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Bulletin
OF THE
Ontario Hospitals for
the Insane

Rockwood Hospital Number.

*A Journal devoted
to the interests of
Psychiatry in Ontario*

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THE NEW HISTORY FORM.

The Provincial Government has recently issued a new form of history, to be filled in making application for admission of a patient to a Hospital for the Insane.

While some minor changes may be called for in this form, it must be acknowledged to be a great improvement upon the forms heretofore in general use in our Institutions.

An endeavor is being made, by careful and exact methods, to record as fully as possible, accurate accounts not only of the patient's present condition, but also what we may call the physiological history of the person whose case is under consideration, and as far as it can be ascertained, that of the relatives also.

The value, for scientific deduction, in a study of heredity, consanguinity, etc., of a mass of such information is at once apparent, and the various medical staffs are undertaking a great labour along this and other lines of research. The great difficulty is to get statements sufficiently full, and at the same time exact, anything less being not only valueless but entirely misleading.

To accurately fill the new history form entails some care on the part of the physician, and it is to bespeak his interest and active co-operation that this paragraph is written. It is hoped, indeed, that he will not even confine himself to the form in question, but that he will communicate by letter any other facts of personal or ancestral history that can be furnished, being assured that their value will be fully appreciated.

HOME TREATMENT.

We have thought, in this number of the Bulletin, that it would be well to offer to our Medical Confreres a few suggestions on the early care of incipient cases of Mental Disease, knowing well the difficulties they have to face in caring for these cases in private practice, and trusting that some details may be outlined, which, in conjunction with the family physician's skill, may be the means of cutting short attacks and avoiding the necessity for hospital treatment. For such cases as ultimately find their way to the hospitals these suggestions may aid in securing early such treatment as is more nearly in accordance with the practice of well-equipped hospitals than has often heretofore been practicable in home treatment. We fully appreciate the fact that the family physician comes in contact with cases of mental disease at a much earlier period than the hospital staff, who generally have no knowledge of the case until application for admission has been made and the patient has become troublesome or dangerous to himself or others.

The cases which cause the practitioner most trouble and anxiety are usually either those showing depression, with suicidal tendency and refusal of food, or those showing excitement with insomnia, and it is to those types that the following remarks are directed. In these days, when it is possible to obtain the services of a nurse who has had training in a Hospital for the Insane, many physicians, availing themselves of this facility, find the problem of home treatment much less difficult than it formerly was. It cannot be impressed too strongly that the patient must be in charge of some competent person, and that not a relative. A safe rule is to regard as suicidal all cases showing marked depression.

It is worthy of note that the suicidal impulse may be aroused to activity merely by the sight of any object by

which the act could be accomplished, and in view of this, all possible means by which this could be done should be excluded.

Food may be refused from various notions, either on account of delusions of poison, poverty, etc., or directly with the intention of starving. From whatever cause, it is highly important that the tendency be overcome, as full nutrition is a very necessary element in the management of these cases, and if the refusal of food is persisted in, forced feeding must be resorted to. The simplest method is by means of a soft rubber catheter attached to a small funnel or the glass barrel of a piston syringe. This catheter, when lubricated, can be readily passed through the nares into the oesophagus obviating the necessity of forcibly opening the mouth.

It occasionally happens, that by persistent efforts, the end of the catheter is expelled by the mouth, in which case the stomach tube must be resorted to. A suitable diet would consist of 2 eggs and 1 to 2 pints of milk, to which a little sherry can be added. The milk should preferably be peptonized. The addition of a tablespoonful of sugar adds to the value of this meal, which should be administered three times a day or more often. Purgatives, the use of which should not be overlooked, may be conveniently administered at the time of feeding. Variations of diet, consisting of broths, gruels, etc., will suggest themselves.

The management of the excited cases, in private practice, is a problem offering much difficulty owing to the seeming impossibility of avoiding physical restraint, a procedure which invariably does harm, and has been long abandoned in the Hospitals of Ontario. While it is well that those in charge should be of good physique, it is often remarkable how much more can be accomplished by an intelligent display of tact rather than by a simple resort to force. Too often it happens that patients are brought to the Hospital who have been bound with ropes,

etc., and very roughly handled during their home treatment. This should not be, as it only tends to increase the excitement and prejudice the patients against the friends. Much can be done, however, to control even the most violent case, by the use of the hot wet pack, with cold applications to the head. This simple proceeding has generally a decided calmative effect, the patient often falling asleep in the pack. If this result is not obtained after the patient has been in the pack 30 minutes, it is advisable to repeat the process several times daily if necessary, provided it is well borne, before resorting to the less desirable method of control by drugs. It may be necessary to supplement this with such hypnotics as Veronal, Sulphonal or Trional, or, in some cases, by the cautious use, hypodermically, of Hyoscine, which will seldom be required in doses of more than $\frac{1}{100}$ of a grain. In administering Sulphonal better effect will be produced with a dose of not less than 30 grains, in a glass of hot milk. A full and abundant nutrition should be supplied, often best accomplished by giving stated quantities at regular intervals of not more than three hours.

The bowels will always require attention, and the other channels of elimination must never be neglected, and herein consists one of the virtues of the pack.

During periods of excitement the patient should be kept in bed if possible.

To recapitulate, therefore, the essential elements are:—

- 1st. Rest in bed. Attend to the elimination of waste products. Keep up the nutrition by forced feeding if necessary.
- 2nd. Try to induce sleep, and calm the patient by the use of hot wet packs, and only resort to sedatives and hypnotics as a last resort.

HOSPITAL TREATMENT.

It is our intention to simply outline the method of treatment pursued in Rockwood Hospital, Kingston.

On admission the patients are sent to our Reception Ward, where they are given a warm bath and put to bed. A careful physical examination of the whole body is then made, each system is carefully gone over and examined, and the case is then discussed at a Staff conference. The patient is weighed and urine examined. A blood count is made with the Thoma-Zeiss Hæmocytometer, and the blood pressure taken with Riva Rocci's Sphygmomanometer, the Hæmoglobin is tested with Talquist's scale. If the case is diagnosed to be of toxic origin, the patient is then prescribed a course in the Continuous Baths, or given hot air baths, after which they are given an alcohol rub and massage. Forced feeding, i.e., some easily assimilated diet given every three hours, and tonics, etc., are prescribed as indicated. Other patients are given the rest treatment, as outlined by Weir-Mitchell. In the excited phases hot wet packs, or continuous baths are employed. Saline infusions are given in the conditions of exhaustion. In other conditions the patients are taken out on the grounds, and kept in hammocks, in the open air, for several hours daily. Various amusements and occupations are also provided.

In Tuberculous cases, if not too far advanced, the Tuberculin treatment is given, based on the opsonic treatment of Wright. This, of course, is somewhat in the experimental stage. These patients are also given the benefit of the open air, during the summer months, being segregated in cottages built for this purpose. We have plans at present under consideration, for the construction of a thoroughly up to date Tuberculosis Building, that can be occupied the year round.

A completely equipped Surgical Department provides ample facility for caring for those cases where surgical interference is indicated. This is in a separate building, erected and equipped for this purpose.

An efficient Training School for Nurses has been in operation at this Institution for fourteen years, so that now, not only is our Nursing Staff trained, but numbers of our graduates have gone out into the wider field of nursing, and are creditably filling many positions of responsibility; therefore not only have we been able to minister to the Insane in this Hospital, but nurses who have gone forth from here have carried with them a knowledge of the scientific care of this class, which cannot but have been of incalculable service. Training Schools are being or have been established in the other Hospitals for the Insane.

Although Hydro-, Electro- and Mechano-therapy and other physiological measures have entered largely into our work, these supplement rather than supplant the use of drugs and other remedial agents.

RESEARCH.

Preventive medicine is very properly becoming the aim of the modern physician. The best minds in active professional duties, as well as amongst those who are spending their lives in scientific research, are devoting their energies not so much to cure as to prevent. Every disease leaves its scar, whether it be a disease of the mind or a disease of the body, and this scar tissue is liable to break again in the physical, as well as in the mental life. How great is the interest of humanity in the prevention of disease. Clinical methods can be of great service in this direction, but the clinician cannot do all. The laboratory must contribute its share. The lives of Pasteur, Koch, Manson and others, through their scientific labours, have revolutionized modern medicine.

In psychiatry the clinician cannot do all. There must be scientific research. There must be laboratory investigation. There must be men who, devoted to the ends in view, will in the silence of their laboratories, and divested of administrative duties, seek earnestly the light. It may not appear to-day or to-morrow, but dawn it will.

Problems more obscure have been solved, and in their solution have brought untold blessings to humanity. Up to the present time this Province has contributed little of a scientific character to the study of insanity. Ontario will do well to contribute of her energy, of her great and varied resources in intellect and material wealth, to search for that which has not yet been revealed. Ontario needs no justification in seeking, even at some sacrifice, the cause and thus the prevention of a disease the most dreaded of human afflictions; and Ontario will do her duty.

PREVENTION OF INSANITY.

In the prevention of insanity the general practitioner might be of great and valuable assistance. He does not hesitate to make himself intimately acquainted with the cell tendencies of his clientèle. The strength and weakness of the physical life of his patients in all their tissues is a necessary study to the general practitioner if his labor should be successful. He is thus able the better to cure, and more important still, to prevent disease.

We might be pardoned, did we urge upon the general practitioner the absolute necessity of studying carefully the mental attitude of his patients, his hereditary tendencies, social environments, habits of life, the light and shade of his intellectual growth and development. He is thus in a position to be of valuable aid, to guide his patients in the hour of danger, and to observe the first signal of mental distress. When the strain of modern social and commercial life approaches the breaking point the physician should warn his friend and patient of the danger, and caution him of the inevitable result.

When intemperate and vicious habits are being formed and the laws of nature disregarded he should be advised that these laws are inexorable and cannot be violated with impunity. When adversity threatens and sorrow sets her crown, tis then the wise physician who knows the skeleton in the closet can encourage and direct till danger is passed. But why further enumerate? The practitioner knows what we desire he should do. We appeal for his kind assistance and generous co-operation.

VOLUNTARY ADMISSION.

Since the installation of our Continuous baths, of our Hot-Air apparatus, and the equipment, in a measure, of our laboratories, the treatment of acute cases of insanity, and more especially those cases due to alcoholic and drug inebriety has been quite successful. The results have become known to the public and to the profession, and as a consequence we have had many applications for the admission for treatment of acute cases without the accompanying certificates of insanity. This of course we were unable to grant, under the law as it stands at the present time. We were obliged to tell these patients and their friends, and their physicians, that although our institution existed for the treatment of incipient and acute cases of insanity, no matter what the cause, yet, under present conditions we had no alternative. The alcoholic, the drug inebriate, the toxic following fever, the puerperal, the septic, all must be certified as insane before receiving treatment.

Admission of many acute cases of mental disorders, no matter what the cause, might be entirely voluntary. It seems positively cruel to refuse admission to the very class of patients who would respond most quickly to treatment.

The details could very easily be worked out. We throw out the suggestion for respectful consideration.

THE COMMISSION.

Upon the authority of the Hon. the Provincial Secretary, a commission, consisting of the Hon. Dr. Willoughby, Dr. C. K. Clarke of Toronto Asylum, and Dr. Edward Ryan of Rockwood Hospital, Kingston, was appointed to study the treatment of the insane in Europe. The commission visited the chief centres of population in the various Continental countries.

The system obtaining in Germany received careful consideration, and a thorough study was made in the time at disposal, of the Psychiatric Hospitals in Berlin, Munich, Tubingen and Giessen. The Hospital at Zurich, and the Salpetriere Hospital in Paris, noted for its early triumphs in psychiatry, received earnest consideration.

The commissioners visited the Asylum at Claybury, where the pathological labors of Dr. Mott and his associates are conducted. They also visited Morningside Asylum and Craig House, Edinburgh, in connection with which are the laboratories of Dr. Ford Robertson. Richmond Asylum, Dublin, and the Asylums at Waterford and Clonmell received careful examination. The report of the commissioners and the findings based thereon will be presented to the Hon. the Provincial Secretary at an early date.

ADMISSION OF PATIENTS TO HOSPITALS FOR
THE INSANE.

We would like to call the attention of the Medical Profession throughout the Province to the form of procedure necessary for a patient's admission to the Hospitals, as frequently patients are brought to the Institution without the proper forms having been made out. The impression seems to be abroad that it is only necessary to copy out the form of certificate and schedule as mentioned in the Statute, and, as soon as they are filled up, send the patient into the Hospital, no notification whatever being given to the Superintendent, so that he has no knowledge of the case until the patient is brought in to the Hospital. You can easily understand that this is often very inconvenient, for the simple reason that there may not be a vacant bed in the Institution. We are always anxious to facilitate the admission of cases to the Institution, when we have accommodation,

The simple procedure in each case is to telegraph or write to the Superintendent of the Hospital in whose district you are residing, asking for papers of admission, giving the name of the patient and stating sufficient particulars to indicate the urgency of the case. The necessary papers will then be forwarded to you by the next mail.

The Province of Ontario is divided into six Hospital districts, as there are only six of these Hospitals which admit patients direct from their homes :—

No. 1, or the London District, embraces the Counties of Essex, Kent, Elgin, Lambton, Huron, Middlesex, Bruce, Oxford and Perth.

No. 2, or the Hamilton District, embraces the Counties of Halton, Wentworth, Welland, Lincoln, Haldimand, Norfolk, Brant, Wellington, Dufferin and Grey.

No. 3, or Mimico District, embraces the Counties of Peel, Simcoe, Ontario, Victoria, Peterborough, and the

Districts of Muskoka, Parry Sound, Nipissing, Algoma and Rainy River and Thunder Bay.

No. 4, or Toronto District, embraces the City of Toronto and the County of York, but the private wards in No. 4 are available for patients from all sections of the Province, and are not limited to any territorial division from which they may be admitted.

No. 5, or the Kingston District, embraces the Counties of Durham, Northumberland, Hastings, Lennox, Addington, Prince Edward, Frontenac and Renfrew.

