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ON THE MEDICO-LEGAL APPLICATION OF ENTOMOLOGY.¹

BY

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The remarkable results of Mégnin's² studies on cadaveric fauna have made medico-legal entomology part of the regular stock-in-trade of the medical expert. One may now judge from the animal fauna met with in a dead body how long it has been exposed. The creation of this special department of legal evidence is an honour which belongs to Mégnin alone, although prior to him, Bergeret³ had already made some practical applications based on the erroneous views current at the time.

Through the publishing of his *Faun des Cadavres*, the popularisation of the subject has been greatly furthered, though the subdivision of the stages in the process of destruction into 8 successive stages is perhaps less easy to comprehend than the simpler classification previously adopted with 4 stages.

The result of over 15 years experience at the Paris morgue, during which period M. Mégnin had been entrusted with all the expertises requiring a knowledge of entomology, has been, according to Professor Brouardel⁴, entirely satisfactory. Often the conclusions which he had arrived at from the examination of a few debris and insects were borne out in the most striking manner by the subsequent course of the case. Sometimes the mystery was never cleared up. But in no single instance did the results of the inquiry go to show that M. Mégnin's deductions were erroneous. There is something almost uncanny in the way which M. Mégnin could state for instance after

¹ Read before the Canadian Medical Association, Montreal, August, 1896.

² P. Mégnin *Faune des Cadavres*, Paris, 1894, *Gazette Hebdom. de Méd. et de Chirurg.*, July 20, 1883; *La Faune des Tombeaux*, 1887.

³ *Annales d'Hygiene*, 1855, Tome IV., p. 404.

⁴ *La Mort Subite*, 1894, p. 99; *L'Infanticide*, 1896, p. 141.

examining a few bones and some dust that a murder had been committed during the latter part of February of the year before last—and then be absolutely justified by the dying confession of the suspected party. The chief danger to be feared from Mégnin's imitators is that they might tend to indulge in guesses having no very solid basis and to apply rules to countries and climates where they were inapplicable. We considered that before any safe deductions can be made in the case of Canada a number of comparative observations must be made to show how far the data obtained from French fauna hold good here.

It is very much to be regretted that in addition to giving the generalisations and medico-legal applications made by him, M. Mégnin has not also given us the assistance of his numerous observations which underlie these deductions, that we may know accurately the degree of variation of dates actually met with under definite conditions of experiment.

For convenience we have arranged in tabular form the dates which Mégnin assigns for different fauna to attack the body, as far as these can be determined from the literature above mentioned, though, of course, considerable latitude must continually be allowed for variations, and for this relation M. Mégnin is not personally responsible.

The principle is that the products formed at different epochs in the progress of decomposition attract certain forms and repel others.

The typical course of events shown by the table may be summarised as follows: While the body is still fresh it attracts the diptera *Musca*, *Curtonevra* and *Calliphora*. After decomposition has set in, the flesh flies *Lucilia* and *Sarcophaga* are attracted. Later, when fatty acids are formed, the body is invaded by the beetle *Dermestes* and by the moth *Aglossa* (this latter we have never met with in our Canadian observations, but it is apparently very common in France). Later *Ptyopbila* of the diptera and *Necrobia* of the coleoptera appear, as the condition becomes caseous. After this comes a period of ammoniacal decomposition marked by liquefaction of the tissues into a blackish pulp, during which stage a group of coleoptera, *Necrophorus*, *Silpha*, *Hister* and *Saprinus* are met with, as well as the diptera *Ophira*, *Tyreophora*, *Phora* and *Lonchea*. In the next stage the tissues dry up and are invaded by acari, the debris and excrement of which form a powdery deposit. Subsequently, with the progressive drying of the tissues, *Aglossa* (2nd generation) reappears, together with the moth *Tineola* and the coleoptera *Attrigenus* and *Anthrenus*. Finally, when nothing but the dried ligments remain on the bones, two forms of coleoptera, *Tenebrio* and *Ptinus*, appear and devour these.

In the case of buried bodies, the fauna are said to be much less varied and to consist mainly of *Phora* and *Ophira* in the diptera, and *Philontes* and *Rhizophagus* of the coleoptera, together with any diptera which have gained access to the body before burial.

FAUNA OF DEAD BODIES EXPOSED TO THE AIR.¹
(COMPILED FROM MÉGNIN).

	Physical Condition.	Minimum time.	Forms met with.
First Period....	Bodies fresh.....	{ First three	(D) <i>Musca</i> .* <i>Curtonera</i> .* <i>Calliphora</i> .*
Second Period...	Decomposition com- menced.....	{ months.	(D) <i>Lucilia</i> .* <i>Sarcophaga</i> .*
Third Period....	Fatty acids.....	{ 3 months to	(L) <i>Dermestes</i> .* <i>Aglossa</i> .
Fourth Period...	Caseous products.....	{ 6 months.	(D) <i>Pyophila</i> .* <i>Anthomyia</i> . (C) (<i>Cornytes</i> .) <i>Necrobia</i> .
Fifth Period....	Ammoniacal fermenta- tions, black liquefac- tion.....	{ 4 months to 8 months.	(D) <i>Tyreophora</i> . <i>Ophira</i> .* <i>Lonchea</i> , <i>Phora</i> . (C) <i>Necrophorus</i> . <i>Silpha</i> .* <i>Hister</i> .* <i>Saprinus</i> .*
Sixth Period....	Dessication.....	{ 6 months to 12 months.	(A) <i>Uropoda</i> .* <i>Trachynotus</i> . <i>Tyroglyphus</i> .* <i>Glyciphagus</i> . <i>Serrat</i> .*
Seventh Period..	“ extreme...	{ 1 year to 3 years.	(L) <i>Aglossa</i> . <i>Tineola</i> . (C) <i>Attagenus</i> . <i>Anthrenus</i> .
Eighth Period...	Debris.....	{ Over 3 years.	(C) <i>Tenebrio</i> . <i>Ptinus</i> .

FAUNA OF BURIED BODIES.

Before Burial.....	(D) <i>Calliphora</i> *, <i>Curtonera</i>
After Burial.....	(D) <i>Ophira</i> *, <i>Phora</i> . (C) <i>Philontes</i> *, <i>Rhizophagus</i> . (T) <i>Achorutes</i> , <i>Templetonia</i> .

(The genera marked * in the table are those met with by ourselves.)

¹ (D) Diptera, (C) Coleoptera, (L) Lepidoptera, (A) Acari, (T) Thysanura.

The following is a list of all the species mentioned by Mégnin. Those found by us and not mentioned by Mégnin are placed in brackets. Those marked * are North American; marked † European, and those marked ‡ Cosmopolitan. † † Signifies that the species is European, but the genus is largely represented in North America

DIPTERA.—*Musca* † *domestica*, *M.* † *Carnaria*, etc., *Curtonera* † *stabulans*, etc., *Calliphora* † *vomitaria*, [*C.* * *erythrocephala*], *Lucilia* † *Cesar*, *Sarcophaga* † *carnaria*, *S.* † *arvensis*, *S.* † *laticrus*, *Pyophila* † *casei*, *P.* † *pelusionis*, *Anthomyia* † *vicina*, *Tyreophora* † *cynophila*, *T.* † *furcata*, *T.* † *anthrophophaga*, *Ophira* † *leucostoma*, *O.* † *cadaverina*, *Lonchea* † *nigrimana*, *Phora* *aterrimax*.

COLEOPTERA.—*Dermestes* † *lardarius*, *D.* † *frischii*, *D.* † *undulatus*, *syn. Necrobia* [*Cornytes*] † *ruficollis*, *N.* † *cœruleus*, *Necrophorus* † *fossor*, *N.* † *humator*, *Silpha* † *littoralis*, *S.* † *obscura*, [*S.* * *noviboracensis*], *Hister* † *cadaverinus*, *H.* * *foedatus*, *Saprinus* † *rotundatus*, [*S.* * *assimilis*], *Attagenus* † *pellio*, *Anthrenus* † *muscorum*, *Tenebrio* † *mollitus*, *T.* † *obscurus*, *Ptinus* † *brunneus*, *Philontes* † *ebeninus*, [*P.* † *psittus*], *Rhizophagus* † † *parallelo collis*, [*Omosita* * *colon*, *Trox* * *unistriatus*].

LEPIDOPTERA.—*Aglossa* † *pinguinalis*, *A.* † *cuprealis*, *Tineola* † *biselliella*, *T.* † *pellionella*.

ACARI.—*Uropoda nummularia*, *Trachynotus cadaverinus*, *Tyroglyphus spinipes*, *T. siro*, *T. longior*, *Glyciphagus spinipes*, *G. cursor*, *Serrat amphibiis*, *S. necrophagus*.

THYSANURA.—*Achorutes* † *armatus*, *Templetonia* † *nitida*.

Looking at the table, one is at once struck by the small number of genera and species represented out of a total of diptera, coleoptera, acari and lepidoptera occurring in France, so that in practice their recognition becomes a relatively easy matter.

It must be kept in mind that Mégnin's observations apply to human bodies. One is also struck by the absence of several forms well known to attack the flesh of dead animals, birds or reptiles; either they do not appear in the above list, or only appear at a much later date. The burying beetles, for instance, which attack game left exposed for a few days, will not attack human bodies under several months. Hence observations conflicting with Mégnin's work which rest upon observations on other animals, horseflesh for example, have, to our mind, very little practical value, what is wanted being rather multiplication of observations upon human remains, when all the conditions as to dates and meteorological conditions are accurately known. In this direction we have made some studies, which will be mentioned later, and others are still in progress. The possibility that some of the fauna may be attracted by the clothes and not by the bodies we have not found to be a serious obstacle.

Our observations now extend over a period of two years. As far as we are aware, no American or Canadian observations on this subject have been published, so that we had no direct information as to how far the dates and successions, laid down by Mégnin, might hold true of the climate of Canada. As to the comparative frequency of occurrence of various European, American and cosmopolitan genera and species there is considerably more information, though this is for the most part recorded in transactions and books not generally accessible.

To illustrate the difference in climate we have tabulated the mean monthly temperatures of the air and soil for Montreal, Greenwich and Paris and the soil temperatures for Montreal and Greenwich (the depth of soil temperature for Paris not being quite identical). The differences in summer temperature are very much less than one might expect, and this may explain the general correspondence of our results with those of Mégnin. The climate of Canada is peculiar in having a long, cold winter, (during which the ground is deeply covered with snow, which prevents the frost from penetrating deeply) followed by a hot summer. The interval between winter and summer is short. Everything is in full leaf within about a month after the disappearance of the snow, and during the warm weather temperatures from 80° to 95° Fahr. (27° to 32° C.) are not uncommon. Thus the temperature of the surface soil in summer is rather higher at Montreal than at Greenwich, and probably very near that of Paris,

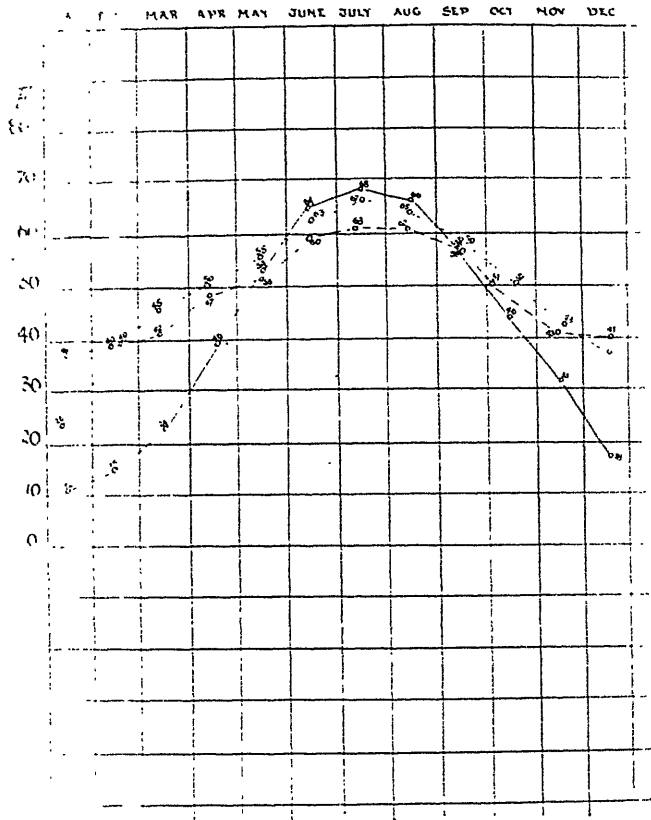


Fig. 1. Monthly means of air temperature at Montreal — and Greenwich.....

