tissue infiltration, as we should expect if they were the result of long-continued catarrhal inflammation, but they are the "erectile tissue" of Bigelow, the turbinated corpora cavernosa which have become permanently dilated, and their contractile powers gone. Our physiological function has become pathological. 2. In addition to the irritations from without, we have constantly irritating factors in deviations of the septum and in cartilaginous and bony excrescences upon the septum when they come in contact with the soft parts, as they do at an early stage of the disease. 3. Anterior closure of the nostrils from these sources means mechanical swelling all the way along the nasal channels, which disappear when the obstruction in front is removed. 4. It is quite possible that the apparent hypersecretion of a so-called catarrhal process is not real, but an accumulated normal secretion.

Now, as to treatment, I repeat the first section of this paper, "The successful treatment of nasal disease is to-day essentially surgical." The indications for treatment are exceedingly simple, although there may be some choice as to the measures to be adopted. 1. Nasal obstructions must always be removed. 2. Contact between the soft tissues and the septum must always be prevented.

In dealing with soft swelling I agree with Dr. Harrison Albs, of Philadelphia, when he says that the galvano-cautery is the best surgical instrument we have in the treatment of nasal disease. There is but one agent that comes in competition with it, and that is chromic acid. As to the respective merits of these two agents. It is a little difficult to gauge the amount of destruction and

contraction we shall obtain with the acid, while with the cautery we can regulate the action exactly. In experienced hands the cautery is easier of application. I first apply a ten per cent. solution of cocaine. As a rule, this will remove the anterior swelling, showing how little of connective tissue infiltration there is in these enlargements. The flat electrode can be applied to the surface, or a pointed one can be thrust into the swelling, a destruction of a few of the blood vessels and the work is accomplished. There will be sufficient contraction to prevent further obstruction. The cautery should be applied gently and not too hard, in order to get the minimum inflammatory reaction. A prescription reading as follows:—

℞	Morphiæ sulph.	gr. i.
	Cocaine hydrochlor.	gr. x.
	Aquæ distill.	ʒi.

Can be placed in the hands of the patient with directions to apply it to the nostrils with a camel's-hair pencil to prevent swelling after the cauterization. It is of course possible to foster too much tissue by a too liberal use of the cautery. Enough of the anterior enlargement should be left for physiological purposes. When they are entirely removed we have a condition simulating atrophic rhinitis. Dry, scabby nostrils and a pharyngitis sicca. After the anterior swellings have been reduced we can pay attention to those on the middle portion of the inferior turbinated bones, which, however, are not common.

There are circumstances which require the use of other measures, such as the use of antiseptic solutions of 1-3000, which are to be greatly preferred to plugging of the nostrils. Jeffrey's rhinoscope is to be preferred. Gauges, self-retaining plate hooks, trephining, and radical operation on the nasal septum were spoken of and the occasions for using them indicated.

SOME PECULIAR CASES OF EMPYEMA.

AN ADDRESS BEFORE THE ONTARIO MEDICAL ASSOCIATION, BY DR. WHITEMAN, SHAKESPEARE.

JUDGING from what has occurred in the field of my own observation, as well as what I meet in medical literature, I am forced to the conclusion, that although in few diseases is an early diagnosis of so much importance to the future well-being of the patient (I mean if followed by proper treatment), yet there are few in which the real nature of

the case is so frequently overlooked, in proportion to the total number of cases occurring, as in purulent pleurisy or empyema—increased frequency of respiration with pain, fever, dyspnoea, absence of respiratory murmur, dullness on percussion, rigidity, flatness of intercostal depressions, œdema, are the symptoms and signs given for this disease.

And these, if all found, would certainly indicate a collection of fluid in the chest, which, having once concluded, I do not hesitate to use a hypodermic needle and ascertain its nature; the precaution being taken of first dipping the needle into strong carbolic acid, then into boiling water, and sticking it into a clean cloth, and removing any loosened epidermis or sweat by washing the part of the chest selected for the insertion of the needle. In this way I have found it perfectly safe, and even a two or three year old child will not complain much of pain.

The majority of cases occurring in children, during the majority of dentition, when indigestion plays a large part in the ailments of childhood, often a hasty diagnosis of worms or teething is made, especially should a convulsion mark the commencement of the trouble, as it frequently does at that period of juvenile life, and the patient is dosed with santonine or pink root, and perhaps its gums lanced. Should one or more worms follow the administration of the former, there appears to remain no further need for reviewing the diagnosis, and failure to recover is frequently ascribed to the perversity with which the little sufferer objects to taking his medicine.

I will illustrate. Annie V., *æt* 4 years, April 4, 1878. Emaciated, pulse 180, \mathcal{R} 100, alternate fever and perspiration. Had been ill since latter part of January. Treated by eclectic doctor for *worm fever*. Begun with convulsion, and diagnosis confirmed by passage of worms after administration of powders. Continuing very ill. On change of doctors was treated for pneumonia. Had coughed and vomited purulent matter for several weeks. I aspirated one pint of laudable pus when child fainted, and I quit and gave stimulants, fresh air, etc.

On the 8th I made free opening and discharged about one and a half pints, when she complained of pain in the side, and syncope again threatened. I inserted pledget of cotton and closed the wound, so as to stop the discharge. 9th. I inserted drain-

ge tube and irrigated with dilute carbolic acid. This was continued until May 26th, when she was quite restored to health and has been strong and healthy since.

In arriving at a diagnosis in all cases of internal abscess, no matter where, I have, during the whole of my professional career, been very much assisted by a remark made by my old preceptor, Prof. W. T. Aikins, in one of his surgical lectures.

It was to this effect: When a patient emaciates with chills, sweats, and local pain, continuing for several weeks, and without evident cause, examine carefully for internal abscess. As to the signs given, they are not, I find, all reliable.

Absence of respiratory murmur given as one, and which we would naturally expect, I have found pretty constantly in hydro-thorax, but not in pyo-thorax.

I can only account for this by supposing that frequently during the intense inflammation preceding the effusion that ought to displace the lung the costal and pulmonary pleuræ become adherent and so portions of lung tissue are held down to the lower part of the pleural cavity, and such cases give trouble both in diagnosis and operation.

Wm. Ross, *æ*t 2 years, seen July 1, '79. Ill about 4 weeks. Frequent sweats, dullness on right side. Half inch enlargement, etc., but respiratory murmur over whole of side; explored and got pus. Assistance was called; patient anæsthetized, and using hypodermic needle before operating as we both felt timid. On account of respiratory murmur we found it impossible to obtain any pus and gave up.

On 9th, finding my patient getting worse I used the needle again and got pus. I unscrewed the barrel from the needle of the syringe and cutting down beside the needle obtained eight ounces of pus; inserted drainage tube and irrigated, this was continued for four days when the tube came out with the dressings and could not be reintroduced. It was not required and patient made uninterrupted recovery.

Sometimes it would appear that pleurisy is not the primary disease but that inflammation of a neighbouring organ or viscus extends to the pleura. An empyema of this class is likely to be somewhat circumscribed.

Miss H., *æ*t 24, of German parentage, was taken suddenly ill about midnight, Jan. 2, 1887. Severe

pain in right hypochondria, shooting to left side and right shoulder. I saw her about 8 a.m., Jan. 3, pulse 48, temperature 97; cold perspiration, vomiting. Two years before had had an attack of bilary colic with jaundice. The only cause which she could assign was drinking a glass of cold lager beer about noon the previous day which caused her to feel chilly. Gave morphia hypodermically and treated the case as one of bilary colic. Jan. 4—Pulse 120, temperature 103; no friction sounds but pain over liver and base of right lung, increased on deep respiration. Patient rapidly emaciated with slight jaundice, chills, fever, and sweats. Jan. 10—Dullness above natural superior border of liver. Explored but got no pus, as I strongly suspected, either above the liver or empyema. I frequently explored until Jan. 18; on my ninth attempt I obtained fœtid pus between ninth and tenth ribs, a little to the front of the axillary line.

I made free opening, inserted double drainage tube secured by strong safety pin, irrigated with tr. iodine, one teaspoonful to the pint until it ceased to have an offensive smell. There was only about a pint and an half of fluid in this case but so offensive that the attendants were compelled to leave the room. After thoroughly irrigating I dusted the side with iodoform covered with antiseptic gauze and over this a thick pad of antiseptic marine lint.

On removing dressings on the 19th, I found the discharge again offensive and temperature of patient, which shortly after operation, had fallen to normal, rising. I again irrigated the cavity, removed the drainage tubes, and replaced them by freshly disinfected ones, and renewed antiseptic dressing as before.

This patient recovered somewhat slowly; frequently, no matter how cleanly kept, the discharge would become offensive, requiring repeated irrigation which gave her no inconvenience. Temperature and pulse always affected when discharge became offensive. By February 1st was able to sit up for a couple of hours. Tubes removed February 8th, and on the 20th all healed.

Since then has enjoyed excellent health. My opinion is that in this case the inflammation began in the liver.

Empyema may be double, adding materially to the difficulty of diagnosis. As the terms dullness and flatness on percussion are relative terms, hav-

ing no fixed standard, and only to be appreciated by comparing corresponding portions of both sides on the same patient, scarcely ever two patients giving the same resonance on percussion; in case of double effusion, in a child, where the surface to be percussed is small, it is difficult at first to say whether you have effusion at all or not.

On the 8th of April, Louisa and Sarah Meher, twin sisters, had been playing together in the open air during most of the afternoon of the previous day. During the night both took convulsions, followed by pains in the chest, rapid respiration, and pulse in high fever. I saw them on the morning of the 8th, and as measles were epidemic in the neighbourhood, at first I suggested that perhaps they were contracting that disease.

As their temperatures ranged from 103 to 105 constantly and pulse 140 to 160, I soon had to revise the diagnosis. Louisa gave evidence of double pleuro-pneumonia; Sarah, consolidation at left apex without bronchophony.

A consultation was arranged and I was informed that my patients had catarrhal pneumonia; this was April 18th. It was suggested that they should both have large quantities of stimulants, a proposition to which they objected so strongly that it could not be carried out. Sarah was improving but Louisa kept getting worse, and on the 28th I made an exploration of the right side and got pus. I made a free opening, inserted double rubber tube secured by safety pins and irrigated. About a pint of pus escaped and the percussion note became more tympanitic, showing, by comparison, considerable dullness on left side. As there was but little improvement in her general condition, on May 3rd I explored the left side and found that it also contained pus. I aspirated and got about six ounces, followed by mitigation of all the symptoms. On the 13th, as fever was somewhat higher, I aspirated again, getting about two ounces and again on the 31st, the last time, getting only about an ounce of sero-purulent fluid. During all this time the double tube was kept in the right side. She gradually improved after last tapping, and in the first week in June was able to play about again, the tubes were removed. Both children completely recovered and have been strong and healthy since that time. The case of Louisa is, I believe, a rare one; I have not seen the report of a similar case followed by recovery. The left side of this patient

is the only case in which I have tried to treat an empyema by aspiration. My intention was to repeat the aspirations as required until the right side was healed, should the patient stand it so long, and then make a free opening, as I would not venture to open both sides at once. However, it has demonstrated, I think satisfactorily, the possibility of a cure being affected by repeated aspirations.

As to treatment I consider it essential to have two openings and so far from endeavoring to exclude air, I consider it useful to let pure fresh air pass freely in and out of the cavity. I have on two occasions seen wounds of the chest in healthy individuals in which air freely entered the pleural cavity, completely displacing the lung, yet the wounds healed rapidly without injury to either lung or pleura. I will not dispute that in a recent case where the lung is not bound down, its expansion may be so great as to occupy the space as fast as the pus is removed and so empty the cavity through a single opening. But, if any one thinks he can do so in an old case where the lung is not only bound down by adhesions, but from lung compression, has in a great measure lost its power to expand, being in fact carnified. Let him try to empty a small keg or barrel by a single opening through a rubber tube. He will find it necessary to make a second opening before the fluid will run and it is necessary that air should take the place of the outflowing fluid.

Dr. Louis A. Sayer, of New York, covers the ground here very nicely in his excellent work on "Orthopædic Surgery," when speaking of the admission of air into deceased joints, he says, "I am not afraid of fresh air but I am afraid of imprisoned air." So long as the surroundings of the patient are aseptic there is nothing to be feared from free ingress and egress of air, more than in any other abscess. The old method of making a second opening lower down than the first was good, its only objection being the difficulty of making it. I have found two rubber tubes fastened together by a large safety pin and one about an inch longer than the other answer admirably, and when necessary to irrigate I inject through the lower tube.

Mrs S., æt about 45, the wife of a German farmer. I saw her shortly before her death on February 25, 1884, in company with her medical attendant and another physician. Her pulse was from 180 to 200 intermitting, with cold extremities. It was explained

that she had been ill since last fall having first a hydrothorax which was tapped and followed by empyema.