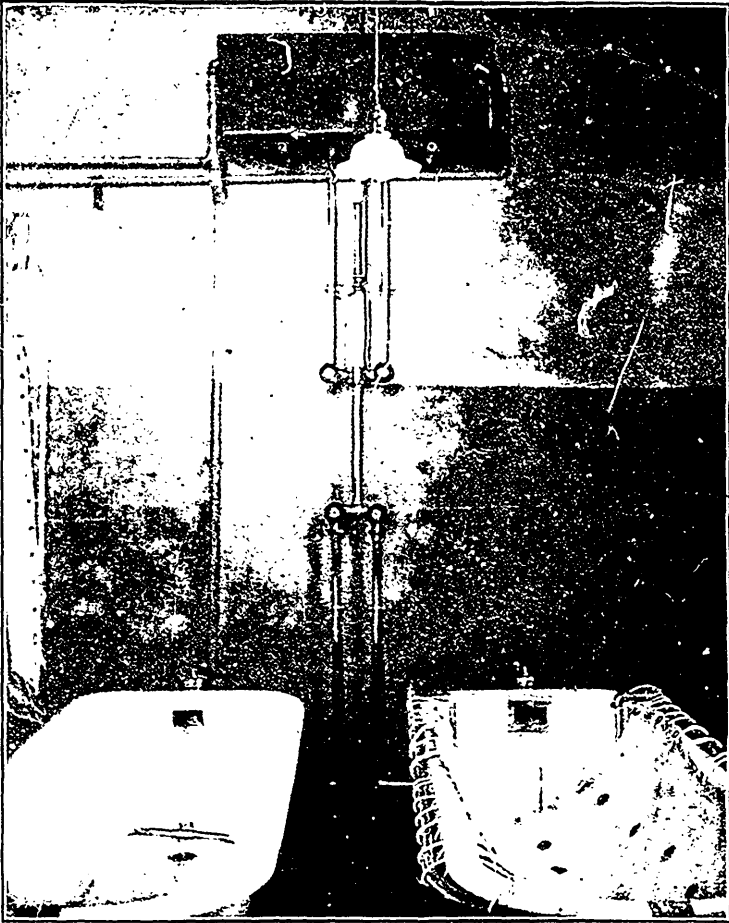
No. 6, or the Brockville District, embraces the Counties of Leeds, Grenville, Dundas, Stormont, Glengarry, Prescott, Russell, Carleton and Lanark.

These districts were all reckoned according to population and in regard to the accommodation in the District Hospital. We frequently have applications from doctors residing in other districts, asking for admission of a patient to our Hospital, but this can only be allowed on the authority of the Inspector of Asylums.

Frequently certificates are sent to the Institution with only one witness, while the law requires two witnesses.

It would be well also to ask the Profession, where, in the first part of the certificate, frequently they write "has delusions, hallucinations, etc.," to state what these delusions, etc., are. The second part of the certificate is also very important, namely, the facts communicated to the examining physician by others. These should always be fully stated.

If these few details were kept in view it would simplify matters very much and cause less worry and trouble to every person concerned.



The Continuous Bath.

THE CONTINUOUS BATH.

An important addition to our equipment was the installation of four continuous or permanent baths.

To describe these briefly :—In the first place the bath tubs are specially constructed, being six feet long, and having a very wide brim-fold, to prevent the patients catching hold and trying to get out. They are enamelled steel, with extra large over-flows, so constructed as to allow water and excreta to escape freely. Extending all around the bottom of the tub is a pipe having numerous small holes, to allow the water to escape. On the wall, above the tub, is a tank of two compartments, one for hot and one for cold water ; pipes lead from each compartment to a mixing chamber, to which is attached a thermometer. The desired temperature is controlled by valves. By this arrangement the water in the tub is continually changing, and is kept at an even temperature. There is, suspended from a frame, a canvas cradle, on which the patient lies. This cradle, or hammock, has numerous large grommet holes, to facilitate the circulation of the water. The patient's head rests on an air pillow, and an ice cap is kept constantly applied.

The temperature of the bath is kept between 96° and 100° F.

The patients are kept in these baths for about eight hours daily, although, at Ward's Island Hospital they have been kept in constantly for four days ; while at Kræpelin's Clinic, in Munich, patients have been kept in for eighteen or twenty days, the patients eating and sleeping in the bath. They are encouraged while in the bath to drink plenty of cold water.

A nurse stands beside the tub, and watches the patient and thermometer carefully. These baths are generally arranged in pairs, so that one mixing chamber supplies two baths.

In order to prevent maceration of the skin, it is carefully anointed, either with mutton tallow or olive oil. When the patient is removed, he is given an alcohol rub, and placed in bed.

The therapeutic use of water in various forms of baths and even the continuous bath cannot be said by any means to be a new idea, but the greater perfection of apparatus has rendered it more available and thus permitted more general and more scientific application.

We have found these baths of great benefit to a large number of cases, especially those of toxic origin. The therapeutic value of these baths is due to their marked effect on the local innervation, the blood vessels dilate and contract, altering the circulation in a part, the distribution of blood to the whole body is changed, cardiac contractions weakened or strengthened, the amount of secretion and excretion varied, and radiation of heat increased. They certainly secure elimination of morbid products, through natural channels, aid nutrition, arouse the paretic vasomotor system, and restore the balance of vascular tension. They are also sedative, and we have found that fewer hypnotics have had to be used. Dr. Rogers, of Danvers, Mass., says that "less so-called chemical restraint has been used, excited patients have been calmed, depressed and melancholy ones cheered and stimulated, and their condition in many ways improved." Dr. Page, of Danvers, Mass., says, "In our experience Hydrotherapy is a most gratifying substitute for hypnotic and sedative drugs. It seldom fails to relieve insomnia, it calms excitement, and chronic patients, subject to periodical disturbance, have had their attacks modified or cut short. Several cases of prolonged Melancholia on the verge of Dementia, have been cured."

REPORTS OF CASES.

CASE No. 1.

L. T.—Residing in one of the Northern Counties. Age 33. Roman Catholic. Public School Education. Married at the age of 22 years. Husband is a laborer. Father living, age 64. Mother living, 60. Father and Mother were not related. Has 4 brothers and 3 sisters living, 1 sister dead, cause of death, Rheumatism.

She is the mother of 5 children. Last child died at the age of 9 months, cause not stated. The children are all healthy and well developed, and have not shown any mental or physical defects, or any nervous disease. The birth act was not attended with any abnormal manifestations. Maternal Grandfather was an extreme alcoholic. The patient suffered from pneumonia preceding this attack. She had no delirium during the attack of pneumonia until the day of the crisis. Patient had a slight electrical shock, while out boating about 5 years ago, and said she was numb for about half a day, when she completely got over the effects of it. She has been of good character and disposition, steady and successful at her work, mild, and not impulsive. Never had any previous attack. Never used alcoholic stimulants, nor narcotic drugs. The patient had been in very good bodily health, and had not been ill, except for the few days following child-births.

On the 18th May 1907 she had an attack of pneumonia; there was no delirium until the crisis on May 26th. The symptoms then came on suddenly and were very violent. There was great excitement, restlessness, at times talkative, at other times morose and sullen, with a tendency to smash things, and some self accusation. The mental changes varied suddenly, the patient at times seeming quite sane. Had the delusion that her neighbors were going to kill her, that her husband was the devil, that there was poison in her food and refused to take it from

her husband. Protests that persons talking in ordinary voice are talking very loudly. Refuses food for some days. At times refuses to talk to any one, and again will sing for hours. Appreciates the fact that at periods she is not right in her mind. Tried to hit her husband with a chair when he attempted to prevent her going out of the house. On the 17th June, told her brother that if she were taken away from her mother she would kill herself.

She was admitted to Rockwood Hospital on the 19th June 1907. The Medical Certificates stated that she was absent-minded, restless, had become careless of appearance, indifferent and violent. Chewed her hair, sang, struggled to get out, refused food and medicine, talking and laughing a great deal; says she had bad dreams, and had heard voices, and at other times that she had a confession to make.

On admission patient weighed 130 lbs. She was sent to our reception ward, bathed, and put to bed. Was very excited and wrought up to high tension. Physical examination was made, and the respiratory and circulatory systems were found to be normal; urine contained no albumen nor sugar. Digestive system weak, indigestion at times. Tongue coated, breath foul, temperature normal, pulse 86, full high tension, blood pressure 135, haemoglobin 70%, red blood corpuscles 4,100,000, reflexes normal. She took her supper, after considerable coaxing, and was quiet until about 9 o'clock, when she became very noisy, scolding at some imaginary person. Has auditory and visual hallucinations. When interviewed, said she was scolding at the persons who were talking to her, and when asked who they were, said "Don't you hear them? They are talking to me now." On further questioning, stated that her friends wished to kill her. Was given a hot wet pack, and became some quieter about midnight.

On the 21st June was very depressed all morning, until about 2 o'clock, when she became very excited,

whistling, singing and dancing, difficult to keep in bed. She was then put in the vapour bath for 30 minutes, after which became somewhat quieter. In the evening was very irritable, scolding and threatening the night nurses, when they went near her. Very resistive about taking nourishment and has to be forced.

June 22nd. Very excited and resistive. Refused to give her tray, knife and spoon up after her dinner, saying "she could make use of them," but refused to state what use she intended to make. She struck at the nurse and tried to put her out of the room. Noisy at intervals all day, her conversation being a tirade of abuse against imaginary enemies. Was given two wet packs, which had a quieting effect on her.

June 23rd. She was quiet, rested well and slept in the afternoon, but during the evening became noisy, singing and whistling and disturbing the whole ward. She was given 30 grains of trional, and was quiet all night.

June 24th. Quiet and well behaved all day, did a little sewing in the ward.

June 25th and 26th. She was quiet all day, but restless, singing and noisy part of the night. Is getting regularly 2 hot air baths a day, which she thoroughly enjoys. Is now eating much better and commencing to improve. She was given a tonic of Iron and Strychnine t. i. d. Is given a course of massage once a day.

June 27th. Quiet and occupied all day and talks quite rationally on a good many subjects; still thinks, however, that her friends were trying to injure her. Says she is not afraid to take the food here, because she knows that it is not tampered with. Says she does not hear the voices except occasionally during the night, and that she sings, whistles and shouts to try and drown these voices.

June 30th. Quite cheerful to-day. Talking freely and rationally on a number of subjects. Her appetite has improved very much. She goes out walking every day for a short time. Taking more interest in her surroundings.

July 4th. For the past few days has been very quiet, and employed in some occupation during the day. During the nights, however, she spends a couple of hours whistling and singing.

July 8th. Discontinued the hot air baths, and massage. Patient is improving very rapidly, and says she does not hear the voices so much, and that her head is feeling clearer, that she is not so confused and muddled as she was. Says that the pain in the top of her head has gone.

July 16th. She was quiet last night for the first time since her admission, and slept fairly well all night.

July 17th. Was feeling a little more depressed, so the hot air baths were commenced again.

July 20th. She still seems somewhat depressed; and gives as a reason for her depression that she is home sick.

July 23rd. Was somewhat fretful to-day.

July 27th. Has been quiet and cheerful for the last day or two; the hot packs were ordered to be stopped to-day. She has gained 5 lbs. in weight, and is of great assistance to the nurses in looking after the helpless patients.

Aug. 2nd. Continued to improve, and was to-day allowed home on probation.

Sept. 1st. Reports received from her friends show that she has continued to improve and is keeping in good health both physically and mentally.

CASE No. 2.

D.—Age 43. Married. Canadian. Fair education. Active and energetic. Runs a prosperous manufacturing enterprise. Never had any serious illness, but he has been at times a heavy drinker for years. The present attack was attributed to Neurasthenia and overwork. This is the first attack; it came on gradually and has lasted two weeks, during part of which time he has been under treatment in a general hospital. At first he suffered from sleep-

lessness and became very nervous, then delirious night and day, talked loudly, rambling in speech and not finishing a sentence before he would leave the subject and speak of something else.

On admission to Rockwood. 7th September, 1906, he was very thin, weighing only 120 lbs., was unable to stand alone; he was very restless, incoherent in speech, and it was difficult to understand what he said. In fact his condition amounted to one of muttering delirium, with subsultus. He had incontinence of urine and fæces, and there was every indication of early dissolution.

He refused food and had to be fed by force. He had been at times so restless and such a disturbing element in the General Hospital that he was considered quite unmanageable, and his presence there greatly objected to. The deep reflexes were much exaggerated, sense of pain much reduced over the entire surface of the body. The urine showed nothing abnormal in its constituents, rather high coloured Sp. Gr. 1.30.

8th Sept. Was given high enema of normal saline, and a warm bath of an hour's duration, with ice applied to the head and forced feeding of liquid nourishment. He was very resistive to all attention, and was repeatedly in a filthy condition, showing no control over evacuations. The bath was repeated later in the day, and extended somewhat longer, with the result that he became quiet and slept for four hours.

9th Sept. Very restless and resistive, often trying to get out of bed. Bath at 99° to 100° F., continued for about 4 hours. Given milk and eggs liberally and high enema of normal saline.

10th Sept. He was talkative and restless most of the night, did not appear to sleep more than about 2 hours. He receives daily saline enema and the continuous bath. His pronunciation of words is perceptibly more distinct.

11th Sept. He was very restless for a time last night, but slept 6 hours. He has been put on Tr. Cinchona, Liq. Strych.

12th Sept. Slept very little and is quite restless.

13th Sept. Slept 6 hours. Feeding continued at frequent intervals, liberal quantities of milk, eggs and other nutritious diet being given.

14th Sept. General condition somewhat improved. Speech much more distinct, and occasionally he answers a question in a relevant way. Slept 6 hours.

15th Sept. Slept nearly all night.

18th Sept. Slept well. Was much brighter mentally, speech quite distinct. Could converse in a connected way, and showed improvement in memory.

19th Sept. The saline enema discontinued. Was dressed for a short time to-day. He sat about the ward and entered into conversation quite readily. He is still somewhat agitated and his manner is nervous.

24th Sept. The baths were discontinued. He went out for a short walk to-day. Eating and sleeping well. Talked quite rationally. He was of rather nervous manner, but discussed his mental condition with much appreciation and realized quite well his relation to environment, and the necessity for his being at Rockwood. He is making plans for future action and getting quite back to his normal interests.

27th Sept. He went home to-day, though physically he was not very strong.

He continued to improve and in a very short time resumed active business relations, which he still continues at the time of this writing.

This case was distinctly of toxic origin. The condition became constantly more profound up to the time of admission, but was one peculiarly suited to treatment by the continuous baths, and although they were not given in such long-continued periods as is often the case, it is interesting to note the rapid and complete recovery under this process of elimination, with liberal, nutritious diet.

It is worthy of remark also that only on one or two occasions was anything of a hypnotic nature administered, the bath very soon asserting its efficiency in this respect.

CASE NO. 3.

J. G.—Admitted 12th June, 1907. Age 49. Farmer. Married. Common School Education. Of temperate habits. Quiet manner. Cheerful disposition. About two weeks before admission, his brother, who is known as a very jealous-minded man, attempted suicide by cutting his throat.