The charts are not drawn quite accurately as to scale.

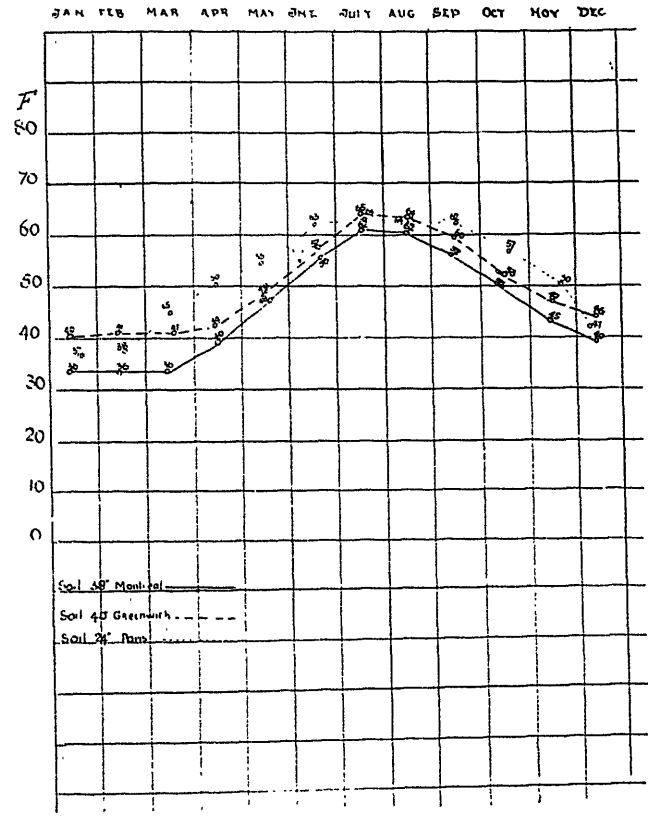


Fig. 2. Monthly means of soil temperature at Montreal 40 in. — Paris 24 in. - - - - and Greenwich 38 in.

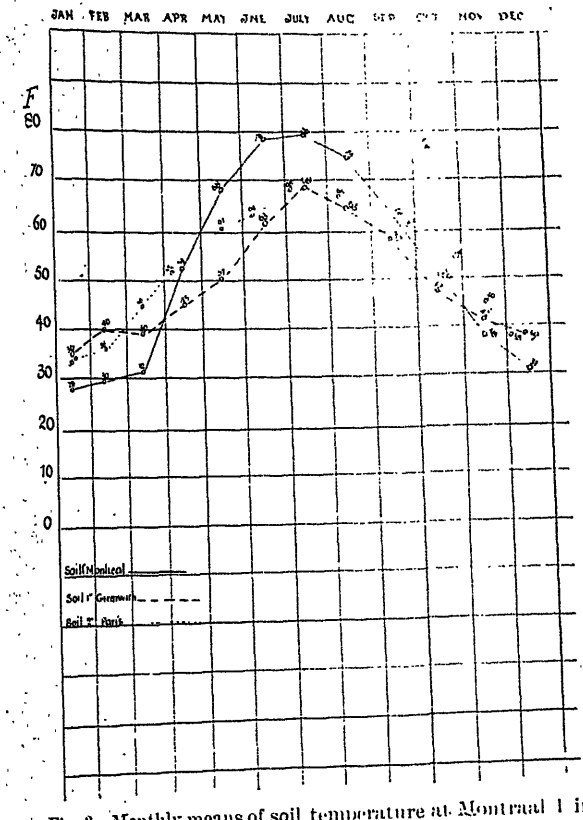


Fig. 3. Monthly means of soil temperature at Montreal 1 in. — Paris 2 in. - - - - and Greenwich 1 in.

The percentage of bright sunshine between April 1st and September 30th, is 65 at Montreal and less than 53 at Paris. From the tracings it will be seen that the mean air temperature at Montreal is slightly higher than that at Paris during the summer. The relative humidity in summer is 72 at Montreal and 71 at Paris.

	AIR TEMPERATURE °FAHR., MONTHLY MEANS.			* SOIL TEMPERATURE °FAHR. MONTHLY MEANS.					
	Mon- treal.	Paris.	Green- wich.	Mon- treal at 40 in.	Paris at 24 in.	Green- wich. at 38 in.	Mon- treal at 1 in.	Paris at 2 in.	Green- wich at 1 in.
January ...	12	26	38	36	37	40	28	35	36
February ..	15	40	39	36	38	41	30	36	40
March	24	45	42	36	45	41	32	46	39
April	40	50	47	40	50	44	54	52	45
May	54	55	53	48	55	49	68	61	51
June	64	63	60	56	63	57	78	64	63
July	67	67	63	62	64	65	79	68	68
August	66	65	62	62	64	64	74	66	65
September.	58	59	58	57	62	60	64	61	57
October....	46	51	51	52	57	53	50	54	47
November .	33	43	43	45	50	47	38	46	42
December .	18	38	41	40	41	46	31	38	39
Annual Mean...	41.8	52.0	50.0	47.6	52.0	50.3	51.8	51.8	49.5

It was suggested to us that the relatively rapid growth and development of the Canadian flora might be associated with a corresponding rapid evolution of the fauna as compared with those of Europe. This we did not find to be the case with the individual insect forms studied. We did find, however, that the successions of insect forms occurred in a shorter time on exposed bodies than we had expected from Mégnin's statements.

On the other hand we found that the order of the successions followed the rules laid down by Mégnin.

In our comparatively small number of observations, out of the 23

* The soil temperatures for Montreal are from observations by H. L. Callender and C. H. McLeod, Pro. Roy. Soc. Canada, 1895 and 1896. The soil temperatures for Paris are from observation by E. and H. Bequerel, Comptes Rendues, 1883, Tome 96, p. 1109. All temperatures were taken beneath turf. For simplicity they are expressed by the nearest whole number of degrees Fahr. The variations from the monthly means average 1° to 4° Fahr.

genera indicated by him, as characteristic of exposures up to one year, we have met with 13, and of the 10 remaining 6 are rare on this continent. We have only encountered two which he does not mention. These were *Trox* and *Omosita*, both rare in France, although necrophagous.

The diptera characteristic of the first and second periods were found by us regularly on bodies exposed during the warm months, and were not found during the cold weather, unless the body had been previously kept for some time indoors. An exception worth noting was met with in the case of a patient who escaped from an asylum on February 22, 1896, while the fields were covered with snow. The body was found on April 20, 1896, in a snowy spot in a field, and showed about the eyes and nostrils numerous small white larvæ, which on hatching out, proved to be those of *Calliphora Erythrocephala*. It is true that the development and hatching of the pupæ had not taken place. A knowledge of the period of the year at which breeding of the different insect forms takes place is of the utmost importance in determining the dates.

A deduction not mentioned by Mégnin, which we have repeatedly found of practical use, is that if empty dipterous puparia are present, the date of exposure may be reckoned as not less than one month, while the absence of empty puparia indicates an exposure of not over one month in warm weather.

Our observations conform with Mégnin's as to the order of the successions. Thus whenever acari were found, it was evident that *Silpha* and *Hister* had preceded them. *Pyophilæ* was only seen when saponification of the fat was well marked. *Dermestes* was seen earlier in the saponification period, but never in the preliminary decomposition. *Calliphora* and *Lucilia* were the forms met with up to the end of the first month in cases where the dates were accurately established. Where the exposure lasted a few days only, *Lucilia* was absent.

Our failure to find such forms as *Attegenus*, *Anthrenus*, *Tenebrio* and *Ptinus*, taken in connection with the fact that none of the observations reached the time limit at which they were found by Mégnin, is also confirmatory of his statements. In one case where the date of exposure was definitely fixed at five weeks, these forms were absent, although the bones of the skull were laid bare and the cervical vertebrae were stripped of their flesh and disarticulated. The inequality of the destruction in different parts of the body was striking in this case. for the state of the abdominal organs was so entirely free from decomposition that an analysis for arsenic was made, with negative results.

Whenever possible we bred the larvæ in order to determine the time necessary for the complete cycle. This was not found in any case to be lower than that given by Mègnin. It was found to be extremely difficult to obtain more than two generations. Unfortunately the pamphlet of instructions for practical entomological work, published by the Washington Bureau of Entomology was not obtained in time to adopt its valuable suggestions in our earlier observations.

In a case in which one of us (V.) was summoned as an expert, the nature of the fauna present afforded much valuable information. Early in May, 1895, the body of an unknown man was found dead in a lonely spot, with a bullet hole in the skull. There existed an advanced state of adipocere transformation, and in places the bones were partly bare. The body and clothes were swarming with small white larvæ which, from their characteristic skipping action, were thought to be those of *Pyophilæ casei*, and which on being hatched out subsequently proved to be so. In addition, the body and the clothing were literally covered with large dipterous larvæ and empty pupa cases. These we were not able to identify satisfactorily. No acari or coleoptera were found. The assumption of the police that the man had been murdered *during the winter* in a house near by was disproved by the evidence of abundant diptera, placing the date of exposure back to some time during the warm weather of the preceding summer or autumn. Following this clue, information was obtained which resulted in the body being identified as that of an individual who had been seen in the vicinity during the harvest season of the previous year and who was known to have a revolver in his possession. The subsequent finding of a revolver near where the body lay strengthened the original opinion of the medical examiner that the case was one of suicide.

In another case the body of a new-born male infant, found under some loose planks in the floor of a bath-room and directly over the kitchen ceiling in April, 1895, was sent to one of us (J) for examination with the statement that if the testimony of the witnesses was correct it must have been placed there on a certain night, 5 weeks previous. The supposed mother, a servant in the family had been noticed by strangers to have a suspicious degree of abdominal enlargement, though her mistress stated that she had not noticed this. After the night in question this enlargement suddenly vanished and the girl was noticed to be out of sorts for a few days. Her fellow servant who occupied the same room said that the accused had gone to the bath-room in the night "to change her socks" and had come back covered with blood. Marks of a copious bloody discharge were found

on her bedding and on her under-garments when seized by the police a month later. Unfortunately a proper vaginal examination was not consented to at the time of the inquest, though we learned subsequently that she allowed herself at the request of the coroner to be examined by a midwife, who claimed to have found a condition indicating a recent parturition. There appeared to be no moral doubt that she had been pregnant and confined in reality at the time alleged, the only question being as to the identity of the child.