As the woman was evidently dying I did not interfere with the case simply joining with the others in an expression of opinion that she could not recover. Her attendant pointed out to me, with the air of a man who had done his whole duty, the precautions which he had taken to prevent air getting into the pleural cavity. He had wedged a large rubber tube into the single opening in the chest wall, kept the patient on her back, and the other end of the tube was kept in a vessel of carbolyzed water beside the bed. This, I was informed, secured the purity of pleural cavity. On the 27th, as patient still lived, I was sent for again (al-

though I had previously given my opinion that she could not possibly recover). I found that she had rallied slightly but was not really any better. As she complained of the tube causing pain, I removed it, when there ran out over a quart of most horribly fetid pus, so that many of the friends who had gathered around the bedside had to go out and vomit. Of course the blood poisoning was already too pronounced for her to recover, but I have no doubt that the above invention was a great hindrance to any chance which the poor woman originally had, and strange to say it is only a short time since I saw the same method advocated in a medical journal, not as a result of experience but on theoretical grounds.

EDITORIAL

MEDICAL ETHICS.

"Duty and Honor!

Those are ambiguous words, of many meanings;
You should interpret them for him."

—*The Death of Wallenstein.*

WE have been interested to observe that the Committee on Credentials of the Ontario Medical Association has had entrusted to it the task of reporting on a number of individual points relating to professional etiquette and, we suppose morals; and it has occurred to us that the above quotation very exactly expresses the whole situation, and as the *you* in this instance stands for the Committee, we commend these words of wisdom to them for their serious consideration.

Doubtless it is true that any well constituted society must have certain well defined laws to regulate it, and we deem it quite right and proper that the medical profession, as a caste, must have its creed and standards of faith to which every member is expected, if not required, to subscribe. We do not propose to anticipate the decisions of the Committee on the very serious questions which they have to consider, and can only hope that the leaven of Phariseeism may be entirely absent from their deliberations, and that while straining at a gnat they do not swallow a camel.

The cardinal principle, we take it, of the only true guide to human conduct is contained in the saying. "Do unto others as ye would that men do

unto you;" and all honest discussion will resolve itself into the problem of how, under circumstances to which these several questions relate, medical men should act or govern themselves. Where Phariseeism might possibly enter into the deliberations of the Committee, would be where it might assume that ethics demands that the element of business must be wholly ignored by a professional man. With a profession overcrowded, and many more entering it every year, it must at once be taken for granted that unless the newly-arrived practitioners have decided to become apostles of Tannerism, they are going to make a vigorous struggle to escape extinction by a process of slow starvation. Bearing directly upon this phase of the problem is one question which we notice is to be discussed, viz., the ethics of a handbill of varying dimensions, stating that Dr. So-and-So has removed to Street A., No. B. We await with pleasure the Committee's *dictum* on this point, and claim the right in the meantime to our own unexpressed opinion.

Another, and to us a more serious, aspect of this question is the practical ethical differences between the actions of the physician as an individual and as one of a number, *e.g.*, the staff of a medical college. Does an immoral action become moral if sanctioned by usage? and can the fact that a certain number of physicians are associated together by a legal charter to grind out young practitioners, make ethically correct their actions in sending broadcast,

by whatever methods as seem most likely to accomplish the desired end, flaming circulars in the shape of a College Calendar, setting forth, after their names, all the charities, etc., to which individual physicians are attached, with a varied alphabet and other *et ceteras*, for the real, if not ostensible end, of obtaining a large class of students from whom to abstract fees, which net said professors a very handsome income as well as the *kudos* attaching to the position?

Here again we express no opinion, but would suggest that the Committee take this matter under its serious consideration before issuing its conclusions. We sometimes have heard the actions of medical men sternly deprecated when they have been found guilty of touting for public patronage in the vulgar manner of the New Haven fishwife, who cries, "caller herrin', twa' a penny, twa a penny"; but have failed in our limited reading to have noticed that the local notices and the extended reports of closings of the various institutions have been by our sticklers for etiquette severely commented upon. The more we view the question in its various aspects the more firmly we are convinced that a high purpose and a lofty ideal in the individual as pertaining to all human action can be the only standard of medical ethics.

"And blest are they

Who in this fleshly World, the elect of heaven,
Their strong eye darting through the deeds of men ;
Adore with steadfast, unpresuming gaze
Him, Nature's essence, mind, and energy."

TORONTO SEWAGE DISPOSAL.

IT might perhaps with reason be said that this enterprising city has made fair headway towards the accomplishment of its many labors of Hercules, for we have notification of disease, registration and licensing of plumbers, house inspection, etc.; but still we have left what may indeed be called her Augean stables still uncleansed, for with the exception of a certain amount of night-soil which is daily removed to market-gardens beyond the city from privy-pits which ought to be non-existent, we are depositing the total filth of the city, whether of garbage and street-sweepings, or of sewage, in places where it ought not to be, speaking either from the æsthetic or the sanitary standpoint. To-day may be seen, as has been too truly pictured by a leading daily journal, the contents of

the sewers being poured into the bay at the front of the city, at points where more largely than anywhere else it affects the æsthetic sensibilities of all going on or living near the wharves; and, so far as its effects are directly deleterious, affecting directly their health. It seems extremely absurd that people in order to reach the boats for Niagara or the Island should have to pass through a Gehenna; but it may be that the subaqueous demons who are deprived of their victims by these modern inventions of steamers and sail-boats, and crafts innumerable, are determined that the *dévotées* of Hygeia shall pay tribute to the *dii inferni* in some way or other, and so have decreed that this Stygian flood, or Acheronian pool shall exist and flourish *ad æternum* as a *cloaca maxima* for the Yonge Street sewer and its innumerable branches. The absurdity of the whole matter, apart from its serious aspect, is seen in the attitude of abject helplessness which is assumed by the *patrii* of the city when hotly berated for the existing state of affairs.

We are greatly reminded of Hamelin Town in Brunswick and its Council in their heroic endeavours to rid the town of rats:

"An hour they sat in council:
At length the Mayor broke silence:
For a guilder I'd my ermine gown sell;
I wish I were a mile hence!
It's easy to bid me rack one's brain—
I'm sure my poor head aches again,
I've scratched it, too, and all in vain;
Oh, for a trap, a trap, a trap!"

Without assuming in any way the part of the piper of Hamelin, inasmuch as we like him, would first like to see our "thousand guilders" present as 'spot cash,' we wish in a brief way to indicate something of what has been done for the solution of the question under similar circumstances.

The disposal of garbage and night-soil is now satisfactorily carried out in many towns in England and Scotland by cremators, notably "Fryer's De-structors," as at Leeds, Birmingham, Manchester, etc.; and several places, as Montreal, though at excessive cost are doing the same on this continent. But the great problem of the disposal of sewage has been successfully worked out in many instances. In a recent number of the *Sanitary Record* has been published a description of what "The Association of Sanitary Inspectors saw on their visit to Croydon, England." As touching most directly

upon the question at issue, we would quote from the journal :

"On Saturday, July 7th, the Association of Public Sanitary Inspectors paid a visit to the Croydon Sewage Farm at Beddington, at the invitation of and under the guidance of Dr. Alfred Carpenter. As this farm has been in existence for more than thirty years, and now disposes of the sewage of nearly 100,000 people, a short account of it—for much of it we are indebted to a statement compiled by Mr. Alderman Grundy, chairman of the Beddington Farm Committee—may prove interesting to our readers. The farm, which lies in the parish of Beddington, about two miles from Croydon, consists of about 600 acres of land, 500 acres being used for irrigation, but not more than 75 acres being under sewage at one time. The soil is fairly light, with a gravel sub-soil. The land has an easy natural fall to the River Wandle, so that no pumping is necessary at any point after the sewage leaves the town. Croydon is for the most part sewered on the separate system, but during times of heavy rainfall—as during the past week—the sewage, of which the average dry weather flow is about four million gallons daily, is much increased in volume, even to more than double the above-mentioned quantity, and it is then allowed to flow over three acres of osier beds, which will take any quantity of sewage without injury to the crop, or, failing this, over the land where it will do least damage. There are no storm overflows, so that all the sewage, even during the wettest periods, must pass over land—none can enter the stream untreated.

Before arriving at the farm, the coarser solid bodies are removed from the sewage in the outfall sewer by means of a Latham's extractor. The sewage is then passed over the land, which is laid out for broad or surface irrigation. As a rule the treatment adopted is as follows:—The crude sewage enters the subsidiary carriers from the main carriers, and is then forced by the lowering of sluice board: to flow down open grips at right angles to the carriers, from which it flows over the surface of the field when backed up by boards placed in the grips. The effluent sewage is brought back to mix with the crude sewage, and this weakened sewage is passed twice again over the land. In the first field all floating particles are arrested by the rye-grass, and the sewage is partly purified. From the

second field the water passes off clear; from the third field, which is permanent pasture at the lower end of the farm, the effluent comes off clear, of a yellowish tint, but free from sewage odour, and is then discharged through a channel into the River Wandle. The lower part of the farm, near the river, is underdrained, at a depth of 5 or 6 feet; but the larger portion is undrained, so that the purification is chiefly by surface flow, and by means of the growing vegetation, which absorbs impurities through its roots, and not to any large extent by filtration of the sewage through the soil. Italian rye-grass having a large capacity for absorbing sewage, which benefits it at all stages of growth, forms the staple crop of the farm. It is cut green when the seeds begin to grow, and is sold to cowkeepers, who cart it away. Mr. Dibbins, a dairy farmer who has cowsheds for 200 head of cattle at the south-west corner of the farm, is a large customer for rye-grass and mangolds. Three or four crops, averaging 10 tons an acre, are produced yearly. Any rye-grass not sold is made into hay, but, except in a very dry season, haymaking is a very tedious process, involving much labor. Rye-grass is only made into hay from necessity. Ensilage has been tried, but has not been persevered with. When the land has been under rye-grass for three years it is ploughed up, and crops of mangolds, beets, vegetables, and corn are grown, but these take little or no sewage. They, however, serve a useful purpose in exhausting the sewage left in the land by the rye-grass. After two or three years of these crops rye-grass is again grown. The corporation do not now keep live stock, but horses and cattle are taken in to graze on the pasture lands, and most of the produce of the land is sold to dairy farmers. The Association inspected Mr. Dibbin's 200 head of cattle, including numerous milch cows, in his admirably constructed and appointed cowsheds, and the beasts, which are at this time of the year fed on sewage-grown rye-grass and grains, were all in prime condition and free from any trace of disease. As to the cost of the farm to the corporation, the surplus of receipts over payments for the year ending Lady Day, 1888, was a little over £1,000; the surplus for the present year, which has every prospect of being a bad one for sewage farming, is estimated at about the same figure. This does not include anything for interest on the capital sunk in the purchase of the farm. The

cost of disposing of the sewage does not involve more than a rate of 3d. in the pound on the rateable value of Croydon, the whole of which goes to pay interest and purchase money for the land. This payment will extend over a period of less than forty years, when the corporation will be absolute owners of a large, valuable, and unincumbered freehold estate.

Although the farm was working under difficulties on the day of the visit, owing to the excess of storm-water, nothing in the shape of a nuisance was perceptible anywhere, and the effluent water was sufficiently purified to be by no means an unwelcome addition to the River Wandle. It would no doubt be an improvement if more of the sewage carriers were concreted, and if a larger portion of the farm was underdrained, so as to insure the more efficient filtration of the sewage through the land, but we are aware of the financial stumbling blocks which beset every sewage-farm committee, and can certainly congratulate the corporation on the success which has attended their efforts.

After the conclusion of the report Dr. Alfred Carpenter, after paying a tribute to the usefulness of the work performed by sanitary inspectors and to the value of their Association, said that it seemed to him that if towns would more generally adopt sewage-farming as a means of disposing of and utilizing their sewage, the necessity for allotments to prevent the agricultural laborer and his family from drifting into the large towns, where he too often helps to swell the large mass of needy and indigent populations there existing, would be obviated. Owing to the enormous crops grown on sewage farms, the amount of labor required was far in excess of that required on an ordinary farm of the same size. Work, and remunerative work, was given to a large number of hands, and food—milk, meat, and vegetables—were produced in large quantities which became available for the town populations, and tended to keep down the prices of these necessities of life. The benefits derived from sewage-farming were not only local benefits but they were national benefits. Any other system of disposal of sewage but that of irrigation on land with the production of crops was waste. The Metropolitan Board of Works were now engaged in carrying out a huge system of waste. The sewage of London was to be clarified by chemical precipitation at immense cost to the rate-

payers. The precipitated sludge would be taken out in steamships to be thrown into the sea, whilst the clarified but still impure effluent would be, as now, turned into the Thames to its continued defilement. There was land suitable for irrigation in the neighbourhood of London; but the Metropolitan Board of Works preferred to adopt a system which, if perhaps less costly for the moment, would before many years place the metropolis in a dilemma compared with which its present situation would be an enviable one.

Mr. Alderman Grundy, chairman of the Beddington Farm Committee, gave some statistics as to the working and cost of the sewage farm, which have been already embodied in this matter.