Previous to this event the patient was in his usual health in every way, attending to his business, sleeping well, and in no particular showing any tendency to nervous weakness or mental aberration. He was greatly affected by the action of his brother, but went to bed as usual that night. During the night he became restless and appeared to be in fear; he began to think that people were after him and refused to be left alone in a room. The least noise excited him, and this has continued with slight remissions. He has talked of suicide and tried to get to a pond to drown himself, and wanted his friends to upset a lamp to burn them all up, or to let him do it. He thought he was being poisoned with carbolic acid, and accused those about him of injuring him. Said his family, as well as himself, were about to die, and at times talked volubly and incoherently and became quite sleepless.

At the time of his admission he was quiet, sat and talked about himself, though with some restraint, and evidently had some appreciation of the fact that he was not right. His face had a careworn and anxious expression, and as he talked he would become somewhat agitated. Pointing to his head he remarked, "There is something there that is a mystery to me, something blank there," and again, with more show of feeling, "It is a terrible thing that has happened; it will never be revealed unless I reveal it, and I can't." This apparently referring

to his brother's attempted suicide. Another time he sat swaying backwards and forwards with his arm outstretched towards the floor, and when asked why, he said, "Just to put it out this way." The second day of his residence he was asked how long he had been here and said "Quite a while. About six months."

Being of suicidal tendency he was placed in a dormitory for special observation. During the night he became very excited and violent, shouting, grabbing hold of things within reach, and tearing the bedding, as well as the clothes of the attendants in charge. On account of the extreme degree of motor excitement present, his condition at times amounting to frenzy, he was placed in a hot pack, which had a very salutary effect, and at night he was given sulphonal.

15th June. He slept some last night and rested much more quietly. The packs are continued about two hours and repeated. He remains in bed more willingly, but still mutters a good deal to himself. Talks of having been ill-used and passing through hard times. These remarks are made referring to a distant town, where he appears to think he now is, there being evidently very poor orientation. He will repeat over and over, with much show of agitation, "It was a terrible thing that happened, a terrible thing, terrible thing, and it can't be helped" and similar expressions, evidence of a feeling of utter helplessness and hopelessness.

16th June. He talked a good deal during the night, but slept about 6 hours.

17th June. Remains in bed willingly, is much quieter, speaks more connectedly, still very depressed and makes references to "the terrible thing that happened."

19th June. Quiet, slept well all night.

24th June. Speaks rationally, though somewhat depressed, both physically and mentally. He was up and dressed to-day, and is well conducted, showing also some appreciation of his own condition, location, and

the necessity there has been for his control and special treatment, but he is not inclined to talk much about himself, except when questioned. He is sleeping well every night, and the packs will now be discontinued.

13th July. A swelling in the nose, interfering with respiration was found to be an abscess of the septum, resulting from an injury due to a fall during one of his out-bursts of excitement. This was evacuated and treated antiseptically. This is, of course, entirely inter-current, but it is worthy of mention, owing to the rarity of the occurrence of abscess of the septum.

16th July. He is now composed, rational, and appears to be on the highway to recovery.

1st Aug. Has continued to improve in his physical health and is apparently in his normal mental condition. While he is of a nervous type and would not be spoken of as a strong-minded person, he would class well as a good citizen, and like many others is able to meet all the ordinary demands of life, but under the unusual and undue strain of what appeals to him as calamity he breaks down, and loses self-control entirely. Patients of this class we occasionally have, but it is very unusual to find the history of so definite an origin, in a fixed event, at an exact date; this case, in fact, having apparently its origin in the shock received from the attempted suicide of his brother.

During the first few days sulphonal was used, at one time, Grs. 45, in conjunction with packs, but aside from this, and general tonic and supporting treatment, with extra feeding throughout, the packs were relied upon with great satisfaction.

CASE No. 4.

M.A.M..—Age 33. Female. Married. Occupation, Housewife. Born in Canada. Roman Catholic. Poor education. Active and industrious. Is the mother of 5 children. The age of the youngest is 3 months. Was

married at the age of 22. Her father and mother are both living ; of Irish parentage, both over 70 years of age. There was no degree of relationship between parents. Has 3 sisters and 6 brothers living and 1 brother dead, he being drowned 6 years ago. Had a brother insane, a patient in this Hospital for a few months ; he made a good recovery.

The patient had a previous attack, and was a patient in this Hospital in 1901.

Since her last child was born she has nursed him and has been working very hard, sitting up till 11 and 12 o'clock at night, sewing and slaving for her children.

One week before her admission she suddenly went insane, imagining that people were going to injure her. Became very restless. Her conversation was irrational and incoherent, at other times she would refuse to talk, running out of the house in her night-dress, and visiting her neighbors. She threatened to destroy herself, and attempted to throw her baby out of the window. Has delusions that people are pursuing her.

She was admitted to Rockwood Hospital on the 27th May, 1907. Seemed rather depressed upon admission, although at times she would talk quite rationally, but without any warning would become very excited. She had been nursing her child until the morning of her admission, and her breasts were very hard and painful. Was given a warm bath and put to bed. She was very restless, did not sleep well, sitting up in bed most of the night, asking to see her children ; very resistive, refusing to take a hypnotic or nourishment.

May 28th. She was carefully examined to-day, nothing abnormal was found in any of the systems, except a slight laceration of the cervix uteri. She had slight bruises on her arms and a varicose condition of the veins of the legs.

May 29th. Very resistive and restless on the ward to-day, says she is frightened, and thinks every one is afraid

of her. Can talk very rationally on a good many subjects and can orientate very well. Her grasp is very good. She recognizes where she is and states that this is the same ward that she was on six years ago. She recognizes some of the patients that were on the ward when she was here before. Would not keep bandages on her breast. She was given two hot air baths in the cabinet yesterday, was very noisy and violent, pounding the floor with her bed and knocking the plaster off the walls. Worked herself up into a perfect frenzy, destroying her clothing; would not keep anything on her at all. Impossible to keep her in bed, she was given a hypo. $\frac{1}{100}$ of a grain of Hyoscin, and was quiet the rest of the night. She was very resistive all day about taking nourishment. At 11.30 became quite frenzied again suddenly, and before she could be prevented smashed seven panes of glass in the window. Was very resistive, attacking the nurses and myself whenever we went near her. She was given a hypo. of Hyoscin, $\frac{1}{100}$ of a grain, and taken to the continuous baths. Was very quiet the first afternoon in the baths.

May 30th. Slept about 3 hours before midnight, then commenced pounding her bed on the floor and singing. Was noisy until about 2 o'clock, when she quieted down and remained quiet until the morning. Was kept in the continuous baths about $6\frac{1}{2}$ hours to-day, but was very resistive, and made frequent attempts to drown herself by getting her head under water.

May 31st. Was kept in the continuous baths all day. She was quiet and slept for about 5 hours last night until 3 a.m., when she became restless and noisy, singing loudly the rest of the night. She was very resistive about taking food and had to be forcibly fed.

June 1st. Was not put in the continuous baths to-day, as she is menstruating,—this is the first menstruation since her admission. She was restless, noisy, and did not sleep much during the night. When the night

nurses were making their rounds, at 8 o'clock, she attacked one of the nurses, and was with great difficulty prevented from choking her to death, tore up her mattress, and was very destructive during the night. With considerable coaxing she was prevailed upon to take some hot milk.

June 3rd. Was very resistive to-day in the continuous baths, and tried several times to drown herself; grabbed the nurse by the throat and tried to choke her, only was prevented by the intervention of other nurses. Was very restless during the night, singing and pounding, slept for about 2 hours. It is very difficult to get her to talk. Was very restless in the bath to day, refusing to take food, saying it was poisoned. She was fed by tube three times to-day.

June 8th. She is now very quiet in the baths, and was quiet all last night, but sleepless, and destroyed her mattress.

June 9th. Slept soundly nearly all night.

June 10th. Was very well-behaved in the bath to-day; very talkative, and in the evening brightened up very much, asking about her home and all her relatives. Does not remember anything that has happened to her during the last few days.

June 11th. Was very good. Kept in the bath $3\frac{1}{2}$ hours. Was taken out to the Band Concert, and afterwards kept on the corridor, where she was very well-behaved. Was quiet nearly all night, singing for a short time only.

June 13th. The continuous baths were discontinued to-day. She is given massage. She is resting much better at night.

June 15th. She is continuing to improve, and has gained 3lbs. in weight. She is out walking every day, and is taking more interest in her surroundings, and can talk quite rationally about her family and home life.

July 7th. Continues steadily to improve. Eating and sleeping well. Taking an active interest in the ward work.

Aug. 1st. There was nothing eventful during the last three weeks, except that she made steady progress towards recovery. She was allowed to go on probation with her friends to day. She was bright, cheerful, and had gained 7lbs. during her residence here.

Sept. 1st. Reports from her friends show that she is still continuing in good health and spirits.

LUMBAR PUNCTURE.

Of late the diagnostic value of an examination of the cerebro-spinal fluid in certain mental states, particularly general paralysis, has been much discussed. All investigators are agreed that a lymphocytosis is invariably present in general paralysis, but there are still many points at issue. We have just begun a series of lumbar punctures in those cases of general paralysis which are on the wards of Rockwood Hospital.

Only four punctures have been made at the time of writing; of course we can draw no conclusion from such a number. Our investigations have been directed towards the presence in the cerebro-spinal fluid of a lymphocytosis, and an increased albumen content, as well as the bacterial content. We found the cerebro-spinal fluid sterile in every case. In two of the cases examined, we found a lymphocytosis present, while in the other two cases an examination showed absence of leucocytes of any kind. After removal of the serum-globulin, by precipitation with a saturated solution of ammonium sulphate and filtering, serum-albumin was easily demonstrated in every case in increased amount.

While this cannot at all be considered in the nature of a report, inasmuch as the number of punctures was only four, and the centrifuge method was used in estimating the lymphocytosis, still our findings, so far, agree with a recent report by Kraepelin, that it is not unusual to obtain a negative result in cases clinically general paralysis, whose cerebro-spinal fluid has been examined for lymphocytosis, and that a negative result is not significant unless present for two or more punctures made at intervals of not less than ten days or two weeks. It is our intention to repeat the punctures in those cases in which a negative result has been obtained.

AUTOPSIES AT ROCKWOOD HOSPITAL

Through the courtesy of Dr. C. K. Clarke, then Superintendent of Rockwood Hospital, I was (following my appointment to the Chair of Pathology in the Medical Faculty, Queen's University) permitted to make the post-mortem examinations of those cases, dying in the Institution, in which permission could be obtained for such an examination. This courtesy was continued by the present Superintendent, Dr. Ryan, who has so interested himself in this line of work as to recently secure my official appointment as Pathologist to the Institution. For the first few years, not being specially interested in Neuro-pathology, my attention was more particularly directed to the general morbid changes, and these were more specially studied. In all cases, however, where distinct gross changes were found in the nervous system, a microscopic investigation was made, or the material has been preserved for such an examination. In future, while continuing the investigation of the general morbid changes, more particular attention will be paid to the examination of the nervous system.

In the following report a summary of the work so far performed, in which a fairly complete investigation (gross and microscopic) has been undertaken, will be given. The series is a comparatively small one, especially for statistical purposes, and no attempt will be made to draw any particular conclusions therefrom. It will be noted that the great majority of mental cases present a well-defined cause of death, residing outside the nervous system. Of course many of these partake of the nature of terminal infections, which are markedly predisposed to by the mental condition. Then too, as in all Institutional life, a marked cause of death is tuberculosis, especially of the lungs. Cardio-vascular disorders too are very common, as might be expected in a population of which all have

reached adult life, and the majority are over 40 years. Then, too, the toxic bodies, which are undoubtedly highly important etiological factors in the causation of many cases of insanity, act also upon the circulatory system leading to sclerotic and degenerative lesions.

The series of autopsies here recorded consists of 78 cases, but these are not all complete examinations, as, in some instances a partial autopsy only was permitted. The distribution of these examinations in point of time, and comparison with the total number of deaths in the Institution, will be found in Table I. It will be noted that autopsies have been performed in about 20% of the deaths.

TABLE I.

YEAR.	DEATHS.			AUTOPSIES.		
	Male	Female	Total	Male	Female	Total
Oct. 1, '96—Sep. 30, '97	24	18	42	2	1	3
“ 1, '97— “ 30, '98	16	18	34	5	0	5
“ 1, '98— “ 30, '99	22	10	32	4	2	6
“ 1, '99— “ 30, '00	17	21	38	2	3	5
“ 1, '00— “ 30, '01	24	20	44	3	2	5
“ 1, '01— “ 30, '02	17	30	47	4	5	9
“ 1, '02— “ 30, '03	26	13	39	7	3	10
“ 1, '03— “ 30, '04	18	12	30	2	2	4
“ 1, '04— “ 30, '05	17	17	34	6	2	8
“ 1, '05—Dec. 31, '06	20	22	42	9	6	15
Jan. 1, '07—June 30, '07	19	16	35	5	3	8
	220	197	417	49	29	78

Below will be found a grouping of the autopsy cases under the different clinical types of mental disorder :—

A. Mania.

Subacute	2
Recurrent	2

Delusional.....	1
Chronic.....	18
Typical.....	5
Epileptic.....	2
Total.....	30
B. Melancholia.	
Simple	7
Chronic.....	2
Stuporous	1
Total.....	10
C. Paranoia.....	1 1
D. General Paresis.....	4 4
E. Dementia (including senile forms)..	25
Epileptic.....	4
Total	29
F. Idiocy.....	2 2
G. Imbecility	2 2
	78

The ages of those examined varied from 25 to 89 years, there being only 4 of thirty or under and 19 under 40 years, while a similar number were 71 or over. Of the 19 who were 40 years or under, 9 died of tuberculosis, while 3 out of the four cases of paresis were under this age. A grouping of the series according to age is found in Table 2.

TABLE II. AGE GROUPING.

25-30	31-40	41-50	51-60	61-70	71-80	81-90
4	15	10	13	17	14	5

TUBERCULOSIS.

