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## Original Communications.

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### PNEUMOTHORAX, ITS ETIOLOGY, SYMPTOMS AND SIGNS WITH A STUDY OF TWELVE CASES.

BY

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The following cases, with but one exception, have been observed in the wards of the Royal Victoria Hospital, and form the sum total of such cases treated in that institution since its opening. I am greatly indebted to Drs. James Stewart and Bell for permission to study and report their cases.

CASE I.—H. M., male, aged 30, admitted May, 1897, re-admitted in August, again re-admitted Jan. 1898. He presented when first admitted marked pleural effusion of the left side. From the history given it was chronic and of undoubted tubercular origin. The onset was marked by severe pain in the side, with dyspnoea and, after several weeks, with an audible splash, first heard by the patient himself. Two years previous to this onset, his health had failed him somewhat, and he was the subject of cough with expectoration. The family history gave no evidence of tuberculosis. The patient never spat blood. The heart was much displaced to the right, the coin sound was absent and succussion was not made out. The amount of fluid present was so great that aspiration was urgently indicated and several ounces were withdrawn with considerable relief to the patient. After some weeks the splashing sound of which the patient previously complained returned.

The general condition of the patient was much improved for several months, and though the displaced heart returned partially to its normal position after aspiration it remained permanently to the right,

where it was doubtless held by pleuro-pericardial adhesions. The compressed lung never re-expanded, but occupied a small portion of the thorax posteriorly towards the apex and the middle line. Numerous aspirations were made and finally in Feb. 1898, a portion of the 8th rib was excised on the left side posteriorly, and large quantities of pus continued to discharge until the patient died, Aug. 29th, 26 months after the occurrence of this complication. All the physical signs together with a fairly characteristic onset of pneumothorax were present in this case, and the patient afforded a striking example of how pneumo-thorax may arrest the progress of pulmonary tuberculosis. This arrested state was inferred from the following facts. The quantity of expectoration was greatly diminished. There was a total absence of febrile movement for several months, except after the application of the tuberculin test. The patient during this period showed little tendency to emaciate. The case terminated with signs of sepsis and chronic diarrhoea, doubtless of tubercular origin. Clinically the opposite lung showed but few traces of disease.

CASE II.—J. L., aged 17, male, was admitted March 20th, 1895, with left-sided pneumothorax of tubercular origin. The onset was sudden, with severe post-axillary pain in left side four months previous to admission, when he felt something giving way in his lung, followed by marked dyspnoea. This was more marked on exertion. His previous health had not been good. For nine months he had had a cough with loss of flesh and weakness. His condition on admission was afebrile, respirations and pulse slightly accelerated. Signs of left pneumothorax were manifest in prominence of left side, character of the percussion note, metallic tinkling, coin sound and succussion splash. The course of the case was favourable, the temperature variable, sometimes febrile, sometimes subnormal. He was discharged, improved, four and a half weeks after admission. Physical signs were not materially changed.

CASE III.—K. F., female, aged 38, with left-sided pyopneumothorax. The onset was indefinite. It was not possible to fix the date. Her health had been failing for a year previous. She had spent considerable time in bed; she coughed and expectorated, but never spat blood. Shortness of breath, variable in degree, had existed several months, but had never been severe until two weeks before admission. Six months after onset of illness, hence about six months before admission, she complained of splashing sounds on the left side of her chest, which were observed over a period of about six weeks, then disappeared. She noticed the heart palpitate on the right side of chest. She presented on admission, well-marked signs of effusion into

the left pleura, with compression of the left lung, and displacement of the heart. After two aspirations of 45 oz. of pus in all hippocratic succussion was obtained, while the coin sound and metallic tinkling were absent. The third aspiration was performed nine days after, after which metallic tinkling, the coin sound and succussion splash were elicited. The course of the case in the hospital was afebrile with but one exception and patient showed marked improvement, doubtless due to the aspiration. Further operations were not performed, as the patient left the hospital and was lost sight of. In this patient downward displacement of the spleen was observed, while her case affords a typical example of latent pyopneumothorax.

CASE IV.—M. D. McM., aged 24, male, was admitted August, 1895, with pyopneumothorax of tubercular origin, left-sided. The onset had been sudden with almost total collapse. His previous health had been failing, marked by loss of flesh, cough, chills and fever, malaise and sweating at night. There had been slight expectoration of blood. Physical examination of the chest on admission showed cardiac displacement to the right; the left side of thorax was bulging, with a tympanitic note; the coin sound was present, but no succussion. Metallic tinkling on respiration was present and succussion was elicited after several weeks. It may be said, however, that the patient's condition did not justify the movements necessary to demonstrate the presence of succussion until several weeks after he was admitted. The pulse was constantly rapid, the temperature febrile during most of patient's stay in hospital and dyspnoea was a variable feature. The right lung showed signs of disease, manifest by localised pleuritic rub, and a few fine crepitant râles. The patient after nine weeks in the hospital accomplished a train journey of several hundred miles and lived for some months, fully seven months and a half after the onset of this complication.

CASE V.—K. H., aged 14, female, was admitted on 11th of January, 1896, with right-sided pneumothorax, of tubercular origin. The previous health had been poor as shown by weakness, cough, hoarseness, feverishness. The onset was rather sudden, characterised by severe pain in right side, but no marked shortness of breath. Condition on admission was as follows: Febrile temperature, rapid pulse, dyspnoea, signs of apical infiltration of the right lung with pneumothorax over the lower portion of the thorax, shown in cardiac displacement to the left, dulness beginning one inch to the left of the left edge of the sternum, distant amphoric breathing. Tympanitic resonance, faint respirations, metallic tinklings, the coin test, were observed but no succussion splash. Thirteen days after admission succussion splash was

elicited over the right side. The patient died five weeks after the onset of this complication manifestly with general tuberculous infection as both lungs showed tubercular disease. She was delirious and diarrhoea was a constant feature.

CASE VI.—K. N., female, aged 19, was admitted on Oct. 5th, 1898, with right-sided pneumothorax. The onset was sudden. The health had been failing, marked by loss of flesh, slight cough, tendency to take "cold," recent anemia and weakness. One sister gave a history of tuberculosis. (More particularly; after a severe chill on awakening one morning and getting up, she returned to bed and slept for about two hours, to awaken again in profuse perspiration, with substernal pain, lasting for two days and then referred to her right side, with catchy breathing, amounting to dyspnoea).

Condition on admission; normal temperature, respirations 40, pulse, 100; with one exception the temperature remained normal throughout the following 18 days of stay in hospital. The pulse and respirations were not accelerated after the 4th day. Dyspnoea was not a marked feature. Attitude in bed was dorsal and lateral, without preference. The thoracic examination showed asymmetry, right side more prominent, hyper-resonance of the right side, weak respiratory sounds with moist râles of a peculiar metallic ring. Vocal resonance had a metallic ring also, the whispering was somewhat cavernous. Coin sound and succussion sound were absent. Cardiac displacement was marked, the mid-axillary line in the 7th interspace showing the apex pulsation. Dulness from above downwards began at the level of the nipple and transverse cardiac dulness began to the right of the mammillary line. Abdomen, right upper quadrant, showed evidence of displaced liver. The progress of the case was favourable throughout, dyspnoea diminished and a state of general wellbeing was experienced. The coin sound was elicited on the 8th of October, seven days after the probable onset, in a very limited area about one inch square just at the level of the seventh rib at the posterior axillary border.

Oct. 12th.—Four days later two other small areas were discovered giving this sign. One was found just below the angle of the scapula and was about the size of the bell of an ordinary stethoscope while the other about the same size was in the axillary space at the level of the 8th interspace.

Oct. 16th.—Yet four days later, the anterior and posterior areas above mentioned, *i. e.*, the first and third failed to give this note and the coin test was positive in one area only.

On Oct. 20th it was absent.

On Nov. 3rd it was still absent.

All metallic quality of voice and respiratory sounds have disappeared. The patient suffers no inconvenience except that due to over-exertion and is now attending to light house work.

Signs of fluid were never found.

CASE VII.—J. P., aged 59, male, seen in consultation with Dr. H. S. Shaw, was one of pneumothorax of doubtful origin. Previously he enjoyed good health. On Nov. 27th, 1897, he fell and broke his leg. He remained under treatment in bed till Dec. 22nd, when some pain developed in right side of the chest. This pain passed away by 26th. On Jan. 1st, while still in bed severe right-sided pain developed and a few râles were heard over the area. On the 2nd a dyspnoic attack occurred and the signs of pneumothorax were manifest. The coin sound was obtainable widely over his right chest, weak distant amphoric breathing was present. The patient improved, signs of cardiac displacement disappeared, the coin sound also disappeared and was completely absent on 11th Feb., and March 1st patient was at work, and has been in good health ever since. The cause of this case is doubtful, and must remain so since there is no evidence either from the history or the physical signs pointing to tuberculosis, while the occurrence of such an event in one confined to one's bed by no exhausting illness inducing thrombosis or embolism, with subsequent localized pulmonary gangrene, renders a decision very difficult.

CASE VIII.—H., male, aged 19. The date of onset is doubtful. His previous health had been good. While walking upon the street four or five months previous to admission he experienced dyspnoea. It was not severe, he continued his journey to his place of work performing his duties that day. Some thoracic pain developed after a few days, but no distressed breathing to interfere with his work. About three weeks ago, about Oct. 1st, while pulling on a hoist, he experienced dyspnoea and subsequently pain in the left side. On admission he presented signs of pneumothorax on the left side shown in cardiac displacement to the right side, fulness of the left chest with obliteration of intercostal spaces, hyper-resonant note throughout, metallic echo of vocal resonance, and faintly heard coin sound. There was no succussion. He was afebrile, not dyspnoic. The course of the case has been uneventful except that it is thought the left chest shows less fulness, while the area of cardiac pulsation is less prominent toward the right, succussion splash has not developed, the coin-sound is very variable. It is best heard when tested in the left supra-clavicular area and the lower portion of axillary space. It transgresses the median line, passing to the right above the junction of the 1st and 2nd pieces of the sternum. It may be heard also from axilla posteriorly

over the lower part of the thorax but this is doubtful. The patient presents the type of latent pneumothorax according to the French authors since there is at least attenuation of the pain and dyspnoea which so frequently usher in this condition.

The case is in all probability one of partial pneumothorax, for reasons which we may discuss later.

CASE IX.—G., aged 19. This is the case to which reference will be made in discussing the etiology of pneumothorax, and will be given in sufficient detail there.

CASE X.—M. L., male, aged 9. Pyopneumothorax, origin doubtful. Left pleura. He had been ill with signs of pulmonary disease, either of pleurisy or pneumonia or both, which set in with considerable pain and cough. On sitting up after two weeks in bed considerable thoracic pain and dyspnoea were experienced. The cause of his illness appears to have been empyema. There was no succussion nor coin-sound present. This patient was operated on, a resection of a portion of the 8th rib was done and drain introduced. The recovery was uneventful.

CASE XI.—Female, E. H., aged 29. This patient was under treatment for pulmonary tuberculosis of several months duration. The disease was one of severe type and rapidly progressive. No signs of a complication with this condition were present, although signs of cavitation were described. The night before she died she complained of pain in the left lower axillary region. There were no other signs or symptoms recorded, denoting the presence of pneumothorax which was demonstrated by an autopsy and found to belong to the partial type, being situated about the upper lobe.

CASE XII.—Male, aged 56. Left pyopneumothorax. The patient had been ill with pleurisy and empyema several months and had been frequently aspirated. One cannot fix the date of the pneumothorax. Hippocratic succussion and the coin-sound were both present. He died three weeks after operation, resection of a portion of a rib, and from the autopsy report it is evident that the original cause of the complication described was tuberculosis.

#### THE ETIOLOGY OF PNEUMOTHORAX.

Much interest has always gathered about the question of the etiology of the somewhat rare condition of pneumothorax which occurs according to good authorities in from 3 per cent. to 12 per cent. of all cases of pulmonary tuberculosis.

The anatomists of many years ago who taught that the arteries were air tubes, regarded the presence of air in the pleural sac as an

“exhalation” from the vessels of the pleura involved. Then also its occurrence was explained by the process of gangrene of the pleura or by a process of decomposition in the pleuritic exudate found so often in such cases. A third explanation had reference to the most common condition—that of *perforation*—which is now the only recognized immediate cause.

Lænnec, who first taught directly concerning the presence of air in the pleura, described the cases under three classes: (a) Simple or essential pneumothorax; (b) the presence of air or gas together with fluid effusion; (c) air or gas with fluid effusion and a fistulous opening communicating with the bronchi.

Thus two forms may be included under the division of non-perforative pneumothorax, while the other, form (c) is classified as the perforative variety.

Concerning the first form, essential pneumothorax, authors did but little more than hint at the possibility of the secretion of air or gas by the pleural sac. Walshe, in speaking of the development of tympanitic sound over a pneumonic area asks, whether the phenomenon can depend on temporary secretion of air by the pleural sac. In referring again to this point in another section of his work on Diseases of the Lungs, he says: “It seems admissible as a bare possibility . . . . tympanitic resonance may be caused by air secreted by the pleura.” This teaching, never positive however, has long since been regarded as fallacious, and thus one form of Lænnec’s classification has passed away. Such an origin for the gas is physiologically impossible.

It was contended by Jaccoud in 1864 that there was no evidence for either form of non-perforative pneumothorax, but such cases were most likely due to minute pleural perforations which soon closed and the air was absorbed. In this opinion many high authorities concurred, among whom may be mentioned the names of Fagge and Powell.

Quoting from the former author we find as follows: “Most writers have admitted that in exceptional cases gases may be found in the pleural cavity as the result of chemical decomposition of liquid effusion, and perhaps by direct secretion (or rather exhalation) from the lining membrane. Such notions, however, accord ill with the general doctrines that are now held by almost everyone—and as neither of these supposed causes of pneumothorax has in its favour the slightest clinical evidence, we may now, guided by the experience of more than half a century, reject them altogether, and assume that air is never found in the interior of the pleural space except as the result of a

*breach in the continuity* of its surface, placing it more or less in direct communication with the external atmosphere."

This seems scarcely the teaching of the present day, however, and guided by the observation of the last decade, we may assume that simple pneumothorax does exist, or at least, such a condition without perforation, and gases may be formed within the pleural cavity and give rise to all the signs characteristic of that condition. Bacteriological examination into such cases has established the presence of gas producing organisms of anaërobic type.

Three case reports may be cited supporting this view. The first is that reported two years ago by E. Lévy, of Strasbourg, in which no perforation was found, but the exudate contained on two occasions an anaërobic micro-organism capable of producing gas in cultures as well as in guinea-pig tests. From the clinical history of his case, it would seem that this infection was one of secondary character, and in presenting his report Dr. Lévy makes a plea for essential pneumothorax.

The second is that reported in the *Deutsches Archiv für Klinische Medicin*, 61 Band. Dr. Richard May and Dr. Adolf Gebhart describe a case of pneumothorax of this class in which the gas formation was evidently due to the presence of the bacterium coli.

The third case is No. IX., in our series. A patient under treatment for a severe form of appendicitis, was operated on and four or five days later he developed signs of disease in the right lung and subsequently in the pericardium—signs leading to a diagnosis of pneumonia and pleurisy of the right side with hydropneumo pericardium. The autopsy confirmed the diagnosis and further revealed a pyo-hæmo-pneumothorax of the right side, as well as a pleurisy of the left side. The pericardial effusion was similar to that in the pleura, but the pus elements were more scanty.

An examination of the abdomen showed a suppurative track—a retroperitoneal dissecting abscess, extending upwards, traceable along the inferior vena cava to the diaphragm. Viewed from the pleural side no perforation was discoverable, but near that point where the inferior vena cava emerged through the diaphragm a reddish grumous broken-down area existed. The pericardium presented no such area suggesting even the possibility of perforation, although, as we have said, it contained ante-mortem and post-mortem signs of pneumo-pericardium.

Subsequent examination of the organs of this patient, as reported by Dr. A. G. Nicholls, in the *British Medical Journal*, of 1897, showed the presence of the bacillus *aërogenes capsulatus* in large numbers—and the gas found in the serous sacs was doubtless due to an infection with this gas producing bacillus.

Granting, however, that such cases of pneumothorax do exist, they are very rare, and each case suspected of being such must be carefully followed out in order to determine whether or not perforation is present, and if absent, what forms of organisms account for the formation of gases. Clinically such cases are scarcely within the range of precise diagnosis.

Pneumothorax occurs not infrequently in those apparently healthy, and many observers regard it possible that such may be really healthy. This observation gathers strength in the light of many such cases going on to recovery within a few weeks, leaving no sign of the cause of such a condition.

However, in such cases there is ample ground for doubt, and among those who oppose this teaching no one has done so more strongly nor more logically than Samuel West, who maintains upon the following grounds that in all probability a pulmonary lesion has given rise to a perforation under conditions of over-strain.

Perhaps all will admit the grounds upon which he reasons concerning this point. They are in substance as follows :

1. Lesions exist undetected clinically.
2. Recovery may be complete from pneumothorax, even though there be a tubercular process at the bottom.
3. The bursting power of a healthy lung is greater than could be exerted by any expiratory effort.

Doubtless many cases occurring in the apparently healthy are caused by tuberculosis.

Not only in the advanced cases with cavity formation may this complication occur, but an early case where small superficial caseating areas exist,—so small that they can not be discovered clinically—pneumothorax may develop while the subject of it is regarded as previously healthy.

Of interest under this division of the subject are the statistics of a large number of cases. Some years ago Biach collected from the records of 38 years the reports of 918 cases in three of the large hospitals in Vienna.

His table showed :

Tuberculosis in.....	715 cases, 76 per cent.
Gangrene of Lung.....	65 "
Empyema.....	45 "
Injury.....	32 "
Bronchiectasis.....	10 "
Lung Abscess.....	10 "
Emphysema.....	7 "
Necrotic Hæmorrhagic Infarct.	4 " Total, 888

Of the remaining 30 cases, 14 were undecided, while the other 16 were divided between thoracentesis, parasitic—peritoneal and intestinal origin—and carious changes in ribs and sternum.

Other observers show about 90 per cent. of cases due to tuberculosis.

In this group of 12 cases the causes are as follows: Tuberculosis, 5 cases; empyema, 2 cases; unknown, 4 cases; *B. aërogenes capsulatus*, 1 case.

Latent forms were found in (Nos. 3, 11, 8, 12) 4 cases.

Purulent fluid was demonstrated in 9 cases. No signs of fluid were found in 3 cases. Of the twelve cases, six are dead while two are at work, one under observation; one, a child running about; two others showed some improvement under treatment and were finally lost sight of. The left side was involved 8 times, the right side was involved 4 times.

There were 7 men, 3 women, and 2 children, 9 and 14 years of age, and the length of time varied from 2 days to 26 months.

#### THE DIAGNOSIS.

The diagnosis of pneumothorax is not always made clinically. Much stress has been laid upon the two *symptoms* which frequently mark the onset, viz., pain and dyspnoea, while in addition sometimes a sense of tearing or a crackling is realised in the chest. The dyspnoea may amount to orthopnoea,—the pulmonary insufficiency of Wintrich. These, however, may be absent or so slight as to pass unnoticed, as Pierre Angereau has recently pointed out, and the presence of air in the pleural sac may be discovered incidentally when making an examination in the usual way.

This author whose monograph has been published recently deals with the subject of such forms of pneumo-thorax which he terms *latent pneumothorax*. Among other conclusions he states:

1st, that total pneumothorax is attended by much pain and dyspnoea;  
2nd, that in partial pneumothorax pain and dyspnoea may be slight or wanting;

3rd, that there exist forms of general pneumothorax absolutely *silent* in their symptoms without pain or dyspnoea.

