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The KINGSTON MEDICAL QUARTERLY is presented to the Medical Profession with the compliments of the Editorial Staff. Contributions will be gladly received from members of the Profession and willingly published. JOHN HERALD, Editor

THE PREVENTION OF TUBERCULOSIS.

WE have received the circular from the Provincial Board of Health's Standing Committee on Epidemics, from which we extract the following resolutions:—

Moved by Dr. Cassidy, Seconded by Dr. Bryce.

"1st. That as Tuberculosis is a contagious and infectious disease, all inmates of Provincial Institutions who are affected with this disease should be isolated in wards set apart for such patients, and not be permitted to associate generally with other inmates.

2nd. That when rooms or wards, which have been occupied by consumptive patients, become vacant, they should be disinfected according to the methods set forth by the Provincial Board of Health in the pamphlet issued by it containing rules for checking the spread of contagious disease.

3rd. That an individual, affected with tuberculosis and living in a private family, should be isolated as much as possible from other members of the household, especial care being taken in the destruction of his expectorations.

4th. That when the room occupied by such patient becomes vacant, it should be thoroughly disinfected, and, as a matter of prevention, the whole dwelling should be disinfected according to the instructions in the pamphlet regarding the disinfection issued by the Provincial Board of Health, and that such other precautions be taken as are provided in Section 101 of the Public Health Act (1897).

5th. That the Local Boards of Health be urged to establish rules for the notification of cases of tuberculosis to the Medical

Health Officer or to the Secretary of the Local Board of the municipality."

With these resolutions we are most heartily in accord. When we consider the frightful havoc tuberculosis makes every year in our population, and when we further consider the appaling ignorance and carelessness of the public regarding this disease and the almost criminal action of the authorities of our public hospitals in admitting patients suffering from tuberculosis into the public wards alongside of patients suffering from less dreadful diseases we feel we would be negligent of our duty if we did not make special reference to this circular and again utilize the QUARTERLY to call the attention of the authorities of our hospitals and our local Boards of Health to this important matter. If any of our hospitals were to place a scarlet fever or a diptheria patient in their public wards they would be prosecuted and rightly so. Yet we may visit almost any of our hospitals and find tuberculosis patients lying in bed along side of another patient suffering from some simple disease as bronchitis. A patient with bronchitis brought in contact with a tuberculous patient) as we know) is particularly liable to incur the latter. The bronchial mucous membrane is in an inflamed condition and thus prepared by disease to receive the tubercle bacilli and afford them a breeding ground. A bronchial patient thus contracting tuberculosis has been criminally exposed, has good grounds for action against the institution which so exposed him, and if he dies the onus of his death must be laid upon the authorities of the institution which permits such a condition of affairs to exist. Were a poor patient thus exposed to the contagion of small-pox who would defend the institution permitting such exposure and yet dangers from small-pox are slight in comparison with those of tuberculosis. A patient attacked by small-pox has a fair chance of recovery. A patient suffering from tuberculosis has almost a certainty of death. This dread disease carries off more victims than do all other contagious diseases collectively. When will the people whose money helps to maintain public hospitals arise in their might and compel the authorities of those institutions to provide isolation wards for tuberculous patients.

At present, it is true, there is a movement to establish in various parts of this Province sanataria for the care of consumptives. So far, so good. But the benefits to be derived from these sanitaria are as yet available only by those who are able to pay for these benefits. There is no provision made for sanitaria for the poor. Nor is there likely to be. The expense would be considered too great. For not only would there be the expense of maintenance, but also that of conveying the patients to these sanitaria. This difficulty can be overcome in two ways. Either establish sanitaria at a great number of places, or make use of the hospitals already established, and set apart certain sections of these institutions for tuberculous patients. The latter is the cheaper method and permits the friends of the patients to visit them without unnecessary expense. The Kingston General Hospital a couple of years ago decided to so provide for tuberculous patients, but alas, as yet nothing has been done. Want of funds is the excuse. This in a community which is the seat of a University with a Medical Faculty, and where, if anywhere, the people have opportunities of learning about the infectious character of tuberculosis. The Governors of the Hospital know the danger of indiscriminately mixing tuberculous patients with others. By resolution they acknowledged the necessity for separate wards for these patients. Can nothing be done? Will the city do nothing? Will no private individual blessed with an abundance come to the assistance of the suffering poor, and help to protect the public from the ravages of this dread destroyer of mankind.

The Provincial Board of Health directs attentiou to the danger of having tuberculous patients going about and mingling with their fellows. What do local Boards of Health do to impress upon these patients and the public generally the danger of having such patients mingling with their fellows and expectorating promiscuously around them, and thus scattering the germs of disease broadcast? The dairyman is more careful of his cattle than the public are of themselves. A dairyman finding one of his cattle afflicted with tuberculosis immediately kills it and has its carcase destroyed. The human being so afflicted is allowed to go about and freely distribute the germs of disease. We cannot, of course, do with him as the dairyman does with his cattle, but surely we can insist that so long as he goes about he must not expectorate wherever and whenever he pleases;

surely we can insist that when he is no longer able to go about he must be isolated, either at home or in a special ward in a hospital. This is not only necessary in the interests of the public, but in his own interest as well. A patient so isolated can be more successfully treated, his unfortunate condition can be rendered more bearable, and the hope of ultimate recovery is just as good, if not better, than when he is left to his own devices.

One point more. The Provincial Board of Health advises that all cases of tuberculosis be reported just as are cases of scarlet fever, small-pox, etc. We agree with them. Were this done we are confident that more stringent measures of disinfection of a patient's clothing, bedding and his room would be carried out. Further, we believe were this done friends would be more cautious about going and sitting in the room with a tuberculous patient. Again, we believe that if the history of a house were followed up it would be found that a house which has been inhabited by a tuberculous patient becomes a source of infection to others. The building becomes impregnated with the germs of disease, and new families moving into it are liable to become infected. This is because up to the present time no systematic destruction of tuberculous expectorations has been insisted upon, and no thorough disinfection of the rooms occupied by tuberculous patients carried out.

SEWAGE PURIFICATION BY BACTERIA.

Being a paper presented at the Annual Meeting of the Association of Executive Health Officers of Ontario, held at Kingston, Ont. By WILLIS CHIPMAN, Toronto.

DURING the past winter and spring, the writer visited nearly all of the important Sewage Disposal Works in Great Britain, giving particular attention as an Engineer, to the practical experiments now being carried on at different places, and carefully inspecting recent installations of the Dibdin Bed System and the Septic Tank System.

The following paper may be considered as a summary of the results of the writer's observations.