Out of the 417 deaths in the Institution during the period under consideration, 118 were due to tuberculosis or its immediate complications, a tubercular death rate of 28.3%. Of the cases examined, in 18 (Nos. 3, 6, 7, 8, 9, 10, 18, 25, 42, 46, 48, 49, 53, 56, 61, 69, 72 and 76) death was due to active tuberculosis, a tubercular autopsy rate of 23.1%. Locally active (but having no direct effect in causation of death), latent and healed tubercular lesions were found in 25 other cases of the series, making a total of 43 out of 78 with tubercular infection. No doubt the infection rate would have been greater had it included such conditions as scarring of apices of the lungs without pleural adhesions or bronchial gland involvement. Of the cases classified as showing healed tubercular lesions, in one (Case No. 23), the contraction of scar of a circular tubercular ulcer of bowel had led gradually to partial obstruction of lumen and perforation at edge of scar with fatal peritonitis. This same case is the only one of the series with a distinctive fibroid phthisis.

Of the 18 active cases, in all the lungs were extensively involved and in the great majority lesions were also found in trachea, larynx and intestine. In two of these cases an acute pleurisy with effusion was the terminal event. In three cases (not counting one mentioned above) perforation of a tubercular ulcer and acute peritonitis was the direct cause of death. In one case there was a general tuberculosis with stress falling on meninges and peritoneum. This case also presented numerous superficial tubercular abscesses of skin. In two other cases there was an acute endocarditis of mitral valve, non-tubercular in character. In another case, where death was sudden, there was found a ball thrombus (likely from left auricle) plugging the aorta at origin left carotid artery. The suprarenals were found involved in two cases, viz., in one of the active cases and in a case dying with cardiac dropsy (Case No. 44), in which there was a

marked bronzing of face, hands and abdomen, and in which a probable diagnosis of Addison's disease had been made. Case No. 34 presented an instance of the lighting up of an old tubercular abscess in the psoas muscle by a secondary infection by a bacterium giving many of the characters of *Bacillus coli communis*. In this case there was an enteritis with follicular ulcers and the colon like bacillus was also isolated from the spleen. Another case (No. 40) presented suppurating tubercular cervical glands, along with an acute enteritis and acute mitral endocarditis.

SEPTIC INFECTIONS.

Most of the septic infections were consecutive to bed sores and were purely terminal events. The majority of these presented themselves as acute endocarditis, there being four cases coming under this heading, viz., Nos. 57, 73, 74 and 75; two of these being in cases of paresis. In one case (No. 35) bed sores were followed by formation of a septic thrombus in right ventricle with multiple pyaemic infarcts of lung and miliary abscesses of the kidney, a typical pyaemia. In another case (No. 53) with enlarged prostate there was a septic cystitis and pyelo-nephritis with an embolic abscess in frontal lobe of brain.

CARDIO-VASCULAR AFFECTIONS.

Acute Endocarditis. Of the acute lesions of the cardio vascular organs this was the only type found, there being in all 7 cases. Two of these were in tubercular subjects (Nos. 3 and 25), while a third was in case No. 40 with enteritis and tubercular cervical glands and abscesses, while the balance were the cases mentioned in previous section, where the infection originated from bed-sores. In all cases the mitral valve was involved and in only one case (No. 73) did sufficient time elapse for the development of a secondary lesion, viz., pyaemic infarct of kidney.

Chronic Valvular Lesions. Apart from occasional slight nodular thickening of one or more cusps of the tri-

cuspid valve or dilatation of the tricuspid valve ring there were no lesions of the valves of the right side of the heart. On the left side, however, sclerotic and degenerative changes were common, especially in the mitral cusps. Of the more extensive grades of involvement, sufficient to certainly lead to stenosis or incompetence or both, eight cases (Nos. 2, 19, 29, 33, 40, 44, 45, 47,) were noted. Of these, two were examples of mitral stenosis, three of mitral incompetence, while other three were incompetent aortic valves with some grade of stenosis, as all were due to fusion of two valve cusps. The largest heart of series was from an aortic incompetent case (No. 47) and weighed 32 ozs. (empty).

Of these cases of valvular lesion the three cases of mitral regurgitation all died from "failure of compensation" while three others were sudden deaths, two of these being aortic incompetent cases, while the third case (No. 45) was a case of mitral stenosis, with death due to embolism of right pulmonary artery. Of the two remaining cases, in one the heart lesion (mitral stenosis) had no connection with death, while in the other, though there was some back telling and slight oedema, the terminal event was an acute pleurisy.

Adherent Pericardium. This condition was noted in three cases, viz., Nos. 3, 40 and 68, but in case No. 40 the adhesions were thin, while in other two cases there was firm adhesion. The heart in all three cases was hypertrophied and chambers dilated, but in none was there any evidence of serious interference with the heart's action.

Aneurysms. Fusiform dilatation of the arch of the aorta was noted in four cases (Nos. 5, 52, 55, 59), and was accompanied by tendency to aneurysm formation elsewhere. These four cases were all of considerable interest. In case No. 5 the dilatation of aorta had stretched the aortic valve ring, rendering the valve incompetent, causing marked hypertrophy of left ventricle and "back-telling" through heart (weight 24 ozs. when empty), with oedema

and dropsy, but an acute pleurisy hastened the end in this case. In case No. 52 death was due to cerebral hæmorrhage, with the usual miliary aneurysms on basal ganglionic arteries. In case No. 55 all arteries at root of neck were dilated, and death resulted from rupture of a small saculated aneurysm of left inferior thyroid artery, there being an extensive hæmorrhage into tissues of neck and the mediastinal spaces. In No. 59 the dilated aorta ruptured into the pericardial sac. In the last three cases death was sudden. Case No. 22 while showing no aneurysmal dilatation of larger arteries, showed numerous miliary aneurysms of the smaller cerebral vessels, with rupture of several, and death from cerebral hæmorrhage. All of these cases were accompanied by considerable hypertrophy of heart, especially of left ventricle, the smallest heart of the series weighing 14 ozs.

Myocardial lesions. While a slight grade of fibrous myocarditis was noted in a number of cases, in none was the condition well developed. Brown atrophy of the heart muscle was met with frequently in the older subjects. Marked examples were found in cases No. 51, 54, 64, 66, 72 and 77. General fatty degeneration of heart was noted twice. In a case of pernicious anaemia (No. 30) it was very marked, and accompanied by a similar degeneration of liver, kidneys and stomach mucosa, with iron deposit in liver, spleen and kidneys and changes in the bone marrow. It was also found in case No. 71, a grave anæmia, not presenting the other post-mortem characters of pernicious anaemia.

AFFECTIONS OF RESPIRATORY ORGANS.

Only one case of acute lobar pneumonia was noted, viz., case No. 41. This condition was accompanied by an acute pleurisy with effusion on the opposite side.

Acute Broncho-pneumonia, as an extension of acute bronchitis, was noted twice (Nos. 13 and 20) while broncho-pneumonia of hypostatic character, but varying in degree,

were met with in 10 other cases of the series. To these should be added a suppurative broncho-pneumonia, developing in a case of acute dysentery (No. 11), and an inhalation pneumonia developing in epitheliomatous stricture of œsophagus (No. 24) and a septic pneumonia as part and parcel of a general pyaemia in case No. 35.

Oedematous Laryngitis, Tracheitis and Bronchitis were noted in two cases (No. 15 and 67) of impaction of foreign bodies at the pharyngo-œsophageal junction, with death from gradual suffocation.

Acute Fibrinous Pleurisy, (involving the pleura over at least one lobe of a lung) was met with four times. In case No. 70, it was the cause of death, while in the other three cases it accompanied inflammation of underlying lung structure.

Acute Pleurisy with effusion was met with in seven cases. In three of these (Nos. 19, 38 and 39) it was the primary cause of death, while in case No. 41 there was an acute pleurisy with effusion on the right side and an acute lobar pneumonia on the left. In three cases the pleuritis was terminal, viz., in case No. 48 and 56 (tuberculosis), and in case No. 5 with "failure of compensation."

Purulent Pleuritis, as a generalized process was noted in a case of pyaemia (No. 35) while as a localized empyema sac, it was found in several of the tuberculosis cases, and in case No. 24 along with suppurative broncho-pneumonia.

Adhesions of the pleura of various extent are found in over 80% of autopsies on adults. No attempt has been made in the Anatomical summary to include all such adhesions recorded in the protocols, but this percentage holds in this series.

PERITONITIS.

Five cases of acute peritonitis were noted, four of these being due to perforation of an ulcer of the bowel, three being tubercular ulcers (Nos. 7, 49, 53) and the

fourth (No. 23) being a suppurative ulcer at the edge of a tubercular scar. The fifth case was a suppurative peritonitis, following operation for gall stones (No. 12), and here the process was limited by adhesions to the parts above the umbilicus.

INTESTINAL AFFECTIONS.

The affections of the intestinal tract, apart from tubercular involvement, were few in number. There is only one case of typhoid fever (No. 31) dying in the third week, and presenting the usual intestinal and general lesions. Death in this case was determined by an acute hæmorrhagic broncho pneumonia and hæmorrhage into the pleura. Case No. 34 had been clinically diagnosed as typhoid fever, and at the autopsy superficial follicular ulcers of the ileum were found, but these showed no typhoid characters nor were the other general lesions of the fever present. This case showed, however, a lighting up of an old psoas abscess, and from the spleen and the pus of the abscess a colon like bacillus was isolated. This was probably a paracolon infection. There was also one case (No. 11) of acute necrotic dysentery, showing as well a terminal suppurative broncho pneumonia. In case No. 66 there was a catarrhal enteritis involving all the small bowel, together with marked superficial ulceration of the colon, especially of the rectum and sigmoid flexure. This was probably a suppurative (ulcerative) dysentery, but no bacteriological examination was made, as too long a period had elapsed before autopsy was made to secure satisfactory results from such an examination.

GALL STONES.

Gall stones were found in fifteen cases, either in the gall bladder, cystic or common ducts, but in only two cases had their presence produced serious effects, viz., in cases No. 12 and 65, while in case 16 a dropsy of the gall bladder was brought about by plugging of the cystic

duct. In case No. 12 there was marked jaundice, due to a stone in the common duct, the gall bladder being packed full of calculi ; death in this case followed operation. In case No. 65 the ducts were all dilated back into the liver owing to a calculus in the common duct, but the gall bladder was contracted on a small calculus. There was marked jaundice but the subject also presented a marked nodular (syphilitic) cirrhosis of the liver with ascites. The stone in the duct permitted the passage at times of bile into the bowel. The calculi in thirteen cases were composed largely of cholesterin, while in two cases bile salts with a little calcic carbonate made up the bulk of the stones.

It might be well to note that no instance of renal or vesical calculus occurred in the series.

MALIGNANT TUMORS.

There were five cases of death from malignant tumors, four from carcinoma and one from sarcoma. Of the carcinoma cases, one (No. 24) was an epithelioma of the upper end of the œsophagus, one (No. 50) a rodent carcinoma (ulcer) of face and jaw, and two (Nos. 28 and 60) were scirrhous growths in the stomach with secondary involvement of the liver. The sarcoma was a recurrent adeno-sarcoma of the breast and had reached a large size before death. This case also presented peculiar ossified ecchondroses of the lower end of the trachea and left bronchus.

FOREIGN BODIES.

Contrary to expectation very few foreign bodies were noted, none at all being found in the stomach. In two cases death followed the lodgment of foreign bodies in the œsophagus opposite the cricoid cartilage (Nos. 15 and 67). In case No. 65 a pin and piece (2 inches long) of wooden skewer were found in the duodenal wall and head of the pancreas, and another pin in the peritoneal covering of the anterior wall of the uterus. Case No. 76

(a tubercular subject), however, presented a very curious condition; the appendix was enlarged to 1 inch in diameter for the last inch and a half, and in its lumen were found 48 common pins, all considerably rusted, and the heads all pointing towards the tip of the appendix, also three small pebbles and a triangular piece of glass, the whole being set in a mass of mucus impregnated with calcareous salts.

CASES OF SUDDEN DEATH AND "FOUND DEAD."

Ten of the deaths were sudden or subjects were found dead. Of the causes of sudden death the great majority were due to lesions of the heart or blood vessels. Thus two cases with aortic incompetence were found dead (Nos. 33 and 47). In one case of tuberculosis (No. 18) death was sudden and was due to dislodgment of a ball thrombus from the left auricle and its lodgment in the aorta at the left carotid orifice, thus shutting off blood to the left side of the head, and to all parts of the body below the occlusion. Embolism of the right pulmonary artery was the cause of the sudden death in case No. 45. Case No. 52 with general arterio-sclerosis and its accompaniments, was found dead in bed from cerebral hæmorrhage. In case No. 55 death was rapid and was due to hæmorrhage from rupture of aneurysm of inferior thyroid artery, while in Case No. 59, where death was sudden, rupture of the aorta into pericardial sac was the terminal event. Case Nos. 43 and 64 were examples of subjects up in years (76 and 66 years respectively) found dead in bed. In both these cases the heart muscle was flabby, chambers dilated and microscopically there was segmentation of the muscle fibres with brown atrophy in case No. 64. These are cases in which the term myomalacia cordis sums up the cause of death. In case No. 21 the patient, while eating bread and milk, suddenly fell dead and death was due to syncope following entrance of food into air passages. In case No. 37, an epileptic subject, death was caused by

suffocation during a fit, the patient's head being buried in his pillow, and the body presenting the typical appearances of death through the lungs.

SUMMARY OF ANATOMICAL FINDINGS.

1. *M. E. T.*—Female. Aged 50. May 18th, 1897. Chronic mania with chorea major. Pachymeningitis hæmorrhagica interna $\frac{1}{8}$ inch thick; milkiness of the arachnoid with increase of cerebro-spinal fluid; adhesion of pia mater to the cerebral substance; ventricles somewhat dilated; sulci wide and shallow (these features apart from the hæmorrhagic pachymeningitis are practically those found to a greater or lesser extent in all cases of chronic insanity, and also in many old people and in chronic alcoholic subjects). Moderate grade sclerotic endocarditis of the mitral valve; moderate grade of general arteriosclerosis, most marked in the aorta and basal cerebral vessels; slight grade of arterio-sclerotic kidney.

2. *J. W.*—Male. 64 years. May 25, 1897. Chronic mania. General œdema and dropsy; hypertrophied and dilated heart weighing $19\frac{1}{2}$ oz. (free from blood and clot). Thickening and retraction of the mitral cusps leading to considerable incompetence; some sclerotic and calcareous changes in aortic valve cusps; advanced general arteriosclerosis; œdema of the lungs, "nutmeg" liver, venous congestion of the kidneys with some grade of interstitial change and scars of infarcts; small hæmorrhagic infarct of the lung.

3. *H. S.*—Male. 45 years. September 23rd, 1897. Paranoia. No gross changes in the brain membranes or brain substance. Caseating tubercular broncho-pneumonia of the entire right lung, and upper lobe of the left lung, with small recent cavities; patchy caseous nodules in the lower lobe of the left lung; caseating bronchial and mesenteric glands; caseating and ulcerating tuberculosis of the solitary follicles and Peyer's patches of the ileum.