Lévy is cited by Angereau as saying that partial pneumothorax in its insidious onset is generally in the advanced cases of tuberculosis.

As factors which may mitigate the severity of the symptoms pain and dyspnoea usually noticed on the onset, one may consider the size of the perforation; the directness or indirectness of it; the presence of adhesions, preventing sudden and complete collapse of the lung; the condition of the patient, whether weakened or not; the presence of fluid, already calling for considerable accommodation to this new condition, viz., the use of one lung.

The signs of pneumothorax are as follows:

- (1.) Displacement of the heart and mediastinum.
- (2) Tympanitic resonance over the greater part of lung area, with feeble breathing and dulness at the base.
- (3) Metallic sounds, including metallic tinkling and metallic echo—the *bruit d'airain*.
- (4) Hippocratic succussion.

1. Displacement of the heart or mediastinum does not always occur it is true, yet so constant a sign is it that it is remarkable how recently only it has been described. Notwithstanding the writings of Lænnec and others on this subject, it remained to M. Gaide in 1828 to describe and lay special stress upon this as a point in diagnosis. One may readily suppose that in such cases where strong pericardial and pleural adhesions have been formed as well as in those where the opposite lung is consolidated, such a mediastinal displacement would not be found.

So quickly does this displacement take place that even before the first severe pain following the perforation is over, the heart cannot be found in its normal place.

I recall the remark made by the first patient whom I had under treatment with this condition. He was a very intelligent young man recently at Saranac Lake for phthisis. One day after dinner, while lying upon his bed, he was seized with a severe pain in his left side and experienced a faint feeling. "Believing," as he said, "it was heart failure, I put my hand in my bosom to feel my heart beat, but it could not be found in the right place." Shortly after, his physician found the apex of the heart in the region of the right nipple and every characteristic sign of pneumothorax well marked.

It would appear that such a change of position must arise from one of two possible causes, either increased intrathoracic pressure by which the heart and mediastinum are pushed over, or diminished traction of the elastic lung on the affected side, leaving the other in a normal state of elasticity unopposed. From the rapidity with which cardiac displacement takes place, as shown by clinical observation and experiment, it is pretty well established that increased intrathoracic pressure does not at first exist. Again the lung of the affected side loses its elasticity. Hence we may believe that the heart is pulled, rather than pushed toward the healthy lung.

2. The characteristic variety of percussion note is readily understood, but in this, considerable variation may be observed owing to the tension of chest wall. When pneumothorax occurs, in a very large percentage of those cases where life is prolonged, some form of fluid exudate develops in the pleura. Generally a purulent pleurisy is in-

duced, and then the characteristic basic dulness is found, but only after considerable effusion has been poured out.

3. Metallic sounds are not characteristic of pyopneumothorax, since they are sometimes heard in other thoracic conditions. Yet they are very frequently associated with the condition, and even the coin sound or *bruit d'airain* may be heard over large smooth-walled cavities. Indeed, according to Osler's note recently published, this sign was present and a localized pneumothorax was strongly suspected. The autopsy revealed a large cavity, the walls of which were covered with "granulation tissue and presented here and there papillary projections which, on section, contained remnants of branches of the vessels and bronchi."

This sign is not always present, and it has been seen to vary from time to time in the same subject.

4. Hippocratic succussion is a conclusive sign, concerning the presence of air (gas) and liquid simultaneously within a cavity.

A question in the diagnosis of perforative pneumothorax often arises, whether one has a valvular or free opening, or if the case is seen after this condition has been present for some time, whether there be any communication remaining between the bronchus and the pleural sac. Some have urged that one can decide upon this question by observing the character of the breath sounds. If one hears the inspiratory murmur and the expiratory murmur one must conclude that the air enters and leaves the pleural cavity. It would appear, however, from the history of several cases that this is not reliable. Such auscultatory findings show at most, perhaps, that air enters the lung involved and doubtless the changed character of the respiratory murmur is a product of collapsed lung and resonating chamber,—the pleura sac.

Powell, of London, in his work on Diseases of the Lungs and Pleura, holds, on the contrary, that an amphoric respiratory murmur is diagnostic of a free opening and of special value on this point is the expiratory portion of the amphoric sound.

#### CONCLUSIONS.

1. There is such a form of pneumothorax as the *non-perforative form*.

2. Latent pneumothorax is not infrequent.

3. Occurring in the course of pulmonary tuberculosis pneumothorax may have a retarding effect upon the disease.

4. Recovery of a total pneumothorax may take place without any sign of fluid.

5. In the advanced cases of pulmonary tuberculosis, or at any rate where the patients were regarded as the subjects of pulmonary tuberculosis, fluid is present and the prognosis is grave.

TABLE OF PNEUMOTHORAX CASES.

No.	SEX.	AGE.	SIDE.	MODE OF ONSET.	PREVIOUS HEALTH.	CAUSE.	FLUID.	TREATMENT.	DURATION.	TERMINATION.	REMARKS.
1	M	30	L	Abrupt	Failing	Tuberculosis.	Pus.	Aspiration, rib resection	26 months.	Death Asthenia.	Latent at first. Improvement of general health.
2	M	17	L	Abrupt	Failing	Tuberculosis.	Pus.	Rest in bed, tonics	5½ months.	Lost sight of	Improving.
3	F	38	L	Indefinite	Pulmonary disease	Empyema?	Pus.	Rest, aspiration	8 months.	Lost sight of	Improved. Latent.
4	M	24	L	Very severe Abrupt	Pulmonary disease	Tuberculosis.	Pus.	Rest, tonics.	7½ months.	Death	In early stage.
5	F	14	R	Rathers sudden	Very poor	Tuberculosis.	Pus.	Supporting.	5 weeks.	Death	General infection. Both lungs. Delirium. Diarrhoea.
6	F	19	R	Rather abrupt, substernal pain	Recent anaemia, slight cough	Tuberculosis?	None	Supporting, creosote	5 weeks.	Patient at work	Slight dyspnoea on exertion.
7	M	59	R	Onset sudden while in bed.	Good	?	None	Aspiration of air, creosote	No signs at end of five weeks.	In health	Still at work, several months after.
8	M	19	L	Doubtful, pain and dyspnoea	Good	?	None	Rest	6 months? 1 month?	Comfortable	When quiet. Latent and partial.
9	M	18	R	Sepsis, pleurisy, pneumonia	Septic peritonitis, acute	Bacillus aerogenes capsulatus	Serous sur- guts.	Palliative	2 or 3 days	Death	Pneumothorax and pneumopericardium without perforation.
10	M	9	L	Rathers sudden	Two weeks illness	Empyema	Pus.	Rib resection	3 weeks.	Health	
11	F	29	L	Insidiously	Failing	Tuberculosis.	Purulent.	Of tuberculous	Not known	Death	Discovered post-mortem. Localized at apex. Latent and partial.
12	M	56	L	Not known	Ill one year.	Empyema	Purulent.	Aspiration	Unknown.	Death	

# ON THE BACTERICIDAL FUNCTIONS OF THE LIVER AND THE ETIOLOGY OF PROGRESSIVE HEPATIC CIRRHOSIS.

BY

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Since writing the paper upon Progressive Hepatic Cirrhosis which Professor Osler was good enough to read on my behalf at the Edinburgh meeting of the Association I have been employed without intermission continuing the series of studies therein indicated. These further observations have so expanded and modified the statements already made that I am pleased that what as regards this JOURNAL was the premature publication of my paper elsewhere permits me now to take up the subject in these columns in the light of further researches and further experience.

To recapitulate briefly my Edinburgh paper. I therein pointed out that investigations conducted in Nova Scotia upon a curiously localised enzoötic known as the Pictou cattle disease showed me that in this disease (the most characteristic lesion of which was a peculiar extensive cirrhosis of the liver) there was to be gained from the liver, lymph glands, bile, and occasionally other organs and fluids of the body, a characteristic polymorphous bacillus, which in the earlier stages of its growth outside the body resembles a diplococcus (*vide* Fig. 1) in the later stages became more bacillary, and again when seen in the tissues was present as a diplococcus surrounded by a faint halo. These forms, I may say, are especially abundant in the liver and the glands, and in general a large proportion of them do not take the stain. These non-staining forms are to be recognised as well-defined shadows having a characteristic brownish colour. In the liver the microbes are present, stained and unstained within the liver cells and to a less extent in the newly formed connective tissue. (Fig. II.) The germ is pathogenic for rabbits, guinea-pigs, and mice; and in these animals while death occurs before cirrhosis has had time for adequate development, the microbes are abundant within the liver cells. (Fig. III.)

Struck by many resemblances between this disease and the ordinary cirrhosis in man, I have examined sections from a series of twenty cirrhotic livers, and in them have found constantly an almost identical form present also in the main within the liver cells. These show themselves as minute diplococcus-like bodies surrounded by a faint

halo; they are so small as best to be studied under the one-eighteenth or one-twentieth immersion lens, although they can be made out, yet with some difficulty, under the one-twelfth immersion (*vide* Fig. II). The method of staining found by me to demonstrate them most surely was by carbolised fuchsin followed by bleaching in the bright sunlight for several days.

As an appendix to my paper, I described a case of cirrhosis which had within the last few days come to the *post-mortem* table at the Royal Victoria Hospital. From the liver and other organs of this case was gained a polymorphous bacillus appearing in early cultures as a diplococcus, and later assuming a bacillary or diplobacillary form (*vide* Fig. IV). I pointed out that while in certain respects it resembled the colon bacillus, I must provisionally assume that it was a distinct species. More especially was I led to this conclusion from the fact that upon lactose and glucose broth there was no fermentation of sugar, while preparations made to demonstrate the presence of flagella showed one, or at most a pair, of these, appearing to be terminal and not lateral.

Such, in brief, were the main facts gained by me up to the middle of July. Since then the subject has widened greatly, and I can here give but an epitome of my later researches, the full details of which will be published elsewhere.

Further study of the form isolated from the case of human cirrhosis and of cultures from a second case (for the material of which I am indebted to my friends, Professor Wyatt Johnston and Dr. Anderson) have conclusively proved that this form must be regarded as at most a variety of the colon bacillus. The colonies upon agar plates and tubes made during the first days of growth were much smaller than those obtained ordinarily from the colon bacillus. A growth on fresh acid potato, while visible, was less abundant than that formed by the stock bacillus, and was of a very pale fawn colour rather than brown, and, as already stated, sugars were not fermented, and lateral flagella appeared to be absent.

But now, with frequent transfers upon slightly acid glycerinated agar, the colonies have become larger, and after passage through the rabbit they are scarce distinguishable from those of the ordinary colon bacillus. Glucose and lactose broths are now fermented with a development of the proper proportion of gas (one-half the closed limb of a Smith's fermentation tube), films made from young cultures in broth and glycerinated agar, show abundant lateral flagella. No distinction can be made out in the behaviour in milk, litmus milk, and on fresh acid potato.

As with the colon bacillus, mice seem to be relatively unaffected by intraperitoneal or subcutaneous injections of the organism in question; rabbits are affected. In short, so far as I have studied the two forms, the only well-marked remaining difference between them is, that while the colon bacillus causes broth reacting  $1.5^{\circ}$  acid to phenolphthalein<sup>1</sup> to become generally turbid in from 24 to 48 hours, with the development of relatively little sediment, the forms isolated from the liver, spleen, and kidney of our case of cirrhosis induce so little turbidity of the medium that at the end of 48 hours it is still possible to read print through the test tubes; again the sediment is relatively abundant. Two series of cultures alone, one from the heart blood, the other from the kidney of my case of cirrhosis, still retain some of their original characters; they show feeble growth, imperfect fermentation, and marked liability to present the diplococcus form; but they also with frequent transfer appear to be approximating towards the ordinary colon type.

These facts, with other considerations to be mentioned later, lead me to the present conclusion that the micro-organism in question must be regarded as one of the very numerous varieties of the colon bacillus. A study of Dr. Wyatt Johnston's case has shown me that, along with similar atypical forms, the typical colon bacillus can be obtained directly from the liver in cases of cirrhosis. Again, looking up my previous *post-mortem* records, and Professor Flexner's note upon the bacteriology of the cases of cirrhosis, material from which he courteously sent me, I find that both of us have frequently obtained the colon bacillus from cases of this disease. So also Professor Kanthack concluded that the cultures which I sent to him two years ago from two cases of cirrhosis were those of the colon bacillus, although when first isolated these had certainly been atypical.

It is very possible that under this term "colon bacillus" we include numerous forms which the imperfections of our methods prevent us from properly distinguishing. But balancing all the facts of the case, I cannot lay down that there are adequate grounds for separating this one form from the main group. The only safe conclusion that I can come to is that the cultures of the colon bacillus isolated from the liver of cases of cirrhosis within a few hours after death may be found markedly attenuated or modified, only gaining typical characters after repeated subculture outside the body.

Making a parallel series of inoculations into rabbits with the cirrhosis form and our stock laboratory culture of the colon bacillus, the results tallied very closely. I will here, however, only mention one—but that one all-important for the full comprehension of the subject.

If 0.5 c.cm. of a 48-hour broth culture of either form be inoculated into the marginal vein of the rabbit's ear, within twenty-four hours the liver cells are crowded with forms which are in the main diplococci. Occasional streaks of three dots or of four can be made out; but whereas the individuals in the 48-hour growth prior to inoculation were present in the main as stumpy bacilli and diplobacilli, now in the liver these were present in a diplococcus form (*Vide* Fig. V).

As to the exact method of the passage of these bacilli into the liver cells, I am not fully prepared to make a statement. Dr. Maude Abbott is at present making a series of studies upon the subject. I can only here point out that (1) it is an observation frequently repeated, that the endothelium of the hepatic capillaries possesses pronounced phagocytic properties; (2) that Chiari has recorded similar results following the intravenous inoculation of a closely allied form (the typhoid bacillus); and (3) that the remarkable appearances presented can be easily reproduced, cautious staining with carbolfuchsin giving excellent results.

It is clear from this one series of observations that the colon bacilli injected into the blood stream find their way into the liver cells, and, what is more, they are present in these in greater numbers than in the spleen, kidneys, or other organs; but what is equally remarkable is that at the end of sixteen to twenty-four hours in rabbits so inoculated, while the liver is so crowded with the bacteria, if streak cultures be made from the various organs, abundant colonies may be obtained from the spleen, the heart blood, and also, but to a less extent, from the kidney; but taking a considerable amount of liver juice, this provides relatively few colonies. So far, in these early cases, the bile has been found by us to be sterile. It would seem clear, therefore, that the liver cells do not act as excretory agents for the bacilli, but have pronounced bactericidal functions. Save for Chiari's observations upon the similar destruction of the typhoid bacilli, this remarkable and important function of the liver cells has so far, I believe, escaped general recognition.

As I shall proceed to point out, when we consider that the colon bacillus is the commonest form within the intestinal canal, and is present there in enormous numbers, the full significance of these observations becomes evident. The bacilli or diplococci thus seen in the liver within twenty-four hours after inoculation, are clearly in the main, if not dead, at least incapable of proliferating outside the body. That they are in the process of degeneration is shown, I am inclined to think, by their form and by the fact that they easily give

up their stain, and again, it seems to me, by the fact that when decolorised they have a peculiar brown tinge.

That the colon bacillus should thus appear within the tissues as a coccus or a diplococcus form rather than a bacillus is somewhat difficult to realise. Certainly one's experience in the bacteriological examination of sections of the appendix removed for appendicitis—an experience which here in Montreal is extensive, and in which again the colon bacillus is the form most commonly to be recognised—had not prepared me to recognise that in these diplococci often surrounded by a faint halo I was dealing with the colon bacillus or some variety of the same. Nevertheless, my observations have made this absolutely certain, that not only in the liver, but in the lymphatic glands, and, indeed, in the kidney and spleen the colon bacillus is liable to assume the above form. I have now been able to recognise in the tissues a series of forms from the easily distinguishable and typical bacillus through the diplobacillus, formed of two stumpy members, to a stumpy bacillus, either alone or still as one member of a pair, in which the main body is unstained and so appears as a halo, while along the main axis are to be recognised two fine spherical bodies giving the appearance, as above mentioned, of a diplococcus. I begin now to understand the very frequent diplococci seen in the routine examination of sections of *post-mortem* material, when cultures have revealed not a single diplococcus lanceolatus or other coccus form.

What is more, I have been able to reproduce a like series of appearances outside the body. It is interesting to note that in the early stages of rapid growth in nutrient broth the bacillus is frequently represented by diplococci of fair size, and where the short stumpy bacterium form predominates, proper staining with fuchsin, and decolorisation, gives the appearance of more intense polar staining with a clearer central space. Again, in older growths the bacillary forms when stained to the proper extent, and when examined under a high power, appear to be composed of an obscure string of spherical bodies united by a common investing substance.

I find, however, that when the bacillus has been grown in broth or upon agar, close to the upper temperature limit of growth and under certain other conditions unfavourable to active proliferation, then these interior bodies, whatever be their nature, are most easily demonstrable, so that a long bacillary form is seen to be composed of an investing relatively colourless ground substance in which are disposed either a row of deeply-stained spherules; or again, each of such spherules, which at first appears to be somewhat oval, can be resolved into a pair of gonococcus-like bodies, the division between which is roughly at right angles to the long axis of the bacillus.

I will not here pretend to lay down what is the nature of these bodies; to call them nuclei or pronuclei would, in the present state of our knowledge, be if not absurd at least indefensible. Their arrangement is, however, very remarkable, and appears to be ultimately related to the vital functions of the bacillus. Here, again, abundant work is necessary before their full meaning is elicited.

Another series of observations begun by me is an examination of sections from some 200 portions of liver preserved from the necropsies at the Royal Victoria Hospital during the last three years. These I have selected from cases in which examination with ordinary stains has shown the absence of anything that could be spoken of as cirrhosis. So far I have already examined only 40 of these, but in this series of sections, to my surprise and, I must acknowledge, temporary confusion, I have found with scarce an exception indications of the presence of these shadows of the colon or allied bacilli. I stained these sections by carbolised fuchsin and bleached them in the sunlight and while I have found in them very rare deeply-staining diplococcus forms and still rarer typical colon-like bacilli, it is the minute brown shadows, namely, the unstaining diplococcus-like bodies tending to be surrounded by a halo that I have almost constantly come across. So common is the appearance, that in the three cases in which I have failed to recognise it I am inclined to ascribe my failure to insufficient study. In other words, not a little of the fine brown pigmentation recognisable in the liver cells apparently healthy (but not all) is an indication that colon—and presumably other—bacilli have been taken up by the liver cells and have there been destroyed. This statement I know will be doubted, but I make it with a full sense of responsibility. I have experimentally, and in the organs, more especially in cases of cirrhosis, observed the successive stages, and I have no longer any doubt about the absolute correctness of the statement.

From this it follows, we must assume (1) that the colon bacilli in small numbers, are, in the healthy individual, constantly finding their way into the finer branches of the portal circulation; and (2) that one of the functions of the liver is to arrest the further passage of these bacilli into the general circulation, and to destroy them through the agency of the specific cell of the organ.

I have not as yet been able to make a parallel series of examinations of the mesenteric glands; I can only point out, that in cases of lobnailed liver the appearance of sections of these glands when properly stained by carbol-fuchsin or carbol-thionin is remarkable. (*Vide* Figs. VI. and VII.)

It is scarcely necessary for me to point out the steps by which the

bacilli pass from the lumen of the intestine into the tissues, and so into the lymph and blood capillaries. Observations of Heidenhain, Ruffer, and others have demonstrated with the greatest clearness that leucocytes are continually passing out on to the free surface of the intestinal mucosa, and that a large number of these, laden with fatty particles, bacteria, and other matters, find their way back into the submucous layer.