Dr. H. G. Thompson, a member of the Croydon Town Council, said that ten or twelve years ago Croydon was in a most insanitary condition. Typhoid fever was very prevalent, and was often at that time spoken of as Croydon fever. Since that time very great improvements have been effected, more especially since Croydon became a corporate town five years ago. Although Croydon had a population of 96,000, it was not yet included amongst the twenty-eight large towns of the Registrar-General, but it had had for a number of years a lower general death-rate than that of the healthiest of the twenty-eight large towns—Brighton or Portsmouth, for instance. The death-rate of Croydon for 1884 was 16.4 per 1,000, for 1885 16.8 per 1,000, for 1885 14.5 per 1,000, for 1887 14.7 per 1,000. The death-rate of Beddington, in close proximity to the sewage farm, was lower even than that of Croydon. He was aware that he (Dr. Thompson) and Dr. Carpenter did not agree about notification of infectious disease, except in so far as that some form of notification was essential, but he had found the system of dual notification in force in Croydon to work well in practice, and to be free from the objections urged against it. They had now in Croydon, besides the sewage farm, the waterworks and the public baths—all belonging to the Corporation—and if they had a hospital for infectious diseases, they would have attained a most enviable pitch of corporate excellence.

Dr. Alfred Carpenter in reply to a vote of thanks proposed by Mr. Alexander, Chairman of Council of the Association of Sanitary Inspectors, said that it had given him the greatest pleasure to

welcome the Association in Croydon. With regard to sewage farms depreciating property in their neighborhood, he should like to say that in 1861 Beddington and Wallington had a rateable value of £11,700. At the present time these parishes had a rateable value of £47,424, an increase of fourfold, although the farm was in their midst. He believed that fresh sewage was never offensive, and the sewage applied to the farm was always in that condition. There was no doubt that the disease germs which might be present in sewage were destroyed when sewage was used to irrigate land. At any rate, the farm hands had always been most healthy, and no case of infectious disease occurring amongst them had ever been traced to the application of sewage to land. In like manner no epizootic or entozoic disease had occurred amongst the cattle fed on the farm or on sewage-grown produce, which could be attributed to the sewage irrigation. Foot-and-mouth disease had occurred on the sewage farm, but it had been invariably conveyed from other farms in the neighbourhood. There was not the least ground for saying that sewage-farming was injurious to either man or beast.

Other speeches followed, and the proceedings of the day, which had been most successful, then terminated."

Our problem in Toronto may be said to be exactly the same as that which Croydon had to meet, and successfully solve, excepting that an increment of cost must be added for pumping, which is not included for at Croydon. On the other hand, the available results ought to be at least as good in Canada as at Croydon, inasmuch the dry climate here is unusually favorable for the utilization of sewage for the production of garden produce. We do not fortunately, however, have to go as far as Croydon for an illustration of a sewage farm. At Pullman, Illinois, has been in successful operation for a number of years a system of sewage-disposal which, in its completeness, is not, probably, excelled in the world. We quote from a recent description of this contained in a report by Dr. Oldright to the Provincial Board of Health:

"The city of Pullman is sewered on the separate system. The sewerage mains discharge 16 feet below the surface of the ground into a reservoir under the water tower. This part of the system is thus described by Mr. Doty:

'This reservoir holds 300,000 gallons, and the sewage is pumped from it as fast as received and before sufficient time elapses for fermentation to take place. The ventilation of the reservoir is perfect. Eight flues run from it to the top of the tower above it, and a twenty-inch flue leads from it to the large chimney which takes the smoke from the fires under the boilers of the Corliss engine. The sewage is pumped through a twenty-inch iron main to a sewage farm about three miles distant, and at the farm end of this main the sewage goes into a receiving tank which contains a screen placed in a vertical oblique position, through which substances that are of more than half an inch in diameter cannot pass. The pressure of the sewage upon the tile piping in the farm is not allowed to exceed ten pounds to the square inch. The sewage from dwellings now, March, 1887, amounts to 100 gallons a day for each person of the population. This seems a large amount, but when it is remembered that every tenement is provided with the best of closets and sinks, and ten per cent. of them with bath tubs, and that the water taps are all inside the houses, it will be seen that a large amount of sewage *per capita* is unavoidable.' The receiving tank at the farm is elevated to such a height that a waggon can be driven under it and receive from a door in the bottom of it the solid matters, such as rags, boots, etc., that have been strained out. From the tank the sewage passes through vitrified hydrants distributed over the farm, in the proportion of about one to every two and three-quarter acres. From these hydrants it is allowed to flow intermittently into different portions of the farm. The soil is underdrained by means of porous tiles, and the effluent passes into mains, and from them into a ditch which discharges it into Lake Calumet. The subsoil drains are placed nearer together than in most irrigation farms, the distance being about 30 feet, and I should think from the nature of the subsoil and the configuration of the locality that this is absolutely necessary. Farms with a gravelly or sandy subsoil, and sloping towards the outfall, have a great advantage in this respect. From the experience he has had, Mr. Martin recommends that the subsoil drains should never be less than four inches in diameter. About fourteen acres are laid out in what may be termed the 'flat-bed system.' I saw some of the effluent in the mains, and it was quite clean and

offensive. Mr. Martin told me that he had one day discovered some railway laborers sitting beside the ditch, making use of the effluent to wash down their luncheon. They were surprised when warned of its character, and said it was the sweetest water they had found in the neighborhood. Mr. Martin gave me some valuable information as to the vegetation best and most profitable to raise. We have been accustomed to consider Italian ryegrass as very suitable. Mr. Martin raised this in his first year and could neither sell nor give it away. It was so coarse and rank that stock raisers would not accept it as a gift. The vegetables which they found they can raise most profitably are celery, onions, and cabbage. Many other vegetables can also be raised. Potatoes cannot be grown at all, except as a decided failure. In some years, the farm (besides being a profitable sanitary investment which it always is) has yielded as much as eight per cent. or over, but in other years—years of drought or of early frost it has yielded no direct profit; the outlay has never exceeded the returns. The city of Pullman is admirably clean and well kept. I would like to refer to one of many things that I would note if time permitted, and that one thing is the excellent ventilation and absence of dust in the shops; over each dust-producing machine in the process is a funnel; these funnels are connected with exhaust air-shafts, the exhaustion being produced by an extract fan situated over the boiler room of the great engine house. Into this room then the saw-dust is drawn, and it passes down to the boiler where it is burned. From an article by Mr. Doty I extract a few descriptive remarks:—

The city of Pullman is built scientifically in every part, and is exceptional in this respect. Here both the drainage and sewerage preceded the population, and the soil is now as free from organic contamination as when it formed a portion of the open prairie. Every building, too, has been constructed from approved plans and under the supervision of competent builders and engineers. The city is situated ten miles south of the city limits of Chicago and upon the west shore of Lake Calumet. The lake is about three and a half miles long by one and a half in width and drains through the Calumet River into Lake Michigan, which is a little more than three miles distant. The buildings already erected are upon ground

which is from eight to fifteen feet above the level of the lake. The soil is a drift deposit of tough blue clay ninety feet in depth resting upon limestone rock. The land gradually rises to the north and west to an elevation of twenty-five feet above Lake Calumet, this lake usually being from three to five inches higher than Lake Michigan. There is no land of a marshy character in the neighborhood, the bottom of Lake Calumet even being of hard blue clay from which the best cream coloured bricks are made. It was deemed unwise to permit any sewage to flow into the lake, so the plan of drainage adopted is what is known as the *separate* one, and comprises two systems of pipes. The fall is sufficient to secure good cellars or basements for all the dwellings of the city, the drain pipes leading from cellars to the laterals being at least eighteen inches below the cellar bottoms. The parks and playgrounds are all thoroughly drained. The lands surrounding the town are well drained by ditches. The population of Pullman, October, 1886, was 9,000, and land enough is already piped for using the sewage of 15,000 people. The pumps at the pumping station can handle 5,000,000 gallons a day if necessary, and the iron main to the farm would carry the sewage made by a population of 50,000. These pumps are now required to handle a million and a quarter of gallons from the town and all the shops and public buildings. All the waste products of Pullman are carefully utilized, being largely transformed by vital chemistry into luxuriant vegetable forms. Every provision is made for flushing and cleaning the sewers and for keeping them in perfect order. There is no town in the world where drainage and sewerage are so perfect as they are here, and the phenomenal health of the population is one of the results. Although supplied with the purest water from Lake Michigan, they do not look upon it as a benefit equal to that of the drainage and sewerage. Cases of zymotic diseases here are rare, and the death-rate of the city was only 8 for every 1,000 of its people during 1886. The average death-rate for most American cities is three times that of Pullman, and the death-rate for the whole world is placed at 32. Ample provision has been made for extending this system of sewerage and drainage to meet the wants of 100,000 people. Engineers, members of boards of health works, committees of common councils and legislative bodies from all

parts of the country and Europe, visit Pullman to study its construction and its sanitary advantages. It has become a recognized factor in all city building and in city extensions, and its great suggestive value is fully acknowledged and appreciated in both hemispheres."

The question has been stated to be a most difficult one for Toronto on account of the question of expense, and it would be idle to expect that a method likely to dispose of so great a difficulty for so many years to come, ought to be proceeded with in a hasty manner, either regardless of results or expenditure.

But with examples of successful sewage farms in England, in France, in Germany, and in America, a city, aspiring to become metropolitan for Canada, cannot long afford to risk her good name either for progress or health upon a water-front which greets the weary excursionists from Niagara with perfumes not of "Araby the Blest."

THE SANITARY ASPECTS OF COMBINED HEATING AND VENTILATION.

NOTHING probably has a greater bearing upon the many-sided questions both of the preservation of health and the cure of diseases than the equability of house-temperatures and the purity of house-contained air. The term "artificial climates" has been with great propriety used to designate essential differences between the ordinary external atmospheres and those within buildings, whether public or private. This great difference having been recognized, the problem at once presents itself how, in the various circumstances under which people live, or are aggregated in houses, tenements, churches, schools, theatres, etc., atmospheres are to be preserved, both as regards purity, moisture and temperature in such a condition as their influence can in the greatest degree approximate themselves to those which are most favorable for the preservation of health. Our attention has been directed to the special question of the atmospheres of school-rooms by a description found elsewhere in this number regarding the methods adopted in the so-called Smead-Dowd system of heating and ventilation.

This system is in a word one of introducing large volumes of warmed fresh air into one or more rooms of a large building at one side, while from the other sides by gratings the air of the room

is being continuously abstracted by a shaft, leading this warm air downward and along a brick-vaulted space in the basement, and thence to the outer air by an extracting chimney, or heated air-shaft. The system is not in all respects perfect, but for such buildings as crowded schools it certainly has one positive advantage, viz., that of continuously abstracting the air which so rapidly becomes foul by the exhalations from the lungs and bodies of many children, thereby not only maintaining, as has been tested again and again, the air as regards carbonic acid in a state of purity far above the average for such occupied rooms, but also aiding to remove infective particles in those instances where children who have had diphtheria and other forms of disease have returned to school, before the air-passages have become entirely freed from the germs. Another feature of the system of heating is that which provides for the desiccation of the excreta in brick vaults, which are placed in the basement of the school building, by the current of outgoing air being continuously drawn over this material. Personal inspection has abundantly shown that this desiccation is well effected, and that the outward current being continuous, there is no danger of effluvia, from this source, returning to contaminate the school air.

This latter possibility was some time ago raised as a strong objection to the Smead-Dowd dry-closet system, and one or two American papers published articles denouncing it, until the State Board of Michigan examined fully into the system, and found that dangers from this source were imaginary. We have recently observed in a western Ontario paper that the system has been attacked from another standpoint, with as little foundation. It refers at length to the dangers which may be apprehended from the outgoing air carrying with it the germs of all sorts of diseases, and disseminating them broadcast over the whole neighborhood.

Apart from the fact that school-children are not likely to be present to any great extent while they are suffering from the acute form of any disease, and certainly not from other than diphtheria or the eruptive fevers, we have yet to learn that diseases, other than cholera or typhoid, have been shown to be disseminated by means of the excreta. Of these we do not have cholera in Canada; and typhoid fever, it need hardly be said, does not large-

ly affect young children, and when it does so they are not likely to be attending school. Assuming, however, that the germs of typhoid are occasionally found in such excreta, it is tolerably certain that such do not become virulent until excreta has been for some hours exposed to the air, and undergoing decomposition. This system of desiccation may be said largely to prevent this by drawing the warm, dry air over the excreta and evaporating its moisture. But let us further suppose that infectious particles can be carried upward and high into the air. We trace the same conditions regarding the destruction of microbes which prevail over the whole city where organic particles are constantly carried upwards from all sorts of sources of pollution, and notably from excreta deposited in proximity to houses, to a degree infinitely greater than what is likely to affect them from a neighboring school of healthy pupils. The feature of this system of heating which we have taken objection to, is one which, as far as the desiccation of excreta goes is one of its greatest virtues. We refer to the unduly dry atmosphere of the school-room, which, unless care is taken to supply moisture artificially, is sure to follow the raising of external air through the requisite number of degrees of heat, thereby proportionately lessening its relative humidity. This, however, is a danger attaching to all sorts of warm-air furnaces, and can in all cases be largely overcome by an adequate supply of water being placed in the evaporating pans. The relative humidity on a cold day in winter, when no water has been evaporated, would probably be as low as 50 R.H., but its capacity for drying out excreta where large rooms, containing 20,000 cubic feet, have their air changed once, at least, in ten minutes, would be very great indeed. We would say in conclusion that it is unfortunate that a system of heating and ventilation, in which there are so many positively good features, should be spoken against when there is such an absence of any other well-devised schemes, especially for ventilating school-rooms, and when on every side the recognized dangers from impure air in school-rooms are so great and so prejudicial to both the physical and mental strength of our school children. We may properly call such men public benefactors, and encourage them to persevere in their labors until the system has been perfected along those lines where improvement may be found possible.