Complete adherent pericardium with hypertrophied and dilated heart (16 oz.) Acute endocarditis of mitral valve.

4. *J. C.*—Male. 70 years, October 14th, 1887. Dementia. Dura mater adherent to the skull cap; milky arachnoid; adherent pia mater; excess of cerebro-spinal fluid; dilated ventricles; brain substance of a slight brownish tint. Sebaceous cyst over right temporal region; small bed sore; calcareous bronchial gland; small fibroma in the muscular coat of the stomach; moderate grade of arterio-sclerosis; moderate grade of interstitial nephritis with small multiple cysts; death largely from senile decay.

5. *C. J.*—Male. 59 years. Feb. 24th, 1898. Melancholia. Brain and membranes showed usual lesions of chronic insane. Advanced diffuse arterio-sclerosis of aorta with fusiform dilatation of arch and thoracic aorta; dilatation of aortic valve ring; extensive hypertrophy and dilatation of the heart (24 oz. free of blood), with "back telling" through the heart; general cedema and dropsy; acute pleuritis with effusion on right side; venous congestion of the liver, spleen, kidneys and a small infarct in process of organization in the right kidney; moderate grade of interstitial pancreatitis; phimosis; puckered scars at the apex of the right lung, with pleural adhesions.

6. *D. McG.*—Male. 48 years. March 10th, 1898. Chronic mania. Brain and membranes present usual evidences of chronic insanity in a marked degree. Extensive tuberculosis in both lungs; right, showing caseous pneumonia and early cavitation in upper lobe with patchy caseous broncho-pneumonic nodules in middle and lower lobes. Left lung shows caseous pneumonia throughout, but lower lobe shows many softened areas, and also a walnut-sized abscess in the thickened pleura. Soft fibroma of left axilla. Small diverticulum of the oesophagus opposite the tracheal bifurcation.

7. *N. I.*—Male. 54 years. Chronic melancholia. Brain and membranes present usual lesions of chronic insanity in moderate degree. The left lung is a mass of

caseous and caseo-fibrous nodules with a few recent cavities. The right lung presents patchy caseous bronchopneumonic nodules in upper lobe and scattered miliary tubercles (bronchial in distribution) in middle and lower lobes. Tubercular tracheitis and laryngitis (ulcerative). Extensive tubercular ulceration of the ileum. Perforation of tubercular ulcer. Acute purulent peritonitis. Slight interstitial nephritis with small multiple cysts. Moderate grade of arterio-sclerosis with hypertrophied left ventricle.

8. *G. McN.*—Male. 30 years. June 17th, 1898. Mania. Milky arachnoid with excess of cerebro-spinal fluid and some wasting of the brain substance. Extensive tuberculosis of both lungs; right being a mass of recent cavities with caseous intervening walls; left lung, upper lobe, is completely consolidated and caseous, while the lower lobe shows patchy caseous nodules. Caseous bronchial and mesenteric glands. Tubercular tracheitis and ulcerative laryngitis. Tubercular nodules and small ulcers of the ileum.

9. *R. W.*—Male. 25 years. October 16th, 1898. Melancholia. No gross lesions in brain or membranes. Extensive tuberculosis of both lungs. Right upper and middle lobes and the whole left lung show caseous pneumonia with areas of softening and early cavitation; right lower lobe shows scattered caseous nodules. Caseous bronchial and mesenteric glands. Tubercular tracheitis and ulcerative laryngitis. Tubercular nodules and small ulcers of the ileum, with marked muco-enteritis of this part of the bowel.

10. *S. S.*—Male. 30 years. October 29th, 1898. Melancholia. Numerous superficial tubercular abscesses; tubercular meningitis, (mostly basal); extensive tubercular peritonitis (acute miliary tuberculosis of the abdomen). Miliary tuberculosis of the kidneys. Upper lobes of both lungs show pea to bean sized caseating and softening tubercular nodules. Caseous bronchial and mesenteric glands.

11. *T.M.*—Male. 30 years. November 14th, 1898. Mania. Brain and membranes not examined. Acute necrotic dysentery, involving especially the caecum and ascending colon. Suppurative broncho-pneumonia completely consolidating the lower lobe of the right lung. Acute broncho-pneumonia of the right upper and middle lobes and of the left lung, with patchy consolidation. Dilatation of stomach.

12. *S. J. S.*—Female. 52 years. November 19th, 1898. Recurrent mania. Recent operation wound over gall bladder region. Deep jaundice. Suppurative peritonitis limited by omental adhesions to the parts above the umbilicus. Gall bladder dilated to twice the usual size. Cystic, hepatic and common ducts markedly dilated. Lodgment of cholesterolin calculus $\frac{3}{8}$ inch in diameter in the common duct just as the duct passes behind the duodenum. Puckered scars and apical adhesions in both lungs.

13. *T.O.T.*—Male. 70 years. January 20th, 1899. Dementia. Brain and membranes show usual features of chronic insanity. Acute bronchitis, bronchiolitis and broncho-pneumonia of both lungs. Old tubercular cavity at right apex. Slight nodular atheroma of aorta and basal cerebral vessels. Early interstitial nephritis with cysts; fibroid spleen.

14. *A. A.*—Female. 37 years. April 25th, 1899. General paresis. Fibrous thickening dura mater over convexity; marked milkiness of arachnoid, with great increase cerebro-spinal fluid and adhesion of pia mater; dilated ventricles; general wasting of the brain convolutions with substance firmer than usual; granulation of the lateral ventricles; (cord not examined). Slight sclerotic endocarditis of one cusp of the mitral; early atheroma of the aorta; fatty liver.

15. *J. W. McQ.*—Male. 30 years. October 23rd, 1899. Imbecility. Milky arachnoid; general atrophy of the

convolutions, the brain weighing only 3loz. ; ventricles dilated ; no adhesion of the pia mater to cortical substance. Lodgement of small cooked potato, $1\frac{1}{2} \times 1\frac{1}{4}$ inches, at the pharyngo-oesophageal junction, with necrosis of the mucous membrane compressed ; oedematous laryngitis ; oedema of the lungs, with frothy mucus in the bronchi ; dark fluid blood ; both lungs everywhere adherent by old fibrous adhesions, with apices showing caseo-calcareous nodules and puckered scars ; hæmatocele of the right tunica vaginalis.

16. *C. B.*—Female. 80 years. November 24th, 1899. Dementia. Markedly thickened skull-cap ($\frac{1}{4}$ inch thick in the temporal region, $\frac{5}{8}$ inch in frontal region, $\frac{3}{4}$ inch above the orbital ridge), with no diploe ; general wasting of the brain substance, with increased cerebro-spinal fluid and dilatation of the ventricles : marked emphysema of both lungs ; recent scattered miliary tubercles of the upper lobe of the left lung ; hypostatic pneumonia of the posterior half of the right lung, with a small focus of necrosis surrounding a bronchus (due to inhalation of a food particle) ; chronic bronchitis ; marked general arterio-sclerosis, with much calcareous change in the intima of the larger vessels, and the media of the small vessels ; gall stones ; blocking of the cystic duct by calculus ; hydrops of the gall bladder ; chronic hæmorrhagic pancreatitis ; arterio-sclerotic kidneys.

17. *M. A. W.*—Female. 42 years. January 13th, 1900. Epileptic mania. Thick skull-cap with trephine opening $1\frac{1}{2} \times \frac{1}{2}$ inch in the parietal bone over the upper end of the left motor region, filled in by membrane ; brain and membranes those of chronic insane. Superficial bed sores over both gluteal regions ; persistent thymus ; emphysema ; heart muscle flabby and pale ; gall stones ; healed infarct of spleen.

18. *T. F.*—Male. 36 years. February 14th, 1900. Dementia. Brain and membranes not examined. Extensive tuberculosis of both lungs, left upper lobe being

completely excavated, only blood vessels stretching along the walls of the cavity, a number showing small aneurysmal dilatations; lower lobe of this lung shows caseous pneumonia, right upper and middle lobes show patchy caseous broncho-pneumonia, while the lower lobe shows scattered miliary tubercles. A pale globular thrombus filled up the aorta at the left carotid orifice; ante-mortem thrombus in the right auricle and in the left auricular appendix.

19. *M. P.*—Female. 84 years. June 24th, 1900. Mania. Usual lesions in the brain and membranes of chronic insanity. Emphysema; acute pleurisy with effusion on the left side; old adhesions and scars at the right apex; fusion of two aortic valve cusps, with calcareous deposit; hypertrophy of the left ventricle, dilated right side of heart; advanced arterio-sclerosis of all the larger vessels; slight interstitial nephritis; adeno-myomatous polyp of the cervix.

20. *S. V.*—Male. 80 years. October 12th, 1900. Senile dementia. Marked lesions in the brain and membranes of chronic insanity. Emphysema; right acute bronchitis, broncho-pneumonia and fibrinous pleurisy; patchy atheroma of the aorta; hypertrophy and dilatation of the right side of the heart.

21. *L. R.*—Female. 41 years. October 15th, 1900. Epileptic dementia. Usual lesions in the brain and membranes of chronic insanity. Lower part of the trachea and both bronchi with their larger branches, especially on the right side, contain semi-solid food (bread and milk); punctate hæmorrhages on the right pleural surface; heart muscle pale and flabby and heart chambers empty.

22. *M. M.*—Male. 61 years. November 1st, 1900. Dementia. Seborrhœic eczema; adherent dura mater, and other lesions of chronic insanity; cerebral hæmorrhages, one in the hinder end of the first and second frontal convolutions of the left side, measuring $\frac{3}{4}$ inch,

and a larger one, $1\frac{1}{2}$ x 1 inch, in the region of the external capsule, tearing the outer portion of the lenticular nucleus; "pipe stem" basal cerebral vessels with miliary aneurysms on the basal ganglionic branches; hypertrophy of heart, especially of the left ventricle (weight 23 ozs.); moderate arterio-sclerosis of the larger vessels and arterio-sclerotic kidney.

23. *B. T.*—Male. 46 years. November 7th, 1900. Melancholia. Head not examined. Upper lobe of the left lung is fibroid with old dry cavities of small size and scattered calcareous patches, and is one-third of its natural size; right lung shows a few calcareous nodules. Acute purulent peritonitis due to perforation of the ileum three feet above the ileo-cæcal valve; large scar at this point encircling the bowel, and constricting the lumen with gradual obstruction and pressure ulceration at the edge of the scar.

24. *M. P.*—Female. 70 years. November 17th, 1900. Melancholia. Brain and membranes present the usual lesions of chronic insanity. Squamous celled carcinoma of the œsophagus opposite the cricoid cartilage obstructing the lumen; secondary nodules in the neighbouring lymphatic glands; acute purulent bronchitis, especially on the right side, with septic pneumonia of the lower lobe of the right lung, and an abscess cavity, holding $\frac{1}{2}$ ozs. of pus in the pleura, between this lobe and the pericardial sac; slight interstitial nephritis.

25. *M. C.*—Female. 36 years. November 29th, 1901. Dementia with chorea major. Usual brain and membrane lesions of chronic insanity; the upper end of the pre-central convolution was especially wasted; the left posterior cerebral artery was furnished by the internal carotid through the posterior communicating. Extensive tuberculosis in both lungs, right and upper lobe of left being a mass of old and recent cavities, with softening caseous intervening areas; left lower lobe shows

scattered miliary tubercles ; tubercular nodules and ulcers in the ileum and cæcum ; caseous bronchial and mesenteric glands ; acute mitral endocarditis.

26. *S. O.*—Female. 35 years. December 12th, 1901. Stuporous melancholia. Head not examined. Recurrent adeno-sarcoma of the left breast (5 x 6 x 3 inches). Small ossified ecchondroses in the lower end of the trachea and left bronchus. Hypostatic pneumonia. Gall stones. Slight interstitial nephritis.

27. *J. S.*—Female. 41 years. December 29th, 1901. Dementia. Patient had been totally blind for some time. Head only examined. Milky arachnoid. Excess of cerebro-spinal fluid, with general wasting of the brain substance. Red softening $\frac{1}{2} \times \frac{1}{4}$ inches in the hinder end of the superior parietal lobule near the parieto-occipital fissure. Yellow softening of the inner half of the under surface of the occipital and hinder portion of the temporo-sphenoidal lobe (practically the lingual lobule) and also the lower portion of the cuneate lobe ; softening extending $\frac{1}{2}$ inch into the cerebral substance. Yellow softening of the entire left cerebellar hemisphere. Blood vessels of brain elsewhere free from sclerotic changes ; vessels of softened areas atrophied and impervious.

28. *I. L.*—Male. 65 years. January 3rd, 1902. Chronic mania. Head not examined. Small button-like nodule of scirrhous carcinoma in the mucous membrane of the anterior wall of the stomach near the pyloric orifice. Liver full of metastatic nodules and weighs 8 lbs. General arterio-sclerosis and arterio-sclerotic kidneys.

29. *G. McC.*—Male. 35 years. January 5th, 1902. Mania. Head not examined. General œdema and dropsy. Sclerotic endocarditis with retraction of valve edges of mitral with incompetence. Hypertrophy and dilatation of the heart. "Back telling" with venous congestion of the lungs, kidneys and spleen.

30. *H. D.*—Female. 35 years. January 26th, 1902. Melancholia. Head not examined. Pernicious anæmia. General œdema and dropsy. Icteroid skin and fat. Fatty degeneration of heart, liver, kidneys and mucosa of the stomach and bowel. Iron deposit in the liver, spleen and kidneys. Bone marrow red, almost hæmorrhagic. Puckered scars at apex of left lung.

31. *D. McN.*—Male. 62 years. March 31st, 1902. Recurrent mania. Head not examined. Intestinal lesions of typhoid fever of the 3rd week. Enlarged spleen and mesenteric glands. Acute broncho-pneumonia of both lungs, in places of hæmorrhagic type, especially in the lower lobe of the left lung, which was completely consolidated, largely with red blood cells; hæmorrhage into the pleura, which contained 12 oz. of blood. Cloudy swelling of the liver and kidneys.

32. *R. L.*—Male. 46 years. July 3rd, 1902. Epileptic mania. Thickened skull cap, adherent firmly to the dura mater; brain and membranes present the usual lesions of chronic insanity; a pea-sized cartilaginous body present in choroid fringe of the right lateral ventricle. Old fracture of the 8th rib on the left side. Emphysema. Flabby, dilated heart.