The body when received for examination was in an advanced state of decomposition and was swarming with *Dermestes lardarius* in both adult and larval stages, as well as large numbers of *Calliphora erythrocephala* larvæ and puparia of which a number were empty and some of the adult flies were found inside the coffin on opening it after it had contained the body for a few hours. The body was found on examination to be in an advanced state of decomposition. It exhaled a strong odour like that of old cheese, and the surface showed extensive pitting from the attacks of the insects. No microscopic or other evidence of acari could be found. The advanced state of decomposition made any decided opinion as to the cause of death impossible. The decomposition of the lungs was relatively far advanced, pointing to the probability of live-birth, but so far to let the question be decided positively. No marks of violence of the severer forms, alone recognisable under the circumstances, existed. The infant was between the 8th month and full term. There were no signs of its having been cared for.

Here we had the anomaly of very positive evidence of witnesses pointing to less than 5 weeks as the time elapsed since death, while on the other hand the state of the body, which according to Mégnin, the only authority on the subject, would require at least 3 months under favourable conditions for its production. The abundance of *Calliphora* did not correspond either with what is met with in early spring and in no other cases of one month's exposure have we ever personally met with the conditions found in this case. On the other hand the position of the body between the floors and over the kitchen was one likely to favour the drying which is so favourable to the *Dermestes*. Some experiments we made with the bodies of new-born infants showed that for the first month the *Dermestes* could not be induced to attack a body, but at the end of the second month they would do so. This latter period was the minimum and was only obtained in a dry atmosphere. The presence of the fatty acids in the vernix caseosa was thought of as a possible factor tending to hasten matters, but under experimental conditions it did not appear to make much difference.

The contradiction between the medical evidence and the theory of the prosecution was pointed out at the preliminary examination, but the case came to trial with the result that the prisoner was acquitted. In this case the circumstances were apparently contradictory of M \acute{e} gnin's views but the material facts were not established so as to exclude doubt.

In another case where the body of an old woman was found lying in a field in August, 1895, there was extensive decomposition and the fatty tissues showed the adipocere change. The integument, where exposed, was parchmented and the bones of the upper extremity were exposed in places. As far as could be ascertained the body had been exposed since the middle of April making an interval of a little over four months. The insects present in this case were the diptera *Calliphora erythrocephala*, *Lucilia caesar* and *Pyophilus casei*; with the coleoptera *Silpha noviboracensis*, *Omosita colon*, *Hister fœdatus*, *Trox unistriatus* and *Saprinus assimilis*. In addition there were in parts of the body large numbers of acari not fully determined by the experts to whom they were referred but which belonged to the genus *Tyroglyphus*.

The finding in this case is decidedly what one might expect according to M \acute{e} gnin as regards the forms present, though they appeared at a date earlier than that he would assign, as already stated. The presence of two forms not mentioned by him, *Trox* and *Omosita* is not evidence against the correctness of his statements as these forms are said to be rare in Europe.

M \acute{e} gnin's method of computing the time interval by the *number of individuals* found and the proportion of males and females, though one of the earliest means employed by him appears to have a less solid foundation, as the number of individuals first having access cannot be positively known.

In the case of buried bodies our examinations have been confined to a few examinations for medico-legal purposes and are not numerous enough to be of any statistical value. We found that in these cases *Philonthes politus* was invariably present. *Rhizophagus* was not met with. Other forms were extremely scanty except in the cases where the bodies had been kept for a few days in the warm weather before burial and as might be expected showed abundance of diptera, mostly *Calliphora*.

Some very interesting observations made by Dr. Murray Motter on buried bodies in Washington, D.C., which will be published shortly, have been in part privately communicated to us. They show the fauna of buried bodies at Washington to be much more varied and numer-

ous than would be anticipated from Mégnin's statements as to France. The importance of comparing the results in different localities is of course very great, and we venture to think that the soil temperature may prove a better index of what may be anticipated than can be had from the atmospheric conditions of climate and temperature, both as to exposed and buried bodies.

Conclusions.—It appears certain observations and experiments upon exposed human bodies should be made in the particular locality before the present entomological data can be directly applied to legal medicine. In the vicinity of Montreal it seems probable that the deviations will be in degree rather than in kind, and concern species rather than genera. As a whole, the statements as to the fact of successions occurring and as to the general order of these successions are likely to be strengthened by further observations. Experiments with animal bodies, other than human, are apt to misleading, and adverse results under such circumstances have not very much significance. The time limits, however, apparently require modifications for the particular locality. We know very little at present as to the difference in habit of different species of the same genera.

We have to thank Messrs. Schwartz and Coquette, of the Smithsonian Institute, Washington, as well as Professor Fletcher, of Ottawa, for having kindly determined species of diptera and coleoptera for us, Mr. A. F. Winn, of Montreal, for information as to the occurrence of North American species and Prof. C. H. McLeod, for information as to meteorology. Especially we have to thank Dr. M. G. Motter, of Washington, for very valuable assistance, as well as for information as to his personal results with the fauna of buried bodies.

THE PELVIC VISCERA IN RELATION TO MICRO-ORGANISMS IN HEALTH AND DISEASE.

BY

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The bacteriology of the genital tract in various normal conditions :

In the New-Born Child, in almost all cases, no germs are found in the vagina. Very soon, however, they enter, favoured by baths, washing, the application of oils, etc. Stroganoff states that a breech delivery of a female child favours their premature entry. Within the first two weeks gelatine-liquefying germs are rarely found.

In Girls and Women various bacilli and cocci may be found in the vagina, as well as sarcinæ, yeast fungus, etc. One of these germs is very common and is called Döderlein's vaginal bacillus. The pathogenic organisms flourish best when the vaginal secretion is alkaline; in acid conditions they are weakened in vitality or killed. As a rule no germs are found in the uterus or tubes. Menge has carried out an interesting series of experiments regarding the bactericidal properties of the vaginal secretion in a large number of non-pregnant women. He introduced into the vagina a number of pathogenic organisms, viz. : bacillus pyocyaneus, staphylococcus pyogenes and streptococcus. In all cases he found that within 70 hours they had been destroyed or their virulence greatly diminished.

He also carried out the following experiments. The vagina was carefully sterilised in the case of 70 women on whom abdominal section was to be performed. About 16 days after the operation the vaginal secretion was carefully removed and alkaline agar plates inoculated. In 62 cases the plates remained absolutely sterile. It was different, however, with specimens taken from the vulva for 66 of these gave rise to growths on the agar, only 4 being sterile. Of the 8 cases in which the vaginal secretion gave rise to growths, the germs were not pathogenic.

In 12 cases acid agar plates were also employed, cultures being obtained in 6 cases (mostly consisting of bacilli); while in the same cases only 3 cultures were obtained on alkaline plates. (These few experiments are not, however, of particular value, for pathogenic germs without exception develop in alkaline media and not in acid media.)

In another series of experiments, 12 in number, he used grape-sugar agar and obtained cultures 11 times, thus demonstrating the frequency of non-pathogenic anaërobic germs in the vagina.

Döderlein has advanced the view that the micro-organism which he has called the "vaginal bacillus," of anaërobic growth, produces an acid secretion, which is the cause of the normal vaginal reaction and prejudicial to pathogenic organisms.

Menge, however, believes that the vaginal secretion, whether alkaline or acid is bactericidal to these organisms and he believes that the acid secretion of Döderlein's bacillus plays an unimportant part in the purification of the vagina. Of more importance is acidity due to other causes (found in the new-born child when no germs are present). But a considerable role is played by phagocytes and leucocytes which enter the vagina. The chief agents are, however, the anaërobic germs and their growth-products. In proof of these statements, Menge made the following experiments. He removed the acid secretion from the vagina in sterilised holders and inoculated it with staphylococci. The latter were soon destroyed. If the secretion were previously sterilised with steam the staphylococci lived for a considerable time or were not killed at all.

If the secretion were made weakly alkaline, the cocci lived longer than in the acid solution. If the alkalisied secretion were sterilised by steam before hand, the germs flourished vigorously.

Menge believes that the tissue fluids possess this bactericidal action, and that this is found in the new-born child, whose vagina is free of germs. The absence of oxygen is also an important factor.

In the order of their importance the factors destructive to pathogenic microbes in the vaginal secretion may be arranged as follows according to this investigator :

1. The antagonism between the normal vaginal bacilli and the pathogenic organisms.
2. The products of the vaginal bacilli.
3. The acidity of the secretion.
4. The secretion of the vaginal wall.
5. Leucocytes ; phagocytes.
6. The absence of free oxygen in the vagina.

It is important to note that the vaginal secretion may vary greatly in its effects on pathogenic organisms. In some cases it may quickly destroy them ; in others it may only weaken them or destroy their virulence, as Winter has shown. Their virulence may be retained, if the nature of the secretion be altered, *e. g.*, by dilution, by secretions

from inflammatory areas, *e. g.*, gonorrhœa in the cervix, or by the addition of solid organic debris.

Secretions poured into the vagina from inflammatory conditions in the uterus weaken the power of the vaginal secretion. In 10 cases in which there was gonorrhœal inflammation in the uterus, the vaginal secretion contained numerous streptococci. If the vagina in these cases were completely disinfected with strong antiseptics *e. g.*, carbolic acid, lysol, corrosive sublimate, and then left for some hours, the streptococci again appeared in the vaginal discharge in 3 to 6 hours. On the other hand, if at the same time the interior of the uterus were thoroughly disinfected with a 50 per cent. chloride of zinc solution, the cocci in the vaginal secretion thereafter disappeared.

As regards the normal uterine canal Menge finds that organisms do not dwell in it, though the secretion be alkaline. The cervical mucosa, according to him exercises a protective influence. He inoculated the cervical canal with streptococci and staphylococci in 15 cases and within 12 hours found the cervical mucus sterile.

The normal tube is always sterile. Menge examined 83 specimens and obtained a culture only from one, in which there was an infective endometritis associated with a carcinoma of the cervix.

As regards the influence of Menstruation.—Jacobs and others state that the vaginal organisms are increased during the period of the flow owing to the diminution in the acidity of the normal vaginal secretion as a result of the entrance of the blood. Stroganoff examined the cervix during the menstrual flow and found that in many cases it contained germs, though none that would liquefy gelatine. It is probable that some germs are washed out by the menstrual blood, and that the vaginal secretion loses some of its strength by the dilution which occurs.

In Pregnancy, the vaginal secretion is believed to be very germicidal to pathogenic organisms. Stroganoff found plenty of ordinary vaginal bacilli, but rarely germs that would liquefy gelatine. Krönig performed a number of experiments on pregnant women, introducing various organisms into the vagina. He found that the streptococcus was killed before the staphylococcus, and showed that douching of the vagina with antiseptic solutions reduced or destroyed its germicidal power, and that the use of plain water slightly diminished it. He thinks, therefore, that prophylactic syringing before confinement can do no good and may be a source of harm.

Stroganoff also found various microbes in the vaginal secretion, but none of them would liquefy gelatine by their growth.

In the Puerperium, the use of antiseptic solutions in the vagina

after labour is being discarded by many authorities, save where digital examination has been carried out, where labour is abnormal, or where operations have been performed ; and in cases where the patient may be depressed in health from various causes, *e.g.*, nephritis, heart disease, syphilis, anæmia, etc.

If, however, there be any inflammatory condition in the cervix, vagina or vulva (especially if of a possible gonorrhœal origin) there is a very strong indication in favour of employing vigorous antiseptic douches.