SMALL-POX.

CYCLES of disease have from time to time been remarked upon, and statisticians have looked for and physicians have contemplated as an inevitable necessity that every five or ten returning years would usher in an outbreak of some contagious disease—smallpox, scarlatina, etc. Defective opportunities for studying either the nature of diseases or of epidemics have doubtless contributed to the establishment of these opinions; but modern experience is teaching us that the reasoning has been of a *post hoc ergo propter hoc* character, and that cycles in disease are largely apocryphal. Speaking especially of small-pox, we are, to-day, under the unpleasant duty of recognizing that this continent is at present more than usually threatened with a severe outbreak of this disease as cold weather approaches. It has maintained its hold and rather increased than diminished since last winter in two of the largest distributing centres, New York and Philadelphia. The New York returns for week ending July 24th gives nine cases, while Philadelphia returns for week ending July 14th give seven deaths from small-pox. Cases are reported from Baltimore and from Selby, Tenn.; and San Francisco, July 2, reports two deaths there for the previous week. The disease has reached Buffalo, there being in the Polish quarter, while Toronto has had three cases recently reported. With so many *foci* it will be strange indeed if some one or other of these does not become the occasion of outbreak which, through accident or neglect, will assume the proportions of an epidemic. In England the disease is similarly present at several centres in notable amounts. During June, 48 deaths occurred in the 28 reporting towns, 23 being in Preston and 16 in Sheffield. The question therefore becomes an intensely practical one for us in Canada. We have been remarkably free during the past two years from outbreaks of this disease, and may congratulate ourselves upon the fact; but when we examine the conditions upon which we ought to be able to base a continued immunity we find much room for reflection and, indeed, alarm. Since the small-pox epidemic in Montreal our people have either ceased to believe that such another outbreak can occur, and have therefore thought it unnecessary to vaccinate or else they have neglected, as we neglect so many other things, simply because we cannot help it. Local Boards

of Health everywhere are empowered and expected to enforce vaccination when they deem it necessary, and physicians are not averse to undertaking systematic vaccination; but the haphazard way in which the people are inclined to have it carried out does not encourage physicians to either hunt up victims or to obtain frequent supplies of fresh and reliable vaccine. We trust that the physicians generally, but especially those who are medical officers of health, will urge the needs of the present to inaugurate local movements for a general and systematic vaccination, not alone for the protection of the individual against small-pox, but against the effects of imperfectly performed vaccination or vaccination with virus which is inert or impure. The conditions of successful vaccination are those of recently taken lymph, freshly opened and immediately used.

TUBERCULAR JOINT DISEASE AND ITS TREATMENT BY OPERATION.

SUCH is the title of three lectures by Arthur E. J. Barker, F.R.C.S., Hunterian Professor of Surgery at the Royal College of Surgeons, London, delivered before the College in June. The paper is of special importance and interest, dealing with this old subject at a time now several years since the bacillary origin of tuberculosis has been accepted as a fact and has carried the minds of our most advanced teachers along new lines of thought regarding curative methods for those local manifestations of a disease of which none is at once more common or more serious than that under review by the lecturer. The speaker at the outset says, "I ventured to think the time had come for a reconsideration of our position in this field of surgery. Within the last few years two great events have occurred which may be said without exaggeration, to have affected this subject to its very foundation. I allude to the general acceptance of the theory of antiseptic, or, as it may now be better styled, aseptic wound treatment, and the discovery of the true nature of what is known as tubercular disease." The lecturer went on to say that up to the present, however, their influence upon practice had been comparatively small as compared with what he believed we may expect in the near future. "If one were asked to furnish a good illustration of the evolution of surgery from the condition of a mere handicraft to the dignity of a science, one could hardly do better than point to the change

which has lately come over the surgeon's mode of regarding and dealing with what has hitherto been generally spoken of as scrofulous joint disease. . . In this enquiry it would soon become abundantly evident that the old days of the strong *tour de maitre*, as applied to excision, had passed away and had given place to a better era, in which the principles of physiology, chemistry, physics, and biology are applied to overcome difficulties and to repel forces either quite unknown or wholly misinterpreted in former times."

He then referred to the various opinions which, in the past, have been held regarding the difference between scrofula and tuberculosis, and to the consensus of opinion now held "That tuberculosis, as it presented itself in internal organs, was a well-defined disease producing definite tissue changes. That the result of the latter in their earlier stages was the formation of peculiar bodies having a well-defined structure recognizable in any tissue of the body, and liable, as they grow older, to contain secondary changes of a degenerative kind. These bodies which received the closest attention in the lungs, soon came to be recognized in many other organs, both in the miliary form as well as in larger aggregations." He traced the observations connecting miliary and caseous tubercles and how gradually it was noticed that the offspring of such patients appeared to be peculiarly prone to chronic joint affections, besides enlargements of the lymphatics. In such glands, as results of final changes, caseous *foci* were found to be developed in every way similar with those known as tubercular in the lungs. Again, in many cases of apparently primary scrofulous joint disease, it was observed that, sooner or later, the lungs, brain, intestines, kidneys became affected with typical tuberculosis ultimately definitely determined by the microscope. A great mass of clinical evidence gradually accumulated pointed in the same direction; and to complete the proof, the discovery of bacillus tuberculosis in the initial lesions of the two affections was made. And to make the importance of this unity more apparent, the stoutest opponents of their identity have become enthusiastic supporters of the discovery of Koch and Baumgarten. Inoculation experiments have further demonstrated the truth of the theory. The lecturer then detailed this identity by giving Baumgarten's inoculation experiments with material from a scrofulous knee into the cornea, kidney, etc., of rabbits,

showing how steadily the bacilli multiplied and how tubercles developed along with them. Various illustrations are given of the possibility of accidental inoculation, of which the following is most interesting:—

“The patient was a healthy veterinary surgeon with a good family history, who, while dissecting a tubercular cow, punctured the joint of his left thumb. The wound soon healed, but was followed by induration of the scar, and later by swelling of the whole joint, which underwent the typical changes of a scrofulous synovitis but without the formation of sinuses. Some months later the patient began to show signs of pulmonary phthisis, which rapidly increased, and he died of this disease a year and a half after the wound of the thumb.” Such cases show that tubercle can be inoculated in any part of the surface of the body and may spread to a fatal issue throughout the whole system.

Thus it is clear, says Prof. Barker, from many experiments, that its tendency to become a general disease varies *aeteris paribus* directly with the number of the specific organisms present at the original part of the inoculation, and that without these no tuberculosis can be produced.

Amongst the many other facts which have been added to previous knowledge is an important one, viz., the influence of the condition of the soil upon the growth of the organism. As of the pyogenic microbes so also of the bacilli tuberculosis, it may be said that they have to do battle in the animal economy with the vital forces of the tissue in which they are first deposited. Schuller's long and admirable series of experiments place this beyond all doubt as regards animals, and our clinical experience of scrofulous inflammation in man confirms the view.

Speaking of the avenues by which the system becomes inoculated, we have first the respiratory passages, presumably the most frequent. Next in order comes the alimentary tract. Animals fed on tuberculous food have become readily tuberculized. Bang's observations on tuberculous disease in the udders of cows is most important in this connection. After describing the disease Bang points out that it is associated with the presence in the udders of countless bacilli tuberculosis, and ultimately with the characters of general bovine tuberculosis. The bacilli can be demonstrated in the milk of such an udder and it will induce the disease in rabbits and

guinea pigs if fed to them. Evidence that even adults may become tubercular is forthcoming according to the statements of Klebs regarding Swiss shepherds. Speaking regarding the possibility of the bacilli being transmitted to the fœtus *in utero*, Barker denies that it practically ever occurs, but he says that to a child with an inherited low vitality there are so many other ways of incurring the infection that we are in no difficulty in explaining its occurrence. Mother's milk, tuberculous patients in a house, sputa, dust, etc., are all means, the wonder being that a delicate child can escape at all.

As to their mode of transmission in the body, while he inclines to the existence of some inherent locomotory power in the bacilli, he says that undoubtedly they are primarily taken up by the lymphatics, and pass from these into the blood current, to be carried by the latter secondarily into distant parts of the body. But, as a rule, the glands nearest the part of inoculation arrest the progress of the organism more or less completely.

In the case of caseous erosion, the contents of such an abscess may break into the wall of a vein, then pass into the general circulation. Remembering this it is easy to understand how surgical treatment of a joint may be by laceration of some blood vessel the occasion of a general inoculation of the system. The lymphatics are, however, the prime carriers, and fortunate is it that they are, since it is doubtless true that the glands, in a large measure, completely arrest the onward progress of microbes, and it is equally probable that here they die or have their powers curtailed. In some instances, however, the bacilli in these pores pass onward, even after having been arrested in the glands, it may be for years, or do not find a part easy of attack until some injury (*e.g.*, inflammation of the lungs, bruised knee joint, etc.), creates the favorable opportunity.

Concluding this introductory, but most interesting, lecture, Prof. Barker says: “Enough has been said, I hope, to indicate the line of reasoning I have been led to adopt as regards tubercular or scrofulous disease, and which I shall venture to pursue in its direct application to joint disease in my next lecture.” We reserve for another occasion the reference to this subject in which both the medical and surgical phases of the subject have been so comprehensively studied.

INDEX OF PROGRESS

SURGERY.

Abnormal Frangibility and Delayed and Non-union of Fractures of the Long Bones in Persons Suffering from General Paresis of the Insane.

BY JOHN HARVEY GIBDNER, A.R.M.D., OF NEW YORK.

Authors of text books which treat of fractures of the long bones invariably divide the causes of delayed union and of non-union of these fractures into two heads, viz., constitutional and local. They have with equal uniformity failed to include among the constitutional causes what I have found to be a most important one, viz.: *General paresis of the insane*. This fact is not surprising, nor are the authors to be censured for this omission, when it is remembered that it is only within the last ten or fifteen years that general paresis has been recognized as a distinct and peculiar form of disease of the brain and nervous system, with a perfectly characteristic history and pathology. Doubtless an even more potent reason for this seeming neglect is the fact that men interested in surgery and accustomed to study diseases and injuries from a surgeon's standpoint, rarely have the opportunity to observe a large number of cases of general paresis for any considerable length of time; cases of this kind are generally inmates of asylums for the insane, and such surgical aid as they require, or receive, is at the hands of the gentlemen composing the medical staffs of those institutions, who are specialists in psychology, hence have no interest in any surgical peculiarities which the disease may present.

My attention was attracted to this subject during two years and a half service as assistant physician to an asylum for the insane, in which there were about seventeen hundred adult male inmates. There were certain wards set apart as a general hospital, for the separate treatment of the physical diseases and injuries of these insane men, and I was in charge of this department. As is well known, one of the symptoms of general paresis is a gradual and slowly advancing paralysis of all the muscles of the body. As the muscles of locomotion become affected, these patients are subject to frequent falls, and in this way the percentage of fractures is greater among them than among men in other circumstances; and further, I am satisfied that a far less degree of force will produce a frac-

ture in a paretic than would be required to cause the same injury in a person in ordinary health. This disease, which expresses itself in the muscular system by partial paralysis, indicates its presence in the osseous system by an unnatural frangibility. Not only are patients suffering from general paresis, greatly predisposed to fractures, but to greatly delayed union, or more frequently, complete non-union is the rule and osseous union the exception.

It might be said that the difficulties to be overcome in placing the fragments in position, and keeping them there, are greater where the patient's mental condition is such as to render him unable to co-operate with the surgeon in his efforts to make a perfect limb. This is true to a certain extent; but it is not so important a factor in treating fractures in insane patients as one unacquainted with this class would be likely to suppose, and besides, I found this very class—general paretics—more manageable under these circumstances than patients with most of the other forms of insanity. No further evidence is needed to show that it is the disease itself, and not lack of co-operation on the part of the patient, when I say that I was always able to obtain bony union, and generally made useful limbs, when the patients suffered from any of the other forms of insanity, such as acute or chronic mania, etc., etc., in nearly all of which, it is more difficult to properly adjust and immobilize the fragments, owing to the restlessness of the patient, than in cases of general paresis.