These observations at first sight would appear to wholly controvert the view that there is any necessary connection between the presence of more or less modified colon bacilli, or varieties of the same, in the liver and the development of ordinary progressive cirrhosis. It may be argued that inasmuch as such forms are constantly to be found in the liver, it is clear that the bacillus can have no power to induce excessive connective tissue formation, for otherwise every living being should suffer from cirrhosis. But there is this to be noticed: in the ordinary liver in which cirrhosis is absent, the forms visible are almost all corpses, and even long action of strong carbolised fuchsin will not lead them to become stained. In cirrhosis, on the other hand, while there are many of these non-staining forms, areas can be made out in which diplococcus-like bodies stain deeply. Either they have only recently entered the organ and are just killed, or they are still alive though in a form so attenuated, that it is only with difficulty that cultures can be gained from the organ. I still cannot but consider that the very great number of these forms found in well-marked advancing cases of cirrhosis is ample evidence that there is a direct connection between these and the process. So, also, in those advancing cases of cirrhosis my observations show me that the mesenteric glands are crowded with a diplococcus form of the bacillus, just as I found them crowded in cases of Pictou cattle disease.

In favour of this contention that there is a relationship between the presence of these diplococcus forms and the development of ordinary cirrhosis, the following considerations appear to be of weight:

1. The very great number of these forms found in the liver in well-marked progressive cases of ordinary hepatic cirrhosis.

2. The coincident great number of the same recognisable in the mesenteric lymphatic glands, there being in this a close parallelism to what is seen in the Pictou cattle disease.

3. The parallelism in general between the bacteriology of these cases and that of Pictou cattle disease. Up to the present time my investigations upon the micro-organism of this disease show that, while very closely allied in form and characters to the colon bacillus, it is and remains a distinct species. Repeated subculture during the

last three years has not brought it nearer to type, if I may so express it. The agar colonies of the bacillus are much smaller than those of the ordinary colon bacillus; it does not ferment lactose or glucose, and does not yield the indol reaction, while upon acid potato the superficial growth is so slight as to be almost invisible, and I have found inoculations fatal to mice—animals not killed by the colon bacillus.

The constant discovery of this form in animals afflicted with the Pictou cattle disease renders it a most reasonable supposition that there is a direct relationship between its presence and the development of the disease. At the same time it is to be borne in mind that, so far, by simple inoculation, although rabbits, guinea-pigs, and mice are killed—and that on the average after relatively long periods (fifteen to thirty days in the two former animals)—I have been unable to reproduce the cirrhotic change in the livers of the same. It may be that the time elapsing between inoculation and death is too short to permit extensive fibrosis to develop, but it may well be that some additional factor is necessary to cause the cirrhosis in the cattle as in the inoculated animals, some prior or contemporaneous action upon the liver cells favouring the multiplication of the bacteria, or aiding the pathogenic action of their toxins upon the hepatic tissues.

Had further work upon human cirrhosis confirmed my first impression that the form isolated possessed individual features, and had further study revealed the repeated presence of such specific microbe in cases of the disease, it would also have been reasonable to assume cirrhosis to be due to the action of such a germ. But further study has shown that while one germ is to be detected in the livers of advancing cases of cirrhosis that germ is evidently the colon bacillus, more or less attenuated, it is true, but still a common form, and one which is habitually to be detected in livers presenting not a sign of cirrhotic change. If, therefore, there is any relationship between the presence of such a form and the development of the disease, clearly some other factor or factors must be at work. But beyond the point that there is this remarkable abundance of modified colon bacilli in the liver and in the mesenteric glands in cases of ordinary cirrhosis, I can at the present moment bring no further facts forward. To state positively what is the additional factor or factors requires experiments which necessitate months to bring to a definite issue. One may undoubtedly hazard a very shrewd guess as to what they must be. If the bacilli gain entry into the system through the intermediation of leucocytes, then a subacute enteritis or gastro-enteritis appears to afford the necessary localised determination of leucocytes, and such subacute or chronic gastro-enteritis is a very familiar feature in

the clinical history of cirrhosis in man. If some depression of the functions of the hepatic cells be requisite, then we know that alcohol, the main predisposing cause of ordinary cirrhosis, has a direct action upon the hepatic parenchyma. Indeed Ramond<sup>2</sup> would seem already to have had a slight measure of success in the experimental production of hepatic cirrhosis, by giving to animals by the mouth alternating doses of alcohol and bacterial toxins over long periods. It is along somewhat similar lines that I am at present working, employing not toxins but cultures of the colon bacillus alternated with alcohol. The result will show whether this will give to us the solution of the cirrhosis problem.

I am the more inclined to be cautious, in that the conclusions reached in the appendix to my Edinburgh paper, although stated to be provisional, may naturally have raised expectations as to the specific nature of ordinary cirrhosis which this further contribution to the study must overthrow. It is so novel and unexpected a discovery that in the tissues the colon bacillus may be represented by a minute diplococcus-like body that I cannot but feel that for the statements contained in my Edinburgh paper no apology is needed.<sup>3</sup> The recognition of this diplococcus-like modification in itself modifies and expands the subject to such an extent as to open up a very wide field. For the present I shall be amply satisfied if I have adduced evidence favouring the view that after all what—in the absence of adequate classification—I prefer to call “progressive hepatic cirrhosis,” is but one of the results of the entry of the colon bacillus and its products into the system.

In conclusion, let me state again that I do not for a moment assume that all extensive fibrosis or cirrhosis of the liver belongs to the same category. I fully admit that syphilis, tuberculosis, typhoid, and perchance some of the exanthemata, may be followed by extensive laying down of new connective tissue in the liver. But in none of these conditions, with the possible exception of syphilis, does the cirrhotic change assume the peculiarly progressive and extensive type seen in the hobnailed liver and the varieties of the same. And, as to Hanot's cirrhosis, never having studied a case possessing the classical symptomatology of this disease I cannot make any statement.

#### REFERENCES AND NOTE.

<sup>1</sup> Procedures recommended for the Study of Bacteria, *Journal of Amer. Public Health Association*, 1898, p. 75; reprint, p. 38.

<sup>2</sup> *La Presse Médicale*, April, 21st, 1897.

<sup>3</sup> Of my previous observations, but one, I believe, has not been confirmed in my further studies. I refer to the observation that in the microbes isolated from a case of cirrhosis the flagella were terminal. In the earlier specimens, made by the Nicolle-Morax modification of Loeffler's method, I looked most carefully for lateral flagella and found none.

*The specimens utilized for my camera lucida drawings appeared so definite that I forwarded it to Edinbuagh, there to be demonstrated. Later specimens stained for flagella by the same method show most clearly the lateral arrangement and abundant flagella. Either the earlier attenuated forms were provided with few flagella, and those close to the ends, or the early preparations were defective. I am ignorant of any observations supporting the former view, and must, therefore, except the latter as the probable explanation. It is, however, interesting to note that the earlier observers upon the colon bacillus made a like mistake and accorded it to terminal flagella.*

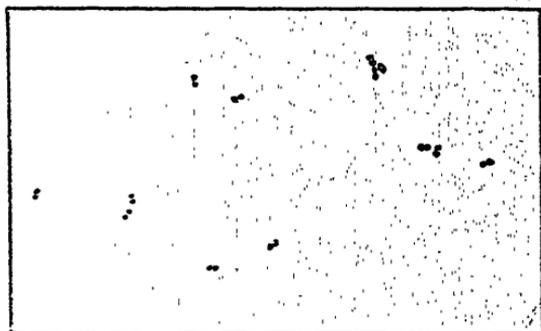


FIG. I.

Microbe of *Pictou Cattle Disease* from 24 hour old agar culture.

Stained Carbol Fuchsin.

Reichart  $\frac{1}{8}$  immersion.

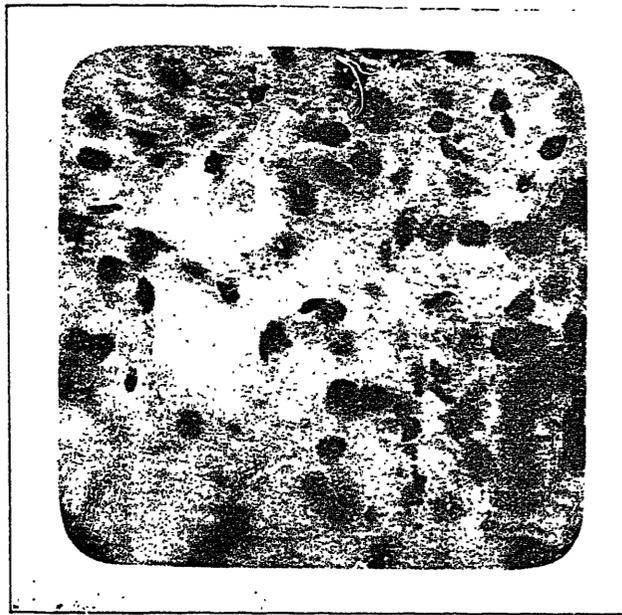
Zeiss camera lucida.



FIGURE IV.

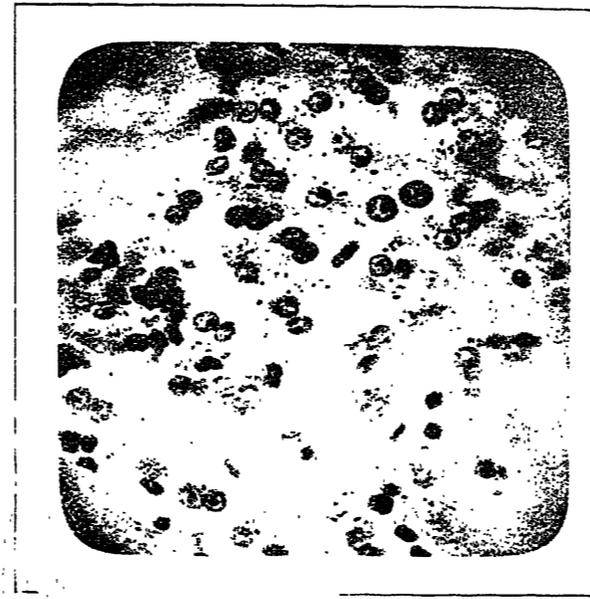
Microbe isolated from case of Progressive Cirrhosis in man. Broth cultures from pipetta of heart blood 24 hours old. Stained Carbol fuchsin;  $\frac{1}{8}$  immersion and camera lucida.

Growth feeble and specimen over decolourised, so that diplococcus forms appear smaller than normal.



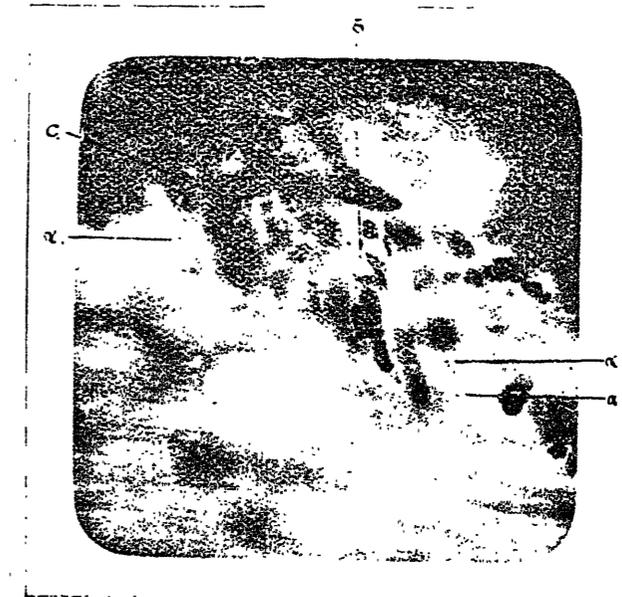
PICTOU CATTLE DISEASE.

Fig. II.—Section of Liver of Cow killed in course of the disease: Stained with Carbol Fuchsin 24 hours bleached in the sunlight for six weeks after mounting. Photographed under Reichert 3<sup>rd</sup> immersion. A few of the diplococcus forms surrounded by a faint halo can be well seen: these appear to be largely within the liver cells. With a magnifying glass the position of several other germs not perfectly in focus, can be made out.



PICTOU CATTLE DISEASE.

Fig. III.—Section of Liver of RABBIT inoculated intraperitoneally with pure culture of microbe, and dying 21 days later. Treated like preceding and photographed under the same magnification. Innumerable diplococcus forms in the main *within* the liver cells. Some, not perfectly in focus seen as ovoid bodies, others as dots (end on). The varying size is apparently due to different degrees of bleaching (in part).



PROGRESSIVE CIRRHOSIS IN MAN.

Fig. IV.—Section of Liver from case of more diffuse Cirrhosis than the preceding: treated similarly to preceding.  
*a.a.* Diplococcus forms within degenerating liver cells.  
*b.b.* The same in the immediate neighbourhood of what appear to be fusiform connective tissue nuclei.  
*c.* Group of diplococcus forms in liver cell.

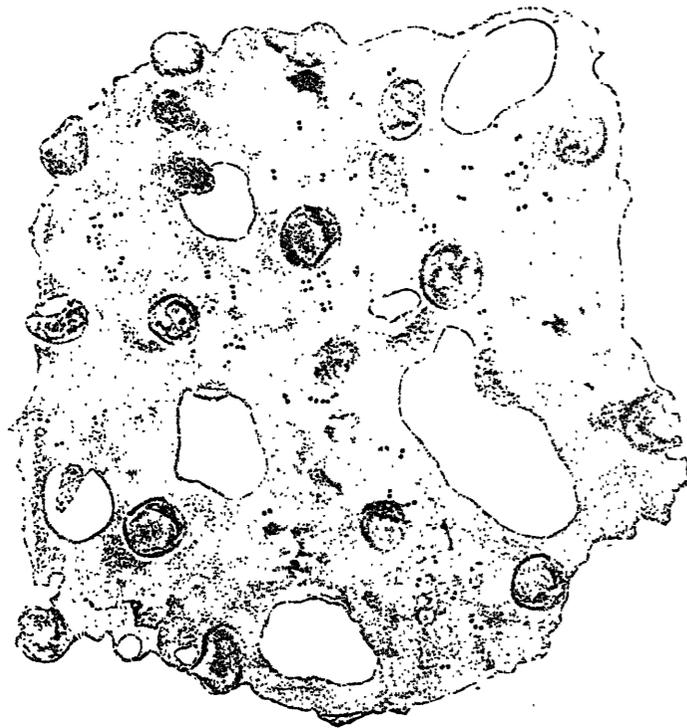


Fig. V.—From section of liver, stained by carbol thionin, of rabbit dying 16 hours after intravenous inoculation of 0.5 c. cm. of a 48 hour broth culture of bacillus gained from spleen of case of progressive portal cirrhosis. Drawing made by Zeiss's camera lucida, 1/2 in. immersion lens (Winkel), Oc. 1. Sections from liver of rabbit inoculated intravenously with like dose of *B. coli* showed identical appearance.

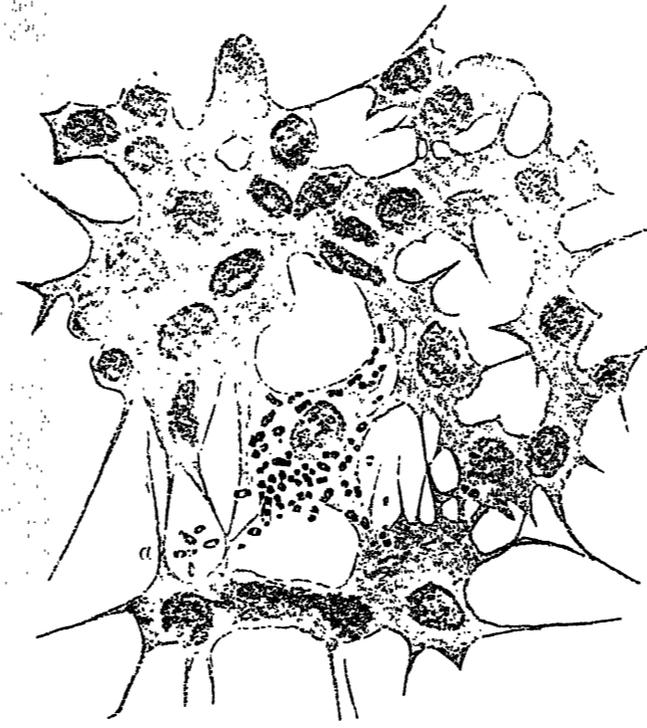


Fig. VI.—From section of mesenteric gland from case of portal cirrhosis. Stained carbol thionin, drawn under camera lucida, 1/2 immersion lens (Reichert), Oc. 4. The section shows portion of a lymph sinus with colon bacilli which have apparently undergone proliferation *post mortem* in one of the large lymph cells. At *a* either the staining is partial or the bacilli already show signs of degeneration.



Fig. VII.—At other portion of the same section, drawn under the same magnification. Here in a lymph sinus some of the cells show in their protoplasm small clear spaces containing two, or more rarely three or four, fine deep brown spherules—shadows of colon bacilli. At *a* is shown the shadow (ansta n d) of some other form. At *b* is a large cell filled with fine pigment particles, unsurrounded by halos. Elsewhere in the section were large accumulations of amorphous brown pigment.

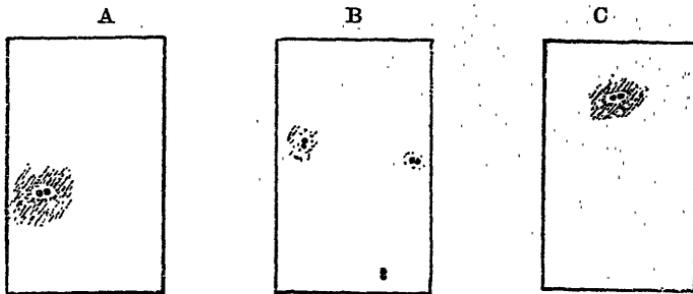


FIGURE VIII.

From slide preparations from agar (glycerinated) cultures made direct from pipettes taken at autopsy 52.98 on case of atrophic cirrhosis. Drawn with Zeiss's camera lucida. Reichert  $\frac{1}{8}$ th immersion. Stained carbol fuchsin.

A From Kidney juice pipettes, 24 hours growth.

B From Mesenteric Gland " " "

C From Ascitic Fluid " " "

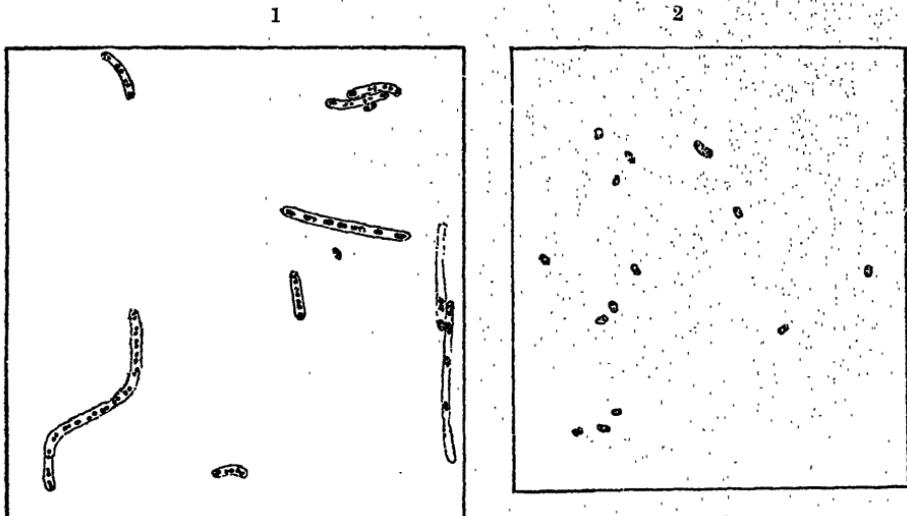


FIGURE IX;

Microbe isolated from case of Progressive Cirrhosis in man. To show extreme polymorphism.