In Abortions, the vaginal reaction varies according to the amount of blood and debris found in the vagina. The germs also vary greatly in number and nature from time to time ; the pathogenic organisms are more apt to be found in the vagina and cervix in connection with abortions than in other conditions, probably chiefly due to the frequent digital manipulations that are carried out or to the carelessness of women in having themselves attended to.

In Old Age, Stroganoff finds various microbes in the vagina, mostly rod-shaped, and smaller, on the whole, than those found during the period of sexual life.

The vaginal secretion is only faintly acid ; in the neighbourhood of the cervix it is neutral or alkaline.

In the cervix living germs were found in about 50 per cent. of cases, though very rarely were any of them able to liquefy gelatine in their growth.

The Bacteriology of the Urethra.—Various germs may be sometimes found in the urethra in health. Gawronsky's experiments may be quoted. He made cultivations from the urethral secretion in 62 cases. In 15 of these bacteria were found, in 8 staphylococcus pyogenes albus, in 2 the bacterium coli commune. Amongst the negative cases were 10 where the women had peri- or parametritis, 6 prolapsus uteri, 3 pregnancy.

The Bacteriology of the Intestines.—Various forms of micro-organisms are found in the bowel. It is not necessary to specify these ; the germ which is of chief importance as an infective agency is the bacterium coli commune.

Relation of Micro-organisms to Pelvic Diseases.—At the present time the tendency is to attribute the great majority of inflammations which occur in the peritoneum, cellular tissue and viscera of the pelvis to the action of micro-organisms. The inflammatory processes are simply, to state the modern view, the series of phenomena caused by nature's resistance to the noxious influence of the infecting organisms. These processes are, therefore, not evil in themselves, but are bene-

ficent and purposeful. The most important germs which act as infecting agents are :

Streptococcus pyogenes (most frequent source of trouble).

Staphylococcus pyogenes aureus.

Bacterium coli commune.

The following are less often a source of trouble :

Staphylococcus pyogenes albus.

Staphylococcus pyogenes citreus.

Staphylococcus epidermidis albus.

Bacillus pyocyaneus.

Diplococcus pneumoniae.

Tubercle bacillus.

These germs may gain entrance by the vagina, rectum, bladder, intestines, or may be carried from some distant part by the circulation.

The conditions which favour their entrance are a favourable soil, *e. g.*, a raw surface, a tissue of impaired vitality, a general condition of bad health in which the power of resistance of the tissues is reduced, dying organic matter such as blood-clot, remains of placenta or membranes.

In some cases the micro-organism *e. g.*, the gonococcus is capable of attacking the tissues and of setting up specific reaction when the individuals are in a state of perfect health. The most common source of entrance for the various germs is, undoubtedly, the vagina. They may spread into the uterus and tubes and may infect the peritoneum and ovaries; this may take place either by an extension of infective activity along the mucous membrane or by advance as a result of germ-development in a favourable medium lying within the genital canal. They may enter a raw, injured or diseased surface and then spread to cellular tissue, peritoneum, tubes or ovaries, or even to more distant parts by means of blood-vessels and lymphatics.

The exact relationship between germ-action and various other factors which have long been regarded as causal in the production of pelvic inflammation has not yet been definitely established.

Thus menstruation has always been considered important especially in relation to the development of inflammation in the uterus, a chill or some extra exertion being considered as playing a leading role in precipitating the inflammatory processes.

Now-a-days, we are rather inclined to regard menstruation as a factor in altering the nature of the vaginal secretion, rendering it, by the addition of alkaline blood, more suitable for the growth of pathogenic germs which might enter the vagina, and making it more easy for them to spread into the upper genital tract and attack the tissues.

It is possible, also, that such influences as chill and fatigue, by diminishing the resisting power of the tissues, render them more susceptible to the action of germs.

Excessive coitus, especially at menstruation, is said to lead to inflammatory changes, especially in the uterus. There is, however, no proof that the mere physical excitement can induce these. Most likely it requires to be combined with microbial activity; the irritation of the tissues caused by the excessive movements in some measure depressing the vitality of the tissues and thus favouring infection by germs which might be present. When it occurs at the menstrual period there is also to be considered the altered nature of the vaginal secretion favouring the development of micro-organismal growth.

In some of these cases, in which the inflammation is supposed to be due to coitus, gonorrhœa is the infecting agent; either an acute gonorrhœa existing in the man or a latent gonorrhœa in the man or woman. In the former of these the virulent germ attacks the woman directly, its infectivity being unaffected by the action of coitus: in the latter the latent condition is stirred into a renewal of activity as a result of the irritation and excitement of the excessive coitus.

The Influence of Labour has long been regarded as most important among the factors causing pelvic inflammations. In the puerperium many conditions favourable to the development of micro-organisms are present. The vitality of the tissues in general is impaired as a result of the fatigue of the pregnancy and labour; the uterus is weakened by its great exertion in delivery, the condition of its circulation is greatly altered owing to the contraction and retraction of its musculature, and its tissues are below their normal standard of strength owing to the puerperal retrogressive changes which take place in them; the inner surface affords a large absorbing area; the placental site presents a number of opened blood-sinuses in which blood-clots are formed; blood-clot often lies in the uterine cavity and portions of the placenta and membranes may be left in it; the cervix, vagina and perineum are more or less bruised and very frequently lacerated.

That the bruising and laceration *per se* can start an inflammation is very doubtful and, by many, is not at all believed. Were it not for the irritation of germs or their products, wounds would heal by direct union or by granulation, without the accompaniment of inflammatory processes.

Certain other conditions in the puerperium are believed by many to lead to inflammation, viz., too early rising, walking or working. It

is very doubtful, however, if these influences can bring about metritis in the uterus directly. They act undoubtedly mainly by impairing the vitality of the tissues and thus favouring infection by germs. It is very noticeable that these conditions are, in many instances followed by no disturbance whatever. Among the labouring classes may be found a large number of women who systematically rise early after child-birth and go to work, in whom no inflammatory changes, whatever, follow.

Injuries resulting from operative measures may also lead to conditions which favour microbial infection, *e. g.*, bruises, tears, cuts; the irritation of a pessary may also act in the same manner.

The influence of all diseases which weaken the system is one which acts as a predisposing cause. It is believed by several that in certain states, *e. g.*, rheumatism, malaria, scrofula, constitutional syphilis, there is a special tendency to inflammatory changes in the pelvis, but their mode of action or their relationship to microbial action is not known. They would certainly act in one way viz., by depressing tissue vitality.

Regarding the modes of action of the various forms of streptococcus and staphylococcus, their various life-histories and the changes brought about by them in the body nothing need be said here, since these matters are fully discussed in works on bacteriology and surgery.

Different tissues are affected, different reactions brought about and different results produced. These differences depend upon the mode of entrance of the germs, their virulence, the nature of the soil on which they grow, the power of resistance of the tissues.

Special reference must, however, be made to the part played by certain specific organisms.

Gonococcus.—Since Næggerath published his first paper in 1872, on the relation of gonorrhœa to pelvic disease, an immense amount of attention has been directed to this subject. In Great Britain, Sinclair, and in Germany, Sânger have been among the most prominent of those who believe in the profound importance of this relationship. Gonorrhœa may affect the pelvic soft parts in different conditions.

Acute Gonorrhœal Infection.—All agree that the vagina may be readily attacked by the gonococcus in childhood. There is some difference of opinion as to the areas which it may attack in the adult. For many years Bumm's views have been most widely held. He stated in 1880, that this organism could not develop in the stratified squamous epithelium of the vagina, being limited in its attacks to the urethral and cervical mucosa. This statement was based upon a number of experiments of the following nature. Active gonococci were placed in contact with the vaginal walls for 12 hours, no vagini-

tis being set up. He also excised a portion of the wall in a bad case of gonorrhœa and failed to find gonococci in it. He believed that the swelling and tenderness of the vagina, so often found in acute gonorrhœa, were due to the irritation of the discharge flowing down from the cervix.

Schwarz, Touton, Dinkler and others have strongly opposed Bunn's views and, more recently, he has modified them, stating that occasionally in the adult a true gonorrhœal vaginitis may occur in acute cases though not in chronic cases, *e. g.*, when the mucosa is in a delicate condition or thinned as in old age. Sanger holds that the vaginal walls can be affected only in children, in young girls, in old women and in the pregnant, states in which the epithelium is particularly imperfectly developed, delicate or altered in vitality.

Mandl has also carefully investigated this subject. He excised portions of the vaginal wall in three cases (aged 21, 21 and 24 respectively) of acute gonorrhœa and examined them with great care. In some parts the epithelium was very thin in its inner layers, here and there, the papillæ being quite exposed. The surface was injected and swollen and had a red, raw appearance. In many parts the epithelium, as well as the subjacent connective tissue was infiltrated with pus-cells. Gonococci were found on the surface and in the entire thickness of the epithelium, many being within the pus-cells. In several places they were detected in the sub-epithelial connective-tissue, being most deeply placed where the epithelium was thinnest.

In one of these cases the uterus was absent so that the influence of a cervical discharge on the vaginal walls was out of the question.

Doderlein has also recently described an undoubted case of gonorrhœal vaginitis after extirpation of the uterus and appendages.

Mandl believes, therefore, that there can be no doubt as to the development of a specific gonorrhœal vaginitis, though there are undoubtedly variations in the resistant power of the vaginal walls and in the degree to which they may be infected. Thickness, toughness and softness of the epithelium, the size of the interstitial spaces are important factors in determining the nature of the resistance.

In examining sections of the vaginal wall, it is important to note the period of duration of the disease. In old cases, the degenerated cocci may easily fail to take on the stains and may so be overlooked.

Very common sites of infection are the openings of the ducts of the glands of Bartholin and the small recesses about the urethral orifice. In most cases of acute infection the disease is set up in the cervix and vulvo-vaginal parts at the same time. Sometimes, the former may be at first affected; sometimes, the infection may attack the

lower structures and spread upwards, or sometimes the cervical mucosa may remain unaffected.

In some cases acute infection may spread along the uterus and tubes to the peritoneum. It may also affect, in some cases, the bladder, ureters and kidneys. It may spread to the Bartholinian glands.

Latent or Chronic Gonorrhœa in the Female.—After the signs and symptoms of an acute infection have passed away the virus may still remain in the various parts above noted, viz., the crypts about the outer part of the urethra, the ducts of the Bartholinian glands and the mucosa of the cervix. In this condition infection may spread and inflammatory reaction be set up in the whole urinary tract, the whole genital tract, and in the peritoneum of the pelvis.

It is necessary to inquire into the cause of infection in these cases. Is the gonococcus the chief factor? Is there a *mixed infection* of gonococcus and other pathogenic germs, *eg.*, streptococcus, or is the infection due to the latter germ entirely, they having been started into activity and having been able to spread by the favouring influence which the products of the gonococcus exert?

These questions cannot be answered with accuracy. By many it has been believed that the gonococcus is capable of carrying infection directly to all the above-mentioned parts, both in acute and chronic conditions.

Now, the tendency is to limit the range of its activity. There are, however, many varying opinions. One fact seems to have been definitely established, viz., that the products of the gonococcus can so alter the secretion in the vagina (rendering it neutral or alkaline) as to render it favourable to the growth and activity of streptococci and other pathogenic organisms.

Regarding the spread of an inflammation from the urethra to the bladder and, it may be, to the ureter and kidney, it is now believed by many that the gonococcus is not the infecting cause, but streptococci, which have developed under the favouring influence of the gonococcus growing in the urethra.