The problem of Sewage Purification, has been given more or less study by Municipal Engineers, Chemists, Sanitary Boards and others interested in sanitary improvements for many years, in all portions of the civilized world, but in no country has it been given so close attention as in Great Britain. The density of the population, the great volume of the liquid wastes, the small size of the streams into which sewage could be discharged, and the limited areas from which water supplies could be drawn, have all contributed to the development and extension of sewage purification works that have become models for the world. As a corollary to these conditions, the general public in England has been educated to the necessity of such works, and the vast sums now being expended on sanitary works by different cities and towns have been voted by the ratepayers ungrudgingly.

In no country have so many experiments been made, in no country have so many failures been recorded as in England. Patented processes have from time to time been received with favor, but in most cases, only to be discarded within a few years for simpler or less expensive methods.

Land treatment has been recognized for many years as the most economical method of disposing of sewage and as giving the best results.

There is probably to-day a larger area of land devoted to Broad Irrigation in England than at any other period, and the acreage is constantly increasing. Nottingham with a population of 250,000, has a sewage farm with an area of 900 acres, about 200 acres additional are now being prepared for use, and 700 acres adjoining have been purchased for future requirements. At Leicester, population 217,000, the sewage is raised 170 feet to a sewage farm of 1,700 acres; and at Birmingham there is a sewage farm of 2,800 acres.

In most places, the cost of operating the sewage farms, nearly equals the revenue derived therefrom, leaving the interest of the cost of works to be borne by taxation.

So satisfactory has been land treatment, and so unsatisfactory have been all other processes and methods, that to-day the Local Government Board (a Standing Committee of the Houses of Parliament) will not sanction a loan for sewerage purposes, except with the provision that a certain area of land is provided, and the effluent from all works must pass over and through land before being turned into a stream. This rule was adopted some years ago, and before the results of the experiments at Barking, Sutton and Exeter were known.

In many places, bowever, there has not been a sufficient area of suitable land available to treat the crude sewage by broad irrigation, and other auxiliary methods have been adopted. Sedimentation tanks were introduced by which a part of the solids in suspension were separated, the proportion depending upon the tank capacity.

The liquid part was then applied to the land or discharged into a stream, but the solids deposited in the tank, known as sludge, remained to be disposed of. In some places the neighboring farmers would remove it or a portion of it, but such removal was intermittent, thus demanding storage at the works. Sludge, however, decomposes rapidly, and storage meant nuisance. By adding lime, copperas, allumina ferric or other precipitants, the amount of sludge deposited in the tanks was greatly increased, aud its decomposition delayed, thus permitting of storage for a limited time. By the introduction of sludge presses with air compressors and other machinery for operating the same, the wet sludge was compressed into cakes that could be handled and the volume was reduced to about one-tenth of that of the wet sludge, but pressing cost money and did not dispose of the cakes.

At Glasgow about ninety tons of cake is now produced daily from 13,000,000 gallons of sewage from the east portion of the city only. At London, Manchester and Salford pressing has been abandoned and the wet sludge is now carried out to sea by specially constructed steamers, and doubtless this is the most satisfactory and the cheapest way for sea-coast cities.

At Sheffield, Birmingham and many other places the sludge is partially dried, then deposited in trenches and covered with earth, while in some places it is run into pits or lagoons and allowed to dry out slowly. Sludge is an abomination everywhere.

At Glasgow and a few other places, a portion of the cake is manufactured into "poudrette," a marketable manure, which in other places is made from the contents of tubs and middens. This is however exceptional, and it must be borne in mind that the cake is made into manure in order to dispose of it, and to prevent an accumulation at the works, not because there is any profit in the manufacture.

The *enormous extravagance in permitting sewage to be* wasted instead of converting it into a valuable manure, has served as a text for many a paper at sanitary conventions, but it will be found that as a rule they have been presented to persons who have had no practical training or experience in such matter, visions that may be realized some day, but at present we must be content with what is practical.

The experiments of the Massachusetts State Board of Health at Lawrence, which have been carried on continuously since 1889, have been studied very carefully in England as in America. These experiments clearly established the fact that the purification of sewage was performed through the agency of bacteria, the necessary conditions being the presence of air and the slow movement of thin films of water over the surfaces of the units of the materials composing the filtering materials.

In the United States and Canada, intermittent downward filtration has been generally adopted as a result of these experiments. In this method the sewage is purified at the rate of about 50,000 gallons per acre per 24 hours, upon specially prepared beds of sand and gravel, no attempt being made to raise crops.

The effluent is satisfactory with proper management, if the beds are not overdosed, and there is practically no sludge to be dealt with.

In Great Britain, filtration beds have been adopted in a few unimportant places. As the purification sewage depends upon the action of bacteria, the term filters, which implies mechanical removal of suspended impurities, should now be abandoned.

Between 1884 and 1896, experiments on sewage treatment were made by the Metropolitan Board of Works and The London County Council, under the direction of Mr. W. J. Dibdin their chemist, which may be considered as a continuation of those of the Massachusetts Board.

When Mr. Dibdin in 1887 propounded the theory of microbial action in a paper read before a convention of Engineers, and suggested that the proper way of treating sewage would probably be found in cultivating proper organisms, the whole audience laughed heartily. He persevered in his work however, and in 1892 he was authorized to lay out a bed of one acre at Barking, which was filled to a depth of about three feet with pan breeze.

After many experiments and some failures, this bed was found to remove 85 per cent. of the impurities from sewage when applied at the enormous rate of 800,000 gallons per day. In 1898 the depth of material was increased to six feet, but the writer was informed by the present chemist in charge, Mr. E. Burke Pike, that the increased depth of filling did not increase the capacity of the bed.

In 1894 Sutton (Surrey) laid out and built sewage disposal works at a cost of £66,000. The system adopted was one of chemical precipitation followed by artificial filtration through a patented material, the sludge being pressed into cakes.

In 1895 the Sutton authorities found that the works were unable to so purify the sewage as to meet the requirements of the Thames Conservancy Board owing to a failure of filters. Mr. Dibdin was then consulted and in 1896 a coarse bed was constructed according to his designs, to take the place of the chemical precipitation and the sludge pressing plant, all of the suspended matter in the sewage being destroyed in the interstices of the filling material. Additional beds have been constructed since 1896, and the sludge pressing plant is now for sale, while the effluent is quite satisfactory.

Sutton soon became a Mecca to which deputations and sanitarians journeyed from all parts of the kingdom, and there are now dozens of cities and towns that are constructing Bacteria Beds. The English Engineer is so conservative and cautious that as a rule he insists on conducting experiments with the sewage from his own town on small beds filled with various materials, before recommending the adoption of any general plan for all of the sewage.