1. From agar plate colony; plate made from isolated colony on glycerinated agar inoculated from spleen juice. Agar plate 5 days old. Shows long filaments composed of series of diplococci imbedded in sheaths.

2. From broth cultures 8 hours old, inoculated from colony on agar plate supplying the filamentous form.

# INFECTIVE PERITONITIS, WITH SPECIAL REFERENCE TO A SUGGESTED METHOD OF IMPROVING THE PRESENT METHODS OF SURGICAL TREATMENT.

BY

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(Continued.)

## *Method of Treatment employed in the Case of Infective Inflammatory Conditions within the Peritoneum*

Here I shall in no way refer to medical measures which may be adopted, but shall confine myself to various surgical procedures which are generally carried out.

In cases of general peritonitis, as I have already stated in the beginning of this paper, the adoption of every method recommended by surgeons of repute has been followed by unsatisfactory results, and in spite of the advocacy of each, favored probably by some happy experience of exceptionally successful operative procedures, it must be confessed that infective peritonitis is attended in the hands of the most skilful operators with a very high mortality.

I have already pointed out the great variations which follow the development of micro-organisms in the peritoneal cavity, both as regards the effects on the system, and the reactionary changes induced in the tissues exposed to the infection. I have also enumerated many observations and experiments showing the great part played by microbes contained within the bowel-lumen.

The accumulated facts which I have summarized, lead clearly to the realization of the difference which exists between an infective process started within the peritoneal cavity, and one developing in most other parts of the body, *e.g.*, arm, buttock, etc. The great difference is this, *viz.*: that the peritoneal cavity is in intimate relationship with an enormous storehouse of micro-organisms, *viz.*, the alimentary tract from which the germs may pass with great readiness where any condition exists which diminishes the vitality of the bowel-wall.

Irrigation of the peritoneum with saline solution or boiled water has its advocates, but there can be no doubt that this method is not suffi-

cient to clean the peritoneum thoroughly, even where adhesions do not exist.

Reichel experimented with dogs and found that he could never save an animal by this method, if severe infective peritonitis was in progress. He also found, on putting fecal matter within the dog's peritoneum, that, after sponging and irrigating with as much as ten or fifteen litres of water, he could not clean the peritoneum from particles. Sponging alone is recommended by many, but it is no more advantageous than irrigation. The most satisfactory results are obtained where free drainage of the infected cavity has been carried out beforehand. Still this method, even though preceded by sponging or irrigation, has done but little to lessen the death-rate in infective processes within the peritoneal cavity.

In mentioning these methods I refer to them as being entirely dissociated from the use of antiseptics.

My aim in writing this paper is to urge the employment of a suitable antiseptic agent, associated with free irrigation and free drainage (and sponging in certain cases).

At the present time the employment of antiseptic solutions within the peritoneal cavity is very little in vogue. Formerly, various substances were employed by different operators, *e.g.*, weak boracic acid, salicylic or corrosive-sublimate solutions, but these have been gradually abolished.

The reason for this change was the establishment of the importance of preserving the integrity and vitality of the peritoneal endothelium. It then became evident that to use antiseptic solutions so weak as not to injure the peritoneum and yet not strong enough to destroy or inhibit the activity of microbes within the peritoneal cavity was a useless procedure. Another important consideration also had to be borne in mind, *viz.*, the toxic influence on the system of the absorbed antiseptic.

It is evident, then, that an antiseptic which can be safely and effectively used within the peritoneal cavity must be one capable of being employed in solutions of such strengths as shall inhibit the activity of the microbes, or destroy them, and be non-injurious to the peritoneum. It must also be non-toxic to the system when used in effective quantities.

About two years ago my attention was directed to the new preparation known as formalin, and ever since I have used it largely in surgical work in cases where infective processes were at work.

Very soon after I began to use this antiseptic I became convinced of its great power in checking the activity and growth of pathogenic organisms.

Bacteriological experiments, also, carried out under my supervision regarding the influence of various strengths of solutions of formalin on different cultures, served but to corroborate published results made by various experimentors of repute.

About a year and a half ago I determined to test the effects of formalin in infective processes within the peritoneal cavity in the hope of being able to establish the value of its action, and to determine whether or not it would fulfil the requirements which I have mentioned above as pertaining to an ideal intra-abdominal antiseptic.

Before beginning to use it in the human subject I decided to test its influence in the peritoneal cavity of animals.

For this purpose I chose various breeds of dogs as being most serviceable, and as possessing a peritoneal coat less sensitive than that of the rabbit or guinea-pig—the other animals which it is most convenient to employ in the laboratory.

In certain cases I used the rabbit, and these will be noted later on. My main object was, in the first place, to determine the influence of various strengths of formalin solution on the peritoneum and on the system in general, and to find out the strongest solution that could be borne with safety.

One fact emphasized by all the experimentors is the powerful influence of this substance in inhibiting the activity of microbes. (It is believed by some that this inhibition is due to the transformation of the outer covering of the microbe into a hard, chitin-like material.)

Of course, though such inhibition be not so effectual as the germicidal action of the drug, for all practical purposes the former influence is all that need be exerted in the treatment of the class of cases under consideration.

Indeed, in the case of formalin, to get an active and rapid germicidal influence, one would require to use strengths which would be decidedly harmful (I refer to solutions of 1 in 100 or thereabouts.)

NOTE.—It is very important in making up solutions of formalin to bear in mind the following points :

The earliest commercial preparation supplied was described as a forty-per-cent. solution of pure formaldehyde in water.

It has, however, been shown that many bottles are not of this strength, but are as low as thirty or twenty per cent., or even less. In the next place care must be taken, in making up a solution of a given strength—say 1 in 1000—to specify whether this is a strength relating to the solution in the bottle, or to the formaldehyde which is present in the solution. In my clinical and experimental work I have made up solutions in relation to the formaldehyde in solution. Thus, my

solution of 1 in 3000 is obtained by adding 8 minims of the forty per cent. formalin to 20 ounces of water.

I shall now detail the various experiments carried out by me in the physiological laboratory of McGill University.

#### I.—Effects of formalin on the normal peritoneum.

1. Pug dog. Peritoneal cavity opened into by a mesial incision, and thoroughly irrigated with 20 ounces of formalin solution (1 in 2000), several ounces being left in the belly when the abdominal incision was closed. Within an hour the dog was running about, having shown no signs of distress. He recovered perfectly, being apparently as lively after the operation as he was before.

2. Terrier bitch. The peritoneal cavity was opened, thoroughly irrigated with 40 ounces of formalin solution (1 in 1000) and then closed, several ounces being left behind. In a little over an hour the animal had fairly well recovered from the effects of the ether and had begun to run about. After a few hours she was apparently as well as before the operation, and continued perfectly normal, day after day, having exhibited no sign nor symptom of distress.

3. Terrier pup. Aged five months. In this case the same procedure was carried out as detailed in experiment No. 2. Within an hour the animal was running about and continued perfectly normal.

4. Rabbit. A similar procedure to the last was adopted, recovery following without any abnormal sign or symptom.

5. Terrier pup. Aged four months. Peritoneal cavity opened and irrigated with 30 ounces of formalin solution (1 in 500), normal saline being used to prepare the solution instead of water as in the first four experiments described. A few ounces were left behind and the abdominal incision closed:

Within an hour the pup was running about, continuing afterward as healthy and frisky as before the operation.

6. Terrier bitch. Procedure the same as in case of experiment No. 5. with the same successful results.

7. Terrier. The same experiment as in No. 5 was carried out, except that the formalin solution was made up with distilled water. A couple of hours after the operation the dog was quite lively, and for two days was apparently quite healthy. On the third day the animal became very weak, and kept very quiet; vomiting began and continued from time to time until next day, when death occurred.

Autopsy: Septic peritonitis was found, the intestines being intensely congested, and covered in places with thick lymph. Very little fluid was present.

Cultures were made and abundant growths of staphylococcus aureus were obtained; the bacterium coli commune was not present.

The infection of the peritoneum in this case was undoubtedly due to the fact that the dog gnawed away the dressings and some of the stitches on the second day after the operation, so that the incision became opened up, forming a free communication between the air and the peritoneal cavity.

8. Pug dog. The procedure carried out was the same as that described in experiment No. 7.

During the operation a considerable portion of omentum bound to the abdominal wall by adhesions was made free, resulting in the escape of some blood. The dog remained quiet during several hours following the operation, and continued languid during the next day. On the second day death occurred.

Autopsy: The dressings and stitches were found to have been gnawed away and the abdominal incision somewhat opened up. A couple of ounces of bloody fluid were found in the peritoneal cavity, but no signs of peritonitis were present. The fluid contained no formalin. Only a few staphylococci were found in it. The bloody fluid in this case had apparently come from the area of the separated omentum. The cause of death was not very evident.

The dog was in a weak condition at the time of operation, and probably had poor resisting power.

NOTE.—The above experiments clearly demonstrate that no ill effects follow free irrigation of the peritoneal cavity of the dog with lotions of formalin in strengths of 1 in 1000 and 1 in 2000.

Moreover, the absorption of a considerable quantity left in the belly is not followed by untoward results.

As regards the stronger solution—1 in 500—it is evident that in some cases it can be quite safely used.

The deaths which I have described in the case of two dogs in which this strong solution was used were probably due to accidental causes.

II.—Introduction of infective material into the peritoneal cavity followed by immediate irrigation with formalin solution.

1. Terrier pup, about six months old. The peritoneal cavity was opened and a broth-culture of staphylococcus aureus introduced (from a case of septic peritonitis). Shortly after the cavity was irrigated with 16 ounces of formalin solution (1 in 1000), a small quantity being left behind before closure of the abdomen. The dog recovered quickly from the effects of the ether and continued apparently quite healthy.

2. Terrier. A broth-culture of streptococcus was introduced into

the peritoneal cavity, the bowel and omentum being pinched and scraped in several places. Soon after the cavity was irrigated with 16 ounces of formalin solution (1 in 1000), several ounces being left in the belly. Recovery occurred without symptoms.

3. Collie. The same procedure was carried on as in the last case, save that a fluid culture of bacterium coli commune was introduced.

Within an hour of the operation a violent fit of vomiting caused one of the stitches to be torn out. This was followed by the escape of part of the omentum through the abdominal incision; at the same time the dog tore off the dressings.

When the animal was found in this state the omentum was lying on the floor, cold and dirty; it was replaced uncleaned in the peritoneal cavity, and some fresh formalin lotion poured in before the abdominal incision was closed.

The animal recovered from the operation without a symptom, and appeared to be perfectly normal.

NOTE.—In the above experiments no attempt at cleanliness was observed during the operation as I was desirous of freely introducing infective matter.

I am quite aware that the successful results in the above cases might by many be considered to be independent of the use of the antiseptic solution employed, and it might be suggested that check experiments should have been carried out. In such cases, however, check experiments may not be at all conclusive, owing to the difficulty of getting two dogs so alike as to make it possible to establish similarity of conditions. Moreover, it is well established that the introduction of infective material into the peritoneal cavity of the dog usually leads to serious or fatal peritonitis.

It might also be alleged that irrigation with sterilized water might have proved as satisfactory as the formalin solution in cleansing the cavity. This is undoubtedly possible. The point which I desire to establish, however, is that the solution of formalin, being a safe antiseptic, is calculated to be more efficacious than water.

In carrying out the above experiments I had in mind those cases in which infective material escapes during operations within the peritoneal cavity of the human subject. If, in addition to the ordinary means, viz.: sponging, irrigation, and drainage, flushing with a solution of formalin of suitable strength can be carried out, an additional chance of safety is given to the patient. Moreover, it must be a source of satisfaction to the operator to know that several ounces of this solution may be left in the peritoneal cavity without danger. (It will afterward be seen that I have carried out this procedure in the human subject.)

III.—Infection of the peritoneum, followed by irrigation with formalin solution after the lapse of various intervals.

1. Mongrel Dachshund. Peritoneal cavity opened. Bowel and omentum pinched and scraped in several places. A little blood allowed to enter the cavity.

Broth-culture of streptococcus introduced into the cavity; abdomen closed. The animal was languid after the operation, and on the following day, forty-eight hours after the operation, the incision was reopened.

Marked congestion of the bowel and omentum was found, the latter being somewhat crumpled and adherent to the parietes. Some turbid serum was present.

The omentum was spread out, its adhesions being separated. The peritoneal cavity was then irrigated with formalin solution (1 in 1000), a large quantity being left in the belly before closure of the incision.

After the second operation the dog remained quiet for two or three days, showing no marked symptoms of any kind beyond languor. In a short time it was running about apparently quite well.

2. Bedlington mongrel. Peritoneum opened, bowel and omentum pinched in several places, some blood allowed to enter the cavity. A broth-culture of streptococcus was introduced. The animal was rather languid after the operation, and on the following day vomited somewhat.

In forty-eight hours after the operation the abdominal wound was reopened. Peritonitis had begun and was especially well-marked in the region of the omentum, which was bound to the parietes and to the small intestine by fresh adhesions.

The latter were separated and the belly was washed out with formalin solution (1 in 1000), a large quantity being left inside, and the abdomen was closed. Four days afterward the dog died.

Autopsy: Some of the abdominal stitches had been torn out, so that a communication was established between the air and the peritoneal cavity. (The dog had gnawed the dressings away.)

Peritonitis was present, though not to a marked extent. Half an ounce of turbid serum was found among the omental adhesions.

Cultures made from the fluid showed the presence of staphylococci. The bacterium coli commune was not present.

NOTE.—The dog in this case was not in good condition before the operation, having recently suffered from distemper.

The tearing apart of the wound by the dog introduced an unfortunate complication, which interfered with the progress of the experiment.

3. Pug dog. Abdomen opened. Omentum and bowel pinched in several places. A broth-culture containing staphylococcus aureus and albus was introduced.

After twenty-four hours, during which time the dog was very languid, the wound was reopened.

Dark congestion of the parietal peritoneum, intestines and omentum was found in the lower part of the abdomen; recent adhesions were present, and a little flaky serum was found.

The adhesions were separated and the peritoneal cavity thoroughly irrigated with a formalin solution (1 in 1000), the belly being left as full as possible when the abdominal incision was closed.

For a few days the dog was languid, but did not vomit nor show any special symptoms. Very soon he was running about apparently quite well.

4. Spaniel. Peritoneal cavity opened. Bowel and omentum pinched and scraped in several places. Blood allowed to enter. Fluid cultures of staphylococcus albus and streptococcus were introduced. In twenty-four hours the belly was reopened. Peritonitis was in progress.

Recent adhesions were broken up, the cavity being thoroughly irrigated with formalin solution (1 in 2000), a large quantity being left in the belly before it was closed.

The dog was languid for a short time, but soon got well, no signs of illness being noted.

5. Terrier. Abdomen opened. Omentum and bowel pinched and scraped in several places, some blood being allowed to enter.

Fluid cultures of streptococcus and staphylococcus aureus were introduced. After forty-eight hours the belly was reopened. Marked peritonitis existed, recent adhesions being numerous.

A considerable quantity of flaky serum was present. The adhesions were separated and irrigation was carried out with formalin solution (1 in 500), the belly being left as full as possible when the incision was closed.

Besides languor, which lasted for a few days, no special symptoms were noted, and the dog soon moved about in a perfectly healthy manner.

In operating in the above cases for the purpose of introducing the infective material, no attempt was made at cleanliness in my technique, in order that the chance of infection might be greater.

The results obtained are undoubtedly of great interest. It is, of course, possible that in no instance was the infection severe enough to cause a fatal peritonitis, so that it might be urged that the opening of

the abdomen, after infection had been in progress, followed by the introduction of formalin solution, had not been the chief factor in preventing death.

On the other hand, such injuries as I inflicted on the omentum and bowel, when accompanied with the introduction of active cultures of pathogenic organisms, are usually attended with fatal results.

It is also remarkable that, in these experiments, the dogs recovered after the introduction of the formalin with such little disturbance. At any rate, the presence of the fluid in the peritoneal cavity must have exerted an important inhibitory influence on the infecting organisms.

These experiments are, it seems to me, strongly suggestive of the line of treatment to be adopted in the human subject in cases in which infective peritonitis is in progress.

A similar procedure to that which was carried out in the experiments would not, of course, be followed in the case of man; in the latter one would, in addition to the irrigation, establish two or more openings through which drainage might be kept up and successive irrigations carried out.

To treat a dog in this fashion is practically impossible, on account of the movements which the animal makes, and because of the difficulty of keeping the dressings in order.

It was because of this practical difficulty that I adopted the plan of irrigating after breaking up soft adhesions, and filling the abdomen as full as possible with the formalin solution.

My aim was to bring about the action of the solution on the infective agents before absorption took place from the peritoneal cavity. It was very evident from my experiments that no general toxic effect resulted from the addition of the formalin solution,

*Cases in which I have used Formalin Solution in the Peritoneal Cavity of the Human Subject.*

Having gone thus far with my experiments, I determined to try the effects of formalin in the peritoneal cavity of the human subject, and, as will be seen, I proceeded with great caution. My observations have been made in a number of cases of which the following may be mentioned:

CASE I.—Abdominal section for bilateral pyosalpinx. After separation of many adhesions and removal of the diseased parts, the pelvis was thoroughly swabbed out with formalin solution (1 in 1000), and drainage kept up for twelve hours. The patient made a good recovery.

CASE II.—Abdominal section for bilateral ovarian abscess and pyosalpinx. After removal of the diseased parts, many adhesions being

separated, 60 ounces of formalin solution (1 in 2000) were used for irrigating the pelvis, coming freely into contact with the intestines. The fluid was sponged out and drainage was carried out by means of a glass tube.

The tube was kept in position for twenty-four hours, being exhausted several times during that period. At each exhaustion some formalin solution (1 in 2000) was poured into the tube while it was moved up and down and turned around. In this way the track of the tube was made to come into contact with the antiseptic solution. The patient made a good recovery.

CASE III.—Abdominal section for pyosalpinx. The same procedure was carried out as in the last case, except that the formalin solution was left longer in the abdomen before being sponged out. The patient recovered well.

CASE IV.—Abdominal pan-hysterectomy for sarcoma of the uterus. After removal of the uterus the peritoneal cavity was thoroughly washed out with formalin solution (1 in 2500). The fluid was allowed to drain out slowly through the vagina, and the cavity then flushed out with normal saline solution.

During the after-treatment, the iodoform gauze which was placed in the vagina was changed from time to time, and during the first three days, at each change of dressing, I passed a double catheter into the pelvic cavity and irrigated it with formalin solution (1 in 2000). The patient made a good recovery.

CASE V.—Abdominal section for double salpingo-ovaritis. Irrigation of the abdominal cavity was carried out with formalin solution (1 in 2500); some of the lotion was left inside when the abdomen was completely closed. The patient made a good recovery.

CASE VI.—Right parametric abscess pointing above Poupart's ligament. The abscess was opened above Poupart's ligament and the cavity washed out with formalin solution (1 in 500).

During the irrigation the posterior wall of the abscess cavity burst, on account of its extreme thinness.

This was followed by the immediate descent of small intestine into the abscess cavity. This complication was not, however, found out until the irrigation had been continued for several minutes. The irrigation was then stopped and a glass drainage-tube inserted.

At each exhaustion of the tube during the first few days following operation, a little formalin solution (1 in 1000) was introduced so as to come into contact with the drainage track. My anxiety in this case was increased by the presence under the skin of a pocket into which the pus had burrowed; this was, of course, very carefully dressed

and no infection of the peritoneum took place. No ill effects resulted from the application of the strong formalin solution, and gradual closure of the incision took place, the patient making a good recovery.