With regard to the occurrence of inflammation in the Bartholinian glands, some believe that the gonococcus may be directly responsible, while others hold that it is the other cocci to which I have referred. I think that while the infection is due to streptococcus in most cases, it may also arise from the gonococcus entirely. The gland is lined with a single layer of cylindrical epithelium—the site most favoured by the gonococcus, and the organism itself may be found in the gland in some inflammatory conditions. It is, however, very difficult to

eliminate the influence of the pathogenic germs, as they can, in these cases, so easily gain access to the gland.

As regards the uterus, there seems little doubt that inflammation may be set up in it by the action of the gonococcus, though as to the frequency with which this occurs, and as to the conditions under which it is most likely to take place, accurate knowledge does not exist. In many cases of uterine inflammation, which clinically might be attributable to the influence of the gonococcus, the germ cannot be found at all. No doubt, in some of these cases the infecting agent is some other organism, *e.g.*, streptococcus.

It must be stated here, however, that Bumm, Gottschalk and Immerwehr have recently reported that in a considerable number of cases of uterine inflammation they could not find any germs in the secretions from the uterus. Menge also reports that examinations of scrapings of the uterine mucosa in 73 cases of endometritis revealed micro-organisms, including the gonococcus and tubercle bacillus only in a proportion of instances. These statements do not, in any way, prove that the infecting agency was not in these cases of microbial nature. We do not yet know how they act in keeping up chronic irritation, nor how numerous they need be to affect a considerable area. It may be that in chronic conditions a few foci in the tissues may serve to diffuse an irritating influence sufficient to continue the altered activity of the tissues. If this be true, it is easy to understand why the microbes might but rarely be found in the secretion obtained from the uterine cavity and why, indeed, they might only occasionally be found in curetted parts of the mucosa.

In some cases the infection of the uterus may be directly due to the action of the gonococcus along with the streptococcus or other of the pathogenic organisms.

It is important to note that the uterine cavity may become the seat of marked microbial development, if it contain detritus from a new growth, from retained membranes or placenta, or if the mucosa be injured.

As regards the Fallopian tubes, there is ample proof for believing that the gonococcus may infect it and lead to inflammatory changes. A. Martin believes that the infection may travel not only directly through the lumen of the genital tract, but also through the lymph-channels and connective tissue spaces in the parametrium.

Here, as lower down in the genital canal, inflammatory changes may result from mixed infection, the gonococcus and streptococcus being both active, or the latter being the chief cause developing in

the lumen under the favouring influence of the products of the gonococcus.

It is interesting to note the results of Menge's examinations of diseased tubes. In 30 cases of hydrosalpinx and 3 of hæmato-salpinx no cultures could be obtained. In 122 specimens of purulent salpingitis he obtained the following results :

In 75 cases the tubes were sterile.

In 28 cases gonococci were present.

In 9 cases tubercle bacilli were present.

In 3 cases streptococci were present.

In 1 case staphylococci were present.

In 1 case bacterium coli commune were present,

In 1 case saphrophytes were present.

In 1 case anærobic bacteria were present.

In 3 cases various bacteria were present (in one case with streptococci.)

He found that 10 cases of pyosalpinx were absolutely sterile, thus differing very decidedly from Boisleux and Witte, who state that an abundance of germs were found in such cases.

There can indeed be no doubt that in the great majority of cases the contents of a pyosalpinx are absolutely sterile.

Kiefer states that generally pus collections in the tubes become sterile in 6 to 12 months, the cocci being probably killed by their own toxins. It is important to note, as Olshausin points out, that with the onset of fresh infection or exacerbations new cocci may be introduced and the infectivity of the pus increased.

In regard to the pelvic peritoneum, Sânger believes that the gonococcus is only capable of setting up localised pelvic inflammation, *e.g.*, periovaritis, perisalpingitis. He thinks that it cannot initiate a wide peritonitis, which he believes due to a mixed infection, the active agent being streptococcus or some other organism. The gonococcus does not appear to survive long in the peritoneal cavity.

Winter is also of this opinion and states that general acute peritonitis is never caused by the gonococcus. Kiefer also observed 11 cases, in which fresh gonorrhœal pus escaped into the peritoneal cavity without any reaction taking place, whereas virulent pus containing streptococci, or staphylococci always caused a reaction.

Several observers have pointed out the frequency of localised pelviperitonitis after removal of pus-tubes. This may be due to foci present before operation in the peritoneum or cellular tissue, to oozing from the uterus through the interstitial portion of the tube, or to fresh infection with bacterium coli.

As regards pelvic cellulitis, it is believed that the gonococcus may be the infecting agent sometimes, but that in the majority of cases one of the other organisms is the cause.

The same may be stated in regard to the ovary.

Menge found in 8 cases of ovarian abscess that the gonococcus was present in 3, the tubercle bacillus in 2, and streptococci in 1; the other three cases being sterile. Kiefer found the *bacterium coli* in several cases.

Sänger has laid great stress upon the marked liability of pregnant and puerperal women to contract acute gonorrhœal infection and, also, on the tendency towards the development, in these conditions, of an acute exacerbation of what was once previously a slight inflammatory process. Thus, a latent condition may develop into an acute outbreak in pregnancy or the puerperium without the inciting influence of any fresh infection.

Sänger also points out that in the puerperium a special variety of acute inflammation of the tubes and ovaries of a pure gonorrhœal nature, may be due simply to a recrudescence of an old gonorrhœal trouble, without any freshly acquired infection.

It must, however, be remembered that similar phenomena may be produced by the action of septic organisms which find a favourable condition for development where gonorrhœa, recent or latent, has altered the state of the secretion in the genital canal. Possibly, therefore, some of the cases referred to by Sânger are of this nature.

Latent Gonorrhœa in the Male.—The particular work carried out by Nœgerath was to point out the importance of latent gonorrhœa in the male as a prominent factor in the production of various forms of inflammation in the female pelvis, *e.g.*, endometritis, salpingitis, ovaritis, and localised peritonitis. He pointed out what is now generally recognised, that the male urethra may remain the source of an infective power long after all apparent signs and symptoms of acute gonorrhœa have passed away. This power resides in a discharge produced by the remains of the original gonorrhœal infection, and is probably limited to the crypts of the mucous membrane. The excitement of marriage, of alcoholic indulgence, or of over-fatigue may stimulate these areas of latency into renewed activity and, as a result, the woman after coitus may be infected in the various ways already described by me. The manner in which the infection is brought about is not clearly known. In many of these discharges from the male urethra no gonococci can be found. Very probably, in such instances, the discharge may act by modifying the vaginal or uterine secretions so as to afford a suitable medium for streptococci or other

infective germs, which may spread upwards and lead to the various disturbances which I have described. Very often a perfectly healthy woman may be infected as a result of this latent gonorrhœal condition in the male, the most distressing pelvic troubles developing soon afterwards.

Gonorrhœal infection of the mucosa of the rectum may follow immediately upon an infecting coitus, or it may afterwards follow as a result of the entrance into the bowel of gonococci from the vulvar discharges. Rarely it may follow rupture of a Bartholinian abscess into the rectum. The inflammation may be followed by an ulcerated condition.

Bacterium Coli Commune.—This organism, first described by Escherich in 1885, is believed to be the most frequent infecting microbe which may extend from the intestinal tract into neighbouring parts. It is of great importance in relation to general peritonitis, as has been shown by Treves and others, but it also plays some part in local pelvic inflammatory affections. According to the researches of Vignal and others, this organism is found in the whole alimentary tract. Normally, it is believed to number about 95 per cent. of all the organisms in the bowel (Treves).

According to Tavel and Lanz there are many varieties of this organism, and also corresponding differences in its virulence. According to the experiments by LeSage and Macaigne a culture outside the body is harmless and will not set up peritonitis when placed in the peritoneal cavity of animals, because under normal conditions the germ is not virulent.

It may, however, become virulent under various conditions, *e.g.*, in weakened, diseased or injured states of the wall of the gut, such as obstruction, strangulation, congestion, diarrhœa, compression, bad constipation, etc.

If in such a condition of virulence, a culture of the germ be made, it has a distinct influence when placed in the peritoneal cavity of animals, varying according to the degree of toxicity. Thus it may only lead to slight constitutional disturbance with diarrhœa; a localised purulent peritonitis may be set up; or in some cases acute septicæmia may lead to death before any local signs of peritonitis are developed.

P. Ziegler has pointed out that normally the bacterium shows no tendency to pass through the bowel wall; if however, the vitality of the wall be impaired, in addition to becoming virulent, it at once begins to penetrate the wall and may extend into surrounding tissues for a considerable distance.

When the bacterium reaches the peritoneum it may set up an inflammatory reaction varying in extent according to its virulence (as well as other conditions).

Paul Ziegler has shown that its activity is increased there, if fluids, especially blood, be present in the peritoneum. It is also accentuated, as Laruelle has pointed out, if the intestinal secretion be present, even though the latter be artificially sterilised. This germ is generally the cause of peritonitis in hernial sacs, in obstruction and strangulation, in appendicitis cases and other intestinal conditions.

Freshly filtered fluid from the normal bowel introduced into the peritoneum generally sets up peritonitis. The cause is the bacterium coli. According to Barbacci the peritoneal endothelium is damaged by this fluid, thus favouring an infection by the germs; and I have already pointed out that the activity of the microbe is increased by the presence of the intestinal fluid in the peritoneal cavity. If the fluid be in any quantity it has a depressing influence on the system on account of the absorption of the toxins in it.

The bad effect of fæces when introduced into the peritoneal cavity is due to the presence of microbes, especially the bacterium coli, in it. If sterilised fæces be introduced no bad result follows.

It is likely that a considerable proportion of local pelvic infections in women are due to this bacterium and it is possible that in nulliparous women the frequency of retro-uterine inflammation is related, not to infection from the uterus in the great majority of cases, but from the rectum.

The overstretching of the rectum from constipation, so common in women, the continual soaking of the wall in this state with toxic matters in the bowel-contents, the occasional occurrence of cracks and ulcers in the rectal wall are all factors which favour the passage of the bacterium coli into the utero-sacral ligaments, surrounding cellular tissue and peritoneum and even the uterus.

Tubercle Bacillus.—Tuberculosis in the genital tract may be set up in a variety of ways.

1. It may be primary, *i. e.*, the bacilli may enter from the outside by way of the vagina, being introduced by dirty instruments, by examining fingers, by sleeping with a tubercular person, by coitus with a man suffering from genito-urinary tuberculosis. In such cases, the vagina and cervix may be first affected, the disease spreading afterwards along the uterine and tubal mucosa; or the upper genital tract may sometimes be first attacked, according to Whitridge Williams, the bacilli entering a denuded surface on the vaginal wall and being carried up by the lymphatics.

2. The genital organs may become affected by the direct spread from neighbouring tuberculous areas, *e. g.*, tuberculosis of bladder or bowel; ulcers may perforate or abscesses burst leading to fistulous communications.

W. Williams states that one of the most frequent sources of genital tuberculosis is tubercular peritonitis. Weigert has shown that in this disease the bacilli which become free in the peritoneal cavity tend to sink into the pelvis setting up infection; they are there in the best position to be swept towards and into the tubes and they may undoubtedly be carried into the tubes setting up disease without infecting the pouch of Douglas at all.

3. The bacilli may be introduced directly into the vagina when the patient has tuberculosis in some other region, *e. g.*, urinary tract, intestines, lungs, the infection spreading from the discharges.

Hegar has pointed out that genital tuberculosis is rare in childhood and after the climacteric.