33. *A. Q.*—Female. 80 years. July 25th, 1902. Senile dementia with epilepsy. Thickened skull cap with adherent dura mater; brain and membranes present in a marked degree the lesions of chronic insanity. Fusion of two aortic valve cusps with retraction of the edges and incompetence; hypertrophy of the left ventricle (heart weighs 14 oz.). Moderate grade of arterio-sclerosis and of arterio-sclerotic kidney. "Corset-lined" liver. Cystic endocervicitis. Cataract of the right eye.

34. *A. M.*—Male. 59 years. October 17th, 1902. Dementia. Thickened skull with absence of diploe; brain and membranes present the usual signs of chronic insanity. Coal miners' lung (anthracosis with marked patchy fibroid

pneumonia and thickened pleura). Anthracosis and caseous tubercular bronchial glands. Follicular ulcers of the small bowel. Acute catarrhal pyelitis of the right side. Psoas abscess, pus of a curdy character, but contained many leucocytes and gave a culture resembling *Bac. coli*. Healed carious tuberculosis of the bodies of 10th, 11th and 12th dorsal and 1st lumbar vertebræ.

35. *H. B.*—Male. 34 years. December 15th, 1902. Epileptic dementia. Brain and membranes show the usual lesions of chronic insanity. Softening septic clot under one cusp of the tricuspid valve. Multiple pyæmic (hæmorrhagic) infarcts of both lungs with suppurative broncho-pneumonia of the posterior half of the left lung, and hypostatic pneumonia in the posterior half of the right lung. Purulent pleuritis. Pyæmic miliary abscesses and infarcts of kidney. Bedsores over sacral and gluteal regions.

36. *J. P.*—Male. 36 years. January 14th, 1903. General paresis. Marked milkeness of the arachnoid and increase of cerebro-spinal fluid; marked adhesions of the pia mater to cerebral substance; the right supra-marginal, angular and first occipital convolutions were wanting, being replaced by a cystic membranous mass opening into the dilated ventricles; the caudate nucleus of the left corpus striatum is entirely wasted, its place being taken by sclerotic tissue; the spinal cord in the lower cervical, dorsal and lumbar regions showed sclerosis of posterior columns. Hypostatic pneumonia of the bases and posterior portions of both lungs with fibrinous pleuritis over the same. Moderate grade of arterio-sclerosis in the large vessels. Scars on the under surface of the liver, possibly syphilitic. Adhesion of prepuce to glans.

37. *L. L.*—Male. 40 years. January 30th, 1903. Idiocy, epilepsy. Right side not so well developed as left. Athetosis of right hand. Thickened skull and pericranium; milkeness of the arachnoid; engorgement of pial veins; left precentral gyrus slightly less plump than the right;

ventricles dilated. Dark, tarry blood and cyanotic organs. Engorged right side of heart. Calcareous bronchial glands. Gall bladder full of small gall stones. Death evidently due to suffocation.

38. *F. L.*—Female. 79 years. April 14th, 1903. Chronic mania. Brain shows usual lesions of chronic insanity. Acute pleurisy with effusion of left side; collapsed left lung; patchy hypostatic pneumonia in base of right lung with considerable œdema of whole lung. Engorged right heart and venous system with firm clotting of blood. Patchy atheroma of the aorta, coronary and basal cerebral vessels. Pressure ulcers of sigmoid flexure.

39. *S. K.*—Female. 85 years. April 21st, 1903. Chronic mania. Brain and membranes present the usual lesions of chronic insanity. Acute pleurisy with effusion on left side; collapsed left lung; acute congestion and early hepatization of upper lobe and œdema of middle and lower lobes of the right lung. Slight sclerotic endocarditis of the mitral valve. Moderate arterio-sclerosis of all arteries with white, granular kidneys. Puckered scars and pleural adhesions at left apex.

40. *E. H.*—Female. 57 years. April 25th, 1903. Dementia. Brain and membranes present the usual lesions of the chronically insane. Tubercular cervical glands, abscesses and sinuses. Old adherent pleuritis and pericarditis; healed tubercle of both apices. Caseo-calcareous bronchial glands. Hypostatic pneumonia. Sclerotic mitral endocarditis with one recent vegetation; mitral stenosis; hypertrophy of heart. Moderate grade of arterio-sclerosis and of interstitial nephritis. Acute enteritis involving ileum.

41. *G. B.*—Male. 62 years. August 19th, 1903. Acute mania. Milky arachnoid with increase of cerebrospinal fluid; congestion of pial arteries; dilated ventricles; thickened dura mater; right posterior cerebral

given off from the internal carotid through the posterior communicating. Acute pneumonia, grey hepatization of most of the left lung. Acute pleurisy with effusion on right side with collapse of the lower and middle lobes of lung.

42. *W. H.*—Male. 31 years. August 31st, 1903. Epileptic dementia. Skull cap much thickened; very large pacchionian bodies with other lesions of chronic insanity. Scattered miliary tubercles, along the course of the middle cerebral artery. Caseation, softening and extensive cavitation of the left lung. Scattered areas of caseous broncho-pneumonia in the right lung. Caseous bronchial and mesenteric glands. Small bowel from duodenum to ileo-caecal valve shows marked tubercular ulceration of follicles and Peyer's patches. Great bowel throughout shows very extensive ulceration, the mucosa being largely destroyed; ulcers are tubercular in origin, with secondary infection by pyogenic bacteria. Fatty liver.

43. *R. E.*—Male. 76 years. September 18th, 1903. Chronic mania. Usual brain lesions of chronic insanity. Flabby, dilated heart with over distention of the right side and segmentation of the muscle fibres. Moderate arteriosclerosis involving all the arteries. Slight interstitial nephritis. Puckered scars and pleural adhesions at the apices of both lungs.

44. *J. Z.*—Female. 65 years. October 25th, 1903. Dementia. Marked bronzing skin of face, hands and abdomen. Brain and membrane show usual lesions of chronic insanity. General œdema and dropsy. Sclerotic mitral endocarditis with retraction of valve edges and shortened chordæ tendinæ; mitral incompetence; hypertrophy of both ventricles; dilatation of both auricles and right ventricle. Chronic venous congestion of lungs, liver and kidneys. Caseous nodules and miliary tubercles at apices of both lungs, and caseous bronchial glands.

Caseous nodules replacing left suprarenal. Moderate grade arterio-sclerosis.

45. *J. C.*—Male. 80 years. December 21st, 1903. Dementia. Marked kyphosis and some scoliosis. Usual lesions in the brain and membranes of chronic insanity. Old adherent pleurisy with considerable fibroid thickening in apex of right lung and in upper lobe of left lung. Thrombosis of pulmonary artery supplying the upper lobe of the right lung. Persistent thymus gland. Sclerotic mitral endocarditis. Double ureter from left kidney joining in bladder wall.

46. *M. O. B.*—Female. 52 years. August 21st, 1904. Chronic mania. Brain and membranes present the usual features of chronic insanity. Extensive tubercular abscesses of the left lung; patchy bronchiogenic tuberculosis of the right lung, with compensatory emphysema. Nodular and ulcerative tuberculosis of small bowel. Slight mitral and aortic sclerotic endocarditis. Patchy atheroma of all the larger arteries. Moderate grade of cystic interstitial nephritis.

47. *P. McG.*—Male. 75 years. September 20th, 1904. Chronic mania. Brain and membranes present the usual lesions of chronic insanity. Aortic stenosis and incompetence due to fusion of two valve cusps; general hypertrophy and dilatation of the heart (weight when empty 32 oz.); heart muscle well nourished. Chronic venous congestion of the liver, spleen and kidneys. Slight grade of cirrhosis of liver. Chronic gastritis and dilated stomach. Patchy atheroma of aorta.

48. *J. S.*—Male. 49 years. October 24th, 1904. Imbecile. Head not examined. Advanced tuberculosis of the left lung with complete cavitation of the upper lobe and extensive bronchiogenic invasion of the lower lobe with dense pleural adhesion; acute pleurisy with effusion on the right side, the lung being compressed but showing numerous broncho-pneumonic caseous tubercles. Tubercular ulceration of the caecum. Flabby, dilated heart.

49. *J. B.*—Male. 48 years. January 12th, 1905. Dementia. Head not examined. Tuberculosis of both lungs; caseation and patchy cavitation of the left upper lobe with dense pleural adhesions, while the lower lobe and the upper lobe of the right lung show patchy, caseous, broncho-pneumonia. Flabby, dilated heart. Thrombosis of vena azygos major throughout its course. Early atheroma of the aorta. Marked tubercular ulceration of the ileum and caecum with two small perforations, one foot from the ileo-caecal valve. Early acute peritonitis. Chronic purulent cystitis.

50. *C. B.*—Male. 58 years. January 21st, 1905. Chronic mania. Brain not examined. Extensive rodent carcinoma of face, jaw and neck. Small tubercular nodules through the lung. Patchy, fatty and calcareous atheroma of larger arteries.

51. *J. J.*—Male. 89 years. March 20th, 1905. Dementia. Usual lesions in brain and membranes of chronic insanity. Emphysema; chronic bronchitis. Brown atrophy of heart. Moderate grade of arterio-sclerosis of all arteries. Arterio-sclerotic kidney. Enlarged prostate.

52 *Mrs. De M.*—Female. 70 years. March 20th, 1905. Dementia. Recent right-sided cerebral hæmorrhage into external capsule and lenticular nucleus, $1\frac{1}{2}$ inches in diameter. "Pipe stem" basal arteries, with miliary aneurysms on basal ganglionic arteries; fusiform aneurysm of the aortic arch with advanced fatty and calcareous atheroma of all vessels; small aneurysmal dilatations of splenic arteries with marked calcareous deposit in their walls. Fibrous spleen. Arterio-sclerotic kidneys. Hypertrophy of left heart. Calcareous deposits in mitral valve. Puckered scars and pleural adhesions at apices of both lungs. Gall stones.

53. *A. Q.*—Male. 56 years. April 20th, 1905. Chronic mania. Brain and membranes show usual lesions of chronic insanity. Complete cavitation upper lobe of

left lung with miliary tubercles and hypostatic pneumonia of lower lobe ; large cavity upper lobe of right lung with numerous smaller recent cavities and caseous areas ; caseous nodules throughout the middle and lower lobe. Tubercular tracheitis and laryngitis. Caseous, bronchial and mesenteric glands. Tubercular ulceration of ileum and caecum ; perforation of ulcer, 18 inches from the ileo-caecal valve ; acute fibrino-purulent peritonitis. Gall stones. Sclerotic mitral endocarditis. Patchy, fatty and calcareous atheroma of the aorta.

54. *A. B.*—Female. 73 years. July 20th, 1905. Dementia. Brain and membranes show usual lesions of chronic insanity. Rheumatoid arthritis of left knee and right shoulder. Old fracture at junction of middle and upper thirds of the right humerus. Brown atrophy of heart. Puckered scars and pleural adhesions at apices of both lungs. Extensive arterio-sclerosis with marked calcareous deposit in intima of aorta. Marked arterio-sclerotic kidneys.

55. *J. A.*—Male. 51 years. August 19th, 1905. Chronic mania. Brain showed the usual evidences of chronic insanity, also intense venous engorgement. Extensive bilateral, symmetrical swelling of the neck due to extravasation of blood beneath the deep cervical fascia, and also into the anterior and posterior mediastinal spaces. Small ruptured aneurysm ($\frac{1}{2}$ inch diameter) on the left inferior thyroid artery. Marked arterio-sclerosis of all large arteries with fusiform dilatation of the left carotid and subclavian vessels, and slight enlargement aortic arch, hypertrophy of heart, especially left ventricle (14 ozs.). Arterio-sclerotic kidneys.

56. *F. T.*—Male. 40 years. November 2nd, 1905. Chronic mania. Head not examined. Extensive tuberculosis of both lungs, right lung being riddled with cavities with caseous intervening walls, left lung showed old cavities at apex with more recent cavities in the rest of the upper lobe, while the lower lobe showed scattered

miliary tubercles and caseous nodules ; acute pleurisy with effusion on left side ; acute fibrinous pleurisy over right lower lobe. Caseous bronchial and mesenteric glands. Tubercular ulcers in bronchi, trachea, larynx, and ileum.

57. *Mrs. P.*—Female. 70 years. November 20th, 1905. Dementia. Head not examined. Suppurating bed sores. Healed (fibrous union) intracapsular fracture of the right femur. Acute (infective) mitral endocarditis on thickened valve cusps. Patchy atheroma of the aorta. Sub-mucous uterine polypi (adeno-myomatous).

58. *J. F.*—Female. 54 years. February 10th, 1906. Acute mania. Head not examined. Gangrene of left arm to above the elbow. Thrombosis of axillary artery and its branches below the mid-axillary line. Gall stones.

59. *R. McC.*—Male. 55 years. March 12th, 1906. Chronic mania. Head not examined. Advanced atheroma of the aorta. Fusiform dilatation of the arch of the aorta. Slit-like perforation of aorta 1 inch above the aortic valve into the pericardial sac, which was distended with $1\frac{1}{2}$ pints of blood. Hypertrophy of the left ventricle. Slight interstitial nephritis.

60. *M. F.*—Male. 75 years. April 5th, 1906. Chronic mania. Head not examined. Diffuse scirrhous carcinoma of stomach, involving the lesser curvature and the anterior wall from the cardiac to the pyloric orifices. Small secondary nodules in gastro-hepatic and gastro-colic omenta, and in the liver.

61. *C. C.*—Male. 57 years. May 15th, 1906. Chronic mania. Head not examined. Tuberculosis of lungs, the left lung showing old and recent cavitation and caseous pneumonia, the right lung showing patchy tubercular nodules and miliary tubercles. Proliferative tuberculosis of the vocal cords. Caseous nodules in the supra-renals. Patchy, fatty atheroma of aorta.

62. *S. W.*—Male. 46. May 31st, 1906 Dementia. Brain and membranes show usual lesions of chronic insanity. Emphysema. Hypostatic pneumonia of left lung. Old adherent pleuritis. Sclerotic mitral and aortic endocarditis with calcification. Calcareous atheroma of larger vessels.

63. *R. N.*—Male. 81 years. June 25th, 1906. Chronic mania. Brain and membranes show usual lesions of chronic insanity. Small embolic abscess in anterior orbital convolution of frontal lobe. Enlarged prostate. Acute suppurative cystitis and pyelonephritis. Sclerotic endocarditis with calcification in mitral and aortic valves. Calcareous atheroma of large and medium-sized arteries.