In reference to these last cases (with the exception of Case VI.) I wish it to be clearly understood that I employed the formalin solutions, not at all because of the value of their antiseptic action, but solely for the purpose of determining their influence when introduced into the human peritoneal cavity in such strengths as to carry out the conditions which I have already detailed as pertaining to the ideal intra-abdominal antiseptic.

I began tentatively at first, merely sponging the peritoneum of the pelvis and its viscera. In case V. I carried out the same procedure which has been described by me in connection with many of my experiments on dogs, viz., irrigation of the peritoneal cavity followed by closure of the abdomen, a considerable quantity of the solution being left inside.

In no instance did the application of the formalin appear in the slightest degree to cause any unusual symptoms. The accident which I have described in connection with Case VI., viz., the escape of the intestines into the abscess cavity in the progress of its irrigation with strong formalin solution (1 in 500), was of extreme interest in demonstrating that the human peritoneum may, sometimes at least, stand the irrigation of such a strong formalin solution as well as the peritoneum of the dog.

The application, so entirely accidental in this instance, I would not counsel in any other case, because as I have already pointed out, the inhibitory influence of weaker solutions (1 in 1000, 1 in 2000, 1 in 3000, etc.) on microbial activity is sufficiently strong; and the great desideratum in dealing with the peritoneal cavity is to obtain the greatest amount of benefit with the smallest amount of risk to the peritoneal endothelium.

In a certain number of my experiments on dogs, as well as in my operative procedures on the human subject, I employed normal saline solution instead of water in making up my formalin solutions. This I did in the expectation that they would be better borne by the peritoneum. In future work I intend to modify this procedure still farther, viz., first of all, irrigating the peritoneum thoroughly with saline solution, removing this by sponging, and afterward introducing the formalin solution.

The object of this variation is to prevent too rapid absorption of the formalin solution by the peritoneum, and thus to allow its activity to be longer manifested in relation to the infective material present.

That this previous irrigation with saline solution reduces the absorptive powers of the peritoneum, seems to have been fairly well established by Kinscherf's and Delpet's experiments:

**KINSCHERF'S EXPERIMENTS.**—1. The peritoneum was irrigated with a saline solution, and immediately afterward with a solution of corrosive sublimate (1 in 2000). No symptoms of mercuric poisoning followed.

2. Irrigation with corrosive-sublimate solution alone was followed by toxic symptoms.

**DELPET'S EXPERIMENTS.**—Irrigation with saline solution was kept up for ten to twenty minutes. Then more strychnine than would produce tetanus in a control animal was introduced without any symptoms following.

The following cases occurring in the surgical practice of two friends are worthy of note. Their employment of the formalin was at my recommendation.

**CASE I.**—(In care of Dr. Boone, Presque Isle, Maine.)—Male. Aged 56. Abdominal section was performed for appendicitis. A large peri-appendicular abscess was found in which the appendix lay as a mass of slough.

The cavity was washed out with formalin solution (about 1 in 500) and drainage was kept up with a glass tube for a few days. Each day it was thoroughly flushed out twice with the formalin (1 in 1000). On the sixth day the cavity had shrunk to a very small size, and there was scarcely any discharge.

In two weeks from the operation the patient was practically well.

**CASE II.** (In care of Dr. Boone, Presque Isle, Maine.)—Girl. Aged 11. Was first seen after fourteen days of severe illness, in a very low state. A large mass filled the lower part of the belly, and evidences of peritonitis were present.

Abdominal section was carried out, a mesial opening being first made, through which a large quantity of pus escaped. Another opening was also made in the right flank.

Irrigation was carried out with normal saline solution, and afterward with formalin solution (about 1 in 500), the fluid passing among the bowels from one incision to the other.

The inflamed intestines were also sponged, as much as possible, free of lymph.

A glass drainage-tube was then placed in each incision.

Each day after the operation the peritoneal cavity was flushed out with the formalin solution.

Rapid recovery took place, closure of the incision occurring very satisfactorily.

NOTE.—In both of these cases some pain was complained of when the formalin solution was introduced. This was probably due to the strength of the solution employed. The latter was not necessary; a weaker solution might in all probability have been used as effectually and with less disturbance.

CASE III. (In care of Dr. W. F. Hamilton, Montreal.)—Male. Aged 48. A localized peri-appendicular abscess had been opened and the cavity drained. The appendix was found to be a mass of gangrenous tissue, and it was surrounded with large sloughs. On the day following, septic peritonitis was marked, the temperature being elevated and pulse rapid. On the next day there was abdominal distension, vomiting and hiccough.

Dr. Hamilton, who was called in consultation, determined to open the peritoneal cavity freely. The incision made at the operation was reopened and a fresh opening made in the right loin. Thorough irrigation of the belly was made with formalin solution (1 in 500), and, afterward, with a weaker solution. Free drainage was kept up with tubes and every day irrigation of the cavity was carried out with formalin solution (1 in 1000).

On the fourth day the abdominal distension was less and flatus was passed. On the fifth day sloughs came away freely from the original seat of trouble. By the sixth day the temperature had fallen to  $99\frac{2}{3}^{\circ}$  F. and continued low afterward. The patient made a good recovery.

These cases are of great value in demonstrating the safety of formalin solution in the peritoneal cavity. In the two first described, a very strong lotion was employed by my friend, the surgeon in charge, because of the extreme severity of the disease, both where the infective process was mainly localized and where it was generalized.

There seems little doubt that where inflammatory changes are in progress in the peritoneum stronger solutions may be used with safety than where the peritoneum is scarcely or not at all altered.

But, besides illustrating the harmlessness of formalin, these cases demonstrate its power in checking microbial activity in different varieties of infection, viz.: localized sloughing and suppuration, gangrene and diffuse suppurative peritonitis.

The rapidity with which local conditions improved was very remarkable in each instance, and they can only be attributed to the sudden checking of the infective process.

An important feature in the treatment was undoubtedly the making

of two incisions, whereby free drainage was allowed, as well as free thorough irrigation with the formalin solution.

This is a most important procedure, especially in the cases where diffuse suppurative peritonitis exists. If two openings are not sufficient, there should be no hesitation in making a third.

ADDENDUM:1.—Clark, in his recent paper dealing with drainage in abdominal operations, has emphasized the various risks attendant upon the use of gauze and tube-drains. One of these risks I wish to notice, viz.: infection occurring in the drain-track in cases where it was not present at the time of the operation. Though in most cases this infection leads merely to local trouble, it may be a troublesome complication, and several operators have drawn attention to it.

As a means of preventing its occurrence, I wish to recommend the use of formalin solution (1 in 1000 or 1 in 2000). I have already described how this may be employed when drainage is carried out with a tube.

If gauze be the drain-material, the solution could easily be made to saturate it from time to time.

ADDENDUM 2.—Experiments to determine the effects of chinisol in the peritoneal cavity.

Not long ago chinisol, one of the quinoline compounds, was introduced as a non-toxic, non-corrosive, non-irritating, powerful antiseptic agent.

According to the reports of various experimentors who studied its effects on micro-organisms, its inhibitory influence is manifested even in weak solutions in a marked degree.

Wyatt Johnson, in a report to the Board of Health of the Province of Quebec, Canada, states that chinisol is practically non-toxic, even when used concentrated, and that its power of checking or inhibiting the growths of microbes is very high even in very weak solutions. He points out, however, that it requires very strong solutions to *destroy* the germs. He states that it offers "decided advantages for therapeutic surgical purposes."

I have recently begun a series of experiments on animals on the lines described in connection with formalin.

I.—Influence of chinisol when placed in the peritoneal cavity.

1. Mongrel fox-terrier. Abdomen opened and irrigated with chinisol solution (1 in 500). On closing the incision the belly was left as full as possible. Inside an hour the animal was running about. No ill effects followed.

2. The same experiment repeated, with same results.

3. The same experiment repeated, with same results, a formalin solution of weaker strength being used.

II.—Introduction of infective material into peritoneal cavity, followed by immediate irrigation with chinisol solution :

Terrier. Abdomen opened. Bowel and omentum pinched and scraped in several places, and a fluid culture of staphylococcus aureus introduced. Irrigation was then carried out with chinisol solution (1 in 500), several ounces being left in the belly when closure took place.

Recovery occurred without any abnormal symptoms.

III.—Introduction of infective material followed by irrigation with chinisol solution after the lapse of a period of time :

1. Collie. Abdomen opened. Bowel and omentum pinched and scraped in several places. Fluid cultures of bacterium coli commune and staphylococcus aureus were introduced. Within twelve hours the dog became very languid and lay down most of the time.

Forty-eight hours after the operation the belly was reopened. Acute peritonitis was present, there being considerable bloody fluid in the cavity. Numerous adhesions had formed. Those were broken down and irrigation carried out with chinisol solution (1 in 1000), several ounces being left in the belly when it was closed.

The dog remained languid for a couple of days, but made a perfect recovery.

2, Terrier. Abdomen opened. Bowel and omentum injured. Blood allowed to enter cavity. Fluid cultures of bacterium coli commune and of micrococcus flavus were introduced.

Within twelve hours the dog was sick and languid, breathing irregularly, and having diarrhoea.

Twenty-four hours after the infection the belly was reopened. Early peritonitis was present, adhesions having begun to form.

Irrigation was carried out with chinisol solution (1 in 1000), several ounces being left inside when the belly was closed.

3. Terrier bitch. Abdomen opened. A hole was made in the ileum close to the colon, and the bowel contents (fluid matter) squeezed from half a foot of bowel into the peritoneal cavity.

At the same time a fluid culture of bacterium coli commune was placed there. The opening in the ileum was carefully closed.

Some hours after the operation the dog became languid and had shivering attacks.

Twenty-four hours after the operation the abdomen was opened. Early peritonitis was in progress, some serous fluid being present.

Thorough irrigation was carried out with chinisol solution (1 in 1000), as much as possible being inside when the belly was closed.

The dog was very quiet and indisposed for several days, but recovered perfectly.

## BIBLIOGRAPHY.

- Armstrong, *Montreal Med. Journ.*, 1897.  
 Barbacci, *Centralbl. f. Path. u. Path. Anat.*, 1893.  
 Bönnecken, *Virchow's Archiv*, Vol. 120.  
 Clark, *The American Journ. of Obst.*, 1897.  
 Ekehorn, *Upsala Lakere Forh.*, 1892-93.  
 Fränkel, *Wiener klin. Wochenschr.*, 1891.  
 Grawitz, *Charité Annal.*, 1886.  
 Halsted, *The Johns Hopkins Hosp. Rep.*, 1891.  
 Hawkins, "Diseases of the Verm. Appendix," London, 1895.  
 Kaiser, *Deutsch. Arch. f. klin. Med.*, 1876.  
 Kinscherf, "Die Drainage d. Peritoneums," Würzburg, 1890.  
 Klecki, *Ann. de l'Inst. Pasteur*, 1895.  
 Körti, *Deutsche. Gesellschr. f. Chir.*, 1892.  
 Krecke, *München. med. Wochenschr.*, 1892.  
 Kriege, *Berlin klin. Wochenschr.*, 1892.  
 Macaigne, "Le Bact. Coli Commune," Paris, 1892.  
 Muscatello, *Virchow's Archiv*, 1895.  
 Pawlowsky, *Virchow's Archiv*, 1880.  
 Porter, *Amer. J. of Med. Sc.*, 1893.  
 Reichel, *Deutsche. Zeitschr. f. Chir.*, Bd. XXX.  
 Reynier and Reichel, *Comptes Rendus*, 1880.  
 Tavel and Lanz, "Ueber d. Aetologie d. Peritonitis," Basel, 1893.  
 Treves, "Peritonitis," London, 1894.  
 Wegner, *Verhandlungen d. deutsche. Gesellsch. f. Chirurgie*, 1877.  
 Welch, *Am. Journ. Med. Sc.*, 1891.

## Case Reports.

### EXCISION OF HALF OF THE TONGUE.

BY

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J. L., *æt.* 63, entered the Montreal General Hospital on Sept. 15th, complaining of a painful lump on right side of tongue and difficulty in swallowing.

About two years ago the patient noticed a roughening on the right side of the tongue, about  $1\frac{1}{2}$  inches from tip, which caused no pain but did not disappear. Four months ago a little lump appeared on the right side of his tongue which pained him greatly and inconvenienced him in swallowing.

For the last two months patient has not taken any solid food and during the last four months has lost flesh. Examination of the tongue showed, on the right side of the border of the tongue, a small hard indurated mass, about the size of a small bean, which appeared to involve the lingual nerve. Hot and cold liquids caused the patient pain.

An operation was advised for removal of half the tongue by Butlin's modification of Kocher's method.

Patient was prepared for operation on Sept. 21st. Ether having been given, a preliminary tracheotomy was performed and a well-fitting canula introduced. The pharynx was then packed. An incision was then made from the mastoid process to the hyoid bone and thence along the anterior belly of the digastric muscle to the jaw, slightly to the right of the median raphe. The platysma was divided and the lingual artery ligatured as it passed under the hyoglossus muscle. The facial artery was tied, the submaxillary and lymphatic glands were then extirpated, all the lymphatic glands carefully dissected from the anterior triangle of the neck, the mylohyoid muscle divided and the sublingual glands removed. The mucous membrane along the jaw, and the mylohyoid muscle was then divided. The tongue was split down the middle line, the right side drawn well out of the wound and excised well behind the disease. All oozing being stopped, the wound was closed, the tracheotomy tube left in and the

pharynx freshly plugged. For three days the patient was fed by the rectum and after that by a tube through the mouth. On the eighth day the tube was removed, and on Oct. 25th, the patient was discharged, cured, being the thirty-first day after operation. The pathological report was carcinoma of the tongue.

This patient presented himself for inspection on the 1st December. The remaining half of the tongue lay in the middle of the floor of the mouth and was straight, not curled up; it was moist, and materially useful in mastication and speaking.

# ALCOHOLISM AND RESPONSIBILITY.<sup>1</sup>

BY

GEORGES VILLENEUVE, M.D.

Associate Professor of Legal Medicine and Mental Diseases at the Laval University, Montreal; Medical Superintendent of the St. Jean de Dieu Asylum for the Insane, Longue-Pointe, Que.

I desire to submit to the society the case of a man brought before the Court of Queen's Bench for trial on an accusation of having illegally attempted to commit suicide. The action was brought in virtue of article 338 of the Criminal Code of 1892, which reads as follows: "Any one attempting to commit suicide, is guilty of an "illegal act and liable to two years imprisonment."

The attempt or rather attempts at suicide of which L. T., is accused were made in a police station cell, and the circumstances under which they took place were told by the police officers at the preliminary inquiry held by the Police Magistrate. L. T., had in succession tried to cut the radial artery of the left wrist, to hang himself, and to strangle himself. When he was locked up at the police station, the accused who had been drinking heavily for two or three days, was in a very advanced state of intoxication, and had a very wild appearance.

The fact and the seriousness of the attempts at suicide are indisputable, they were corroborated by the testimony of credible witnesses, and the prisoner himself still bears the marks. "T" himself, however, declares that he never had the intention of committing suicide, that he recollects nothing, and receives with some hesitation the story of the police officers.

At the time of examination L. T. did not show any intellectual trouble, and his state of mental health during the whole time under observation could not furnish any ground for doubt. His clearness of mind was perfect, his memory sure and reliable, and he perfectly understood his position, stating voluntarily that he profoundly regretted the abuse of drink to which he gave way, and certainly realized the consequences. He did not rave on any subject (delusions) and did not experience any sensory troubles (hallucinations.) Moreover, his sanity was never suspected, except on the occasions when he gave himself up to alcoholic abuses. His neighbours say, that relatively, a very small quantity only was enough to make him drunk, and

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<sup>1</sup> Read before the Médico-Psychological Society of Quebec, October 15th, 1898.

that when in that state he acted like a fool, and that once, after he had made an attempt at suicide in a drunken spree, he was sent to an asylum in the United States and confined there. L. T. himself says that when sober, he never has had the idea or desire to commit suicide, and that at all events he never made an attempt to kill himself except when in liquor.

L. T. is 26 years of age, and has been married for six years. His father is a respectable citizen and a total abstainer, of irreproachable conduct and ordinary intelligence, and has never shown any intellectual trouble. The fact that he has held the same situation for thirty years is ample proof of this. His paternal grandfather was an inebriate given to frequent and prolonged sprees, a paternal uncle also was an inebriate, going on sprees, and often had delirious attacks following his abuses of alcoholic stimulants. His father's married sister died at St. Jean de Dieu Asylum within two weeks from an attack of acute mania, consequent on the fatigue and grief occasioned by the sickness and death of one of her nieces. She had had frequent severe and prolonged attacks of mania, resulting from the most trivial causes both before and after her marriage.

While the prisoner is of small stature, the development of his head is considerable, the measure of his hat being No. 7. A lump on his left temple, a slight deflection of the nose, and a default in one of the points of his chin, give him an appearance of want of symmetry which is quite noticeable.

The information which I have obtained concerning his mode of life is not very full, and should be cautiously considered. It has been furnished by one of his class-mates, whose recollections are rather dim, by his father who fears him and trembles lest his son should take his life and who would like nothing better than to see him confined, by his wife, who seems to be indulgently inclined, and by the prisoner himself, who desires nothing so much as his freedom and seeks, with that end in view, to belittle the effect of his errors. In spite of all their exaggerations or reticence, the character and conduct of L. T. is distinctly brought out.

At college he was considered a bright student, notwithstanding a propensity for laziness, and stood well in his class because it required little effort on his part to learn, but he was shunned on account of his sullen temper, and was generally looked upon as a badly balanced man. Later, after leaving college, he always fulfilled intelligently, when sober, the duties confided to him. His last employers testify, that when sober, L. T. gives them entire satisfaction, that he is an excellent employee, polite, of good manners, laborious and intelligent.

The fact of their having kept him in their service in spite of his misdeeds, and of having taken him back after his conviction, is sufficient evidence of the good opinion his employers have of his intelligence, work and capability.

His habits of intemperance have become boisterously manifest since his marriage. Previous to this nothing was noticeable, but his father is of the opinion that he drank secretly outside with his friends, and that he in this manner, contracted the habit for drink. However, since his marriage, he has frequently got drunk, never letting more than a month or two pass without going on sprees lasting several days, except when confined in the asylum or prison. The disorderly manifestations of his drunkenness had often led to his arrest, and his repeated attempts at suicide were the cause of his being cited several times before the courts.

L. T's. drunkenness almost always shows the self-same character. He gets drunk very easily, and alcoholic stimulants act on him with great effect, after a few glasses, he completely loses control of himself. He then drinks until he becomes mad, and if he is thwarted he becomes violent. On one occasion he knocked his wife down and seized her by the throat to force her to give him money for more drink. When he is drunk he is wicked, aggressive, and strikes, brandishes arms, and breaks the furniture. He has threatened his father, and the latter has several times had great trouble in subduing him. After a short while, sometimes within 24 hours, the alcoholic delirium makes its appearance, manifesting itself by nightmare, nocturnal fears, and specific hallucinations. He sees his dead relations, fantastic animals, bugs as big as elephants, who open enormous fans, he sees rats creeping over his body, etc., etc. On several occasions he has had violent epileptic fits, accompanied with falls to the ground, tonic and clonic convulsions, deep snoring, intense twitchings of the face and frothing at the mouth. As soon as he is deprived of liquor, delirium promptly leaves him, he rapidly regains his senses, and the intellectual troubles do not further bother him. It was after a series of similar sprees and mostly always in the police cells where he was confined as drunk and disorderly, that he was guilty of his attempts at suicide, which can be counted at least by tens.