Infection by men suffering from genito-urinary tuberculosis is of considerable interest. Derville reports five cases in which the husbands of women with genital tuberculosis had tubercular epididymitis. Fernet reports four cases in which men with pulmonary tuberculosis infected their wives, but we do not yet know whether the semen in such cases may contain tubercle bacilli. Landouzy and Martin mixed the semen of a guinea-pig which had died of tuberculosis with salt solution and injected the mixture into the peritoneal cavity of 15 guinea-pigs; five died of tuberculosis. Curt Jani found very few bacilli in apparently healthy testicles and prostates of several persons with tubercular phthisis. Gärtner in reference to Jani's description states that in tubercular patients, before death occurs, the bacilli may spread to various parts of the body and hence in this stage may often be found in the blood.

Spano injected semen from a tubercular man into the abdominal cavity of eight guinea-pigs and produced tuberculosis in six cases. In two other cases by injecting it into the vagina, genital tuberculosis was caused.

Mafucci injected large doses of bacilli into the jugular vein of a dog and found them afterwards in the semen of the animal.

Rohlf, however, introduced semen from a tubercular man into the anterior chamber of the eyes of goats and rabbits with a needle puncture and got no result; but the amounts injected were very slight and goats are not very susceptible to tuberculosis.

Westermeyer introduced testicular tissue from a tubercular patient

into the peritoneal cavity of rabbits without setting up tuberculosis, but he was not able to distinguish tubercle bacilli in microscopic examination of the testicles. In a case of acute miliary tuberculosis in which bacilli were found in the testicle, injections of portions of it into the peritoneal cavity caused tuberculosis in the rabbit.

Walter examined several testicles in cases of phthisis and found no tubercle bacilli in them. Gärtner believes that they are very scanty in the semen in such cases. He injected tubercle bacilli in the trachea and lungs of male guinea-pigs, setting up infection, and after three or four days obtained semen from their testicles. In 32 cases, he found tubercle bacilli only in five, and the semen in these few instances, when introduced into the peritoneum of other animals, set up only a mild form of tuberculosis.

In another set of cases he set up tuberculosis in the testicle by local injection and found that in 50 per cent. of the animals into which he introduced the semen from these cases, severe tuberculosis was set up. Gärtner, therefore, believes that genital tuberculosis in the male is a very much more serious danger for the female than distant tuberculosis.

The various parts of the genital tract, including the ovaries, may be affected, though the vulva and vagina are very rarely attacked. Sometimes a mixed gonorrhoeal and tubercular infection may take place. Pyosalpinx may develop in tubercular salpingitis (? due to a combined septic infection).

BIBLIOGRAPHY.

- Barbacci, *Central. f. Path. u. Path. Anat.*, Oct. 12, 1893.
 Bunn, *Der Microorganismus d. Gonorrhoeischen Schleimhauterkrankungen*
 Wiesbaden, 1895, *Über d. Tripperansteckung beim Weiblichen Geschlechte*
 und ihre Folgen, *Münch. Medic. Wochenschr.*, 1891, Nr. 50, 51.
 Derville, *Thèse*, Paris, 1887.
 Dinkler, *Archiv. f. Ophthal.*, 1888.
 Döderlein, *Deutsche Med. Wochenschr.* 1895; *Monatschr. f. Geb. u. Gyn.*, Bd. V.,
 Hft. 1.
 Escherich, *Fortschritte d. Med.*, 1885.
 Fernet, *Bull. de la Soc. Med. des Hôpitaux*, 1884.
 Gärtner, *Zeitschr. Hyg. u. Infektionskrankheiten*, 1893.
 Gawronsky, *Münch. Med. Wochenschr.*, 1894.
 Gottschalk and Immerwehr, *Archiv. f. Gynack.*, 1895-06, Bd. I.
 Jacobs, *Centralbl. f. G. u. G.*, 1895.
 Jani, *Virchow's Archiv.*, 1886.
 Laruelle, *La Cellule*, 1889, Vol. V.
 Landouzy and Martin, *Revue de Méd.*, 1883.
 Le Sage et Mucaigne, *Archiv. de Méd. Exper.*, 1892, Vol. IV.
 Mafucci, *Centralblatt f. Allg. Path. u. Path. Anat.*, 1894.
 Mendl, *Monatschrift f. Geb. u. Gyn.*, 1897, Vol. V., Hft. 1.
 Menge, *Zeitschr. f. Geb. u. Gyn.*, 1891; *Deutsch. Med. Wochenschr.*, 1894.
 Nøggereth, *Die latent Gonorrhœe u. Weiblichen Geschlecht.*, Bonn, 1872.
 Rohlf, *Inaug. Diss.*, Kiel, 1895.

- Sänger, Die Tripperansteckung beim weiblich Geschlecht. Leipzig, 1880.
Schwartz, Volkmann's Sammlung Klin. Vorträge, No. 279.
Sinclair, Gonorrhoeal Infection in Women, London, Lewis, 1888.
Spano, Gazette degli ospitali, 1893.
Stroganoff, Monatschr. f. Geb. u. Gyn., Bd. II., Centralbl. f. Gyn., 1893. 1895.
Tavel u. Lanz, Ueber die Ätiologie d. Peritonitis, Basel, 1893.
Touton, Berlin Klin. Wochenschr., 1894.
Trevs, Peritonitis, London, Bale & Sons, 1891.
Walther, Beiträge z. Path. Anat. u. Allg. Path., Bd. 16, 1894.
Westermeyer, Inaug. Dis. Erlangen, 1893.
Williams, Tuberculosis of the Female Generative Organs.
Zeigler, P., Ueber die intest. Form d. Peritonitis, Munch, 1893.

A CASE OF MYXŒDEMA.

BY

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Mrs. M. L., *æt.* 53, was admitted to St. Francis Hospital, Sept. 14th, 1896. She complained of weakness, unsteadiness and awkwardness of gait, clumsiness and numbness of fingers, cold feelings in legs, noises in the head and dizziness.

History—In November, 1895, she was told that her face looked swollen. She felt, about this time, some irritation of the eyes. Shortly afterwards a stiffness of the muscles, especially those of the arms, was felt, and her skin felt "hide-bound." In April, 1896, she, and others, noticed that her speech was slow and thick. The symptoms gradually increased up to the date of admission.

Personal History—She is a native of Ireland, and has lived in Wisconsin since the age of 14 years. She married at 21 and has had twelve children. All but the second, third and seventh died at birth, or very shortly after. The third and seventh are still living; the second died at 30, cause pleurisy. She had malaria for 14 weeks at the age of 14 years.

Present Condition—The patient is a medium sized woman; general nutrition is good; and she is able to be up and about. The facial expression is dull and sleepy. She talks intelligently, but her speech seems to require considerable effort and is slow and thick, the voice being drawling, husky and somewhat nasal in character. One's first impression on seeing her is that the entire body is *œdematous*, and that pitting is easily produced; but on palpation the skin is dry, and instead of pitting one meets a somewhat firm, elastic resistance in the tissues beneath the thin parchment-like skin.

The skin looks scaly, though there is no actual scaling. The hair on her head is sparse, dry and brittle.

There are no clinical evidences of disorders of the functions of any of the organs.

On this date (Sept. 14th, 1896,) she was given 5 gr. thyroid tablets three times a day.

On Sept. 19th she complained of feeling ill and weak. The pulse became quickened (98) and the temperature, from being subnormal (97°), reached 102½°. The tablets were temporarily stopped.

21st Sept. Clinical note—"Skin appears softer and more flexible

subcutaneous tissue less resistant ; face and hands smaller and show more of the natural wrinkles."

The tablets were resumed, only from one to two being given daily.

At the end of September she went to her home in Iowa. She was very much improved. The skin had lost that dry transparent look which it had previously had. She perspired naturally. The subcutaneous tissue thickening was much lessened. She moved with much greater celerity and the numbness had nearly entirely disappeared from feet and hands.

The voice was clearer and she declared that the feeling of dulness and slowness of mental processes had entirely disappeared. She continued to take one five gr. tablet daily.

In January, 1897, she returned to the hospital to report and appeared quite well. About six weeks ago she wrote that she was as well as ever she had been. She takes constantly 1 tablet (gr. v) daily.

REPORT OF SIXTY-EIGHT CASES OF TYPHOID FEVER DISCHARGED FROM THE ROYAL VICTORIA HOSPITAL DURING THE YEAR 1896.

BY

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During the year 1896, sixty-eight cases of typhoid were discharged from the Royal Victoria Hospital. Of these, six cases were admitted previous to January 1st, 1896.

With the exception of two cases, all were treated to a conclusion. One of these latter cases was a Chinaman, who was taken home by his friends to be given the regular Chinese treatment, and the other, a woman in the 34th week of pregnancy, left to be confined at her own home. It was afterwards learned that both of these cases made a satisfactory recovery.

In addition to the above there were five cases remaining on January 1st, 1897, but these are not included in the subjoined statistics.

There has been no fatal case during the year.

With regard to treatment, hydrotherapy has been employed as a routine practice. The graduated baths were given, the patient being immersed at a temperature of 90° for 15 minutes, and the water rapidly cooled to 80°. After the first bath the patient was immersed at 80° and the temperature reduced to 70°, or in some cases to 65°, if the condition of the patient was not a contra-indication.

Baths were given every three hours when the temperature remained above 102.3.

Of the 68 patients treated during the year, 47 were given baths. In 7 of these cases the baths were discontinued; in two because the pulse became rapid and feeble, and there was marked cyanosis while in the bath; in another on account of phlebitis. One patient complained of severe neuralgic pains during and after the bath; in another case, during a relapse, on account of abscess formation. One case, a child, was too refractory, and in another case, also a child, the signs were those of a meningitis, rather than those of typhoid in the earlier part of the illness.

In most of these cases sponging was substituted for the bath.

The average duration of the bath treated cases was 48.9 days; the average number of baths given to each patient was 21.8, the greatest number in any case was 79, while the least number was one.

In 21 cases baths were not given ; in 12 of these the temperature was such as to render bath treatment unnecessary ; in 5 cases the diagnosis was not clear ; in one case, pregnancy, in the 34th week, was thought to be a contra-indication ; in another case the fever followed confinement and was complicated by acute parenchymatous nephritis ; while two cases were admitted so late on in the disease that it was thought advisable not to begin bath treatment.

Of the 5 cases in which the diagnosis was at first not clear, sponging with ice water was resorted to whenever the temperature reached 102.3. In a few cases Yeo's euclorine mixture was given, but additional measures were rarely employed save that when constipation was present at the onset a calomel purge was given.

Milk diet was strictly maintained throughout the earlier stages of the disease, but when the fever showed signs of abating weak coffee or cocoa and, in some cases, broths were given in addition.

The average duration in hospital was 45.4 days.

The average duration of the febrile period was 23.9 days ; the longest febrile period in any case was 84 days, while the shortest period was 3 days.

As regards the symptoms, in addition to the elevation of temperature there was a distinct eruption in 78 per cent. of the cases, and in 66.2 per cent. of the cases the spleen was palpable.

Diarrhoea was present in but 8 per cent of cases, while constipation, necessitating the administration of enemata, was present in the balance. Relapses occurred in but 8 cases, the average duration of which was 19.7 days. In no case was there more than one relapse. The symptoms of these relapses were as follows : In one case a typical elevation of temperature, accompanied by a subacute bronchitis ; in two other cases, elevation of temperature only ; in four cases, in addition to elevation of temperature, there was enlargement of the spleen, and in the remaining case there was elevation of temperature, enlargement of the spleen and a most diffuse eruption. In this last case the eruption during the first illness had been very scanty. The longest febrile period in any relapse was 42 days, and occurred in the last mentioned case ; the shortest febrile period was 11 days. The longest period at which a relapse occurred after normal temperature had been reached was eight days. In several of these cases the cause of the relapse was thought to be solid food which had been smuggled in to the patients by their friends, while in the others no definite cause could be assigned.