64. *J. A.*—Female. 66 years. September 6th, 1906. Chronic melancholia. Brain and membranes show usual lesions of chronic insanity. Emphysema. Adherent pleuritis. Flabby dilated heart with brown atrophy and segmentation of muscle fibres. Patchy calcareous atheroma of large and medium-sized vessels. Sclerotic mitral endocarditis. Interstitial nephritis. Multiple calcareous fibroids in prolapsed uterus. Small parovarian cyst left side.

65. *Mrs. R.*—Female. 60 years. September 18th, 1906. Delusional mania. Thickened skull cap with absence of diploe. Brain and membranes present the usual lesions of chronic insanity; the basal cerebral vessels were only two-thirds of their usual size. Marked jaundice. Large double cystic goitre (with hæmorrhagic and calcareous deposit). Caseo-calcareous nodules in apex of the left lung and in the bronchial glands. Patchy, fatty and calcareous atheroma of the larger arteries. Abdominal dropsy. Advanced (syphilitic) cirrhosis of liver. Gall stones in atrophied gall bladder. Gall stone in common duct. Dilated hepatic and common duct. Chronic gastritis. Dilated œsophageal and gastric veins. Hæmorrhage into stomach. Skewer and pin in duodenal wall and head of pancreas. Pin in peritoneal covering of the

anterior wall of the uterus. Moderate grade of interstitial nephritis. Enlarged hæmorrhagic spleen.

66. *E. W.*—Female. 88 years. October 29th, 1906. Dementia. Brain and membranes present the usual lesions of chronic insanity. Emphysema. Calcareous nodules at apex of right lung and in bronchial glands. Entero-colitis with extensive superficial ulceration of colon. Brown atrophy of heart. Moderate grade of arterio-sclerosis and of arterio-sclerotic kidneys.

67. *A. L.*—Male. 76 years. November 16th, 1906. Dementia. Brain and membranes present the usual lesions of chronic insanity. Lodgement of some foreign body (not present at autopsy) at pharyngo-œsophagæal junction with necrosis of mucosa anteriorly and posteriorly. Oedematous laryngitis with purulent tracheitis and bronchitis. General venous engorgement. Patchy atheroma of aorta and larger blood vessels, with much calcification and ulcer formation with thrombus deposit. Gangrene of the small toe of the right foot. Old fracture of the eighth rib near the costal cartilage and old dislocation at acromial end of the clavicle. Enlargement of prostate. Horse-shoe kidney (fusion of lower end). Moderate grade of interstitial nephritis. Gall stones.

68. *R. B.*—Male. 76 years. December 15th, 1906. Dementia. Head not examined. Adherent pericardium. Chronic mitral endocarditis with calcareous deposit. Hypertrophy of left ventricle. Dilatation of right side of heart. Old adhesive pleuritis and suphrenic adhesive peritonitis. "Nutmeg" liver. Gall stones. Chronic gastritis. Fatty and calcareous atheroma of the larger arteries with partial obliterating endarteritis of superior mesenteric artery. Moderate grade of interstitial nephritis. Bed sores.

69. *R. S.*—Male. 36 years. December 17th, 1906. Dementia. Brain lesions those of chronic insanity. Extensive tuberculosis of both lungs; upper and middle

lobes of the right lung are transformed into a tubercular abscess, while the lower lobe shows small cavities and caseous nodules ; upper lobe of left lung showed recent cavities and caseous broncho-pneumonia while the lower lobe showed caseous nodules and miliary tubercles (bronchogenic distribution). Tubercular ulceration of the larynx, epiglottis, trachea and bronchi. Extensive tubercular ulceration of the small bowel, cæcum and ascending colon. Caseous bronchial and mesenteric glands. Fatty liver. Gall stones.

70. *E. F.* — Female. 80 years. December 26th, 1906. Dementia. Head not examined. Emphysema. Acute fibrinous pleuritis of the right side. Advanced arterio-sclerosis, especially of the abdominal vessels. Interstitial nephritis. Hæmorrhage into both suprarenals. Gall stones.

71. *B. G.* — Male. 55 years. January 3rd, 1907. Dementia. Head not examined. Yellow fat. Pallor of organs. Oedema of the soft parts. Very pale, flabby, dilated heart with microscopic findings of fatty degeneration. Fatty degeneration of kidneys (no iron deposit in liver, spleen, kidneys). No assignable cause for anæmia. Gall stones.

72. *C. R.* — Female. 62 years. January 26th, 1907. Melancholia. Firm adhesions of dura mater ; other lesions of brain and membrane those of chronic insanity. Emphysema. Patchy, caseous tuberculosis of both lungs. Caseous bronchial glands. Small, flabby heart with brown atrophy of muscle fibres. Slight patchy atheroma of larger vessels. Bilateral laceration of cervix.

73. *B. O.* — Male. 60 years. March 1st, 1907. General paresis. Emphysema. Chronic bronchitis. Acute (infective) mitral endocarditis. Pyæmic infarcts of kidney. Extensive arterio-sclerosis. Bed sores. (Brain and cord removed, but microscopic examination not completed.)

74. *F. W. W.*—Male. 35 years. March 9th, 1907. General paresis. Acute (infective) mitral endocarditis on thickened sclerotic valve cusps. Early interstitial nephritis. Bed sores. Purulent infiltration in upper, inner part of the right thigh and gluteal region. (Brain and cord removed, but microscopic examination not completed.)

75. *M. F.*—Female. 75 years. March 29th, 1907. Chronic mania. Marked thickening of skull cap with several deep pits in bone. Adhesion of dura mater; marked development of the pacchionian bodies; other brain lesions those of chronic insanity. Emphysema. Acute (infective) mitral endocarditis developing on sclerotic valves. Old infarct of spleen. Extensive arterio-sclerosis with arterio-sclerotic kidneys. Gall stones. Laceration of cervix. Bed sores.

76. *A. M. E.*—Female. 31 years. May 7th, 1907. Idiocy. Head not examined. Extensive tuberculosis of both lungs, left lung being consolidated throughout and breaking down, while right lung showed extensive broncho-pneumonic tuberculosis. Caseating and ulcerating tuberculosis of the lower part of the ileum and caecum. Appendix filled with pins (48), pebbles (3) and glass (1).

77. *P. H.*—Male. 49 years. June 5th, 1907. Dementia. Head not examined. Emphysema. Old adherent pleuritis with calcareous plaques on left side. Caseo-calcareous bronchial glands. Brown atrophy of heart. Sclerotic mitral endocarditis.

78. *N. B.*—Male. 65 years. June 28th, 1907. Mania. Brain and membranes present the usual lesions of chronic insanity. Hypostatic pneumonia. Scars and pleural adhesions of both apices. Left adherent pleuritis. General arterio-sclerosis of moderate grade.

ON DIPHTHEROID BACILLI.

Bacteria which resemble the Klebs-Löffler bacillus of diphtheria have been described and studied practically ever since the isolation of the diphtheria bacillus itself, the best known diphtheria-like bacilli being Hoffman's bacillus and the xerosis bacillus. At first, these diphtheroid organisms received scant attention, as this was focussed on the diphtheria bacillus, but during the past few years these bacteria have received much attention, not only on account of the frequency with which they are met with, but on account of their probable relationship to the true diphtheria bacillus and their possible import in the propagation of diphtheria. Further, from the work of Cautley (1), Gordon (2), Benham (3), Prosser White (4), and others on the bacteriology of common colds, attention was directed to the marked frequency with which diphtheroid bacilli were found in the nasal discharges making up a considerable percentage of the bacterial content. Cautley named this bacterium *B. coryzæ segmentosus*, while Benham suggested *B. septus* as the direct action of the bacterium in the causation of coryza still remains to be proved.

Early in March, 1907, a small outbreak of acute coryza occurred among our medical students, and in eighteen cases examined by me, a bacterium corresponding to Cautley's bacillus was found six times, and in these cases from 25 to 75 per cent. of the colonies developing on the serum tubes were colonies of this bacterium. Again, the work of Dr. Ford Robertson (5), (Pathologist to the Scottish Asylums Board), and his assistants, has called attention to the probable relationship of diphtheroid bacilli to paresis or general paralysis of the insane. Dr. Robertson holds that in general paralysis there is a localized focus of infection by diphtheroid bacilli (most commonly in the buccal or naso-pharyngeal mucosae); and to ab-

sorption of toxin from this focus and its action on the central nervous system can be ascribed the progressive features which characterize most cases of this disease. Dr. Robertson at first considered this bacterium to be an attenuated Klebs-Löffler bacillus, but now looks upon it as a special organism and describes two varieties which he names *B. paralyticans longus* and *brevis*. These differ slightly in morphology as their names imply, and also in their fermentation reactions on sugars, the *B. paralyticans longus* type giving the sugar reactions of the diphtheria bacillus, while the *brevis* type ferments glucose and saccharose, but not the other sugars. Feeding experiments on rats were carried on with both types of these bacilli and led with both to the production of a paralytic disease in which the lesions are claimed to be similar to those of general paralysis. I need not further describe Dr. Robertson's claims except to say, that Dr. Robertson recognizes the widespread distribution of diphtheroid bacilli and holds that the mere presence of these bacilli on mucous surfaces is of little significance, but that actual tissue invasion is the crux.

O'Brien (6) in an examination of insane patients found diphtheroid bacilli in naso-pharyngeal mucosa in 98 per cent. of cases of general paralysis and in only 2 per cent. of other cases of insanity.

Eyre and Flashman (7) in an examination of 60 cases of general paralysis found that 16.6 per cent. showed diphtheroid bacilli, while in 78 other cases of insanity they were present in 17.9 per cent. of cases. These authors classify their bacilli into three classes, viz. — True *B. diphtheriæ* 5, and 5.1 per cent., Hoffman's bacilli 8.3 and 11.5 per cent., xerosis bacilli 3.3 and 1.2 per cent. respectively. These authors also examined post-mortem material in 10 cases of general paralysis and 26 cases of other forms of insanity. From the result of their investigations they fail to find any evidence of a causal association between diphtheroid bacilli and general paralysis.

Seeking to determine wherein lay the truth in these contradictory findings, I began an examination of the available material in Rockwood Hospital in July, 1907, and submit the following preliminary report:—

Only six cases of general paralysis were found among the 600 inmates at Rockwood, and in these cases diphtheroid bacilli were found in noses and in one case from tonsil. In making preparations, sterilized swabs were rubbed against the nasal septum (using a sterile speculum) and then smeared over Loeffler's serum tubes. Similar preparations were made from the tonsil, but after several dozen tonsils had been examined with only one positive finding, the tonsil examination was omitted. The inoculated serum tubes were incubated at 37 degrees C. from 18 to 24 hours and then examined. Four pure cultures were secured from the six positive general paralysis cases and kept for further examination. Attention was then turned to other forms of insanity, and in 21 cases (7 male, 14 female) diphtheroid bacilli were found in 18 cases, and in 12 of these, pure cultures were secured. I may say, that only one examination was made, in fact only one nostril in each case, so that possibly the percentage (85.7 per cent.) in other cases of insanity would have been still higher had a second examination been made.

In examining the patients, cases from all different wards were chosen, and no case was examined in which there was any suspicion of nasal trouble. The frequent presence of these bacilli somewhat surprising me, I next examined some cases from the wards of the General and Hotel Dieu Hospitals. Of 12 adult cases from the wards of the General Hospital, 8 gave diphtheroid bacilli and four pure cultures were secured for further examination. From six children in the Scarlet Fever Isolation Wing, 2 gave diphtheroid bacilli. In the Hotel Dieu Hospital, 12 ward cases gave 5 with diphtheroid bacilli, and from these, two pure cultures were secured. Thus, in 24 adult cases in

ordinary hospitals, 13 showed diphtheroid bacilli from a single examination, a percentage of 54.1 per cent., while in six children the percentage was 33.3 per cent.

Further study was made of 4 cultures from general paralysis cases, 12 cultures from other forms of insanity and 5 from ordinary hospital cases. With these were contrasted three strains of true diphtheria bacilli and one diphtheroid bacillus recently isolated from a case of acute coryza and corresponding to Cautley's *B. coryzæ segmentosus*.

CHARACTERS OF CULTURES EXAMINED.

Morphological Characters.—From an examination of the morphological characters alone the 22 diphtheroid bacilli could be separated with two classes, viz., a short form to which five of the cultures belonged, and a longer form comprising the balance of the cultures. The short forms resemble the short forms of the diphtheria bacillus, but were more regular in size and shape and stained more uniformly than the average short diphtheria bacillus. In all these cultures unstained portions were noted, and usually these were situated centrally in the rod. In the usual routine examination of swabs in Public Health work these bacteria would be placed in the suspicious class unless the card report accompanying specimen showed the clinical features of diphtheria. Three of these five cultures were from cases of general paralysis, while the other two were from other types of insanity. (Nos. 1, 2, 3, 4 and 5 of table.)

In the 17 other cultures the resemblance to diphtheria bacilli was closer, but again there was more regularity in size and shape of the constituent bacteria, though beading was marked, and if anything this beading (methylene blue stain) was more regular. However, I have no hesitation in saying that had I found these bacilli developing from swabs sent in usual routine of Public Health laboratory work I would have pronounced them diphtheria bacilli.

Of course, however, in this examination the conditions are essentially different from routine Public Health work, as swabs are only sent from suspected diphtheria throats, but there would necessarily be trouble at times in swabs sent for release from quarantine when, as in Ontario, the Provincial Board of Health requests swabs to be sent from the nose as well as the throat. Morphological and cultural tests alone do not certainly suffice to differentiate these diphtheroids from true diphtheria bacilli.

Staining Characters.—Methylene blue (Loeffler's) preparations make decidedly the best microscopic pictures. This stain is the routine stain used in my laboratory in examination of diphtheria organisms. All the cultures were Gram positive. All stain more or less well by Neisser's method when examined from 20 to 24 hour serum cultures. I lay no stress on this stain as a means of differentiation, however, as age of culture has very much to do with the positive or negative character of staining reaction.

It is true Neisser's stain shows metachromatic granules in very young cultures of most true diphtheria bacilli, but equally as good granule staining was found in several of these diphtheroid bacilli, especially Nos. 1, 11, 19 and 20.

Cultural Characters.—On Loeffler's serum considerable variation was noted in the rapidity and richness of growth, these variations being entirely independent of the richness of inoculation of the media. The cultures throughout bore a close resemblance to diphtheria bacillus, especially at the end of 24 hours, but after 48 hours considerable variation in the different cultures was noted.