It was impossible for me to procure exact information on the subject, for the prisoner does not remember, or pretends not to remember, the acts he commits when in an advanced state of drunkenness; all that he pretends to know is what they tell him. In New York, where he lived for the first few years after his marriage, the delirium always following his drunken sprees and the convulsive attacks to

which he was subject were often the cause of his being taken for a fool or an epileptic by people who were not acquainted with his antecedents, and several times he was brought to Bellevue Hospital to be examined, in view of his commitment to an asylum. However, as these morbid appearances, notwithstanding their intensity, quickly disappeared with the privation of alcoholic stimulants, he was not committed. Once, however, following an attempt at suicide by drowning, December 24th, 1894, he was brought to the hospital, suffering from a convulsive attack, and as he had delirium, the doctors, who did not know him, believed him to be suffering from delirious epilepsy, and made out a certificate of mental aberration. The following day he was transferred to the asylum and remained there until March 30th, 1895. The day after his arrival, he was perfectly sane, spoke reasonably, and was in a state to give the doctors all particulars. He recalled having been drinking and causing disturbance in a street car, but he had no recollection of his attempt to commit suicide, or of his having been in the hospital, where he must have shown some mental trouble for the examining doctors testify that he replied to the questions after the manner of an epileptic. All the time of his stay at the asylum he had no convulsive attacks and never showed the least mental trouble. As we have previously seen, outside his drunken excesses, L. T. had never shown any mental trouble and was considered a very intelligent man, and had even given proof of remarkable business qualities. It then clearly follows from the study of the phenomena presented by L. T. on the night of July 24th, 1897, in connection with those of similar previous fits, that he made the attempt at suicide during a fit of alcoholic delirium sufficiently pronounced to make it possible to declare that he had lost all consciousness, and that he was not capable of appreciating the nature and the seriousness of his act and of realizing that the act was wrong, and that he was incapable of controlling his will.

L. T., can then on this point, be declared irresponsible and his behaviour is manifestly due to an abnormal or pathological inebriety. But it appears to me that here we can ask the important question, namely: Is the prisoner capable, and in what measure of preventing himself from drinking? L. T. is intelligent enough to realize the consequences of alcoholic abuses, he does not drink in pursuance of a delusional idea or of an hallucination. It remains only to be seen, if L. T. is fatally and irresistibly driven to drink by an impulse, that is to say, if he is suffering from dipsomania, or else if his will power is strong enough to overcome his appetite for alcoholic liquors.

As we have previously seen, the patient became by degrees accus-

toned to drink with friends without the knowledge of his father. By degrees his drunken sprees became more frequent and of longer duration, so that now he often gets drunk. He in this manner contracted the taste for alcoholic liquors from habit, so that he is in a state of habitual appetite, of which he has knowledge, since he takes certain precautions to shun this evil. For example, he sends his wife to collect his wages in order not to have any money about him, nevertheless, when the occasion arises of accepting a glass from a friend or of offering one in celebration of a sale, or to close a bargain, he does not shun it. He says to himself, that there is no harm in taking a glass, and that he will stop there. Unfortunately, this first glass calls for a number of others, intending each one to be the last. He always thinks that he will be able to stop in time. There is a vast difference between these alcoholic excesses, and the fits of dipsomaniacs who are irresistibly forced to drink by an uncontrollable impulse arising outside of any occasion, and preceded and accompanied by characteristic symptoms making a well defined morbid entity, in fact, a disease for which the individual can in no way be held responsible, any more than a typhoid patient for his typhoid fever, or a consumptive for his tuberculosis.

We can then affirm that L. T. is not driven to drink by an irresistible impulse and that consequently he is free to drink or not; but to what degree? Such is the question that we must now answer.

Drunkennes often shows pathological marks that are sufficient by themselves to point out traces of a morbid predisposition, that predisposes the person to easily get drunk. His physical resistance, in the presence of alcohol, is often so weak that drunkennes overcomes him after taking a quantity which would have no effect on a well-balanced man (Legrain). And more than that, this drunkennes rapidly renders the form anormal and complicated. (Vetault). Such is absolutely the case of L. T. He shows an anormal susceptibility to the poisonous action of alcohol, indicating a defective mental organization, which must naturally be attributed to a predisposition inherited from his grandfather and which is also affirmed by the delirious alcoholism of his uncle and by the insanity of his aunt, being brought on by trivial causes insufficient of themselves to affect a mind not already disposed thereto.

Legrain says in his study on the heredity of alcoholism; "Another principal point that we have established is the fatal hereditary transmission of the appetite for strong drink in a great number of cases." In this same treatise, he adds: "that one of the main signs of mental degeneration is the great facility with which these people let themselves be influenced, and that they are very often of weak

“will power.” It is justifiable to admit, taking into consideration the circumstances of the prisoner’s mental state, that his voluntary action may be lessened by a predisposition that he has inherited.

*Conclusions* :—The following conclusions naturally present themselves to my mind. L. T. should not be considered as a lunatic as no mental weakness or any signs whatever of delirium could be found in him. At the time of the incriminating offence, his mental faculties had undergone a complete obscuration on account of the profound drunkenness in which he was plunged.

As the fact of the drunkenness is not the direct result of disease properly speaking, it does not belong to me to judge of the penal responsibility of the accused, the judgment of which belongs to the courts. However, on account of the morbid heredity, which makes him a “predisposé,” there can be admitted in his favour a palliation of the penal responsibility. L. T. could advantageously be confined in an inebriates home such as they have in other countries for patients of this kind.

For discussion of this report see page 961.

# RETROSPECT OF CURRENT LITERATURE.

## Medicine.

UNDER THE CHARGE OF JAMES STEWART.

### Traumatic Nervous Affections.

THEODORE DILLER, M.D. "Traumatic nervous affections."—*The American Journal of the Medical Sciences*, Sept. 1898.

In this article Dr. Diller reports ten cases which he divides into litigation and non-litigation cases. Eight belonged to the former group, seven of whom were injured by the explosion of natural gas.

The conclusions of his studies are as follows :

1. Nervous symptoms complained of as following severe accident, while often exaggerated are frequently very real.
2. Simulation is rare and easily detected by the skilled neurologist.
3. To successfully simulate nervous symptoms is a difficult task, possible to only a few.
4. The symptoms in any case may be subjective, wholly or chiefly.
5. The nervous symptoms are as a rule neurasthenic or hysterical, or both.
6. A certain number of cases suffer from symptoms not attributable to either of the above conditions.
7. An actual degeneration of the nerve substance is sometimes set up, and may progress.
8. While there is a strong tendency to recovery in many of these cases, the prognosis in not a few cases is grave, and in still others quite hopeless.
9. While the physical element in most of these cases is powerful, there are others in which it plays a very minor role.
10. Any name used to describe these nervous affections, carrying the idea that they constitute a morbid entity is undesirable.
11. Some name, *e. g.*, "traumatic neuroses" if used to mean any nervous affection following a traumatism would be desirable.

### Danger of Error in Diagnosis.

JANEWAY, E. D. "Danger of error in diagnosis between chronic syphilitic fever and tuberculosis."—*The American Journal of the Medical Sciences*, Sept. 1898.

A series of seven cases illustrating this subject is presented in this paper read before the last session of the Society of American Physicians.

The symptom group consisted of loss of weight, continued fever, weakness, night sweating, sometimes cough, and pain in the right side. In five cases the patients had been sent to health resorts, their physicians regarding them subjects of tuberculosis although physical signs were not confirmatory. No improvement followed the climatic and other antitubercular treatment. A history of syphilitic infection was obtained in the majority of the cases and the administration of remedies thus indicated was followed by most salutary results.

Dr. Janeway points out very clearly how ignorance of the fact that syphilis in the so-called tertiary period may occasion a fever of long duration, malaise, emaciation and perspiration, leads one into this error of diagnosis. Tuberculosis, malaria and sepsis usually explain many obscure phenomena, which, by the light of this article, may be referred hereafter to syphilis.

### The Pathology of Diphtherial Paralysis.

BATTEN, FREDERICK E., M.D. "The pathology of diphtherial paralysis."—*The British Medical Journal*, Nov. 19th, 1898.

Batten examined the nervous systems of the bodies of six patients who died, the subjects of diphtheria, five of whom showed diphtherial paralysis. They were all children under six years. The longest case was 100 days, the shortest 43 days in duration.

Of the six examinations of the nervous system only four gave a positive result showing a parenchymatous degeneration of the nerves. The negative finding in one of the cases was most anomalous, since clinically the signs were well marked and the patient had been hemiplegic for 21 days.

In three cases the spinal cord showed degeneration in the grey matter.

The phrenic nerve was affected in four cases, the vagi in two; while other peripheral nerves were affected in all four cases.

A parenchymatous nerve degeneration seems established in the examination of these cases. It is probably primarily peripheral. The cells of the anterior horns, according to Mouravjeff, are first involved.

and in the later weeks of the infection the nerve changes occur. During this time it is possible for recovery of the parts first involved to take place, or those parts may become atrophied.

In conclusion upon the work of other observers and upon his own, Batten says it is probable that the dominant lesion in diphtherial paralysis is a parenchymatous degeneration of the myelin sheath of the nerves and that this degeneration affects both motor and sensory fibres alike.

*W. F. Hamilton.*

## Ophthalmology.

UNDER THE CHARGE OF J. W. STIRLING.

### Ocular Symptoms in Constitutional Disease.

DREISCH. "Oculomotor disturbances following measles."—*Münch. Med. Wochenschrift*, May, 1898.

CORTE. "Pupillary reflex in infectious diseases."—*Klin. Therap. Wochenschrift*, May, 1898.

YARR. "Malarial affections of the eye."—*British Medical Journal*, Sept. 2, 1898.

HINSDALE. "Eye symptoms of acromegaly."—Boylston Prize Essay, Harvard University, 1898.

HELBORN. "Bilateral chancre of the eyelids."—*Münch. Med. Wochenschrift*, May, 1898.

LUEBBERS. "Ocular changes in disseminated sclerosis."—*Archiv. für Psychiat. und Nervenkr.*, XXIX., 3.

Dreisch, in his article, reports three cases of oculomotor paralysis, all in children. In two of them there was only paralysis of accommodation coming on, in one case eleven days, and in the other three weeks after recovery from measles. The power of accommodation, however, soon returned. In the third case, there was vomiting and chills at the onset accompanied by diplopia, due to incomplete paralysis of all the extra-ocular branches of the third nerve. Recovery resulted in three weeks. Dreisch offers no explanation of the immediate cause, except that he does not think it is a toxin circulating in the blood, since similar post diphtheritic paralyses are not prevented by the injections of serum. He inclines to the lesion being in the peripheral nerves, as it is sometimes, so sharply limited to one branch.

Corte states that the pupillary reflex is normal in measles, scarlet fever and smallpox, except the hæmorrhagic form of smallpox, where it is weaker or absent.

In typhoid, with lung complication, it is sluggish, and in infectious endocarditis it is absent. In puerperal fever with endocarditis or peritonitis the reflex is absent.

Yarr's paper on malarial affections of the eye is well worth studying, especially on account of the curiously slipshod way with which the

subject is treated in text-books on ophthalmology. The malarial troubles all originate in circulatory disturbances, and Yarr classifies them thus: 1. Neuritis. 2. Retinal hæmorrhages. 3. Retino-choroiditis. 4. Effusions into the vitreous.

As an example of the neuritis he cites a typical case, the characteristics being as follows: 1. Repeated attacks of malarial fever. 2. Almost constantly supra-orbital pain and photophobia at onset, and frequently night blindness. 3. Colour perception unimpaired except in cases going on to complete optic atrophy. 4. Marked variation in the visual acuity from time to time, failing and improving, are characteristic of the malarial optic neuritis, a visual acuity of  $\frac{1}{10}$  cm. rise in two or three weeks to  $\frac{1}{2}$  or  $\frac{1}{3}$ , falling again perhaps in two or three days. 5. The visual fields are intact or only slightly contracted. 6. The swollen disc assumes a peculiar greyish red colour and is due to parasites in its capillaries, this being pathognomonic. In many cases there are minute peripheral hæmorrhages. 7. Eighty per cent. end in partial atrophy of the optic nerve, some end in complete recovery and but very few in complete atrophy.

The retinal and optic nerve changes are due to melanæmia with increased vascularization, and the subsequent atrophy is due to consecutive endarteritis. The lesions are invariably binocular.

*Retinal Hæmorrhages* are either minute peripheral ones or large peripapillary and macular. The first variety may be overlooked. The transient disturbances of vision in malaria are often likely due to slight œdema of the retina, followed by these minute hæmorrhages. The large peripapillary and macula hæmorrhages are rare, occurring with optic neuritis and in malarial cachectics. The prognosis is grave, as they may absolutely abolish vision. They are due to impacts of parasites followed by extravasations.

*Retino-choroiditis.*—In twenty per cent. of acute intermittent cases. at the end of the hot stage, supra-orbital pain, tenderness of eyeball, photopsia and photophobia develop. There is a diffuse œdema of the retina, this is later followed by capillary atrophy of the choroid and atrophy of the retina and disc, the fundus appearing grey as though powdered with pepper—all being due to chronic inflammation of the choroidal and retinal vessels set up by the irritation of the plasmodia.

*Effusions into the Vitreous.*—The rare form of white infiltrations—due to serous exudations—arises from time to time and recovery may occur.

Sudden persistent amaurosis without any fundal change is likely due to some obscure focal lesion. Sudden amaurosis ending in optic

atrophy is likely due to hæmorrhage in the sheath of the nerve ; but sometimes to quinine amaurosis.

Periodic blue vision has been reported,

Hinsdale mentions the following symptoms as met with in acromegaly. The bones and orbital ridges are heavy, the cartilages and skin of the lids thicken, and exophthalmos develops, due likely to proliferation of the adipose tissue of the bulb. The lids are pigmented, often being bronzed, and the secretion of tears increased. Movements of the eyes are slow, and there is sometimes failure in the synchronous elevation of the lids. Nystagmus and internal and external strabismus have been observed. Complete oculomotor paralysis and partial paralysis of sixth nerve is present. There is diminished reaction of the pupils to light. Vision is often practically or completely lost, the latter with neuroretinitis and optic atrophy. The fields vary in size and shape, due to hypertrophy of the bone in the region of the chiasma or optic foramen pressing on the chiasma or nerve. The visual disturbances are, as a rule, an early symptom and are slowly but surely progressive.

Helborn's case is interesting on account of its rarity, there being only seven authentic cases recorded. The disease was transmitted from an individual with mucous patches in the mouth.

Luebber reports on eleven cases of disseminated sclerosis. One which came to section, showed complete optic atrophy with increase of interstitial tissue, and in part grey degeneration of optic nerve centre. In the other cases there was more complete optic atrophy. In three cases the field was normal, in seven there were simple scotomata, in two cases peripheral contraction of the field, and in six cases nystagmus.

#### Heat and Cold in Eye Disease.

HERRNHEISER. *Die Artzliche Praxis*, XI., 1898.

Herrnheiser advises cold applications in acute catarrhal conjunctivitis, inflammatory stage of trachoma, blennorrhœa and in pain after operations on the conjunctiva and in episcleritis.

Cold or warmth are equally indicated in interstitial keratitis, acute iritis and iridocyclitis, and hot applications in exudative iritis, in the pain of glaucoma, in panophthalmitis, and in trigeminal neuralgia.

#### Recurrent Erosion of the Cornea.

HIRSCH. *Wochenschrift f. Therap. u. Hyg.*, August, 1898.

GRADLE. "Traumatic recurrent keratitis."—*Annals of Ophthalmology*, October, 1898.

These interesting cases are caused by some slight injury of the

cornea, such as a scratch with a finger nail, a straw or a twig. The wound heals, then after a varying interval pain sets in and a small blister develops on the site of the injury. This blister breaks down and the spot heals in a few days, only to recur again. Hirsch considers the recurrence is due to neuralgia of the corneal twigs of the trigeminal, especially as an aura of pressing or burning sensations in the eye preceded it.

Gradle's paper is a *resumé* of our knowledge, or rather lack of knowledge, about this disease, with several very good case reports. The treatments advised varied—a bandage, cocain, calomel dusting, atropine, excision of the scar, cauterization of the scar, antipyrin internally, tonics, quinine—all giving a varying success.

### **Ocular Symptoms in Inflammation of the Sinuses.**

DE LAPERSONNE. *Archives d'Ophthalmologie*, June, 1898.

De Lapersonne points out, in inflammation of the frontal sinus, the possibility of intermitting pains simulating facial neuralgia and acting very markedly upon the ciliary nerves. In subacute accidents there is the formation of abscesses in the orbit with separation of the sequestra, but which heal easily, whereas in the chronic cases with old ectasia of the sinus, it is hardly possible to avoid having a permanent fistula. In cases where the maxillary sinus is affected, the peculiarity is the frequency of the extension or action on other cavities of the face, particularly the sphenoidal sinus and ethmoid cells.

*J. W. Stirling*

# Pathology.

UNDER THE CHARGE OF J. G. ADAMI.

## Acute Poisoning with Different Alcohols.

BAER, G. "Acute poisoning with different alcohols."—*Archiv. für Physiologie*, 1898, IV., p. 283.

Many observers have examined the toxicity of alcohols of the methyl alcohol series, and have given varied opinions as to the poisonous qualities of these substances. The object of this author was to decide between the conflicting results previously obtained.

Two stages are present in acute alcoholism: 1st. A short excitation followed, according to the amount of the agent used, by a longer period of depression.

Schmiedeberg eliminates the first stage altogether, and views it merely as a symptom of beginning cerebral paralysis. According to Prof. Rabuteau and others, the toxicity of different alcohols increases with increase in their molecular weight and consequently with increasing boiling point. Richardson showed that the stages of intoxication by the higher alcohols were the same, except that the period of excitation was shortened.

The author examined the toxicity of a mixture of alcohols. This was of interest, because on the one hand Huss and Dahlström affirmed that the presence of small quantities of fusel oil in brandy were only of secondary importance, while Dujardin-Beaumetz, Audigé and others, showed that impure alcohol had incomparably greater toxic qualities than had pure spirit.

Rabbits were used for the experiments and the different alcohols were introduced into the stomach by means of an œsophageal tube.

The experiments were divided into three groups according to the severity of the intoxication.

The following table gives some results expressed in grams per kilo body weight.

	LIGHT.	MODERATE.	SEVERE.
Methyl alcohol.....	3.2 —5.2	5.6 —6.9	7.2 —9.02
Ethyl alcohol.....	2.5 —4.1	4.45—6.15	6.25—7.44
Propyl alcohol.....	1.6 —2.4	2.58—2.96	3.0 —3.46
Butyl alcohol.....	1.0 —1.5	1.05—2.00	2.1 —2.44
Amyl alcohol.....	0.83—1.08	1.25—1.66	1.F —1.95

The last mentioned number in the severe form is the lethal dose.

In the case of a mixture of ethyl alcohol with 4 per cent. amyl alcohol, the lethal dose was diminished from 7.44 g., to 4.66 g.; with 2 per cent. to 5.85 g.; with 1 per cent. to 6.82 g. He concludes that the amounts of fusel oil found in distilled liquors (0.3 per cent.—0.5 per cent.) are not sufficient to produce toxic symptoms by themselves, but may in certain cases augment the action of the ethyl alcohols. For fusel is much more toxic than amyl alcohol, but its poisonous action has been greatly over-estimated. A full bibliography is given.

*C. G. L. Wolf.*

# Canadian Medical Literature.

UNDER THE CHARGE OF KENNETH CAMERON.

[The editors will be glad to receive any reprints, monographs, etc., by Canadian writers, on medical or allied subjects (including Canadian work published in other countries) for notice in this department of the JOURNAL. Such reprints should preferably be addressed to Dr. Kenneth Cameron 903 Dorchester street, Montreal.]

## The Canadian Practitioner.

October, 1898.