Complications occurred in 30 cases and were as follows : In two cases there was subacute mania, in one towards convalescence in a

neurotic individual, and in the other at the outset. In one case an abscess developed in the cheek and this was followed by facial erysipelas, which necessitated remaining in hospital at least three weeks longer than would otherwise have been the case, and in addition this patient developed an epididymo-orchitis. In 9 cases there was acute or subacute bronchitis, and in one of these, in the patient longest in the hospital, there was in addition a subacute nephritis. In one case there was pericarditis and towards convalescence phlebitis, and in two other cases phlebitis occurred, in one of which there was also septicæmia. In two cases there was myocarditis; in one of these, during convalescence, measles and chicken-pox, and in the other acute suppurative otitis media. This latter complication also occurred in two other cases. Nephritis occurred in 4 cases, in three of which it was subacute and in the other acute parenchymatous coming on with the fever and following confinement. Furunculosis occurred in 3 cases. Cultures from the pus showed staphylococci in all. There was one case of intestinal hæmorrhage, one case in which chicken-pox developed, one case of peripheral neuritis and one case in which the illness occurred late on in pregnancy.

The following is a brief account of the more severe cases:

Typhoid, ushered in by rigors, and complicated in the third week by hæmorrhage, with signs of collapse the following day.—T. O., æt. 43, was admitted Dec. 21st, 1895, complaining of headache, weakness, pain in the back and loss of appetite, commencing, he said, 17 days previously with chilly feelings which, in a few days, became actual rigors, lasting from 3 to 5 minutes, occurring two or three times each hour, day and night, and continuing altogether about a week. Accompanying the above was violent headache and pain in the back and limbs. During the second week he had no chills, but he suffered from severe headache, loss of appetite, gradually progressive weakness, slight diarrhoea and crampy abdominal pains.

On examination the patient was found to be emaciated and anæmic, with an anxious drawn expression. There was general nervous tremor, and owing to dryness of the mouth and tongue, some difficulty in speaking. There had been rapid loss of flesh. The tongue was heavily coated and the breath foul. Temperature, 102°; pulse, 112; respiration, 24. The pulse was of low tension and dicrotic. There was a short, rough murmur at the aortic cartilage and the aortic second sound was accentuated. There were a few sibilant rales in the lungs. The abdomen was distended, there were a few rose spots, and the spleen, although apparently enlarged on percussion, could not be felt. The urine contained considerable albumen.

Four days after admission he had a hæmorrhage, but as it occurred with a stool the quantity could not be estimated. After the hæmorrhage there was no sign of weakness, no change in colour. The pulse and respiration were not apparently altered. There was no fall in temperature and the patient looked as if nothing had happened. Twelve hours later the patient showed signs of collapse. The pulse became rapid, small and weak, the extremities cold, the skin blanched and bathed in perspiration. Two hours afterwards the temperature could not be taken per rectum, and it was not until late in the afternoon that the thermometer would register. No more blood was passed, and the stool the following day, although black, did not contain free blood. Soon after the patient began to improve gradually, and was discharged without further misfortune.

Typhoid, with stupor followed by delirium, and complicated by acute bronchitis and sub-acute nephritis.—E. T., æt. 50, was admitted from the out-patient department, May 22nd, 1896, complaining of gradually progressive weakness, which began three weeks previously. During this time she had at intervals suffered from headache, loss of appetite, sore throat, and pains in the limbs. She had had occasional asthmatic attacks.

On examination she was found to be well nourished and healthy looking. The face was flushed, lips dry, tongue clean. Temperature, 103°; pulse, 100; respiration, 20. The lungs showed evidence of chronic bronchitis and emphysema. The pulmonary second sound was reduplicated, the abdomen was distended and the spleen was readily palpable. The urine was acid—1020—and contained albumen and casts.

The subsequent course of events was as follows: During the first ten days in the hospital the patient was dull and apathetic, then she became stuporose. The angle of the mouth was drawn to the left side, but the tongue was protruded straight. It now became dry, furred and fissured. The patellar reflex could not be obtained. This condition gave place in a few days to active delirium and it was with great difficulty that the patient could be kept in bed. The least noise in the ward would cause her to scream loudly and there was considerable volitional tremor. The examination of the lungs at this time showed a fairly acute bronchitis. For ten days the patient was in this condition, some days of course being worse than others. Gradually she became rational, but convalescence was very tedious, although uneventful, and she was discharged after having been in the hospital 118 days.

Typhoid, accompanied by phlebitis, repeated rigors, unusually high temperature, and the presence of staphylococci in the blood.—

P.C., aged 20, was admitted August 31st, 1896, complaining of loss of appetite, headache, pain in the back, and general weakness.

For ten days patient had felt out of sorts but was not confined to bed until 4 days previous to admission, during which time she suffered from severe frontal headache, vomiting, pain in the back, marked prostration, and had some elevation of temperature.

On examination she was found to be anæmic, but with a fair amount of subcutaneous adipose. The lips were dry and cracked, the tongue was large, flabby and coated. Temperature, 102.3; pulse, 124; respiration, 36. There was a faint systolic murmur at the apex. The abdomen was full and the spleen readily palpable, but rose spots were nowhere visible. The urine contained a trace of albumen. In this case the fever ran a moderate course during the ten days following admission, then a phlebitis developed, slight at first, but it having increased considerably in a few days, the baths were discontinued and sponging substituted. Nothing further of importance occurred until the 16th day after admission, when, without warning, the patient had a severe rigor lasting 20 minutes, the temperature at the time of the rigor being 106.3. On the following day she had another rigor, with temperature 105°, and two days later two rigors, the temperature in the first being 105° and in the second 106.1°. Cultures taken from the blood at this time showed at the end of 24 hours staphylococci, while cultures taken repeatedly previous to this were sterile. The general condition of the patient at this time was very poor. There was low muttering delirium, twitching of the fingers and picking at the bed clothes. The pulse was rapid and feeble and the free use of cardiac tonics, e.g., alcohol, strychnine and digitalis was resorted to. It was not until 30 days after admission that the patient entered on a period of convalescence, which though very protracted and tedious, was otherwise uneventful.

Typhoid, preceded by acute dysentery; Complicated by bronchitis, epididymo-orchitis, non-specific urethritis, alveolar abscess, and facial erysipelas.—J. P., æt. 21, was admitted Oct. 12th, 1896, complaining of pain all over, headache, general weakness and cough. Three weeks previous to admission patient was seized with an attack of acute dysentery which lasted for a week, and for another week the dysenteric condition was present but not nearly so acute. For a week there had been progressive weakness and pains, and the day before admission severe headache and cough.

On examination the patient was found to be a well nourished but

anæmic young man, dull and apathetic. The cheeks were flushed, there was some cyanosis, the skin was hot, the tongue coated and the teeth covered with sordes. Temperature, 103.3° ; pulse, 80; respiration, 20. There was a subacute bronchitis, a systolic murmur at the apex transmitted into the axilla and another at the base. The pulmonary second sound was accentuated. The abdomen was distended and tender, there were a few rose spots and the spleen was palpable. The urine contained albumen.

During the two weeks following admission the course of the fever was moderately severe, and during this time, save for bronchitis, there was no complication. In the third week an epididymo-orchitis developed, and with it a bloody purulent discharge, in which neither gonococci nor tubercle bacilli were present, and which had not been present on admission. In the sixth week a swelling developed in the cheek, a tooth opposite this was extracted and a quantity of pus escaped, but drainage not being free an opening was made a few days later from the outside. Thirteen days afterwards erysipelas set in at the site of the incision, and it was not until the end of three weeks that the patient could be discharged. In all he was in hospital 81 days.

Typhoid, with development of sub-acute mania during convalescence.—J. L., æt. 26, was admitted Oct. 10th, 1896, complaining of weakness and pain in the back. One week previously he began to suffer from headache, chilliness, general weakness, pains and loss of appetite, but did not take to bed for several days. The bowels had been constipated,

On examination he was found to be well nourished and intelligent, but neurotic. The tongue was coated and the teeth were covered with sordes. Temperature, 101° ; pulse, 92; respiration, 24. The abdomen was distended and tender, and the spleen was readily palpable. There were no rose spots. The course of the fever was very mild, the highest temperature at any time being 102° . After the temperature had been normal for five days, the patient was noticed to be very nervous. This was attributed to his having heard some blood curdling stories related by an ex-patient. The following day he had minor delusions and in the evening fancied he was going to die. For nearly two weeks, at times, he became almost maniacal and made several attempts to escape, but eventually he returned apparently to his right mind, although it is to be noted that several weeks after going home his mind became deranged again and he was removed to Verdun.

Typhoid, following an attack of the same disease six weeks pre-

viously, and setting in with despondency, which in a few days was replaced by delirium and sub-acute mania.—D. L., 'æet. 23, was admitted Nov. 3rd. 1896, complaining of loss of appetite and despondency. He was brought to the hospital by his friends. Regarding this patient, it may be said that he was discharged one month previously, after having been in hospital for an attack of typhoid fever, lasting six weeks. For two weeks before discharge he had had a normal temperature. One week before readmission his friends noticed that he was despondent, at times easily excitable, and on the previous day he was delirious. For several days he had had a poor appetite, with occasional vomiting, and at times complained of headache.

On examination he was found to be apathetic and dull and could not answer questions rationally. There was some conjunctivitis, the lips were dry, tongue coated, and bowels constipated. Temperature, 98.2; pulse, 112; respiration, 24. The pulse was dicrotic. There was a systolic murmur at the apex, not transmitted into the axilla, and another at the base; the pulmonary second sound was accentuated. The abdomen was distended. There were numerous rose spots and the spleen was palpable. The urine contained albumen but no casts could be found. During the first 24 hours after admission, the temperature reached 103.2°, and the fever ran a moderate course. The mental disturbance disappeared with the fall of the temperature.

AN OBSCURE CASE OF PURPURA HÆMORRHAGICA WITH
INFECTION BY THE BACILLUS AEROGENES
CAPSULATUS.

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It may be said that the great majority of cases of purpura are obscure. While we may observe the clinical aspects of such cases and classify them according to outstanding features presented by this case or by that, yet there come, and these not infrequently, cases conforming to no type. On the other hand a given case manifests classifying points of a variety of cases during the course of its development. Obscure must they remain until by the aid of added research some ætiological factors are discovered, some certain basis of classification established.

The case which is here reported has some of the clinical features of those described and designated by Hænoch as "purpura fulminans" but it differs from them in its duration and in its hæmorrhagic features.

T. S., æt. 22, student in arts at McGill University, was admitted to the Royal Victoria Hospital on the morning of Nov. 7th, 1896, complaining of spitting of small quantities of blood and of spots over his body.

He was a well developed and a well nourished young man. He had never resided outside his native province, Quebec. His health had been good with the exception of sickness due to measles, mumps, whooping-cough and chicken-pox in his childhood. Besides the eruptions due to these diseases he described a bright red itchy papular eruption which came out in the spring of 1895. This became pustular in part and disappeared at the end of four weeks. The history is altogether negative, touching the points of hæmophilia, malignant disease, previous attacks, rheumatism, venereal disease, use of drugs, alcohol, tobacco and privation. It seems probable from his statements concerning his family that tuberculosis affects one brother. Beyond recurring hæmoptysis in this member and an attack of hæmatemesis in a paternal aunt there was no evidence of hæmorrhagic diathesis.