General paresis is frequently insidious in its attack, and the pathological changes may advance for months and years before the nature of the disease is recognized, or the mind become sufficiently affected to make it necessary to remove the patient to an institution for the insane. Especially is this the case when the fibrous degeneration begins in the spinal cord and lower ganglia of the brain. It is during this period that the surgeon, called upon to treat a fracture in such a case, may be greatly puzzled to explain the cause of non-union in the absence of any apparent cause, and be unjustly censured for a result he could in no way avert. In all cases of non-union of fractures in adult male patients, surgeons should always examine carefully for the earlier symptoms of general paresis, and

bear in mind, that in such cases non-union or soft fibrous union is the rule, and firm bony union the rare exception.

Hospital Gangrene.

Twenty-five years ago, during the American Civil War and since, and before the time of Hueters, Pasteurs, Listers, Kochs, and of others, researches concerning micro-organisms as possible causes of disease, suppuration, etc., the army pestilence, known as "hospital gangrene," was considered a constitutional affection. Its correct etiology was not known. It was thought to be a "relic" of the oriental armies which had invaded Eastern Europe during the latter part of the 17th century, and was classed along with cholera, typhus, scarlatina, etc., among the contagious diseases. Of late, its true character has been established beyond a doubt, and at present it is classed among the affections, the cause of which is to be found in thus far unknown disease-producing germs suspended in the surrounding atmosphere. But although it was generally looked upon as a constitutional affection, it occurred to a few of the army—Goldsmith and others—that it was purely local at the outset, becoming constitutional afterward by the absorption of poisonous exudations—a theory comparable to the present accepted explanation of diphtheria, with which, by the way, some authors consider it to be closely related, if not identical.

During the year 1864, at the Hospital No 2, Chattanooga, Tenn., I had occasion to treat a number of cases of hospital gangrene, and I became convinced of its purely local character at the outset. At that time the "germ theory" had not been advanced: at least, I had no knowledge of it; but what I did know, and what I had occasion to observe almost every day, was that formerly healthy wounds would, under certain local conditions, become poisoned, and within a few hours be transformed into a jelly-like, fermenting, and exceedingly offensive mass, after which constitutional disturbances would soon follow. I observed further, that when energetic topical treatment (nitric acid applications) was adopted, augmentation of the disease would to some extent be checked; but it was not until the systematic use (externally) of bromine was advised that we became successful in combating this loathsome affection. We then had found the remedy (germicide) *par excellence*, and

were enabled to neutralize, as we then termed it, the poison effectually; at least, in those cases where no constitutional symptoms had intervened.

Our mode of procedure would be to "pack" the wound with cotton previously saturated with a solution of bromine and alcohol, 1 part to 4, and allow this mixture to penetrate the infested wound and surrounding tissue. (Experience showed this to be of the utmost importance, as superficial applications failed to have the desired effect in every instance.*) After several hours—generally twelve—of action, the surrounding tissue to the extent of $\frac{1}{2}$ to $\frac{3}{4}$ inch would be turned into an eschar, the removal of which was hastened by warm poultices of yeast and charcoal.

After the removal of this slough, the wound, although greatly enlarged, would invariably present a healthy, granulating surface, with no trace of its former infection; and if then isolation could be effectually established, the healing process would from then on progress favorably.

In a few instances only were relapses to be recorded. These were subjected to this procedure a second time, or oftener, with the same beneficial effect as far as regards cure, but the wounds then would become greatly enlarged, and often disfiguring sequelæ could not be prevented.

During my stay at Chattanooga, diphtheria was a frequent visitor of the families remaining after the occupation of the town by the Union armies. There were but few children, and the many impediments to their social intercourse may have prevented the spreading of the malady; but the commingling of soldiers and civilians was uninterrupted, and we army surgeons were called on to attend their (the citizens') sick and to deliver their parturients.

If the relationship of these affections or of their inciting germs should be proven, I confess that I may have been one of the carriers of the contagion to our wards, and the unintentional cause of much suffering and distress.—"*Anonymous*" in *Medical Bulletin*.

* An interesting phenomenon I had occasion to observe in one instance: One patient had received two flesh wounds, one on thigh and one on arm (biceps muscle). The arm wound became gangrenous several days in advance of the second wound, and this had in consequence to undergo treatment so much later.

Removal of Needles from the Heart.

The *Central f. Chirurgie* contains the following account of a case of Stetzner's, communicated to the German Surgical Society :

A student, after a spree, sought to commit suicide by driving a sewing needle into his heart. Twelve hours after the introduction of the needle the first serious symptoms made their appearance. He then had pain in the cardiac region, difficulty in breathing, and a loud pericardial murmur at the apex. After thirty-six hours the symptoms became so very serious that an operation for the removal of the foreign body was determined upon. No trace of the needle being found either under the skin or in the intercostal space, a piece of the fifth rib was resected, thus opening up the left pleural cavity; then the pericardium was opened up, and about a teaspoonful of cloudy pericardial fluid ran out, and now the needle could be felt lying diagonally in the right ventricle. They succeeded in driving its head out through the anterior wall of the heart, and then fixing it in this position with the fingernail. The irregular and violent beating of the heart made it very difficult to catch the foreign body with the forceps, and, in attempting it, it again slipped into the ventricle, but this time assuming a vertical instead of a diagonal position, rendering it impossible to make any further attempt at its removal; and besides this an iodoform tampon, used to block up the hole into the pleural cavity, was drawn into the cavity by a very deep inspiratory effort. The tampon could not be found again. The wound was thoroughly tamponed, and the patient recovered in four weeks, although in the meantime he had suffered from a severe pneumothorax, with copious exudation. At present the patient enjoys good health, and feels no effects from his escape. There is neither heart murmur nor abnormal pulse, nor any trace whatever of the pleural exudation. Where the needle now is, is of course, mere matter of speculation; it may be in the heart, or it may have gone on into the mediastinum.

Dr. Iver Hardt has collected together, out of medical literature, twenty-two cases of needle in the heart, of which nineteen were found accidentally on making autopsies. In three cases the needles had been driven into the heart accidentally, and penetrated such a short distance that they were easily extracted.

No case similar to the present, in which the heart has been laid bare by splitting the pericardium, is mentioned in medical literature.

In the discussion upon the paper, Hahn, of Berlin, showed the half of a knitting needle which V. Bergmann had removed from the heart of a girl eleven years of age. It had been driven into her breast by a blow from a slipper. The patient suffered immediately from asphyxia, and was removed to the hospital. Under the left third rib, between the parasternal mammillary lines, a black point could be seen, which was felt to be the end of the needle. There was a blowing, systolic murmur at the apex. As the needle was slowly withdrawn it was seen to have a distinctly pendulum movement. Immediately after the extraction, the previously very rapid pulse sank to ninety per minute. The needle was withdrawn very slowly, in order to give time for a clot to form in the punctured wound, and thus avoid hæmorrhage into the pericardial sac, which in some cases of punctured wound of the heart has been the cause of death. Von Bergmann said that he thought there could be no doubt in this case of the puncture of the heart muscle by the needle, because the murmur changed in character while the needle was being withdrawn, and when completely removed the murmur ceased entirely.

MEDICINE.

Diabetes: What it is.

In a notable paper by F. W. Pavy, M. D., F. R. S., on diabetes, occur the following remarks on this subject:—

"It seems to me that what occurs in health is this: the carbo-hydrate absorbed from the intestines is stopped by the liver, converted into glycogen and then into fat, instead of being passed through the organ and appearing in the general circulation. If, however, it passes through the organ we have diabetes. But what is at the bottom of this faulty process? It seems to be a faulty condition arising apparently from a faulty condition of the venous blood. . . . If the liver be not in a good venous condition we have the chemistry of the liver immediately altered, and sugar occurs in the urine. This alteration of portal blood may be produced in a number of ways; it may be by diseases or by experiment. In the first place by the injection of difibrinized blood into the portal circulation. In

a very short time thereafter we find sugar in the urine. The blood may be rendered saccharine by over-oxidizing the blood. . . . How does this apply to diabetes? A vaso-motor paralysis of the arteries of the body will produce those conditions. If, as may be witnessed, we have a vaso-motor paralysis of the arteries of one side of the head and neck, we find that the region becomes distended, not with venous blood, but with semi-arterial blood. As the result of such, the blood will arrive at the liver without being fully de-arterialized; in other words, in an imperfect venous condition. If the arteries of the chylopoetic viscera become enlarged, so that the blood passing through them does not become perfectly de-arterialized the chemical action of the liver becomes so changed as to permit the carbo-hydrates to pass through it, and get into the circulation and so charge the system with sugar. The worst forms of diabetes I have met with are those in which there is a dilated condition of the vessels of the mouth. This is due to a vaso-motor paralysis which has extended to the chylopoetic viscera and visibly involved the mouth. In these cases we have an exceedingly red tongue.

Again, puncture of the fourth ventricle, that celebrated experiment of Bernard, leads to the presence of sugar in the urine. In this instance Bernard observed a dilatation of the chylopoetic viscera. In all such cases the first thing to do is to determine the presence of sugar. This is a common cause of difficulty. One physician finds sugar, and another does not. "I believe the most reliable test for sugar in the urine is the copper test, or Fehling's solution. But the difficulty is, it will not keep. A pellet of it can, however, be made in a certain way." The sulphate of copper is to be placed in the die first, next some Rochelle salt, next the caustic potash, and finally some more Rochelle salt to complete the mass. If kept in well-stoppered bottles, these pellets will keep any length of time. But further, a quantitative analysis is necessary to proper management of a case. Pavy requires that two samples of urine be sent, one passed in the evening and one in the morning on rising. By this method we can discover errors of diet, otherwise impossible. In many cases we may find sugar at night and none in the morning. The following is Pavy's method for estimating the amount:—The amount is estimated from the amount of liquid being examined, that is required

to decolorize a given quantity of the Fehling's solution. The solution is made with sulphate of copper, Rochelle salt, caustic potash, and water of ammonia; into a given quantity of this, the liquid containing sugar is dropped. It is best in testing urine to dilute it with twenty or thirty parts of water in order to make the test more delicate. This is placed in a graduated burette, from which it is dropped into the ammoniated copper solution after the latter has been heated to the boiling point, letting it flow drop by drop until the color has entirely disappeared. The dropping is regulated by a screw adjustment. The exact point at which the reduction takes place can be exactly determined, for there is no precipitate to obscure the view of the reduction. Sometimes albumen is likewise in the diabetic urine. A convenient test for albumen is sodium, the latter being used because it makes a looser pellet than the ferrocyanide of potash. If albumen is present there is a precipitate, and if a precipitate there is albumen. It requires no check and is extremely delicate. To use it, the citric acid pellet must be used first. It readily dissolves in urine containing albumen. This may bring down a precipitate of uric acid, but if so, the urine diluted will dissolve it. The other pellet is now added and it will bring down at once the albumen.

The disease has different stages of intensity. A healthy person after eating much preserves will pass off the sugar. Persons also partaking moderately of carbo-hydrates may pass sugar. Severe cases are in young subjects, mild cases are in old subjects, and the more advanced the age the better the prognosis. It is most common between forty and sixty. It runs in families to a considerable degree. A point of special importance, only recently noticed by the author, is that many patients suffering from it complained of pains in the legs, often put down to gout or rheumatism. There is also more or less ataxia. Such can stand or walk with their eyes shut, but not well. Again, there is some anæsthesia, hyperæsthesia and various forms of paræsthesia. There is an aching in the bones, especially at night. The condition appears to be due to peripheral neuritis. In young subjects, the most that can be done is to stay the disease. It cannot be cured in them. It is a progressive disease, and seems to advance like muscular atrophy or locomotor ataxia. Success may, however, be attained in treating older subjects. Pavy

lays the greatest stress on diet. What the patient may take may be summed up as consisting of any kind of meat, fish, poultry, and game, with eggs, butter, cheese, the various forms of green vegetable food, and a prepared substitute for bread. Milk should be taken only to a limited extent. Gluten bread must be used instead of bread, or even bran, and then with the smallest possible amount of starch. The almond better than anything else suits diabetics. As regards medicine, nothing contributes so much to lessening the disease as opium, morphia and codeia. The test of a cure is when a patient can return to the use of bread as a food without the return of the sugar in the urine."

NEUROLOGY.

Treatment of Recent Cases of Insanity in Private and in Asylums.

Such is the subject of a paper of unusual interest and importance which was delivered by Dr. Blandford, London, England, as one of the general addresses before the International Congress at Washington. The first two volumes of the "Transactions" have appeared, and to those of our readers who have not the opportunity of their perusal, we shall make no apology for making from time to time such extended references in MEDICAL SCIENCE, to papers which contain matters of special value to the practitioner.