The writer visited the experimental works at Manchester, Oldham, Huddersfield, Salford, Leeds, Sheffield, Accrington, Bristol, and other places, but as the final reports on some of these experements have not as yet been published, it can only be stated in a general way, that the results from Bacteria Beds are satisfactory in every way.

In the Sutton system there are two sets of beds, the first filled with coarse material, the second with finer. The sewage is first roughly screened, then flows on the coarse beds, from which it is discharged intermittently on the fine beds which are at a lower level.

The following average of the analyses of the effluents for the year ending March 31st, 1899, may be of interest :—

Effluent from	Ammonia.		Oxygen Absorbed.		Nitrogen.		Suspended Matters	Chlorine
	Free and Saline.	Organic.	At once.	In four hours.	As Nitrites.	As Nitrates		
Coarse Bed.	5.14	0.217	0.39	2.024	0.028	0 110	5.87	9.6
Fine Bed.	1.21	0.084	0	0.828	0.04	3 03	0	9.34

All in parts per 100,000.

The Sutton sewage is purely domestic, but is very concentrated and foul.

It will be noticed that all of the suspended matters have been removed, and that the amount of oxygen consumed falls well below the standard prescribed by the Local Government Board, which is one grain per gallon of oxygen absorbed in four hours.

Experiments have been continued during 1898 and 1899 upon the London crude sewage at the Barking and Crossness outfalls by treating it on coke beds of different depths, the results of which will be found in the reports to the London County Council by Dr. Frank Clowes, successor to Mr. Dibdin. The bacteriological experiments have been conducted by Dr. A. C. Houston.

By applying crude sewage at the rate of 1,665,000 gallons per acre per day to a six foot coke bed, over 50 per cent. of the dissolved oxidisable and putrescible matters of the raw sewage were removed, and all of the suspended matter.

By a second treatment about 20 per cent. additional were removed thus giving a total average of purification 70 per cent. In these experiments the sewage had been roughly screened before reaching the beds, that is, it was free from what is usually described as filth and free from coarse sand and heavy mineral road detritus, but it contained all the suspended solid matter termed sludge.

No trouble whatever was found in keeping the coke beds free as they only required raking over occasionally.

The effluent from these beds was not offensive in character and did not become so when kept, even when the sewage was poured upon the beds in a most foul condition.

Many Engineers are now experimenting with deep bacteria beds filled with various materials, and some now believe that the better results can be obtained by a constant application of sewage in a spray to the surface of the beds and allowing it to trickle through the material, than by intermittently flooding and draining a bed. Several devices have been patented for distributing the sewage. The Whittaker, Candy, Harding and Stoddard Methods, are shown in the accompanying photographs taken by the writer.

Where there is ample fall at the location of the disposal works, the method of continuous application of the sewage to coarse beds of considerable depth will no doubt prove fully satisfactory.

Mr. Stoddart of Bristol, has succeeded in successfully treating sewage at the rate of from 2¼ million to 6½ million gallons per day upon one acre, by means of his patented distributor, the depth of bed material being only five feet. The purification effected as determined by the oxygen consumed was 90 per cent.

Mr. Stoddart experimented on different methods of distributing the sewage over the surface of the bed, and worked for some years on the principal of a perforated plate or tube, but ultimately abandoned it as impracticable, as he found that the liquid treated is never free from suspended solids, and gelatinous growths form, that soon block up the apertures in the plate or tube.

The Candy and Whittaker distributors, which the writer saw in operation, are however, made of perforated pipes, and those who were in charge of the works where they were in use stated that there was very little trouble from the above causes.

Among the prominent variations of the bacterial process are the Scott-Moncrieff system, the Ducat system, the Adeney, the Waring, the Garfield and the Whittaker, all essentially Dibdin bacteria beds, with patented appliances needed, some of very doubtful utility.

The purification is effected in bacteria beds, principally by Aerobic bacteria, or those that work when supplied with air, although Anaerobic bacteria are also present.

In 1895, Mr. Donald Cameron, city surveyor of Exeter, became convinced, as a result of experiments, that the solid matter in sewage could be dissolved and destroyed by Anaerobic bacteria, and the first septic tank system was constructed to deal with the sewage from a small part of the city.

The system consists of a small grit chamber, a closed septic tank, and five small filter beds. The crude sewage flows into the septic tank with a capacity equal to twenty hours flow, in which the sewage stands about seven feet in depth, thence through a submerged outlet pipe to an aerating device, thence to the beds, which are operated in exactly the same way as the finer beds in the Sutton system.

Mr. Cameron has devised a most ingenuous apparatus for automatically filling and emptying the beds in rotation.

Judging from analyses, the action of the septic tank is Anaerobic.

The effluent from the tank is dark and soon becomes offensive; that is, the solids have been broken up and dissolved, and the sewage is prepared for rapid decomposition or for immediate treatment in the finer bed.

Upon the surface of the sewage in the tank a scum or blanket forms, that varies in thickness and consistency with the temperature. The company claims that one cubic foot of gas per capita per day is also produced, that can be utilized for lighting.

The Exeter plant was put in operation in August, 1896, and the writer was informed that it had not been cleaned out since the works started. There was in March last about three feet of semi-fluid sediment, &c., in the bottom, but the work being done in the tank was better than during the first year or so.

The effluent produced by this double process is satisfactory in every way, colorless, odorless and not decomposing.

The effluents at Exeter have been analysed by many chemists, the results being uniformly good. The following table gives the results by Messrs. Dibdin and Thudichum in parts per 100,000 :—

	Ammonia.		Oxygen absorbed in 4 hours.	Nitrites and Nitrates.
	Free and Saline.	Organic.		
Tank Effluent	3.94	0.25	2	0
Final Effluent	2.43	0.11	0.55	0.86¼

The Septic Tank Syndicate designed the works for Barrhead, near Glasgow, which were completed in 1890. These works are intended to treat 400,000 gallons per 24 hours. The sewage is practically domestic, with some street water which carries down dirt.

Two small grit tanks remove the road detritus. From these the sewage flows through four closed septic tanks, thence through aerators to eight beds, the filling and emptying being automatically regulated. The effluent from these works at the time of the writer's visit was exceptionally clear and odorless. The Septic Tank Syndicate has now under construction several works in Great Britain and has established agencies in other countries.

The writer found many engineers in England who believed that an open settling tank could be substituted for the septic tank, and in several places sedimentation tanks were being experimented with as open septics, with results that were generally considered as satisfactory.

Very extended and practical experiments were made at Leicester during the years 1898 and 1899, under the direction of E. George Mawby, M. Inst., C.E., to prove the efficiency of the following :—

(*a*) An open Detritus Tank of comparatively small capacity.
(*b*) A closed Detritus Tank of comparatively small capacity.
(*c*) An open Settling Tank.
(*d*) A Septic Tank of same capacity as (*c*).
(*e*) Coarse Bacteria Beds.
(*f*) Treating effluent from (*e*) on land.