1. The After Effects of Surgical Procedure on the Generative Organs of Females for the Relief of Insanity. JAMES RUSSELL.
2. Supra-pubic Prostatectomy. A. MACKINNON.

November, 1898.

3. Some Notes on Rosacea. GRAHAM CHAMBERS.
4. When Should We Operate (?) WM. OLDRIGHT.
5. Toronto Pathological Society. The President's Address. A. PRIMROSE.

1. RUSSELL protests against the wholesale mutilation of lunatics and raises his voice against the claims made for gynæcological surgery as a remedy for insanity. He had obtained the opinions of the leading alienists in regard to the relation of gynæcology to psychiatry and they held that in not more than two per cent. could disease of the uterus or its appendages be considered a factor in the cause of insanity. In some cases there was temporary arrest of insanity, but this was followed in nearly every instance by a recurrence of the nervous phenomena. The opinion was almost unanimous that more was due to the special nursing, rest, etc., than to the operation.

2. MACKINNON is strongly in favor of suprapubic prostatectomy as the method for general adoption in dealing with hypertrophy of the prostate. He looks upon it as a safe operation if performed with fair skill, and it is much more likely to cure the patient than any other of the suggested methods. He cannot imagine any case that should be treated by castration. He relates the history of five cases, four of whom might be called cured and one was benefitted by the operation.

3. CHAMBERS says that in the treatment of rosacea, the causative agent should be first made out and corrected. Of drugs, strychnine and ergot are of the greatest value. Resorcin and ichthyol may be

used internally if there is fermentation of food. Externally, sulphur and resorcin are his favourite application. Electrolysis and surgical procedure may be required.

4. OLDRIGHT relates the histories of several cases in which early operation had been performed. In some it was a matter of urgency, in others a matter of expediency.

### **The Canadian Journal of Medicine and Surgery.**

*October, 1898.*

1. A Medical Itinerary : Being an Account of a Sail through the Sacred Islands. EZRA HURLBURT STAFFORD.
2. A Case of Abnormally High Temperature Subsequent to Attack of Tertian Ague. S. GRAINGER.
3. The Treatment of Goitre. CHARLES R. DICKSON.
4. Report of a Case of Strangulated Umbilical Hernia. W. J. GIBSON.
5. An Interesting Case of Defective Speech. W. A. YOUNG.
6. New Forceps for Intestinal Anastomosis. ERNEST LAPLACE.
7. The Treatment of Inebriates. A. M. ROSEBRUGH.

*November, 1898.*

8. Sporadic Cretinism in Ontario. ALEXANDER MACPHEDRAN.
9. Empyema, Operation, Recovery. B. R. HOPKINS.
10. Pulmonary Tuberculosis. JOHN HUNTER.
11. The Prevention of Tuberculosis. W. J. WILSON.
12. The Physiology of Nervous Disorders Peculiar to the Sex. J. J. MORRISSEY.

3. DICKSON is a strong advocate for the treatment of goitre by electrolysis. Surgical removal he considers should be restricted to the malignant forms or those fibrous forms not amendable to other treatment. Injections of iodine or other irritating fluids is an unwise procedure.

4. GIBSON reports a case of umbilical hernia that had been strangulated for forty hours; upon opening the sac, six inches of transverse colon was found in the centre of the mass, but was not gangrenous. A mass of omentum, firmly adherent to the margin of the opening was ligated and removed. The patient made a good recovery.

6. LAPLACE describes forceps for performing anastomosis of the intestines rapidly and with accuracy of suturing, without leaving any foreign substance within the gut. The forceps are of five sizes and are easily adjusted to the openings.

8. MACPHEDRAN says that while cretinism is not prevalent in Ontario, a sufficient number of cases occur to merit the careful atten-

tion of the profession. In a collective investigation extending over less than two months he had secured the reports of seventeen cases, but others were known to exist, of which reports had not yet been obtained. Details of the cases are given.

### **The Canadian Medical Review**

*October, 1898.*

1. Toronto Clinical Society—President's Address. DR. GRASETT.
2. Pelvic Disease and Insanity. ERNEST HALL.

*November, 1898.*

3. Salpingo-Oöphorectomy for Uterine Fibroids. ALBERT A. MACDONALD.

2. HALL enters a plea for the judicious gynæcological treatment of the insane.

3. MACDONALD considers that salpingo-oöphorectomy, for the relief of fibroid tumours, has a limited field of usefulness, and it is by a careful selection of cases that the best results are obtained. The interstitial fibro-myomata of medium size, which produce hæmorrhage, but no other serious symptoms, are the ones which should be chosen for such treatment. The large soft tumours, 'fibro-cystic growth, submucous or subserous tumours with broad base, the telangiectic varieties, and others of like kind, should be dealt with in other ways, as serious degenerative changes are apt to follow castration. The best results are obtained by tying the tubes off close up to the uterus, so to cut off not only the blood supply through the ovarian arteries, but the nerve supply as well.

### **The Canada Lancet.**

*October, 1898.*

1. Vicarious Urination (?) A. T. RICE.
2. Coin in Larynx—Tracheotomy—Recovery. D. J. GIBB WISHART.
3. Peach Stone in Œsophagus—Perforation—Death. D. J. GIBB WISHART.

4. The Treatment of Clubfoot. C. L. STARR.

*November, 1898.*

5. Notes on Female Risks. JAMES THORBURN.
6. Facilities for Clinical Study Offered to Qualified Medical Men by the London Schools of Medicine.

2. 3. WISHART relates the histories of two interesting cases. I. A man was holding a ten-cent piece between his teeth, when he suddenly drew it into his larynx. On examination the coin could be seen lying on the vocal cords and in the same plane, covering their

anterior half, and held in place by swollen ventricular bands above. All attempts at removal being ineffectual, the trachea was opened through the two upper rings, and an incision was made in the cricoid cartilage. The coin was then removed and the patient made a good recovery.

II. An old woman swallowed a peach-stone, and complained of pain in the left side of the neck and inability to swallow. As attempts at the removal of the stone were unsuccessful, an incision was made parallel with the anterior border of the sterno-mastoid muscle. In separating between the carotid sheath and the tracheal coverings, a quantity of foul-smelling pus welled up, and a probe discovered the stone lying point downwards, in the same line, outside the trachea, and it was removed. She was fed by nutrient enemata, but gradually failed and died on the seventh day after the operation.

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**The Dominion Medical Monthly and Ontario Medical Journal**  
*October, 1898.*

1. Cases in Practice—Two Months' Work in Abdominal Surgery  
ERNEST HALL.
2. Continuous Irrigation in Puerperal Septicæmia. F. C. HAGAR.  
*November, 1898.*
3. Clinical Reports. T. K. HOLMES.
4. Empyæma. Dr. BRODIE.
5. Fistula in Ano. J. W. SHAW.
6. Diet in Lithæmia. P. McG. BROWN.
7. My Experience with Diphtheria During the Fall of 1897. W. DOAN.
8. Method of Preparations for Abdominal Section in Royal Jubilee Hospital, at Victoria, B.C.
9. An Interesting Case in Practice. Dr. MERRITT.

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**The Maritime Medical News.**

*October, 1898.*

1. Operative Treatment of Cancer of the Tongue. G. E. ARMSTRONG.
  2. Tuberculosis and the Forcastle. J. E. MARCH.
  3. Notes from Midwifery Practice. W. S. MUIR.
  4. Some Leading Gynæcologists and their Work. A. L. SMITH.  
*November, 1898.*
  5. Rupture of Vagina during Parturition. J. W. DANIEL.
  6. Some Interesting Skin Lesions in Practice. G. G. MELVIN.
  4. Some Leading European Gynæcologists. A. L. SMITH.
1. ARMSTRONG says the operations for cancer of the tongue des-

cribed in English text-books fail to fulfil many important requirements, but the one that has given him the best results is the method devised by Kocher of Berne. There is a preliminary tracheotomy, the patient breathes through the tube during the operation and during convalescence, and so the danger of aspiration pneumonia is done away with. An incision is made from below the ear to the hyoid bone and then up to the symphysis of the lower jaw. All the glands are removed, including the submaxillary salivary gland. The facial artery is tied and the loss of blood is reduced to a minimum. He had found it an advantage to close the wound, leaving only sufficient space for the insertion of a large tube packed with gauze. The patient should be fed by large quantities of artificially digested milk and eggs through a tube passed into the stomach.

2. MARCH says that during the past year several ship-masters have stated that there has almost always been at least one case of consumption in their forecastles. In order to get an idea as to what part of all the time spent in the marine hospitals of Canada by sailors, was due to tuberculosis, he wrote to the Medical Superintendents of seventeen hospitals which were each credited by the Auditor General's Report for 1897 with a total of over two hundred days. Ten hospitals reported and the average was 24.50 per cent. or practically one quarter of all the time. The estimated cost to the Marine Department of the reported cases would be \$10,000 for care alone. At the quarantine stations something should be done to improve this condition of affairs, considering the enormous cost of this disease directly and indirectly to the country. He strongly urges that tuberculosis should be scheduled as a quarantine disease; that the regulations should contemplate the return of tuberculous steerage passengers to their homes, by the transportation company bringing them; the removal of consumptive sailors and firemen from the forecastles in which they may be found; the renovation of the quarters which have been occupied by them, and the disinfection by steam at a high temperature of all clothing, bedding, etc., that have been exposed to the infection.

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### Canada Medical Record.

*September, 1898.*

1. Canadian Medical Association. J. M. BEAUSOLEIL.
2. The Pioneers of Medicine in the Province of Quebec. W. H. DRUMMOND.
3. The Treatment of Inebriates. A. M. ROSEBRUGH.

*October, 1898.*

4. Acute Infective Pyo-Nephrosis, complicating Pregnancy. H. L. REDDY.
5. Oxytuberculine in the Treatment of Pulmonary Tuberculosis. A. J. RICHER.

**L'Union Medicale du Canada.**

*Septembre 1898.*

1. Cancer du col utérin compliquant la grossesse. EUGÈNE ST-JACQUES (de Paris).
2. Quelques gynécologistes européens de renom. A. LAPHORN SMITH.

*Octobre 1898.*

3. Péritonite septique généralisée consécutive à l'appendicite et son traitement chirurgical. D. MARSIL.
2. (suite). Quelques gynécologistes européens de renom. A. LAPHORN SMITH.

**La Revue Medicale.**

*Septembre 28 ; Octobre 5.*

1. Le médecin à la campagne, (causerie faite à la Université Laval, le 23 juin). J. D. PARADIS.

*Octobre 12.*

2. De l'emploi du solanum carolinense dans le traitement de l'épilepsie et autres affections nerveuses-convulsives. E. DE LAVAL-THYERNAY.

*Octobre 19.*

3. Leçon d'ouverture du cours sur les maladies des voies urinaires, à la faculté de médecine de Paris, par M. le prof. TUFFIER, reconstituée au moyen de quelques notes prises par le Dr. HENRI LASNIER, de Lévis.

*Octobre 26 ; Novembre 2.*

4. L'antisepsie en ophtalmologie. JÉHIN PRUME.

*Novembre 9.*

5. Strepto-diphthérie. EUGÈNE PAQUET.

*Novembre 16.*

6. De la varicocèle, sa cure radicale par la ligature double et l'excision des veines combinées à la résection étendue du scrotum. M. T. BRENNAN.

*Novembre 23.*

7. Relation d'un cas de monstruosité fœtale. Absence complète du cordon. Insertion du placenta dans le périnée de l'enfant. ALPHONSE LESARD.

2. DE LAVAL-THYERNAY writes of the employment of Solanum Carolinense in the treatment of epilepsy, tetanus, eclampsia and other convulsive affections. He thinks that its use is chiefly indicated in the

epilepsies occurring in young girls, especially when associated with the commencement of the menses. On hysteria it has little effect, but he has obtained excellent results from its use in eclampsia.

4. JÉHIN PRUME describes the necessary details of the antiseptic technique that should be employed in all operations upon the eye.

6. BRENNAN considers that the operative treatment of varicocele should aim to produce a radical cure by not only excising the diseased veins, but by resecting a portion of the scrotum. He relates several cases in which the operation had marked effects in relieving such conditions as neurasthenia, hypochondriasis, spermatorrhœa, masturbation and epilepsy. Resection of the scrotum alone may be done where the varicocele is slight and of recent date, where the veins are flabby and can be emptied by pressure or the dorsal decubitus, where the scrotum is but little relaxed, or where the reflex phenomena are absent. The combined operation should be performed when the veins are rigid, the scrotum relaxed and where there are marked local reflex symptoms.

7. LESSARD describes a rare monstrosity. There was complete absence of the cord, the placenta was inserted upon the body of foetus over the region of the vulva, anus, and upper part of the thigh. The vertebral column was bent so that the pelvis was attached to the shoulders. Both hips were dislocated.

*Kenneth Cameron.*

## Reviews and Notices of Books.

**Cleft Patate, Treatment of Simple Fracture by Operations Diseases of Joints, Antrectomy, Hernia, etc., etc.** By W. ARBUTHNOT LANE, M.S. London: The Medical Publishing Co., Limited.

A very neatly gotten up little book containing a collection of clinical lectures which have been published from time to time.

To two of these lectures one turns with some curiosity. The first is a strong plea, well supported, in favour of the treatment of simple fracture by operation. The simple fractures especially referred to are oblique fractures of the bones of the leg.

If one could always be sure that no pathogenic germ would gain access, there is no doubt but that much better results could often be obtained in this way. But, unfortunately, the best trained surgeon, in a fully equipped operating room cannot yet be absolutely sure of his technique, much less the occasional surgeon, operating, often amidst the most unfavourable surroundings, assisted by totally untrained assistants. Let us hope that it will not be always so. Another point made by Mr. Lane will be assented to by a larger number of surgeons, and that is, that it is blood clot and inflammatory effusion, more than the contraction of muscles, that prevents the proper and accurate approximation of the fragments.

The second noticeable lecture is entitled "Some of the Consequences of Wearing Boots." It is illustrated, and should be read by all, medical and lay, who are prone to sacrifice comfort and common sense to fashion and appearance.

G. E. A.

**Transactions of the American Surgical Association.** Volume the Sixteenth. Edited by DE FOREST WILLARD, A.M., M.D., Ph.D., Recorder of the Association. Philadelphia: William J. Dornan. 1898.

The present volume of the Association is considerably smaller than most of the preceding volumes, containing nine papers and two hundred and eighty odd pages less than the volume for 1897.

A very good portrait of the late Dr. Hayes Agnew forms an appropriate frontispiece. The late Dr. Agnew was President of the Association in 1887. During the past year a monument, lasting in character, has been erected in Philadelphia in the Agnew Memorial Wing of the University Hospital.

The Annual Meeting of the Association was, this year, held in New Orleans. In his address, the President, Theodore F. Prewitt, M.D., discussed "The Future of the Association," particularly regarding the widening of the portals of entrance. The president favors a less exclusive policy and would admit men who are honest, capable, and have won a standing in the profession, which would warrant admission to fellowship in the most distinguished body of surgeons in the United States. Among the valuable papers contributed at the annual meeting, and printed in the present volume, together with the discussion which followed, may be mentioned:

The Etiology and Classification of Cystitis, by N. Senn, M.D. The Question of Operative Interference in Recent Simple Fracture of the Patella, by Charles A. Powers, M.D. The Use of Animal Toxines in the Treatment of Inoperable Malignant Tumours, by Geo. Ryerson Fowler, M.D. An Enquiry into the Etiology of Cancer, with some reference to the late Investigations of the Italian Pathologist, by Roswell Park, M.D. A Case of Appendicitis in which the Appendix became permanently soldered to the Bladder like a Third Ureter, producing a Urinary Fœcal Fistula, by W. W. Keen, M.D. Hypertrophy of the Prostate Gland and Suggestions in regard to its Treatment, by L. C. Lane, M.D.

These and several other papers are very full and very interesting, bringing the subjects treated of up to date.

The volume is neat, the paper good, the printing clear and easily read.

G. E. A.

**Manual of Otology.** By GORHAM BACON, A.B., M.D., with introductory chapter by CLARENCE JOHN BLAKE, M.D., with 110 illustrations and a colored plate. Lea Brothers & Co., New York and Philadelphia. 1898.

After a perusal of this manual, one can only express approbation of it. It is a concise, common-sense book—the salient points in the diseases of the ear, nose, and nasopharynx are clearly put, all unnecessary verbiage is abolished, and the reader is rewarded by a definite comprehensive view of the subject.

The tone of the book impresses one with the fact that it is the production of a man who knows what he is writing about and knows what is needed by his reader. It is impossible to pick out any one portion of the work especially as worthy of commendation, the great point in its favour being above all its conciseness and thoroughness. To the student and general practitioner it must be a useful and practical guide. J. W. S.

**International Clinics.** A Quarterly of Clinical Lectures on Medicine, Neurology, Surgery, Gynæcology, Obstetrics, Ophthalmology, Laryngology, Pharyngology, Rhinology, Otology and Dermatology, and specially prepared articles on Treatment and Drugs. Edited by JUDSON DALAND, M.D., Philadelphia; J. MITCHELL BRUCE, M.D., London, Eng.; DAVID W. FINDLAY, Aberdeen, Scotland. Volume III. Eighth Series. 1898. J. B. Lippincott Company, Philadelphia. Canadian Agent, Charles Roberts, Montreal.

The following well-known names are among the contributors to this volume: James M. Anders, Philadelphia; T. Lauder Brunton, London; Sir Dyce Duckworth; Professor J. Grancher, Paris; O. Heubner, Berlin; Ernest A. Sansom, London; Nestor Tirard, London; Friedrich Trendelenburg, Leipsic; Prof. von Bramann, Halle; Prof. Anton Wölfler, Prague; J. C. Webster, Montreal; Alexander McPhedran, Toronto, Paul F. Mundé, New York.

As in the previous two volumes of this series, such names bear with them their own testimony concerning the contents of this volume. The words of commendation, written in review of Volumes I. and II., apply equally to this.

W. F. H.

## Society Proceedings.

### MONTREAL MEDICO-CHIRURGICAL SOCIETY.

*Stated Meeting, November 7th, 1898.*

J. G. ADAMI, M.D., PRESIDENT, IN THE CHAIR.

Drs. F. M. Fry and H. R. Craig were elected ordinary members; and Drs. Rose, Cushing, Roy, Robertson, Keenan, Brown, Barclay and Smith, of the Royal Victoria Hospital; Drs. Gagnon, Deschambault, Laroche, Lesperance and Ethier, of the Notre Dame Hospital; and Dr. E. A. Gladman, of the Montreal Maternity, were elected temporary members.

#### **Fibroma with Diseased Appendages.**

DR. LAPHORN SMITH gave the report of a case of Fibroma of the Uterus, and exhibited the tumor which he had removed. (Will be published later.)

#### **Notes on Cephalhæmatoma.**

DR. D. P. ANDERSON reported a case of separation of the outer and inner tables of the occipital bone in an infant aged 2 months and 14 days, by a blood clot.

The condition had not been noted until time of autopsy, so, unfortunately, no history of the case was obtained.

This tumour, which was situated on the occipital bone immediately below the lambdoid suture, was somewhat ovoid in shape, with its centre corresponding to that of the occipital protuberance. Its transverse diameter measured  $5\frac{1}{2}$  cm., while its vertical diameter measured  $4\frac{1}{2}$  cm. At its central points the two tables were separated about  $\frac{1}{2}$  cm. from one another, the intervening cavity being filled up with partially organized blood clot.

No communication could be discovered with either the pericranium or dura. The inner table was apparently in normal position, but the outer was projecting from the surrounding bone. At the periphery both tables were moderately thickened, while small bony spicules were found throughout connecting the two tables.

As the pericranium was peeled off with ease, leaving a smooth surface, the inference was that this condition had been brought about by a separation of the tables.