Referring to the difficulties which the ordinary physician has to encounter when an unfortunate case of insanity comes upon his hands, and he has to bear the responsibility of saying that he is not *sana mens*, Dr. Blandford says: "We have to consider when called to a case of acute mania, whether it is to be of brief or lengthy duration, and where and how we can deal with it." Recent insanity is a very curable disorder, as statistics from all quarters prove, and it behooves us to place the sufferer under such conditions that the cure may be effected as surely and speedily as possible. To the majority of cases a well-ordered asylum affords the best means of treatment; for many it is a necessity, and removal ought to be urged in the strongest terms. There are, however, very many reasons why, in certain cases, family considerations or personal prospects, may be of the greatest moment, so that if at all possible, the case should not be placed in a hospital, since the stigma attaches to him ever after, as also to the

family. Blandford says in his thirty years of practice he has seen these brief, yet acute attacks, recognized by physiologists as *mania transitoria*, recover.

Its chief point of prognostic value is the suddenness of the attack. It may come on within a few hours and almost no warning, and in this time develop symptoms of an acute character. There may, or may not have been premonitory symptoms, thus depending very largely on the exciting cause. There is usually, however, a cause lighting up the disorder in a brain prone to "instability" or "explosiveness." Such onsets at times, however, have been the beginning of chronic and incurable mania. If the cause is definite, not having been long in operation, we may hope by its removal that the mania will soon subside. Such may be mental shock, the loss of a friend or surgical operation. In many such instances, although the cause cannot be removed, the mind may gradually regain such equilibrium as to be able to contemplate it with composure, or by having the mind distracted from dwelling upon it by change of scene. Another potent cause is religious excitement. We may hope that in such patients the symptoms will quickly abate. Such occasions, too, are spiritualistic seances, and such are usually as acute cases as are met with. "Another cause of sudden maniacal attacks which I have met with several times is protracted fatigue, an unduly long walk or exposure to hot sun for a long period. Acute maniacal symptoms arise in the course or towards the declining of an attack of acute disease, as typhoid fever. This has been described fully by Dr. Hermann Weber, under the name 'delirium of collapse.' It usually has begun on awaking from sleep and when the fever is declining. It has usually lasted for a short time. Some, however, do not recover by any means so quickly.

Cases of mania occasionally occur in gouty and rheumatic subjects and often suddenly disappear on the supervention of an attack of acute rheumatism or gout in some of the joints. In such cases it is always worth while to try and develop an attack of gout by applications of mustard to the feet and a liberal diet. Brief attacks may follow an epileptic seizure, as also those of *delirium tremens*; but as in both the cause is usually known, the remedy may be applied. In some the attacks are more melancholic than maniacal, being of the

nature of intense panic with delusions, fear that everyone about is conspiring to inflict some injury or traduce and take away their character. In such instances suicide is sometimes attempted.

What is there in the physical condition to aid our prognosis and determine the brevity or length of the attack? The temperature tells but little, as it is seldom much above the normal. The pulse is more diagnostic during periods of great excitement or violence; and if further it remains rapid during periods of quiescence the chances are the mania may be developed from days into weeks. The tongue often remains moist and clean; but if brown and furred, a tongue not so indicative of disordered stomach as of acute nervous disorder, we may expect the case to be more prolonged. If the periods between acute or hysterical attacks are of incoherence and of inability to converse to any degree, the prognosis of a speedy recovery are favorable.

Sleeplessness is a main feature in many of these cases, and it not unfrequently happens that after a long sleep produced by a hypnotic, the patient wakes recovered, or so nearly so, that we are no longer anxious about him. Of the drugs that may be given in such a case, opium may at once be set aside as failing to produce its effects, but with urethran, bromides, chloral, hyoscyamia, refreshing sleep may be obtained. Regarding what is to be done with a case not readily relieved, while an asylum would be the easiest solution, there are many reasons why this cannot often be carried out. Home surroundings and near relatives are prejudicial. Pleasant surroundings and opportunities for outdoor exercise are most desirable and necessary in any case.

Discussing the question of the depressed and melancholic, Dr. Blandford states that in such instances change of scene, etc., will very probably have already been tried before a specialist is consulted. He asks, "Are they to be sent to an asylum?" Some, undoubtedly those noisy and violent maniacs constantly attempting suicide, etc., can only be properly attended in an asylum. Such cases are chronic, and treatment is necessarily slow and tedious: not weeks but months. It is hopeless to treat such at home. There is one special reason for placing such in an asylum. It is the intense egotism, self-feeling, or selfishness, which distinguishes so many. Now place such an one in an

asylum with a hundred or more patients, make him one-hundredth part of the community, instead of one important unit, and the effect is wonderful.

The best medicine for many of those people is termed *judicious neglect*. To cure a patient's insanity without sending him to the asylum is a matter of great satisfaction, both to one's self and the friends of the sufferer. This however, makes it by no means to be decided that it is best in all, or, indeed, in many cases. For many, asylum treatment, is the only treatment likely to effect a cure; "and if our method fails, and it is plain the patient is getting worse and not better, we ought to bring it to an end and have recourse to an asylum, overcoming the reluctance and prejudices of friends, who so constantly think not of the patient, but of themselves."

The law ought to be such, however, that if thought most judicious, such patients can be treated as long as may be deemed best outside the walls of an asylum. This, however, in England (although it is true in Scotland) and Ontario, cannot be carried out by an official alienist physician under the government."

The address concluded as follows:—"I cannot hope to have assisted you much within the limit of this paper in the diagnosis of such cases, but, at any rate, I may claim to have directed your attention to them."

DISEASES OF CHILDREN.

Mortality of Scarlet Fever at Different Periods of Life.

Dr. Tatham, medical officer of Salford, England, makes, in the *British Medical Journal*, the following interesting statement:—"Of the 2,500 cases of scarlatina that had come under his care, 259 occurred within the first two years of life; 26% of these died. Of the 881 cases occurring between two and five years, 14% died. Of the cases that occurred between five and ten years of life, 7.5% died. The mortality among all cases above ten years was 3.5%."

Dr. Line (*Birmingham Medical Review*, March, 1887), reports that in 1,000 cases coming under his observation, the mortality under five years of age was 10.5%. From six to sixteen it was only 1.99%. The greatest mortality was between two and four years. The reports indicate that the risk of death.

from scarlet fever is greater the nearer the patient is to one or two years of age. The risk diminishes beyond the fifth year of life. Children under one are not, as a rule, susceptible to the disease.

While the statistics furnished by Drs. Tatham and Line do not settle the matter, they protest against the practice of some physicians who, when scarlet fever or other contagious disease appears in a house, recommend that no special precautions be taken as to the younger children. They say that, "as one attack of a contagious disease probably gives to the recipient, for many years at least, immunity from that disease, and that, as children are destined to have the so-called children's diseases some time or other, the sooner the better." On the contrary, at the present time, when the majority of young children are artificially fed, and young mothers are mainly of the nervous type, the struggle that is necessary for even a fair physical development is enough to contend with, without the little ones being subjected to the strains which most contagious diseases inflict.

Whatever may have been the rule in times gone by, in the present age immunity from a second attack of contagious disease is not by any means always to be expected; at least this is our experience. If we consider also the debility, prostration, and injury induced by contagious diseases, especially among feeble children, and the increased risk of death, the position of the physicians before referred to does not seem a sound one.

Enemata of Water in the Treatment of Diarrhœa and Dysentery.

Raymond Tripier (*Journal des Sci. Med. de Lille*, April, 1887), reports the use of hot water enemata with an infant twenty-one months old, whose dysenteric movements were every fifteen or twenty minutes. After the first injection there was no movement for two hours, and in a short time the child was convalescent. The temperature of the water should be 45-48° C., and from 300 to 500 centimetres in quantity. If enemata alone do not answer, decoction of ipecac is given internally.

Injections of ice-water are said to be used at the Birmingham General Hospital with marked success in severe forms of diarrhœa in children, two or three fluid ounces being injected each time. The immediate effect, even when there are symptoms of collapse, is quiet sleep, and diarrhœa is in general

easily controlled by a few injections. Medicines by the mouth is also given. Dysentery is not readily controlled by medication, especially with patients living in overcrowded houses, and enemata of hot water seem reasonable.

Enemata of cold water (not iced) have been of great service in the non-inflammatory forms of diarrhœa, especially when nervous and muscular tone are much depressed. An easily worked bulb-syringe is best adapted for these enemata, which should be given either after each movement (if the movements are frequent), or every two hours, until there are but three or four movements per day. An opiate (preferably the deodorized tincture) may be given in the enema, if there is great restlessness or much tendency to strain. Internal medication, if possible, had better be dispensed with. Frequently one injection of cold water, together with regulation of the diet, will cure a comparatively mild case of diarrhœa.

Treatment of Summer Diarrhœa by Antiseptics.

Dr. Win. F. Waugh (*Philadelphia Medical Times*, August, 1887), states that he has treated thirty cases of summer diarrhœa with the sulpho-carbolate of zinc without one death. The cases included inflammatory entero-colitis and true cholera infantum, as well as milder forms. The salt was given in doses of one-sixteenth of a grain every two hours, with one to five grains of bismuth; and, if well borne, the dose was increased to one-fourth of a grain for a child in its second summer. The Doctor claims that the zinc salt is superior to naphthalin and salicylic acid, in that it is more palatable and less irritating to the stomach. Its effect is to stop vomiting and to render stools less offensive, but it sometimes makes them more copious. When the last effect occurs, he substitutes an enema of flaxseed tea containing five grains of the zinc salt and a half drachm of bismuth. Fever was treated by antipyrin in doses of one or two grains.

Within the last few years the antiseptic treatment of summer diarrhœa has made an advance, a prevailing opinion being that micro-organisms in food and air have much to do with the causation of the affection. Antiseptics, allaying nervous irritability by pure air and quiet surroundings and minute doses of opiates or bromides, relieving irritation by regulation of diet, small doses of carbolic acid, opiates, ipecac, cocaine or calomel, and by enemata

of water, seem to be preferable to the use of astringents. As antiseptics, Dr. Holt has used to advantage, at the Infants' Hospital at Mt. Vernon, salicylate of soda, resorcin, naphthalin, and the bichloride of mercury. Dr. Sarah J. McNutt (*Post-Graduate Journal*, July, 1887), is favorably disposed to the use of the bichloridé.

Treatment of Croup.

Dr. W. S. Cline, Tomsbrook, Va. (*Medical World*, May, 1888), claims that within twenty-four years he has seen hundreds of cases of croup, and does not remember of ever having lost a case. He gives a small teaspoonful of a mixture of equal parts of alum and sugar. This is given every twenty minutes till breathing is easier, then follows with a purge of calomel. If relief does not occur in one or two hours, he uses turpeth mineral. He claims that he has never had to make a second visit to a case of croup. This statement seems to be sufficiently remarkable without the inquiry as to whether any of the cases so promptly relieved could have been cases of true croup. While it is true that many cases of spasmodic croup recover, very promptly, even in a few hours, there is reason to believe that some cases, especially in feeble children of a nervous type, have a tendency to last several days, to the great discomfort of the child and the worryment of the parents. Might not some such cases have been considered cases of true croup? The doctor's mode of treatment which has been quite widely copied by medical journals, needs to be verified. In Brooklyn, what has come to be known as Dr. Burge's treatment for croup is liked by many practitioners.

Incubator and Gavage.

Dr. Hirst (report of meeting of Obst. Soc., Phil., Feb. 2, 1888—*Annals of Gynecology*, March, 1888), exhibited the incubator in use at the Maternity Hospital. It is a simplified Crede's incubator, a double walled bath tub of copper. Hot water is poured into the space between the walls, and the temperature is maintained within the tub of nearly 100° F. The doctor explained the "system of gavage" in use in the same institution. It consists in forcing into the child's stomach about 10½ drachms of human milk every hour, through a soft rubber catheter by means of a syringe. He believes a syringe to be better than the glass funnel advocated

by Farnier. Reports one case of a premature infant born at 216th day, weighing at birth 1,080 grammes. After a month's trial of gavage system it weighed 1,460 grammes. The rearing of undeveloped or atrophied babies is so difficult, even with the best care, that any method that will add to the chances of prolonging life is welcome. Feeding by the rectum is unsatisfactory, as it cannot be continued for a length of time. As Prof. Jacobi says (*Archives of Pediatrics*, February, 1888), "The rectum absorbs, but it does not digest. . . . Whatever we do, be the rectum ever so tolerant, not more than one-fourth part of the food required for sustaining life can be obtained by rectal injections, and inanition will follow, though it be greatly delayed. Children are not so favorably situated in regard to nutritious enemata as adults. In these the lengthening of the nozzle of the syringe by means of an elastic catheter permits of the introduction of a large quantity of liquid; indeed, a pint can be injected and will be retained. But the great normal length of the sigmoid flexure in the infant and child, which results in its bend upon itself, prevents the introduction of an instrument to a considerable height. It will bend upon itself, besides a large amount of contents will be expelled by the feeble or resisting patient."

Differential Diagnosis of Pneumonia.