(*g*) Treating effluent from (*e*) on fine Bacteria Beds, and not on land.

The capacity of the tanks was 144,593 gallons, area of coarse beds one-tenth of an acre, and area of fine beds 150 square yards. From 62,000 gallons to 429,000 gallons (in storms) was treated per day.

He obtained the best results by using either the Detritus tank (closed or open) followed by treating the sewage on coarse Bacteria Beds then on land, the beds being worked on the intermittent system.

The following table shows the degree of purification obtained, the quantities being given in grains per gallon :—

	Crude Sewage	Effluent from		
		Detritus Tank.	Bacteria Beds.	Grass Land.
Suspended Matters.	43.7	20.32	4.87	0.385
Alb. Ammonia.	1.182	0.893	0.343	0.156
Oxygen absorbed.	7.442	5.795	2.145	0.663

The Leicester sewage is strong, particularly in albumenoid Ammonia.

The purification effected before reaching the grass land averaged 77 per cent.

Land purification is now recognized as being due to bacterial action, as in the Sutton system, but in the majority of cities and towns a sufficient area of suitable land is not available within a reasonable distance, or at such an elevation that the sewage can be conveyed to it by gravity.

At Manchester, the experts engaged by the city have advised the adoption of the double contact beds preceded by a septic tank, and state that this system is not only the best for Manchester but for the whole world.

The construction of Bacteria Beds and of Septic Tanks are simple problems in Engineering, but the areas and capacities of tanks and beds, the materials and grade of the filling materials, and method of working, must be determined in each case by an experienced Sanitary Engineer. Where the fall available at the works is limited, the Septic Tank method has advantages over double contact bacteria beds, but in most cases the cost will be greater and there are royalties to be paid. Either system will work satisfactory during winter, no sludge is produced, no chemicals are used, and the effluent can be discharged into any stream without creating a nuisance.

One acre of beds four feet deep may be relied upon to remove 90 per cent. of the impurities from the domestic sewage produced by a population of 5000 people, the works will cost less than precipitation works, the operating expenses only a fraction of those of the latter, while the effluent will be much purer.

Within the next few years the precipitation work now so general in Great Britian, will in the writer's opinion, be converted into bacteria tanks, the press rooms closed and machinery sold. In several places visited, the pressing machinery was now idle although the conversion of the works was not fully completed.

ANNUAL MEETING OF THE HEALTH OFFICERS OF ONTARIO.

AT the Annual Meeting of the Association of Executive Health Officers of Ontario, Dr. Bryce of Toronto read a paper on Education. During the discussion which followed Dr. Herald made the following remarks :—

Mr. President and Gentlemen, I have listened most attentively and with extreme pleasure to the paper by Dr. Bryce on Education. Permit me first of all to compliment the doctor upon what I believe to be the sound common sense character of his remarks. I would also, Mr. President, acknowledge that I was considerably surprised as I listened. For years the Educational System of Ontario has been so loudly and so generally vaunted; it has been held up as the best on earth; it has been regarded as something sacred, and, as it were, set upon an altar and all loyal subjects have been expected to bow down and worship it, and anyone who would dare to criticize it adversely was considered as wanting in appreciation of the truly good and beautiful and was even liable to be accused of a lack of patriotism. So, sir, it was with considerable astonishment that I heard Dr. Bryce giving voice to the opinion that all was not as perfect as we had been expected to believe, and that our system was even defective. With the Doctor I am of opinion that our children are expected to go to school at too early an age. Speaking as one who has throughout his life been connected with educational work as pupil, as teacher and as trustee, I am of opinion that those children who begin their school career at 7 or 8 years of age will be found at 12 or 13 years of age to be as far advanced as are those who first went to school when they were only 5 years old. While such pupils are as far advanced educationally, my experience goes to prove that physically they are stronger and intellectually they are better equipped for their life work than are those who were sent to school at an earlier age. And allow me to say further, sir, that this opinion based upon experience it substantiated and confirmed by medical science. It is a well known fact that every organ and tissue of the body is strengthened and developed by exercise, if that exercise be not too severe or indulged in for too long a time. What is true of the coarser tissues of the body is true of the finer ones, as cerebral and nerve tissue. Over exertion, on the other hand exhausts and if persisted in permanently enfeebles. This is particularly true with regard to the tissues of the young. Like the Doctor I am of opinion that a child under 7 years of age should have little or no strain thrown upon his cerebrum ; that until the tissues of the brain are physically developed intellectual effort instead of being beneficial is highly injurious.

Again I agree with the doctor when he pleads for shorter hours for those who first go to school when they are 7 years old. The development of the various tissues of the body depends upon the amount and character of the pabulum supplied. This pabulum is supplied by the blood and the character of the blood depends in large measure upon the digestion. Now sir, we all know that anyone who is physically exhausted cannot perform the complex act of digestion satisfactorily. A child who has been cooped up in a badly ventilated and over crowded schoolroom (as many of our schoolrooms unfortunately are) looses appetite, complains of feeling drowsy and perhaps even of headache. Under such conditions digestion is impeded, firmentation takes place, poisons are generated and these by the circulation are carried to the various tissues of the body and so what was a result—becomes a cause increasing the general lassitude of the tissues including the cerebral. Development is retarded. The child is injured both physically and mentally.

I am also of opinion that the child's physical growth and intellectual development are injuriously affected by the too common practice of prolonging the hours of mental effort by assigning to it tasks to be done at home for recitation during the next school day. In all conscience a child of tender years has had enough and more than enough mental exercise when he has been at it from nine to four without forcing upon him an extra hour or two in the evening. Parents are apt to lay the blame upon the teachers for this extra strain upon their children. I am rather of the opinion that the system and not the teachers are responsible. Examinations and their results are by our educational system made the test of a pupil's progress and of a teacher's fitness for his work. So long as this is the case, teachers who are, like the rest of us, only human will endeavour to have as may of their pupils as possible pass these tests. The pupil, perhaps, suffers in after life but the teacher and his school gains a reputation and our educational authorities can point with pride (?) to the fact that many children, owing to our excellent (?) system, pass the examination for entrance to our High Schools or Collegiate Institutes at the tender and undeveloped age of eleven or twelve years. Such a result, it seems to me, instead of being a subject of congratulation is deeply to be deplored. A boy or girl who is to begin the study of Geometry, Algebra, Latin and French or one of the sciences at eleven or twelve years of age, must do so at the risk of permanent injury to his or her physical health and of lasting impairment of his or her intellectual faculties. To begin the school career at a later age and to carry on the work with less haste and with less desire to see immediate results is the wiser method. Neither plants nor animals (including the human species) should be developed in a hot-house if we wish them to retain their vigour in after life.