The five short forms described all grew somewhat more freely than the three strains of diphtheria bacilli used as controls; the smear was more creamy and the colonies became confluent earlier. Some of the cultures throughout resembled the diphtheria bacillus, but most of the balance grew less freely, the smear being thinner, the colonies tending to be more discrete, smaller, lighter in

colour and more translucent, but the edges showed the usual rosette outline of the diphtheria colonies.

On agar the findings were very similar. On broth as a rule the growth was less free than with the diphtheria bacillus. No scum was noted on any of the tubes.

On Hiss' serum water media tests were made of the fermentative action on various sugars and the results are given in tabular form. A + reaction means that the media was acidified and coagulated, while "a" means that acid was formed but no coagulation occurred. In the table 3D and 7D means that the reactions were examined after three and seven days' incubation at 37 degrees C.

It will be noted that two of the strains of diphtheria bacilli have fermented saccharose, which is contrary to the findings of nearly all who have studied this matter. The saccharose used was supposedly chemically pure, and showed no evidences of inversion after sterilization. I was unable to secure another pure sample for control purposes, but will have to retest all these bacteria using saccharose from different sources. Of the diphtheroids, three gave no re-action whatever with the sugars, namely, Nos. 1, 3, and 4. Six fermented glucose only, viz., Nos. 5, 9, 10, 12, 14 and 20. One fermented glucose and maltose only, viz., No. 17; while one other fermented glucose, maltose and lactose, viz., No. 8. Seven fermented glucose and saccharose only, viz., Nos. 2, 7, 15, 16, 18, 21 and 22, while four others in addition fermented maltose, viz., Nos. 6, 11, 13 and 19.

Knapp (8) says that the diphtheria bacillus ferments glucose, mannite, maltose, dextrin, and probably lactose, but not saccharose; while Hoffman's bacillus ferments no sugars, and the xerosis bacillus ferments glucose, mannite, maltose, saccharose, but not dextrin. So that practically one could differentiate three classes of diphtheria like bacilli by the use of glucose, saccharose and dextrin media.

Graham-Smith (9) practically comes to the same conclusions regarding the fermentative action of diphtheria bacillus, except that it does not ferment mannite; while the xerosis bacillus, he states, forms a small amount of acid on glucose and a trace with saccharose. The *Bacillus coryzæ segmentosus* forms acid with glucose only, while four other diphtheroid bacilli examined by him gave acid on glucose and maltose. Benham in a study of the *Bacillus coryzæ segmentosus*, states that the majority of cultures ferment glucose and saccharose, and some lactose and maltose, but that these findings are not constant.

Gordon places the true xerosis bacillus in the non-sugar fermenting series, and describes diphtheroids of

two types, the most common fermenting glucose and saccharose, while the other ferments glucose and dextrin, and occasionally saccharose; Lat states that there was very marked inconstancy in these re-actions, and much more study of the diphtheroid group was required before any conclusions whatever could be drawn from sugar re-actions. Eyre (10) practically coincides with this view.

Hamilton and Horton (11), state that the sugar re-actions as distinguishing features are practically valueless, failing just at points where differentiation is most needed.

To go back to the results of the morphological, cultural, and fermentation tests, 3 of the cultures can be excluded as Hoffman's bacilli (Nos. 1, 3 and 4); the others all ferment glucose, and 13 in addition ferment other sugars, 11 fermenting saccharose, 6 maltose, and one lactose. These belong to the xerosis-like group of Knapp and Graham-Smith, but it is evident at once that Gordon, Hamilton and Horton, and Eyre are correct in saying that the sugar re-actions are only of limited value as a means of differentiation.

Virulence.—Tests of the virulence of these diphtheroid bacilli were made, controlling the same by the diphtheria bacillus. All proved non-virulent to guinea pigs, when inoculated up to $\frac{3}{4}$ of 1% of body weight of a 3 days' broth culture, into the peritoneal cavity.

CONCLUSIONS.

Too few examinations are included in this summary to draw any conclusions, but the results confirm the observations of others as to the marked frequency with which diphtheroid bacilli are found in nasal cavities evidently as pure saphrophytes. Further it emphasizes the necessity in examination of swabs from nose in routine Public Health work of not depending solely on morphological or ordinary cultural characters. Lastly, one hesitates to accept without complete proof the association of diphtheroid bacilli in the causation of general paralysis.

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REPORT OF PSYCHIATRIC CLINIC AT MUNICH.

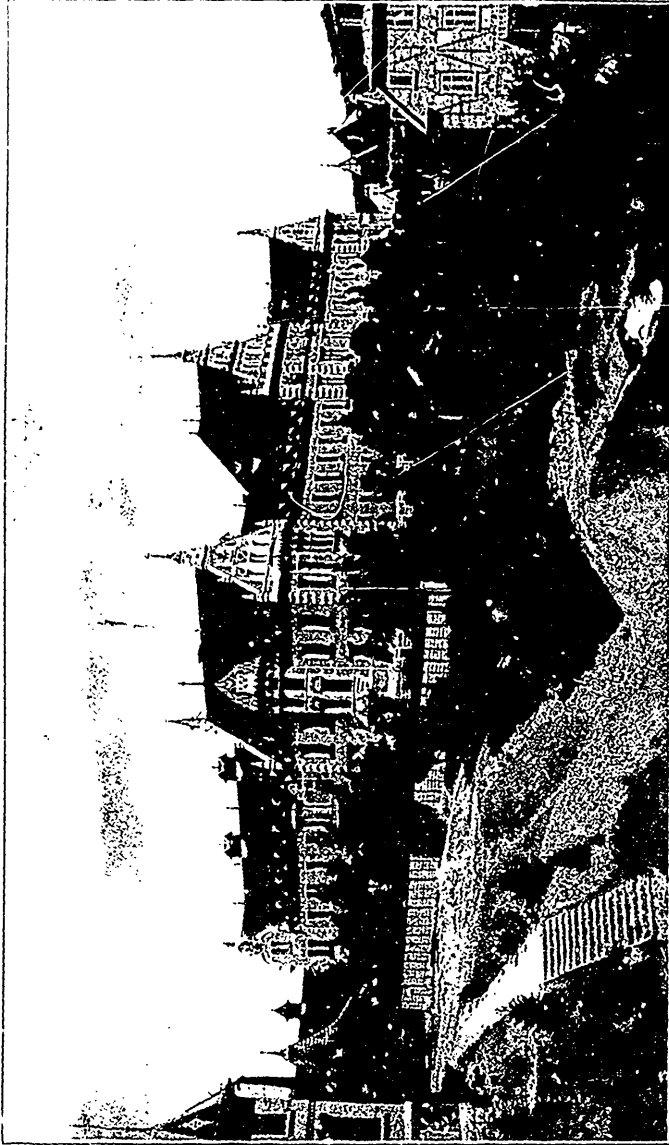
We have before us the yearly report of the Royal Psychiatric Clinic of Munich. This report is now being translated by the staff of Rockwood Hospital, through the kind assistance of Miss Watson of Queen's University.

The report is a most valuable one. It outlines in clear language the organization and equipment of the Clinic, made famous through the work of Kraepelin. In every detail the method of nursing and treatment is fully described and the results acknowledged. The classification of the patients as to the various diseases is given. Of great interest, too, is the character of the research work undertaken, and the various lines of thought followed by each individual laborer in this unexplored field of human investigation. One cannot but notice the amount of work in pathological anatomy, and especially neuro-pathology, a significant indication of the modern trend.

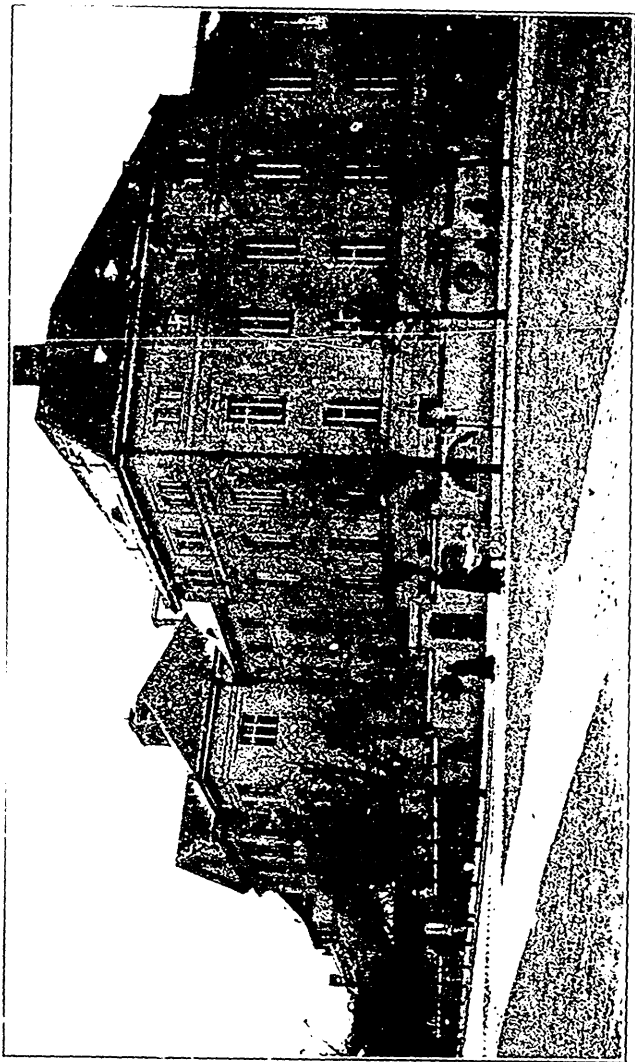
Of interest, too, is the classification of mental diseases and the language and style in which such classification is treated. In each instance there appears a breaking away from the stilted theorising in vogue, and a return to the practical and more purely medical aspect of the various affections.

The report is worthy the earnest consideration of all interested in hospital management; more especially is it invaluable to those who give any special attention to the study of mental and nervous diseases.

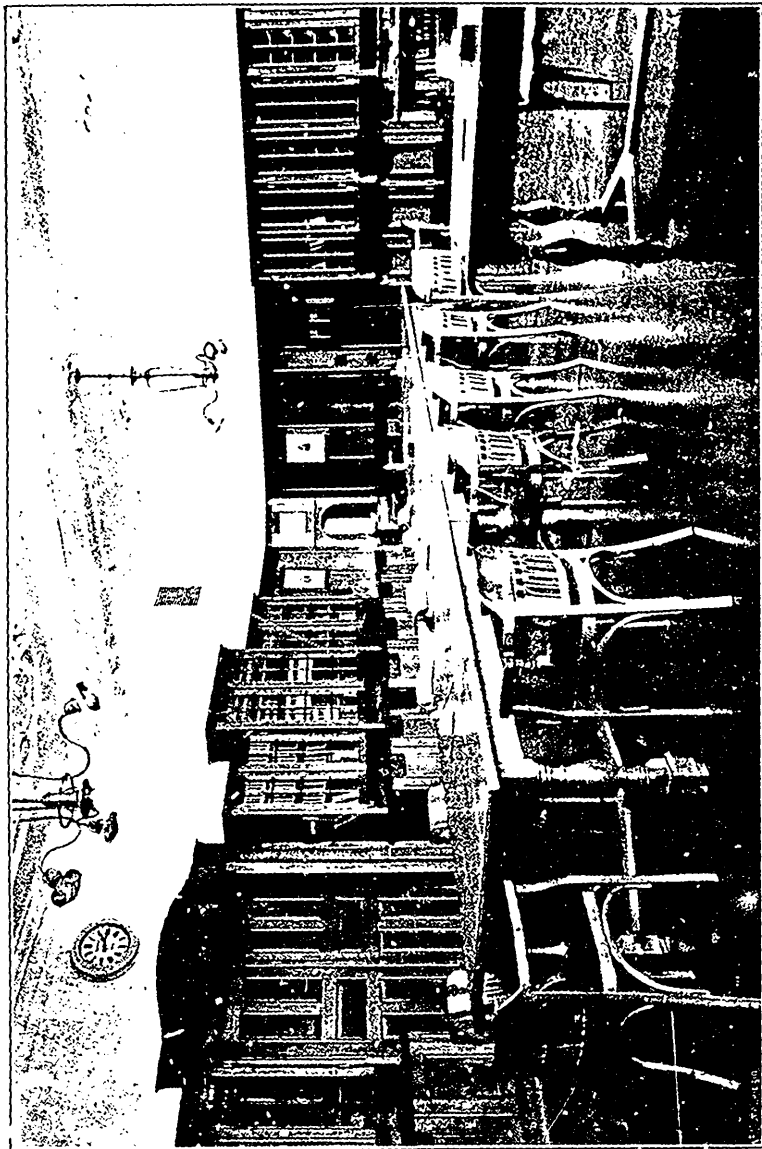
It is the intention to have the report published, and placed in the hands of the profession throughout Ontario.



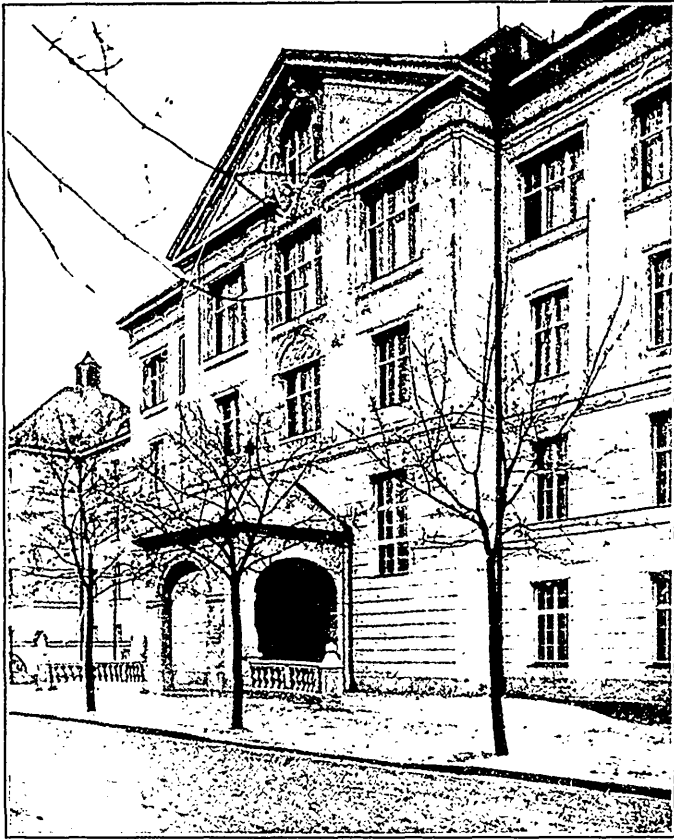
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