The condition was undoubtedly a very rare one. Two somewhat

similar cases were reported on by Flint,<sup>1</sup> and a second by Busch, but both differ from the present case in that they communicated with the sinus by an opening in the bone. No communication whatever was present in this case.

#### **Double Proptosis from Thrombosis of the Cavernous Sinuses.**

Dr. F. G. FINLEY read the report of this case, and Dr. WYATT JOHNSTON demonstrated the pathological specimens. (See page 822 of the November Number.)

Dr. J. W. STIRLING mentioned the case of a child who came under his observation at the Foundling Hospital. In the course of scarlet fever an acute otitis media developed in the left ear, causing a free purulent discharge. A few days later intense swelling of the left eyelids, especially the upper, suddenly developed, and it was impossible to open the lids. This was followed one day later by a similar condition in the right eyelids. Two days later, again, the swelling began to disappear from the left lids and shortly after from the right. Three days after this the child died.

Dr. C. F. MARTIN had found at the post mortem examination thrombosis of the left superior petrosal sinus and also of the cavernous and circular sinuses. It was a parietal clot, adherent to the walls of the vessels. The clot did not entirely fill the vessel lumen, and was fairly well organized. It seemed as if it had been a temporary clot which afterwards softened, broke down, and was tunnelled through.

Dr. H. S. BIRKETT asked Dr. Johnston whether either frontal sinus had been involved, and, on receiving a reply in the negative, said he had asked the question because it was very unusual to have the condition described by Dr. Finley (due to infection from the antrum of Highmore. Most of these cases had their origin from disease of one of the frontal sinuses.

Dr. F. BULLER thought that these cases of thrombosis of the cavernous sinuses were apt to occur from any focus of suppuration connected by venous channels with that sinus, consequently they were not so very rare as a sequence to carious processes in the petrous portion of the temporal bone. They were a frequent lesion in chronic suppurative otitis media, and, so far as he was aware, the occurrence of thrombosis of the cavernous sinus under these circumstances was always necessarily fatal. He had himself observed three such cases, in only one of which a post mortem could be obtained.

This case occurred in the person of a well-known teacher of Scotch dancing, whom he had attended for several years, off and on, for

<sup>1</sup> Extracted by Chelius from *New English Journal of Medicine*, vol. ix., 1820, p. 112.

chronic suppuration in the middle ear. On the occasion of his return from a trip to the Old Country, he arrived in an almost unconscious condition, with all the signs of this disease of the sinus, and never rallied, but died two or three days later. The post mortem showed extensive caries at the apex of the petrous portion of the temporal bone so close to the sinus that it may very well have been directly infected. There was, however, thrombosis of the superior petrosal and an extensive leptomeningitis which undoubtedly accounted for the fatal termination.

Dr. Buller did not think it at all likely that any operative interference could ever be successful in this variety of thrombosis when once established, but there was no reasonable doubt that the initial lesion—the original suppurative focus could often be removed if recognized in time, and this very fatal disease thus prevented.

#### **Pneumothorax.**

Dr. W. F. HAMILTON read a paper on pneumothorax. (See page 885.)

## MEDICO-PSYCHOLOGICAL SOCIETY OF QUEBEC.

Meeting held at the Protestant Hospital for the Insane, Verdun P.Q.; October 15th, 1898.

Dr. VALLÉE, President in the chair.

### **Election of New Members.**

Drs. Henry M. Hurd, Baltimore, U.S.; and Ritti, Charenton, France; A. R. Urquhart, Perth, Scotland; and Villers, Brussels, Belgium, were elected honorary members of the Society.

### **Medical Certificates and Commitment.**

Dr. VILLENEUVE. At the last meeting of the Society, I called the attention of its members to the necessity of modifying the actual form of the medical certificate of commitment. Since then I have continued my studies and researches and have come to the conclusion that in modifying the formula "B" of our certificate, in the sense of the certificate as required in England, and our formula "C," in the sense of the annex of the certificate in use in the State of New York, but, adapting them to the special wants of our Province we would be as near perfection as possible.

In France, the great majority of commitments, are made under the direction of the administrative authority. In England, in the State of New York, and in many other countries, the commitment is ordered by the courts of justice, of different jurisdictions, in the Province of Quebec, it is the medical superintendent of an asylum, who orders the commitment of the insane to the asylum under his charge, and for the district under his control. The insane detained in the gaols, are the only exceptions to this rule, as for the others, the law cannot interfere unless they are adjudged scandalous or dangerous lunatics. The number of the insane transferred from the prisons by order of the Lieutenant-Governor, and those adjudged scandalous or dangerous and committed on warrants by justices of the peace or police magistrates, do not reach the tenth part of those admitted, so that ninety per cent., at least, of the admissions are ordered by the medical superintendent.

The medical superintendent is then placed in the position of a judge, since he is called upon to exercise a function ordinarily devolving on the judges and to decide upon the liberty of individuals, but with this difference, that he decides, not after the examination of the indi-

vidual in question and after hearing the parties, but after the examination of the documents that are furnished him.

Undoubtedly, the most important of these papers, is the medical certificate. This certificate should then afford proof :—1st. That the individual is insane, and this cannot be better shown than by a detailed statement of the symptoms of lunacy, directly observed by the doctor. 2nd. That there is necessity of placing the person in an asylum, either in view of treatment, or protection, or public safety. These different points, are proved by the form of mental alienation of which the medical certificate should give a sufficient idea, by the study of the circumstances in which the patient is found, and by the deeds and actions to which he is prone ; the depositions and names of the eye-witnesses are also indispensable. 3rd. That the physical state of the patient permits transferring him to an asylum, with the hope of favorable results from special treatment, and ground to believe that the patient might become dangerous or scandalous if at large.

As I have shown at our last reunion, these certificates are, in most cases, manifestly insufficient. Many of these certificates do not make any mention of symptoms of lunacy directly observed by the doctor, do not cite the facts observed by other persons in other than an imperfect manner, or exaggerate them, without giving the names of eye-witnesses, so that later on it is impossible to ascertain the exact facts, finally they do not sufficiently establish what is the physical condition of the sick person, so that very often those that are actually dying are brought to the asylum when nothing in the medical certificate would show that such was the case.

To prevent these inconveniences, the giving of a certificate ought to compel the doctor granting it, when he declares that the person is insane and should be incarcerated in an asylum, to state separately : 1st. The facts observed by himself at the time of examination. 2nd. The facts which were told him by others, giving at the same time the names and addresses of the persons. This certificate should also contain a precise declaration of the physical state of the patient.

The English certificate contains all these *desiderata*, and other differences of detail which it would be useful to incorporate in our certificate, as, for example, the precise date of the examination and the exact name of the place where it was held, with the postal address and the place of residence of the doctor giving the certificate.

The formula "C," similar to the annex of our medical certificate and containing as many as thirty-one questions, should be completely changed, because it no longer serves the purpose for which it was originally intended.

I propose, as a model for this change, the annex of the medical certificate of New York State, which in ten questions, clear and precise, embraces all the supplementary information that could be desired.

I am of opinion that the society should name a committee to study this question, so that at the next meeting they would be prepared to submit a form of the medical certificate to the members.

The society adopted the motion of Dr. Villeneuve and named a special committee composed of Messrs. Villeneuve and Anglin to study the question. They will draw up a new series of certificates necessary to the committal of lunatics and submit them to the Society at its next meeting.

### **The Influence of Traumatism on the Mental State.**

Dr. CHAGNON. Incidental maladies and traumatism befalling lunatics during the course of their mental affections are sometimes of good omen to the alienist, inasmuch as they may help to a speedy cure, which otherwise might have come slowly or never.

I have had under observation in my service at St. Jean de Dieu Asylum, a case, which after two years duration terminated in a cure thanks to traumatism. I think it will be interesting to lay before you the facts of the case.

Hugh James K., aged 25 years, the son of a farmer was admitted to St. Jean de Dieu Asylum, Longue Pointe, on October 19th, 1896. There was no hereditary taint of insanity in the family, and he himself did not show any physical stigmata of degeneracy. He was a conductor on the Street Railway cars for several days, when a slight accident happening to the car in his charge was sufficient to upset his mental equilibrium. This occurred about 15 days before he came to the asylum.

On his admission, he showed a slight trace of maniacal excitement which shortly afterwards gave place to stupor during which it was sometimes necessary to have recourse to forced means of nutrition. This stupor did not, however, continue all the time, it was broken by more or less intense maniacal attacks. Some ambitious ideas showed themselves at times and hallucinations of hearing rendered him impulsive; he gradually fell into "gatisme."

On the morning of the 13th of June, 1898, making an attempt to commit suicide, he drove a knife into the epigastric region. The course of the wound was from right to left; the knife followed the rectus muscle for the space of about half an inch, and buried itself in the linea alba by a slight oblique opening measuring one inch.

Doctor Brennan was immediately called upon to perform a laparo-

tomy. He found no intestinal or gastric perforation, but a superficial layer of the omentum was cut off causing slight hæmorrhage of a small vein which was ligated with cat-gut and the abdomen closed. Whilst putting in the deep sutures, the patient showed signs of asphyxia with stoppage of the respiration and was in imminent danger of death. Rhythmic tractions of the tongue after Laborde's method, were practiced and the patient quickly recovered. The result of the operation was excellent; there was no rise of temperature and no suppuration, and the last sutures were removed on the fifteenth day. This attempt at suicide, which was the first, was due to the hallucinations of hearing: "They have bored me too long" he said to me, "and I prefer to die."

During the first week which followed the operation he fed himself very imperfectly, in spite of our entreaties, and wished to die. We saw that in a short time we would be obliged to have recourse to forced feeding, when all of a sudden he decided to take everything which was offered him. From this moment his convalescence progressed rapidly, and on the 31st of August, he was able to return to his family.

#### **Two Cases of Psychological Troubles after Operation.**

DR. CHAGNON. I have had the advantage of observing two cases of psychological troubles after operation, one following an amputation of the breast, and the other amputation of a leg.

*Sarcoma of the breast, operation, acute mania.*—Madame D., was admitted to the Notre Dame Hospital, Montreal, on March 26th, 1891, for an operation for sarcoma of the breast, which was successfully performed on the morning of March 28th. She had little sleep the following night, slight agitation during the day of the 29th, absolute insomnia during the night of the 29th, and at length crisis of acute mania on the 30th. This state continued, and she became so agitated and so noisy that it was decided to send her to the asylum on urgency. She was admitted to St. Jean de Dieu on the 3rd of April, and died there on the 7th of April, from acute delirium. We learned from her husband that shortly after her marriage, which took place three years before, she had showed signs of maniacal excitement for a short time, and that one of her sisters was out of her mind. It was impossible to get any information about her family history.

*Fungous arthritis of the tibio-tarsal articulation, amputation of the leg, cyclic insanity.*—Mrs. F., was admitted to Notre Dame Hospital on June 5th, 1894, to be treated for a fungous arthritis of the tibio-tarsal articulation, of about five years standing.

*Family History.*—Her father died at 77 years of age from senile debility, her mother at the age of 68 years from the "grippe." She had seven brothers of whom four died young, the three living brothers are in good health. Three sisters are also in good health.

*Personal history.*—Mrs. F., had eleven children and one miscarriage. She never showed any nervous trouble. About 18 years ago she noticed that a tumour was growing on the dorsal surface of the foot. Inconvenienced by its growing volume, she had it removed six years later, but the wound did not heal until a piece of necrosed bone was removed. After six or seven years the disease reappeared and she was admitted to the hospital in an excessively debilitated condition. It was pointed out to her that an operation was the only means of saving her life, and amputation of the leg was performed at the lower third. Secondary hæmorrhage was very abundant.

She left the hospital on the third of July in a very anæmic condition and, two or three months afterwards, began to show symptoms of melancholia. She saw everything in black; "as big as mountains;" and was afraid of falling into poverty. This state of melancholia would begin towards evening continuing until the following evening, and was succeeded by a period of mental exaltation lasting the same length of time. The melancholico-maniacal fits, succeeded each other regularly from the time they first began and were followed by lucid intervals. Although not severe, they were yet perfectly distinct. Their beginning had been quite insidious.

In the first case reported there had been a former attack of insanity, collateral, and perhaps direct, heredity, inasmuch as the parents were unknown; and the effect of the traumatism was only to bring forth the intellectual troubles in a brain already prepared.

In the second the patient did not show any neuropathic history, hereditary or personal, and it is not possible to look upon any previous occupation, dread of operation, or the fear of death, as a determining factor. She knew that the operation alone could save her life, and she courageously decided to undergo it. The results of the operation were excellent and the recovery rapid. It must be concluded, therefore, that the operation alone was sufficient to cause the mental trouble.

#### **Alcoholism and Responsibility—The Social and Administrative Aspect of the Question.**

Dr. G. VILLENEUVE read a report on the above named subject. (See page 928.)

Dr. VALLÉE. The communication that Dr. Villeneuve has just made us is very interesting, but I do not entirely agree with the conclusions of his report.

Dr. Villeneuve does not believe that L. T. is responsible for the attempt at suicide committed while he was drunk, but he is of opinion that he is responsible for his drunkenness. Now, from his family history, is it evident that he has inherited this tendency. Several cases of insanity can be found in his ancestors. Besides, he shows an excessive susceptibility to alcoholic influences. A small quantity of alcohol is sufficient to completely derange him. His intoxication is not like ordinary drunkenness; it is marked by so profound mental disturbance that he remembers none of the dangerous actions committed while in that state. The moment he begins to drink he is intoxicated, then he loses all consciousness, and on each occasion makes efforts to kill himself. When he is in his normal condition there is no inclination of this kind. He knows what he exposes himself to in getting drunk, nevertheless he begins again when an occasion presents itself. Does it not appear, as if he were really impelled by some irresistible impulse?

It is very true, he claims that if he drinks, it is because he wishes to drink, and that he could abstain if he liked; but I believe we must take this affirmation with some caution, for the degenerates of this class very often deceive themselves. Do we not often hear insane people, after their recovery give expression to similar pretensions? In the case of hypnotised persons, do they not maintain, that they are free when they are not?

At all events, Dr. Villeneuve regrets that we have not special establishments for the unfortunates of this class, such as exist in other countries. He would be ready to recommend the commitment of L. T. not to prison, nor to an ordinary lunatic asylum, but to a special institution. Now on what grounds would you convict him? If he is responsible, he should be made to answer for his actions, and if found guilty, he should be sent to prison. On the other hand, since we propose sending him to a house of treatment, it is, because he is considered a sick man, susceptible of being cured or at least improved.

I am of this opinion. L. T. is an "alcoholic," he suffers from weakness of will, and in a great measure his responsibility is to be considered lessened by this weakness. It is often very difficult for the doctor to pronounce on the mental state of an individual who has committed an act whilst in a state of drunkenness. Here the doctor is called upon, theoretically, for a decision, without seeing. He should take into consideration the individuality of the patient, the nature of the guilty act, and the circumstances leading to drunkenness. As to L. T., his family history shows that he inherited this tendency, and though quite intelligent in the ordinary affairs of life, the brutal

manner in which he gets drunk after taking a small quantity of alcohol, is evidence of an abnormal organic susceptibility. Drunkenness takes many forms, but in this case real folly seems to be the immediate result.

It was then decided, that at the next meeting, the question of alcoholism, and the establishment of special hospitals for its treatment would be in order.

T H E

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## ALCOHOLISM AND RESPONSIBILITY.

The question of responsibility in cases of mental obliquity such as described by Dr. George Villeneuve, in the present issue,—cases that have been aptly styled “borderland,”—is admittedly a very difficult one.

The distinction between drunkenness and insanity has frequently been the subject of forensic investigation, but it is daily becoming more and more recognized by the profession, and to some extent by the laity, that inebriety in all its forms is a disease of the brain, resembling, if not in some cases constituting, true insanity. That an individual should in all other matters appear to be of sound mind, but that at certain times he should be subject to a morbid desire to reduce himself below the level of a beast by means of drink, is hard to grasp, but none the less true. Equally true is it that the continuous use of alcohol to excess produces a lowering of the moral tone, a dulling of the mental powers, and a weakening of the will which constitute an organized, progressive degeneration, and should, in justice, lessen, if not annul, the responsibility of its unfortunate victims.

Of the non-responsibility of Dr. Villeneuve's case during the stage of alcoholic delirium there can be no question, as he himself states. Whether equally irresponsible during the intervals, in other words, whether able to resist the impulse to use stimulants, is the point at issue. Here also, unlike the doctor, we would incline to the view of non-responsibility, the history tending strongly to stamp the patient, in our opinion, as a “degenerate,” and so less able than the normal individual to resist the temptation to drink. The strong inherited predisposition on the paternal side to both alcoholism and insanity; the hypersusceptibility to the effects of the alcoholic poison; the asymmetry of the head and face; his youthful character as described

by his class-mates ; and his epileptic seizures, all testify to this conclusion.

While, perhaps, not insane in the ordinary acceptation of the term, and hence not fitted for ordinary asylum care, it is none the less sure that L. T. should not be at large, and it is to be regretted that the province does not possess an institution specially designed for such cases, wherein they could be detained on indeterminate sentences.

As clearly defining the status of drunkards and the means best adapted for their care, we quote the following from the report of a Select Committee of the British House of Commons, appointed in 1870, Dr. Dalrymple chairman, to enquire into the medico-legal relations of habitual drunkenness.

“ That occasional drunkenness may, and very frequently does, become confirmed and habitual, and soon passes into the condition of a disease uncontrolled by the individual, unless indeed some extraneous influence, either punitive or curative, is brought into play.

“ That self-control is suspended or annihilated, moral obligations are disregarded, the decencies of private and the duties of public life are alike set at naught, and individuals obey only an overwhelming craving for stimulant to which everything is sacrificed.

“ That the absence of all power to check the downward course of a drunkard, and the urgent necessity of providing it, has been dwelt upon by nearly every witness ; and the legal control of an habitual inebriate, either in a reformatory or in a private dwelling, is recommended, in the belief that many cases of death resulting from intoxication, including suicides and homicides, may be thus prevented.”

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#### MUNIFICENT GIFTS TO THE MEDICAL FACULTY OF MCGILL UNIVERSITY.

At the Annual Dinner of the Undergraduates of the Medical Faculty of McGill University, held at the Windsor Hotel on the 15th instant, the Chancellor, Lord Strathcona and Mount Royal, in replying to the toast of “ Old McGill,” intimated that he had been instructed by Lady Strathcona to make known her wish to donate the sum of \$50,000 to the funds of the Medical Faculty.

It is scarcely necessary to say that this announcement was received with the greatest delight by every one present. When the Chancellor was enabled to proceed, he further intimated that his daughter, the Hon. Mrs. Bliss Howard, had also directed him to make known her wish to contribute likewise the sum of \$50,000 to enable the Medical Faculty to continue and extend the sphere of its usefulness.

The Medical Faculty of McGill owes much to her respected Chancellor. He was the first to materially recognize the efforts made by the Faculty to give a good course of instruction, and this recognition took the shape of a donation of \$50,000. A few years afterwards he endowed the chairs of Pathology and Hygiene, contributing to this purpose the large sum of \$100,000. Altogether the Medical Faculty have received from Lord Strathcona and his family the sum of \$250,000.

It is pleasant to think that Lady Strathcona and the Hon. Mrs. Howard take almost as deep and affectionate an interest in the Faculty as does Lord Strathcona himself.

The gifts referred to were suitably acknowledged by Principal Peterson and Dr. Craik.

The announcement came as a complete surprise to everyone present, and for several minutes the voice of the speaker could not be heard owing to the enthusiasm evoked by a realization of the nature and proportions of the gifts.

The Medical Faculty will be now more than ever in a position to do their part to keep the torch of progressive medicine burning; thanks to the noble generosity of Strathcona and his family.

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