One more remark, Sir, and I shall finish. There seems to be a generally accepted opinion just now that our public schools should prepare our children for the particular calling they are to follow in after life. No one will deny this in a certain and restricted sense. But this doctrine is now being specialized, and so we find a number of subjects being introduced into the school curriculum. Now, however useful such subjects as chemistry, physiology, sewing, carpentering, etc., may be, one may safely call in question the state and the municipality being required to pay for their being taught. I only use these as illustrations, and, perhaps, two of them are poor illustrations, viz., sewing and carpentering. These two may be utilized as means of recreation. To that extent they may be legitimate and useful. The idea, however, which I wish to combat, Sir, is this, that in a special sense our schools should prepare a boy for his life work. Why should the state specially prepare one boy to be a carpenter or a tailor, and refuse to specially prepare him to be a lawyer or a doctor. To me it seems that the state has performed its full duty in this respect when it has placed at the disposal of every boy the fundamentals of a general education. The special education can be and should be acquired afterwards by the pupil at his own or his parents' expense. When a pupil has been taught to read well and to understand what he reads, to write and to express in words what he thinks, and to figure and make ordinary calculations, he has acquired an educational foundation upon which he may at will rear any special superstructure he may require for the special calling he may adopt as his life work. This, Sir, I am quite aware may be regarded as old-fashioned doctrine, and in all probability I shall be regarded by the modern educationalists as what they are pleased so elegantly to term a "back number." I am quite willing to incur the charge. Age is venerable, and even in education the "moderns" have much to learn from the "ancients."

Mr. President, I apologize for speaking so long, but the importance of the subject and my interest in it must be my excuse. Gentlemen, I thank you for your patience in listening to me while I was making these somewhat rambling remarks.

HAEMATHERAPY.

President's Address, read before the annual meeting of the Franklin County Medical Society, May 10th, 1900, by Edmond J. Melville, M.D., C.M., Bakersfield, Vt.

GENTLEMEN,—I have prepared a short paper for to-day on the subject of Haematherapy, or the supplying of Auxiliary Blood. This result may be accomplished in four different ways—1st, by subcutaneous injection. 2nd, by establishing direct connection with a vein, and throwing blood immediately into the circulation. 3rd, by absorption into the sides of the *primæ via* upper and lower. 4th, by topical application to a denuded portion of the external or internal surface of the body, where the blood supply is deficient, either in quantity or quality, to properly nourish the part, or to build up a portion of the tissues broken down, by disease or injury. When there is a solution of continuity in any mucous membrane, bone, muscle, or elsewhere, let us watch nature's method of repair. Immediately after the accident occurs she sends to the scene of the disaster an extra supply of blood, an even greater amount than can be used, causing an outpouring and unloading of it in and around the break. These are her bricks and mortar, and soon by methods familiar to us all repair is obtained. Not in every case, however. How many of you are familiar with the wound that does not heal, with the sinus that will not close, the fistula, that despite our best medical treatment, still discharges, or the old ulcer whose open mouth cries out against the inefficiency of our most potent antiseptic remedies. These are the cases that make us, or break us, on the rack of public opinion. No doubt a radical operation may cure a goodly percentage of such cases, but too well we country doctors know how difficult it is to gain the consent of such patients to an operation. Why do these fever sores, ulcers, etc., remain unhealed? Nature has hurried her forces of repair so often to the site of the lesion, that the blood carriers are paralyzed from over distention, and a state of chronic congestion ensues. Again, fearing a spread of the ulcerative process, she has thrown a solid wall of cicatricial tissue around the break, and spontaneous healing is now out of the question. Here it is that Haematherapy comes to the rescue and changes seeming defeat into victory. The question naturally arises, How are we to procure this Auxiliary Blood, and how after getting it are we going to use it? The *arterial* blood may be drawn from a healthy bullock, the fibrin removed, and the blood then sterilized, or it may be purchased from any druggist in the form of Bovinine, which is already sterilized and elaborated for immediate use. The method of using the above I will endeavor to make clear by a report of a few cases that occurred in my own practice.

Case I. On October 11th, 1895, George P——— of Bakersfield, was accidently shot. The charge of No. 6 shot entered the upper third of the thigh, at its inner and anterior surface, and after leaving wads, clothing and stray shot in its wake, the remainder emerged at the upper and outer portion of the gluteal fold, after traversing the thickness of the thigh, to the inside of the femur. In spite of the fact, that infection took place, the wound healed kindly, and at the end of two months, there was but a sinus remaining, the diameter, of which, was equal to that of a goose quill, and the length about seven inches. To heal the above, I used consecutively every remedy laid down in the text books, but in vain. I advised operation, but could not gain my patient's consent to it. This state of affairs continued, through the summer of '96, and during all those months, I tried remedy after remedy, upon my patient, without any lasting effect. For some reason, unknown to me, at present, I began the use of supplied blood, in the following manner. After cleaning the sinus carefully, and washing out with Peroxide of Hydrogen, I filled the canal with Bovinine, by means of a small medicine dropper, and dressed with plain gauze and a bandage. This procedure was repeated daily, and in addition Mr. P——— filled the sinus, every night, with Bovinine. At the end of three weeks, the parts were firmly healed, and not a drop of pus has exuded from them since.

Case II. On April 4th, 1898, Ben. M———, sawyer, Belvidere, Vt., aged 38, while examining a set screw in a saw mill, had the whole dorsal surface of his right hand removed. The skin, extensor tendons, and interosseous muscles were torn off, only a few shreds of tissue remaining, to show that they ever existed. The 3rd, 4th and 5th metacarpal bones were missing, except portions one eighth inch long, which remained attached to the phalanges. The deep, and superficial palmer facia was badly lacerated, the flexor tendons somewhat torn, and two large holes punched through, into the palm of the hand. The mangled hand was filled with black grease, from the set screw, sawdust from the mill floor, and several spent quids of chewing tobacco, which were applied to the wound to check the haemorrhage. To make matters worse, over zealous friends had compelled him to drink, half a pint of alcohol, and a pint of rye whiskey to ease the pain. As he had never tasted liquor before the effect was rather startling. The man was fighting drunk and was keeping the crowd away, with a broken chair. I was in a lumber camp, many miles away from another doctor, and if I were in a reminiscent mood I might tell you how I first had to capture my patient, etherize him, render that hand aseptic, and transplant three strips of skin from the arm to supply the lost tissue on the back of the hand. I then put on an antiseptic dressing, and splinted the arm to the chest. In twelve hours I returned and dressed hand and arm in the following way:—After rendering parts aseptic I applied warm Bovinine pure, dressed with a one per cent. solution of formalin upon moist gauze, covered with oiled silk, and fastened securely with a bandage. This dressing was repeated twice daily until May 16th, when the tissues were entirely healed. There was a slight suppuration at times, for which I used Peroxide of Hydrogen. The adhesions and consequent stiffness yielded to massage, with hot vaseline. The man went to work in June, and can use that hand, to-day, with almost as much dexterity as ever. Could this result be obtained without the auxiliary blood supply?