Dr. David Phillips (*N. Y. Med Jour.*, April 21st, 1888), states that pneumonia may be diagnosed from a severe bronchitis by means of the expiratory moan and the physical signs; but if both be absent, then by comparison of the pulse with the respiration. In health they stand about 4 to 1. In pleurisy and bronchitis, rarely more than 3 to 1; while in pneumonia, frequently from 2 to 2½ to 1. Henoch says that 40 to 50 respirations a minute in young children indicate inflammation in the large and medium sized tubes, while a greater number a minute indicate inflammation in the smaller tubes.

Nursing Bottles.

(Report of the Committee on Hygiene of the Medical Society for the State of New York—*The Sanitarian*, February, 1888). The committee says that, in spite of the fact that nursing-bottles with large rubber tubes, and glass reaching to the bottom of the bottles, have been condemned in all text-books as dangerous, they are

publicly sold in the shops and are largely used among the poorer classes. Commonly the brushes that are supposed to be sold with them are seldom used. The committee recommends that "the attention of the society at its coming meeting be called to this matter, in order that some steps may be taken to secure appropriate legislation on the subject." This action is suggested, as it is the belief of the committee that such nursing-bottles are injurious to the public health, being largely responsible for the great mortality which occurs among children, especially in the tenement-house districts. It may reasonably be questioned whether, although the tubed bottles may well be called snake-bottles, they can be banished, for physicians do meet with children who thrive upon food administered through them. The fact is, that the danger for their use comes from the carelessness of the child's guardian rather than from the bottle itself; but bottles without corners and tubes are to be preferred. Valved bottles are liable to get out of order. Pap-cups, if carefully used, are excellent. Prof. Starr (*Med. and Surg. Journal*, December 3, 1887), has suggested a new bottle, called the graduated nursing-bottle, made of transparent flint glass, so that the slightest foulness may be seen. The interior surface is free from angles, and an accurately graduated scale of fluid ounces and half ounces, or tablespoonfuls, is blown in the glass. It is said to be convenient, accurate in measurement, and easily cleansed.

Sterilized Milk.

Dr. Augustus Caille, in a paper read before the Pædiatic Section of the New York Academy of Medicine (*The Dietetic Gazette*, April, 1888), after describing the apparatus designed and used by Soxhlet, by which milk sterilized will keep sweet four to six weeks, gives the results of some experiments made by himself with Soxhlet's apparatus, milk remaining good eighteen days; milk boiled in small bottles for fifteen minutes, and these well corked before removal from the water, the milk remaining good for five days; milk boiled in a pot and put into small bottles after cooling, souring after four days; milk boiled in a pot and left standing in an open dish in a room with a temperature of 75°F., soured in from eight to fifteen hours; and milk boiled in a pot and placed in the ice-box in an open dish, turned in from eighteen to twenty-six hours. He concludes that milk can be sterilized in any well-regulated household; that

boiling milk for twenty or thirty minutes in small hermetically sealed bottles is sufficient to destroy the germs of fermentation; that the ordinary method of boiling milk for infant's food is faulty. The essential utensils are small bottles (5 to 6 oz.) with Soxhlet's combination stoppers, and a tin or galvanized iron tray. This enlargement of the plan proposed by Dr. Jacobi years ago, is another step towards the use of cow's milk for artificial feeding instead of patented baby-foods. If milk can be made to keep sweet for a number of days by boiling, and if the caseous matter can be rendered more digestible by peptonizing, the objections to milk will be largely done away with, and the cost of raising an artificially fed baby will be lessened.

The Use of Kephir as an Infant Food.

Dr. H. Longstreet Taylor (*Archives of Pædiatrics*, May, 1888), after observing the use of kephir at Prof. Freund's gynæcological and obstetrical clinic in Strasburg, and finding peptonized milk and malted foods unsatisfactory, tried kephir, during his five months of service at the Home for the Friendless Foundlings, among the atrophied children. He claims not to have had a single death from marasmus, but he does not relate how many cases he had under his care. He says that the kephir fermentation breaks up the caseine into flocculent particles, changes the albumen into peptones, and the sugar of milk into lactic acid, alcohol, and carbonic acid gas. A few children refused to take the food. To those who would, from four to six quarts were taken daily. The first effect was a diarrhœa, which emptied the bowels of partly digested material. This was followed in a few days by normal stools. The skin became less harsh and the abdomen less prominent, appetite improved, and kidneys were more active. Increase in weight was slow. When the body filled out, kephir was stopped and other food given. It should not be used if over a week old, and, to infants over a month, should be diluted one-third; in older children, less dilution. In children over a year old, other food may be given in addition. Any physician who has had experience in a foundling asylum or nursery knows how difficult it is to obtain good results with the puny, atrophied infants that are sure to come under his care. If kephir is superior to koumiss, as is claimed, and will answer when peptonized or malted foods will not, it will be a valuable aid to recovery.

BACTERIOLOGY.

Some New Micro-Organisms Obtained from Air.

In the Royal Society's Proceedings (England) for 1887, appears a monograph by Mrs. G. C. Frankland and Dr. Percy F. Frankland, under the above title. It is there stated, "as these investigations were carried out with the aid of solid nourishing media, we were able to obtain a collection of fine cultivations of a number of micro-organisms derived directly from the air. It appeared to us, therefore, desirable to utilize the opportunity which these experiments furnished for minutely characterizing some of the principal forms which are thus obtainable from the atmosphere." There are many reasons which render this important. . . . It is not unnatural that the brilliant discoveries in connection with the etiology of infectious diseases should have absorbed the lion's share of the attention of investigators in the field of bacteriology, and that the non-pathogenic organisms should have come to be regarded as comparatively uninteresting by the side of their more formidable brethren. It must be remembered, however, that the functions of the non-pathogenic organisms in the economy of nature, are as yet but imperfectly understood, and that as far as these functions have been investigated they do not yield in point of importance to those of the most violent pathogenic forms. Thus the conversion of sugar into alcohol, the oxidization of ammonia to nitrous and nitric acids, besides many other natural transformations which are effected through the agency of such micro-organisms, are certainly not second in importance to the results, terrible as they are, achieved by the pathogenic forms. The organisms producing the above-mentioned change are known to be present in the air, and there can be little doubt that the numerous other aerial varieties will, in the future, be found to discharge important duties in the laboratory of Nature. The exactness with which bacteriological research can now be carried on, thanks to the beautiful methods of cultivation which have been developed during the past six years, renders it imperative that all future investigations on the chemical and physiological action of micro-organisms and not with mixtures, as has hitherto so often been the case. On this account the first step in investigations of this kind must consist in careful

delineations of the characteristics of the specific organisms that their identification may be readily accomplished. In this way it may with confidence be anticipated that the particular chemical and physiological properties of each specific organism will in the future be elaborated as has been done in a few cases already.

The methods for obtaining these organisms have been by means of Hesse's tubes and by the exposure of dishes filled with gelatine-peptones in the manner already described. Each organism deposited on the solid culture gives rise in a few days to a colony possessing a characteristic appearance. These can be transferred separately to a culture-tube by means of a sterilized platinum needle. The tube cultivation can thus with care be likewise obtained pure.

The gelatine tube-cultivations were first inoculated into test-tubes, one-third filled with solid sterile gelatine-peptone and plugged with cotton wool in the ordinary way. The appearances in these have been carefully watched, described, and in many cases, drawn. These appearances are, as is well known, of great importance in serving to characterize specific organisms, and frequently serve to discriminate between organisms of similar and almost identical microscopic appearances. Agar-agar tube cultivations have similarly been made by inoculating with the same organisms. These frequently served to establish differences between organisms, owing to their not being liquefied by any organisms, and thus surface-growths can be obtained. On the other hand some cultivations which are but little distinctive in agar-agar, present important marks of distinction in gelatine.

Broth-cultivations were similarly made of the same organisms. These being fluid-cultivations are generally very much less characteristic than those in gelatine or agar-agar, the chief difference being in the formation or non-formation of a pellicle on the surface of the liquid. There is, however, a special reason for carrying out cultivations in broth as the form of the individual organisms is generally more uniform and natural in a fluid than in a solid culture-medium, for the latter forms are occasionally distorted by pressure.

Gelatine-plate cultivations frequently present the most striking appearances of any method of cultivation, and though often characteristic, to the naked eye they are often far more so when ex-

amed by transmitted light. The colonies are of general importance for the preparation of cover-glasses for microscopic examination with a high power (1,000 diameters) as all the forms obtained from a single colony may with certainty be known to belong to a single organism; and, moreover, forms one of the most important aids in the discrimination and identification of organisms. The authors examined, measured, described, and drew all the organisms as they appear when viewed under the microscope.

The motility and progressive growth of the various organisms was studied by "drop-cultivations." By such methods have these writers been able to describe a number of organisms obtained from the air. They state that a few of these, such as *micrococcus prodigiosus*, the *bacillus subtilis*, the yellow and orange *sarcina* have been more or less accu-

ately described by other observers, but the remainder are entirely new.

The following are those found and examined: Micrococci—1, *Micrococcus carnicolor*; 2, *M. albus*; 3, *M. gigas*; 4, *M. chryseus*; 5, *M. roseus*; 6, *M. candidans*; 7, *streptococcus liquefaciens*; 8, *Sarcina lutea*; 9, *S. aurantia*; 10, *S. liquefaciens*.

Bacilli:—1, *B. aurescens*; 2, *B. aureus*; 3, *B. citreus*; 4, *B. plicatus*; 5, *B. chlorinus*; 6, *B. polymorphus*; 7, *B. profusus*; 8, *B. pestifer*; 9, *B. laevis*; 10, *B. cereus*; 11, *B. subtilis*; 12, *B. (micrococcus) prodigiosus*.

These many forms are described fully as they appeared in the various cultures already referred to. They form a compendium of air bacteriology which will be found most useful for comparison whether in further investigations, there, or upon this continent.

HYGIENE

GENERAL HYGIENE.

Sanitary Protective Association.

Dr. Benjamin Lee, the admirable Secretary of the State Board of Health of Pennsylvania, has recently been discoursing on the above topic before a State Sanitary Convention. Referring to life insurance, he says it is, he thinks, misnamed, and should be called death insurance, and thereafter goes on as follows:

In direct contrast to this somewhat depressing, though eminently useful, form of associate action for mutual benefit, I desire to call your attention for a few moments to another kind of association, the direct object and proved result of which is, to lengthen the lives of those participating in it, and which may therefore lay claim to the title of the true life insurance. Nor does it promote length of days alone. For while its right hand holds out that precious guerdon, in its left are the "riches and honor" which necessarily flow from the possession of a sound mind in a sound body. To the citizens of Edinburgh, Scotland, belong the honor of having originated the conception of a voluntary combination and pooling of resources for the purpose of mutual life and health insurance. This was embodied in the "Sanitary Protective Association of Edinburgh, just ten years ago, and the

movement has been in successful operation ever since.

The following is a general outline of the objects of the association and privileges of members:

1. To provide its members, at moderate cost, with such advice and supervision as shall insure proper sanitary condition of their own dwellings.
2. To enable members to procure practical advice, on moderate terms, as to the best means of remedying defects in houses of the poorer class, in which they may be interested.
3. To aid in improving the sanitary condition of the city.

The first inspection does not cause any disturbance to household arrangements. It is followed by a report making specific recommendations, if any improvements in the household arrangements are thought necessary. The members are not bound to carry out these recommendations.

The subsequent annual inspection will, so long as the sanitary arrangements remain in working order, entail no expense beyond the annual subscription.

The following is a formal statement of the privileges of members. The annual inspection spoken of in the second paragraph will form the main business of the association. It is believed that no system of drains, or other sanitary appliances, can

be depended upon to remain in perfect order without skilled inspection; and this skilled inspection can be cheaply and efficiently provided by the association.

Each member is entitled to the following privileges in respect of property within the municipality:

1. An immediate report by the inspecting engineer of the association on the sanitary condition of one dwelling or property, with specific recommendations, if necessary, as to the improvement of drainage, water supply and ventilation, and a report upon the water by the analyst.

2. An annual inspection of his premises, with a report as to their sanitary condition.

3. Occasional supplementary inspection and advice concerning the dwelling or property in respect of which he is a subscriber.

4. Each member by his annual payment secures the above privileges in respect of one dwelling or property occupied or designated by him. Should he be interested in two or more dwellings or properties, as owner or occupant, he may secure equal privileges in respect to them all by paying the annual subscription for each.

5. A report, to be obtainable on payment of a special fee, on any dwelling or property, or plans thereof, which he may wish to hire or purchase.

6. Reports by the officers of the association as to the sanitary condition of any dwelling or properties, of the very poor, on payment of a moderate fee.

A report, without fee, upon the sanitary condition of any public building, as church, school-house, or place of public resort within the city.