Case III. On August 10th, 1899, was treating John F—— for articular rheumatism by means of superheated air, in a Betz hot air apparatus. The temperature was running to nearly 300 ° F., when he shifted his position, and in some way, disarranged the Turkish towelling, from his foot. The result was a deep blister, about as large as a silver dollar, over the os calcis. I went away, on my vacation, shortly afterwards, and did not see the gentleman again for six weeks. Imagine my surprise when I found the blister was still unhealed, in spite of the fact that it had been treated with slippery elm poultices during the interval. It had now become an indolent ulcer, and prevented Mr. F. from walking about. Visions of a suit for malpractice haunted me, but I used my old stand by, Peroxide and Bovinine and healed it without a scar, in three weeks. I have had the honor to be *physician in extremis*, to the Bakerfield Poor House for the past 8 years, and during that time, have treated many cases of old ulcers over the tibial region. Some had existed for 30 years, while others were of recent occurrence. They had ranged, in size, from the one as small as a silver dollar, to those that involved almost the whole region, from knee to ankle. They are, usually, caused by dirt and disease, combined with periodical starvation. For the past four or five years, I have never seen an ulcer, large or small, deep or shallow, that would not yield to Bovinine. Some, of course, require a preliminary curetting, and from a few I have had to remove portions of dead tibial bone, but, in nine cases out of ten, old ulcers will be healed rapidly if treated by rest, cleanliness, a generous diet, and the intelligent use of Bovinine. Where the patients are poor, or unable from any cause, to have close medical attention, I give them a supply of plain gauze, instruct them as regards cleanliness, etc.; and have them apply a fresh piece of gauze every day, and cover the surface of the ulcer several times a day with Bovinine.

The injection of bovine blood, or Bovinine, either subcutaneously on directly into a vein, I will merely mention, to dismiss, as I have not as yet, had any experience with Haematherapy, applied by either of these methods.

The fourth way in which we can use auxiliary blood supply, is no doubt familiar to you all. Namely by direct absorption into the system, through the mucous membrane of the alimentary canal. It may be administered, either by the stomach or the rectum, in the latter case, deluted half, with salt water. Haematherapy, as applied in the above mentioned way, is useful in a varied number of disorders, but for fear of wearying you, I will mention but two diseases, in which, I have had brilliant results, with this form of treatment. In the early stages of tuberculosis, I have seen marked, steady, and permanent improvement from the use of gradually increasing doses of Bovinine, in milk by the stomach; combined with complete rest in bed and forced feeding. I have had two cases of ulcer of the stomach, where the hemorrhage was severe, and collapse imminent, yield quickly to high rectal injections, of ounce doses of Bovinine and salt water, every three hours. I placed both of these patients upon glauber salts to procure an alkalinity of the blood, and to overcome constipation, and when the stomach was able to bear nourishment, I gave teaspoonful doses of pure Bovinine, to begin, and gradually increased the dose to four times daily. This treatment, combined with a proper diet, and rest in bed, brought about a complete cure in both cases.

In conclusion, gentlemen, I might say, that I am very much averse to recommending a proprietary preparation for fear of being classed with those physicians who immediately rush into print, lauding to the skies each new "cureall" that is put upon the market. On the other hand, I do not believe that a physician violates the code of ethics when he comes out squarely for a reputable preparation that has stood him in good stead, as it would be unjust and cowardly for him to use it secretly. Some of you may ask, If blood is what is needed in these cases, why not use it directly? Why depend on a proprietary article? In answer to these questions I would say that I have not the necessary knowledge, time or chemical appliances necessary to elaborate the arterial blood of the ox; no more than I have the knowledge. etc., to make my morphine from the poppy. Therefore, in the cases where Haematherapy is indicated, I have always used, and shall continue to use, Bovinine.

DOUBLF HARE-LIP WITH PROTUSION OF THE OS INCISIVUM—COMPLETE CLEFT-PALATE.

E. B., male, æt 15 years, came under my care as a ward patient in March, 1899, presenting the hideous deformity partly shown in the accompanying cut. He is one

of a family of eight boys, all of whom with the exception of the patient are perfectly developed. His life had been spent in complete seclusion at his home in one of the back townships, and he was brought to the hospital by a county official. The lower half of the boy's face was enveloped in a handkerchief, and his guardian requested that we should "fix him up, as it was a *crime* to have him going about the country in that shape."

Upon examination it was found that the patient had a complete double hare-lip with marked flattening of the alæ nasi, a protrusion of the os incisivum with the attached central incisors, and a complete cleft of the palate extending through the uvula. The boy was very backward and timid; he articulated with difficulty, but had comparatively little trouble in masticating and

swallowing his food. His confidence was gained, and he then readily consented to undergo the necessary operations.

The first operation consisted in removing the protruding bone and suturing the palate. The labial portion covering the bone was freed with a scalpel, and the os incisivum separated from the vomer by bone forceps. The free arterial bleeding from the divided bone was checked by the thermo-cautery. Our attention was then turned to the closure of the extensive fissure, involving both the soft and hard palate. The margins of the cleft were pared throughout their whole extent, after making traction on the divided uvula, and the soft palate was first united by means of horse-hair sutures passed on suitably curved needles. For the closure of the hard palate Langenbeck's method was adopted. Lateral incisions were made on each side parallel to the cleft extending down to the bone, then a periosteum elevator was introduced and muco-periosteal flaps raised clear through to the cleft, and interrupted silk sutures were inserted to retain the flaps in apposition.

The result as regards the union of the palate was fairly good. Two sutures cut out about the centre of the hard palate, but firm union was obtained anteriorly and posteriorly, leaving only a small oval opening half an inch in length by one quarter inch in width. A fortnight later the second operation was performed. The central labial portion was pared laterally making it V shaped, and the lateral margins freely separated from the bone, and freshened according to Rose's method. The edges were then adjusted by sutures, using silver wire, silk-worm gut and horse hair. Primary union was obtained, and three weeks later the patient left the hospital in a very presentable condition. It was intended to have a photograph of the patient taken in his improved condition, but a fellow patient frightened the lad by telling him that some further operation was to be performed, and consequently he took a hurried departure. A short time ago he was induced to come to the city and his photograph was obtained.

He went about the city, and mingled in the crowds attending the local Fair, without attracting any special attention. He is very much pleased with the result and is bright and cheerful, conversing with considerable animation, his articulation being much more distinct. Slight evidences of a coming moustache give promise of a still further improved appearance in the near future.

W. G. ANGLIN.

VITALITY OF TYPHOID, DIPHTHERIA AND CHOLERA BACTERIA IN MILK

THE role of milk as a carrier of the infective agents of disease is now recognized as a highly important one, but it is not the purpose of this paper to take up all the infective forms so carried further than to say that, practically with the exception of the Tubercle bacillus, all these infective agents are derived from without. We have very numerous forms of bacterial milk infection which leads to manifold disturbances in the body varying from the simple digestive disturbances of infants due to chemical poisoning to non specific and specific forms of infection. Among the specific morbific agents which may and do frequently infect through milk are the causal bacteria of typhoid fever, diphtheria, cholera and scarlet fever. Numerous outbreaks of all these diseases have been traced to an infected milk supply. At varying periods I have made experiments on the vitality of the infective agents of the three former diseases in milk. These experiments are but yet in their preliminary stages but I thought it well to place my results up to the present time before the meeting. The experiments have been carried out at the heat of the laboratory which averages 70° at times going as high as 76 to 78° rarely under 64°. This would be the average temperature range to which milk under normal conditions would be kept. Sterilized milk is an excellent culture medium for all these bacteria under consideration, viz.:—those of Enteric Fever, Diphtheria and Asiatic Cholera. They develop and retain their vitality after a lapse of from 3 to 6 months. Tubes have never been kept longer than the latter period but no doubt living bacteria, particularly of Typhoid and Diphtheria, could be obtained long after this period.

DIPHTHERIA BACILLUS.

The Diphtheria bacillus in sterilized milk at average summer temperature multiplies quite slowly. As the temperature rises so does its rapidity of multiplication. But as the room temperature is the average temperature under which milk is ordinarily kept, nothing has yet been done by me to note the results at higher temperature ranges.

Experiments were made of inoculating sterilized milk tubes with the Diphtheria bacillus and the common bacillus acidi lactici. This microbe was selected because it is the cause of the common souring and curdling of milk, and because it is practically always present in fresh milk, usually being present in the fore milk. In tubes so oculated the Diphtheria bacillus was never noted to increase in numbers while the lactic acid germ increased enormously. The Diphtheria bacilli gradually died out of the milk and were never recovered after the 7th day. The growth of the lactic acid germ in the milk in all my experiments has thus been inimical to the development of the Diphtheria bacillus. I may say that to recover the Diphtheria bacillus I used blood serum as in ordinary Diphtheria diagnosis. On blood serum B. acidi lactici practically refuses to grow at body heat.

Fresh milk was also inoculated with B. Diphtheria and examined afterwards at four hour intervals. Here again no increase in Diphtheria bacilli was found. Though Diphtheria bacilli could be recovered up to the 5th day. In all fresh milk samples the lactic acid bacillus was found, and with it such species as sarcina lutea, a variety of bacillus coli, a yeast and penicillum glaucum. In competition in milk with the penicillum glaucum the Diphtheria bacillus is quickly killed out, disappearing from the 5th to the 10th day. It seems from my experiments to be proven that at a temperature averaging 70 to 72 °F. the Diphtheria bacillus while it remains alive and virulent during the period of time in which the milk is commonly used, yet it does not tend to multiply in such milk and is soon killed out in competition with the common milk saphrophytes. As these results do not seem to be in line with many facts noted in connection with Diphtheria epidemics from milk infection I mean to again go over my experiments to see if a second series confirm my previous results.

TYPHOID BACILLUS.

The typhoid bacillus at the room temperature multiplies very rapidly in sterilized milk, which affords one of the best media for its rapid development.

In sterilized milk inoculated with the B. Acidi Lactici, as well as B. Typhosus, it was found that both forms multiply rapidly, the lactic acid bacillus exerting no restraining influence upon the typhoid germ during the first two days at least. The typhoid bacillus is readily obtained by subculture six to eight weeks after infection of the milk tubes. In fresh unsterilized milk the typhoid bacillus also increased rapidly in numbers during the first 24 hours at least, and could be demonstrated several weeks after in such milk. I may say that in most of my experiments with fresh milk I was much troubled with an actively motile bacillus of the colon type, which was frequently present in the milk as obtained within an hour from the dairy.

These experiments show that the typhoid bacillus once it obtains entry to milk will readily and rapidly multiply therein and remain alive for long periods. This last point assumes importance in relation to infection of one day's supply from the previous days by the use of improperly cleansed utensils. Epidemics of typhoid from infected milk are usually looked upon as of severe type, perhaps owing to the large number of typhoid germs which could be taken in in this way, and, as is well recognized, the number of infecting bacteria usually exercises an influence on the severity of the infection.

SPIRILLUM OF ASIATIC CHOLERA.

The spirillum of cholera rapidly multiplies in sterilized milk at the room temperature and remains alive in it for long periods. In infection of milk with this microbe and with the lactic acid germ the cholera vibrio multiplies for from 6 to 18 hours, when its multiplication is checked by the lactic acid germ, which soon obtains the ascendancy and gradually kills out the cholera vibrios. In most of my experiments the cholera vibrios could not be obtained after 48 hours, in none longer than 72 hours. Practically the same results were noted in connection with the fresh milk samples. The danger from cholera infected milk is during the earlier stages of infection, which is of course the period when the milk is used. Later the lactic acid rapidly kills the vibrio, which, as is well known, is quite sensitive to the effects of acids.

W. T. CONNELL.

PNEUMONIA AND EMPYEMA.

THAT a mistake in diagnosis between these two conditions is probable seems hardly credible, and yet in consultation I have seen several cases in which the diagnosis of Pneumonia had been made, and in which the diagnosis of Empyema was afterwards confirmed by the evacuation of pus from the pleural cavity. That such mistakes have been made must be my excuse for this article.

In general symptoms these two conditions have much in common. In each we have a chill; in each we have a rapid rise in temperature; in each there is difficult respiration with unequal action of the two sides; in each there has been a history of pain in the side; in each we may find a considerable depression and anxiety on the part of the patient; in each we may notice the hectic flush on the cheeks. When, however, we pass from the subjective symptoms and take the evidence obtained by physical examination, the two conditions are more readily differentiated.