So great a degree of public confidence did the association inspire by the thoroughness of its inspections and the practical wisdom of its suggestions for sanitary improvement in individual cases, that it was announced at its sixth annual meeting that the Bank of Scotland had by a recent resolution placed the whole of its branch banks throughout the country, numbering about one hundred, under the supervision of the association as regards sanitary matters. The remarkable apathy of the class of people who should have at once joined a sanitary association, viz., the hotel-keepers and lodging-house keepers, was, however, strongly commented upon. This need not be wondered at when it is borne in mind that out of hundreds only

two of the class referred to applied for inspection. "It is only by reading reports of this kind," said the *British Medical Journal* of April 7, 1883, "that one can form an idea of the unsanitary condition of our houses." The report showed that 612 inspections had been made in the course of the year. About one hundred country houses had been inspected and reported upon, and among them 90 per cent. were found to have direct communication existing between their drains and the interior of the house. Eighty per cent. had their water storage more or less faulty, and no less than 15 per cent. had the main cisterns in direct communication with large brick cess pools filled with putrefying filth.

The example of Edinburgh was quickly followed by certain public spirited and enlightened citizens of Newport, R.I., who in November of the same year, 1878, established the Sanitary Protective Association of Newport. The rapid growth of that popular seaside resort, and the immense increase of its population during the summer months, had completely outstripped the limited system provided by the town authorities for disposing of the waste of all kinds which such an aggregation of human beings would lead to. It was necessary that some concerted action of a positive character should be taken if the fair fame of the city as a health resort was to be saved from reproach.

The secretary of the association, in his second annual report, said, and I quote, because with slight local modifications I have no doubt that his assertions would not be altogether inapplicable to Lewisburg:

"The inhabitants of Newport, owing to the situation of her city, have always enjoyed remarkably good health, and the fact that this has been the case is looked upon by them with pride and satisfaction, and they have been unwilling to open their eyes to the present, or to look forward to the future. It is sufficient that the pure air of heaven has, in the past, brought health and longevity to them, and it is taken as a matter of course that such will be the case for all time to come.

"To be sure, the breezes, as they blow fresh from the sea, are pure as of old, but as they come sweeping through the now thickly populated town, passing through back yards filled with mire of slops and filth, and over stagnant water and marsh, the receptacles of garbage and sewage, the pure oxygen

is soon contaminated with gases which are not health giving, though they may not immediately kill.

"There was a time when wells dug down into the solid rock furnished pure spring water. By an occasional cleaning of the well one generation after another could go on using this water without a doubt of its purity. But estates have been divided and sub-divided, other wells have been sunk, and new cess-pits dug—the latter perhaps, on account of the narrow limits of the place, close to the well of some old homestead.

"Soon the soil becomes impregnated by the liquid filth, and, naturally, the water of the wells in the neighborhood is infected. This has continued until it is the exception where the water of a well is found fit for domestic purposes.

"In some portions of the city, owing to the neglect of the public authorities to remedy existing evils, the air became laden with poison germs, and so reduced the system of many that they readily fell victims to any contagious disease which might spring into existence.

"The importance of placing under strict vigilance the inmates of a house where such disease existed, was overlooked, so that the death-rate of Newport, though small as compared with other cities, was large in those diseases which might have been prevented.

"Eminent physicians, summer residents of Newport, anxious as well for the reputation of the city as to adapt the place to the necessities of city patients, alluded in print to the importance of measures being taken to improve its sanitary defects, and complaints were addressed to the city authorities by native physicians and others. But these appeals were unwelcome and unheeded, and, far from what was earnestly desired, resulted in openly expressed ingratitude to the authors of them.

"Although the board of aldermen were empowered by the State to appoint a board of health, which should have all the powers and duties conferred upon the board of alderman, as a board of health; and, notwithstanding the wish of the people and a memorial signed by the physicians of the city, yet they practically refused to exercise their powers, nor would they confer them upon others."

Dr. Lee thereafter referred to the work which this Society laid out for itself to perform, and indicated from a circular issued by it and stated that such

must be the work which any such Association must undertake. He then outlined a constitution and urged the adoption of some such plan for mutual protection upon those present.

Eminent Success of the Smead Dry Closets in the New Queen Victoria Public School, Parkdale.

Of the many improvements made in the Public School buildings throughout the country during the past few years the attention that has been given to the sanitary department is worthy of commendation. While water closets within the building did away with the dangers arising in cold or wet weather from the use of the old-fashioned privies, which, of necessity, were placed at the greatest possible distance from the school building proper, they nevertheless introduced a greater evil, in the shape of the introduction of the deadly sewer gas and the long vexed question of closets for the accommodation of the pupils where they should not be exposed to the dangers arising from the sudden change from the often overheated school-room to the chilling blasts of the outer winter atmosphere seemed impossible of successful solution. But the appearance of the Smead system of dry closets in conjunction with their system of warming and ventilating has proved, after being in operation in hundreds of public buildings throughout the United States, that closets could be provided within the main building from which no smell would arise and in which all the excrement could be consumed without necessitating the disgusting and dangerous process of removal. The system consists of the vitiated warm air passing from the various apartments under the floors being received in a gathering room, and passing, on its way to the ventilating flue over the excrement, which thoroughly dries it, forming it into fuel by just the same process as the vast buffalo manure deposits on the plains have been transformed by the action of the air into what is known as buffalo chips, the only kind of fuel to be found on the plains, which is almost exactly similar in manner of burning to bituminous coal.

Having spoken of this system from time to time in the columns of *The Mail*, and as it came to our knowledge that the closets in the new Queen Victoria school in Parkdale were to be burned out, *i.e.*, cleaned, the school term having recently closed, we sent a representative to report upon the matter. The handsome structure is a source of just pride

to all Parkdadians, and the perfection of the Smead system of dry closets is one of the features of the building of which the school directors are proud, and on which the people are to be congratulated. A little coal oil was poured through the opening in the closet seat on the first pile of excreta (the one farthest from the ventilating shaft), to assist in igniting the mass. A match readily started it burning, the flames being drawn toward the other piles by the draught toward the ventilating flue, and burning steadily the same as a coal fire. One hour and a half afterwards the total mass was reduced to a small pile of ashes, which shortly afterwards an attendant swept up, when the brick floor receptacle of the closet was as clean as a freshly-swept parlour. Even while the process of cremation was proceeding there was no smell emanating from it that could be noticed in the building, the ventilation being

absolutely perfect. The first to be burned out was the boys' department, which, as we before said, was completed in an hour and a half, and no less a success attended the burning of the girls' department, which was accomplished in even less time. With no water pipes to freeze, no direct outlets from the sewer into the house, as is provided by the ordinary water closet plan to let the deadly sewer gas constantly into the building, and no repairs to make, as is necessary with the water closet system, the Smead system of dry closets has proved itself to be the system for use in Public School buildings, because it provides a system of closets in an apartment within the building, the air in which is at all times as pure and sweet as it is on the outside, and thus prevents the danger arising from the use of closets outside of the building through passing from a warm to the chilly outside air.—*The Mail*.

REPORTS OF SOCIETIES.

Lindsay Sanitary Convention and Summer Session of the Association Executive Health Officers.

The Association of Executive Health Officers of Ontario will hold their annual convention in the Opera House, Lindsay, on Tuesday, Wednesday, and Thursday, August 14th, 15th, and 16th, 1888. The following is the programme:—

FIRST DAY—TUESDAY, AUGUST 14TH.

First Session: 2 p.m.—Opening Prayer, by Rev. Dr. Williams. Official Address, by Mayor Walters. Brief Retrospect of the Progress of Medicine, Curative and Preventive, 1828–1888, or the Review of a Lifetime, by C. W. Covernton, M.D., Toronto, member Provincial Board of Health. Notes on Inspection of Public Milk Supplies, by Egerton Griffin, M.D., Brantford, First Vice-President of the Association of Executive Health Officers. Points to be observed in constructing a healthy house, by David B. Dick, Architect, Toronto.

Second Session: 7 p.m.—Opening Prayer, by Rev. W. K. Anderson. Annual Address of the President, by P. Balmer Burrows, M.D., Lindsay. Practical Suggestions on International and Interstate co-operation for the Prevention of Disease and for Stamping out Epidemics, by Chas. N. Hewitt, M.D., Secretary State Board of Health, Minnesota, and President American Public Health Association. How to Prevent Consumption, by J. J. Cassidy, M.D., Toronto, Member Provincial Board of Health.

SECOND DAY—WEDNESDAY, AUGUST 15TH.

Third Session: 9.30 a.m.—Opening Prayer, by Rev. C. H. Marsh. Sanitary Supervision of Schools, by H. P. Yeomans, M.D., Mt. Forest, Member Provincial Board of Health. The Practical Work of the Board of Health, by John Coventry, M.D., Windsor, Medical Health Officer, and ex-President of the Association. Municipal Health Work: How most Thoroughly and Economically carried on, by Francis Rae, M.D., Oshawa, Chairman Provincial Board of Health. Sewerage of Small Towns, by Willis Chipman, Esq., C.E., Brockville. Citizens' Excursion and Banquet afternoon and evening.

THIRD DAY—THURSDAY, AUGUST 16TH.

Fourth Session: 9 a.m.—Opening Prayer, Vicar-General Laurent. Legal Rights of Citizens to Sanitary Protection, by His Honor Judge Weller, Peterboro'. Air Microbes, illustrated by Flask Cultures, by P. H. Bryce, M.A., M.D., and W. N. Nesbitt, B.A., M.D., Toronto. A Social Problem, by Daniel Clark, M.D., Superintendent Provincial Asylum for Insane, Toronto. Popular Medical Fallacies, and the Duty of Health Officers in relation thereto, by John H. Sangster, M.D., Port Perry.

Besides those whose names appear on the programme for papers, the following gentlemen are to be present and take part in the discussion: Dr. John Sweetland, Sheriff, Ottawa, Chairman Local

Board of Health; Dr. Chas. O'Reilly, Medical Superintendent Toronto General Hospital; Chas. McLeilan, M.D., Trenton, Second Vice-President; Dr. Lachapelle, Montreal, Chairman, and Dr. Pelletier, Montreal, Secretary Quebec Provincial Board, are expected to be present.

On Wednesday, the 15th, an excursion has been arranged for the afternoon, to be succeeded by the Citizens' Banquet in the evening to the delegates to the Convention.

On Thursday, the 16th, although declared by the Mayor a Civic Holiday, regular sessions will be held morning, afternoon and evening. All the meetings are open to the public, and it is hoped that those interested in education and progress

will attend. The Provincial Board of Health sessions will be held afternoon and evening of Civic Holiday, August 16th.

The hospitality of the town has been generously extended to the visitors attending the Convention.

Sturgeon Lake, with Summer Resort and Hotel at Sturgeon Point, are conveniently by the Point being only twelve miles from Lindsay, and visitors will find it convenient to make arrangements for a holiday complete by visiting the Point by the frequent boats.

Railway certificates for delegates can be obtained by applying either to Dr. P. P. Burrows, Lindsay, or Dr. P. H. Bryce, Secretary Provincial Board of Health, Toronto.

GENERAL NOTES

Grandclément greatly praises the use of subcutaneous injections of antipyrin in the temples for ocular pains and spasms of the ocular muscles. He injects 25 centigrammes of antipyrin in 10 drops of distilled water with one-half a centigramme of cocaine. He has never had an abscess, but a little local œdema lasting six or eight days. Four or five injections generally suffice.

Dr. William Covernton, B.A., of Rosario, Brazil, has recently been visiting his father, Dr. C. W. Covernton, of Toronto for a few weeks. This gentleman, who has become a well-known and successful practitioner there, served in the American war as a surgeon, and has not had foot on his native heath for nineteen years. We have no doubt but that the visit has been a pleasant one both to him and our old friend, his father.

Holland has a Society for the Suppression of Quackery, whose chief object is not so much to stamp out unqualified practice, as to enlighten the public mind with regard to patent nostrums. The Society numbers over a thousand members, over half of whom are medical men or chemists. The *British Medical Record* says its work has been fairly successful in showing up a number of "shams." It further remarks that the British maxim *caveat emptor* still remains there as a maxim of commercial morality. Further, the law of libel would deal rather harshly with the would-be philanthropists. In fact it has been found in Holland extremely difficult to avoid conviction for libel, for while the

drugs of the *quack* may be proved worthless or worse, nevertheless the vendor himself must be spoken of as a gentleman; otherwise, as said the learned "Dutch" judge, "he would have a right to damages for the injury done to his *honor (sic)* and *reputation*."

A delicious summer drink can be made by using Horsford's Acid Phosphate with water and sugar only. This article is a pleasant and nutritious substitute for lemons or limes in the preparation of lemonade, and fully meets the wants for an agreeable tonic. No danger can attend its use and the cost is very moderate. Dr. M. H. Henry, the widely known and eminent family physician, of New York, says: "Horsford's Acid Phosphate possesses claims as a beverage beyond anything I know of in the form of medicine, and in nervous diseases I know of no preparation to equal it."

We are informed that the Weir Mitchell Sanatorium in Hamilton, conducted by Dr. Holford Walker, has proved so successful during the past year that the doctor finds it necessary to still further enlarge, and with that object in view he has decided to remove it to Toronto. Before doing so he purposes spending a few months abroad, to see the work of the leading gynecologists, more especially that of Mr. Lawson Tait, and on returning to Toronto will confine himself solely to that branch of the profession, in connection with the cases requiring the rest treatment.