On inspection we find in both cases difficult respiration, which is not equal on the two sides. In Pneumonia there is not bulging of the intercostal spaces; if there is any change it is rather towards a flattening of the chest wall. In Empyema, on the other hand, we will not find a flattening, but may notice a bulging out or widening of the intercostal spaces. This variation of the chest wall, however, is not of much practical aid in our diagnosis, for there may be no noticeable variation in the general contour of the chest wall in either case. A flattening would point to Pneumonia, and a bulging to Empyema. The position of the apex beat of the heart is also worthy of notice. In Empyema this may be displaced towards the side opposite to that on which the Empyema exists. In Pneumonia we do not find the apex beat of the heart so displaced. Change of position of the apex beat would point to Empyema rather than to Pneumonia. A change of position is not found in Pneumonia. This displacement of the apex beat noticed on inspection may be confirmed by palpation and percussion.

Percussion yields better results. In both conditions the percussion note is dull. In Pneumonia the note is flatter than in Empyema, and in Pneumonia there is a decided feeling of resistance; while in Empyema there is more yielding of the thoracic wall—a feeling of elasticity. This latter, however, is not to be too absolutely relied on, for, if the pleural cavity be very full, the sense of elasticity may not be apparent.

Palpation gives more reliable evidence. In Pneumonia we have between the palpating hand and the bronchial tubes the consolidated lung tissue—a good conductor of sound—and hence we find that vocal fremitus is increased. In Empyema on the hand there is fluid lying between the palpating hand and the bronchial tubes, and as fluid is a poor conductor of sound the vocal fremitus is decreased. This test is not absolute—if a small portion of lung only is consolidated, and that situated centrally, or if the bronchial tubes have become plugged so as to prevent the passage of air the vocal fremitus will not be increased. As a rule, however, this may be relied upon to differentiate these two conditions.

Auscultation is the most reliable of the the methods of physical examination for the differential diagnosis of these two conditions, and if the examiner is careful a mistake should not occur. The character of the sounds heard in Pneumonia will vary according to the stage which the disease has attained when the examination is made. In the first stage we will hear broncho-vesicular breathing, with perhaps small crepitant râles; in the second stage pure bronchial breathing; in the third stage broncho-vesicular breathing with perhaps small crepitant râles (râles redux) and moist râles. In empyema, however, we do not get these breath sounds nor these râles. The breathing is vesicular in character but faint and indistinct. The fluid lying between the anterior thoracic wall and the lung obscures the sounds. When either set of sounds is heard we may safely exclude the other condition, *i.e.*, when we hear the râles referred to or the pure bronchial breathing clearly and distinctly we may exclude Empyema, and when we hear vesicular breathing, faint, indistinct, and, as it were, far away, we may safely exclude Pneumonia. Again, as consolidated lung is a good conductor of sound, and as fluid is a poor conductor, the vocal fremitus varies in these too conditions. In Pneumonia it is intensified, and in Empyema it is decreased—feeble.

The character of the sputum is another means of differentiating. When expectoration takes place in Pneumonia (as it usually does) it will be very characteristic—rusty—bloody or prune juice. The expectoration of Empyema has none of these features. It will be mucous or muco purulent. A bacteriological examination removes all doubt as a rule. Pneumococci being found the disease is Pneumonia. This test, however, is not always available. Even when sputum can be obtained a bacteriological examination is not always available and in some cases of Pneumonia there may be no expectoration. I have seen cases presenting all the typical evidences of Pneumonia running a regular course and terminating by crisis and no expectorarion, at least none characteristic of Pneumonia, took place during the whole course of the disease. When the evidence of the sputum is available it is conclusive—when not available we must rely upon the symptoms and especially upon our physical examination.

One other test is still at our command—the hypodermic needle. When sputum is not obtainable or when a bacteriological examination is not available, the hypodermic needle ought, in all cases of doubt, to be used. If proper precautions are taken no injury can result to the patient; and if pus is obtained we have conclusive evidence that we have to deal with an Empyema. The failure to obtain pus, however, on the first attempt is not to be regarded as proof positive of the absence of this condition. The needle may have been passed in above the fluid or the fluid may be in pockets and the needle may have entered at a point between these pockets. I can recall two cases exemplifying this. In one case the first attempt produced no pus but when the needle was passed in at the intercostal space next below pus was obtained. In another case the first attempt was unsuccessful, and on the second trial pus was readily obtained. This patient died, and the post mortem revealed the fact that the fluid was contained in pockets and the needle had at first been passed in between these pockets. These cases emphasize the fact that all means of diagnosis must be tried, and even tried repeatedly before we are sure of our diagnosis.

I said at the beginning of this article that I had seen cases in consultation in which a diagnosis of Pneumonia had been made, which afterwards were demonstrated by the presence of pus to be Empyemas. I shall briefly refer to three of these. One, a child three years of age, with the following symptoms and signs:

Pain in the side; high temperature; labored respiration; dullness on percussion; decreased vocal fremitus; indistinct respiratory sounds. The character of the percussion note and the absence of resistance, the decreased vocal fremitus and the indistinct respiratory sounds, roused the suspicion that we had to deal with an Empyema, and not a Pneumonia. The hypodermic needle was passed, pus was obtained and our suspicions were confirmed. A free opening was made and the cavity drained and the child made a good recovery. The next case was that of a young girl. Pneumonia was the diagnosis. Being suspicious the needle was passed and no fluid was obtained. Still relying upon the evidence obtained by physical examination the needle was again passed lower down, and pus being obtained the diagnosis of Empyema was made. The third case has already been referred to—a middle-aged woman. Judging by the symptoms and the physical signs Pneumonia was diagnosed. The needle was passed—no pus was obtained. Another trial was made and the diagnosis of Empyema confirmed. This patient died, and, as I have said, the post mortem revealed the fact that the pus was contained in pockets.

The fact that such mistakes have been made induced me to call attention to some of the means of making a differential diagnosis between these two conditions. I am fully convinced that either of the gentlemen who were connected with these cases would not have been in error in their diagnosis had they made use of all the means at their disposal before giving their opinion as to the nature of the disease. The trouble with, perhaps, all all of us is that we are liable sometimes to make our diagnosis on incomplete evidence. We make our examination and find much that points to a particular condition and conclude that we have to deal with a case of that particular disease, whereas had we gone further and obtained more evidence we would have arrived at a different conclusion. While it is undoubtedly true that a certain amount of experience in making examinations of the chest is requisite to enable one to differentiate Pneumonia from Empyema, I am fully of the opinion that no one, however expert he may be, ought to make his diagnosis without having first made use of all the tests that are available. In the cases I have referred to the gentlemen who diagnosed Pneumonia were competent physicians, but had made the diagnosis on incomplete evidence. I would repeat again (and it cannot be repeated too often) in making a diagnosis let us use every means at our command to get evidence before we give our opinion, and we will avoid being put in the unpleasant position of having to alter our diagnosis or of having it altered for us by another physician who has been called in consultation.

JOHN HERALD.