History of onset and condition of patient.—On Nov. 2nd, without any premonitory malaise, a few bright red spots of the size of a pin's head were first noticed about the left ankle. From this time until the next evening they became numerous over both the lower extremities. Three days afterward a few spots were observed on the arms, then the chest showed similar areas, the abdomen remaining free until after the 7th. A slight knock at any part induced the appearance of extensive and severe bruising. So far as can be ascertained the patient was not feeling ill or weak during these four days, but in the night of the fourth day he was awakened by flowing of blood from mouth and with coughing and spitting up blood.

On the afternoon of the following day, 7th, he lost large quantities of blood, from nose, mouth and throat, and for the first time felt weakness, rawness of the throat and slight pains in the knees.

Examination of surfaces.—There were the spots already referred to, which were distinctly hæmorrhagic. Besides these small hæmorrhages, which were most numerous on the lower extremities, there were those of similar size on the face, neck and trunk, the abdomen possessing least. Here and there appeared larger purpuric areas varying in size and colour. In a largedark red patch on the left arm two nodules about the size of a pea were noticed. The conjunctivæ presented a few hæmorrhages. The nose was slowly but constantly bleeding. The lips were of good colour. The gums were not spongy. On the soft palate and left tonsil hæmorrhagic areas were seen. The pharynx was congested; there was no glandular enlargement except at the angle of jaws.

The constitutional condition.—Mentally the patient was clear: Temperature $102\frac{2}{3}$, pulse 100, respiration 24.

The blood, etc.—Cultures on agar-agar and in broths were negative microscopically. A few (1 or 2) days before death, the blood showed lymphocytes as the chief form of leucocyte, but one polynuclear cell being found in a search over three sides. Blood count r. c. 4,840,000, w. c. 6,000, hæmoglobin 87%. The circulatory, respiratory and digestive as well as urinary systems were all negative at the primary examination. Ocular fundi negative.

Progress of case.—The patient was under observation for five days, during which a constant and remarkable increase in the gravity of the case was noted—in the varying temperature, quickening and weakening pulse, in the persistent and intractable hæmorrhages, both sub-cutaneous and from the mucous membranes, in the occurrence of hæmaturia, hæmoptysis, hæmatemesis and melæna, and in the sloughy appearance about the palate and œdema about the conjunctivæ and

eye lids. Finally delirium supervened a short time previous to death, which occurred on the morning of Nov. 13th, eleven days after the first spots had been noticed about the ankles and seven days after the occurrence of nasal hæmorrhage and admission to the hospital.

The treatment consists in large doses of fluid extract of ergot at first and then the B. P. solution of chloride of lime. These measures did not seem to influence the hæmorrhages in any way.

The clinical points which present chief interest in this case are :

1. The extreme severity of the disease.
2. The febrile temperature.
3. The similarity of the clinical picture to one of an acute infection.

The severity of the case is manifest in the degree of prostration and the early fatal termination, for, from the loss of good health till the time of his death, but eight days elapsed.

Of the whole temperature course we are not able to speak positively but its range was from 99° to 104° and when admitted on the first day of mucous membrane hæmorrhages it was found as high as 102.4°. Such a temperature, while it may suggest the presence of some specific fever, may certainly be accounted for by the course of purpura hæmorrhagica alone. But apart from the temperature curve we wish to observe that here the primary event was the *occurrence of hæmorrhages*, spontaneous hæmorrhage as already recorded, being first observed about the ankles and right elbow, the young man meanwhile going about without feeling weakness or illness. Then the constitutional symptoms supervened, fever, prostration, delirium.

The striking similarity that such forms of purpura hæmorrhagica bear to that of an acute infectious process has been long since recognised and numerous clinical observers have commented upon it while pathologists have investigated several cases with this thought before them. There is this, however, to be noted, as is well known, that in infectious fevers and exanthemata proper the appearance of the characteristic eruption follows rather than precedes the febrile and constitutional symptoms.

In this case the autopsy was made within 10 hours after death. The body presented the general appearances of death. An extensive purpuric eruption was observed with large areas of subcutaneous hæmorrhages looking like bruises. Some of these measured from 11 c. m., to 17 c. m., in length, while others were about the size of a ten cent piece. There were no ringed spots. The petechiae bore no special relation to the hair follicles.

The head was not examined. The heart showed numerous small ecchymotic areas as well on the visceral as on the parietal pericardium,

while fresh blood-stained fluid to the amount of 30 c. c. was found in the pericardium.

The vessels on the surface of the heart were injected with air, giving the ventricle a peculiar glistening appearance. There appeared to be some interstitial emphysema as well. The right auricle especially was distended with gas. The right ventricle was flabby and somewhat dilated. The left ventricular muscle showed areas of necrosis and subendocardial hæmorrhages were observed. The aorta was small and relatively thin. The valves were normal while the great vessels showed mixed clots which were frothy.

The lungs presented sub-pleural ecchymoses, both recent and old with several interstitial hæmorrhages. The vessels of the lungs contain air mixed with blood.

But little gas escaped on opening the abdomen. The intestines were greatly distended with gas. The mesentery of the lower part of the ileum contained a hæmorrhagic area. In the gastric mucosa numerous hæmorrhages were seen while the contents of the stomach were bile- and blood-stained.

The duodenum was intensely injected and the rugae swollen, the remaining portion of the small intestine presenting an appearance much the same. Peyer's patches showed no changes.

In the lower part of the ileum a few patches of congestion were seen with one large area about 7 c. m. long covered by a false membrane with ecchymoses both within and about it. This area corresponds to the area of ecchymosis noticed on the peritoneal surface in the mesentery, as above described.

The cæcum and transverse colon were greatly congested. In this part as well as in the rest of the colon were extensive submucous ecchymoses. The contents of this viscus were blood-stained and of the consistence of porridge. The rectum presented submucous hæmorrhages.

The liver floated easily in water; it was friable in places, emphysematous and somewhat spongy at parts. The surface was smooth except where air bullæ were plainly visible. The gall-bladder contained thick black bile.

The spleen was small, dry and flabby. Air was seen within the vessels and it floated just beneath the water surface. The pancreas was congested though not visibly hæmorrhagic.

The suprarenals were of fair size with softened medulla.

The left kidney sank slowly in water. Its parenchyma was somewhat degenerated. There were a few sub-capsular ecchymoses. The right kidney floated. In this organ more degeneration was seen and

the hæmorrhagic areas were more numerous. The bladder contained some frothy urine. There were seen numerous submucous hæmorrhages. The walls were thin.

Coverslip preparations made from the blood in the inferior vena cava showed the presence of enormous numbers of a large encapsulated bacillus undistinguishable from the *Bac. aërogenes capsulatus*, which seemed to be in pure culture.

Cultures were made at the time of the autopsy from the various organs. From the blood deep lactose agar cultures showed gas formations at the end of 36 hours and the presence of the *B. aërogenes capsulatus*. Smear cultures on agar of heart, spleen, kidney and liver gave the staphylococcus pyogenes aureus, while cultures from the spleen gave a bacillus smaller than the colon bacillus, whose length was generally about four times its breadth but presenting considerable variability, sometimes appearing as a small diplo-bacillus. Sections of the various organs showed abundant collections of the *B. aërogenes capsulatus*. In the kidney and liver rarer minute bacilli, corresponding to that isolated from the spleen, were to be recognised. A pure culture of this small bacillus injected into the rabbit (1 cm. intravenously) led to death in 14 days. For several days previously the animal was noticed to be becoming more and more emaciated; then paresis set in, beginning in the hind limbs and becoming general. Already by the fifth day the hind limbs could not be used. During the last twenty-four hours the animal showed fairly frequent convulsions. Pure cultures from the peritoneal cavity of the rabbit into a white mouse (0.25 cm.) led to death of the animal in forty-eight hours. However, neither in the rabbit nor in the mouse were there any ecchymoses or signs of a purpuric condition.

Conclusions:—1. From the history and the course of the case it is hardly possible that the bacillus aërogenes capsulatus was the primary infection.

2. It is quite possible that the staphylococcus pyogenes aureus was primary. There is no conclusive evidence of such however, since examination of the tissues showed no large collection of the cocci in any of the organs, nor again were there any typical abscesses anywhere.

On the other hand we know that this form is a frequent inhabitant of the intestines and this, like the bacillus aërogenes capsulatus may invade the tissues from the erosions in the intestinal mucosa.

3. Concerning the third form again nothing definite can be said, for while somewhat similar forms have been described occurring with purpura, inoculations of pure cultures into lower animals in this case,

while leading to their death were entirely unassociated with any evidences of purpura.

While this case is interesting as showing a somewhat unusual complication of acute purpura hæmorrhagica and while so little is known of the ætiology of this form of disease that every case deserves to be placed on record, yet it cannot be said that this careful bacteriological study leads us any further or throws any light on the causation of the condition.

The chief and apparently the oldest area of disturbance internally was the area of diphtheritic inflammation in the ileum. But nevertheless it may be doubted from clinical history whether this was the primary seat of the disease, for the history shows that for two or three days the patient had subcutaneous hæmorrhages with scarcely any disturbance of the general health. Then it was only with the appearance of mucous membrane hæmorrhages that the temperature became elevated and from this point it would appear that the secondary infection may be traced which ended evidently by affording a point of entrance to the bacillus ærogenes capsulatus with the resulting tissue changes in the heart and other organs as above described.

The question whether cases of morbus maculosus are cases of hæmorrhage due to some specific origin is unanswered, and the relation between the various forms of purpura hitherto classified as idiopathic must yet remain in obscurity.

In preparing this report we have been greatly helped by Prof. Adami who furnished us with a report of the autopsy and directed the bacteriological study.

THE TREATMENT OF PUERPERAL INFECTION— PREVENTIVE AND CURATIVE.¹

BY

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I hope the members present will pardon the selection of a well worn subject, but it was suggested to me by the admission, into the Gynæcological ward of the Montreal General Hospital while under my care, in one week, of three patients suffering from the effects of puerperal infection, and also by one or two papers upon the subject which have recently appeared in the *British Medical Journal*.

Since the discovery by Semmelweiss of Vienna in 1847 that "Puerperal Fever" (as it was then, and still is by some, ambiguously called) was due to infection, physicians have been searching for some method of prevention and cure. Although the world owes him a deep debt of gratitude for leading investigations into the cause of this disease into the proper channel, Semmelweiss suffered the fate of many others of the world's benefactors,—dying unknown and in want. He endeavoured to prevent the infection by the use of chlorine in the form of chlorinated lime for his hands, instruments, etc., as did also Simpson, and it may be interesting to quote from the latter's lectures delivered and published a little later. He divided the treatment into prophylactic and curative, as follows:

"Prophylactic.

1. Preparatory dieting, medicine, etc: The use of quinine, arsenic, perchloride of iron, etc.
2. Best possible air and ventilation.
3. Avoidance of contagion and inoculation. Use of chloride of lime, cyanide of potassium, etc., to disinfect the fingers of the *accoucher*.

Curative.

1. Venesection?
2. Leeches.
3. Fomentations.
4. Rapid counter-irritation, as by turpentine or blisters.
5. Enema or purgatives.
6. Opium with calomel.

¹ Read before the Franklin County (Vermont) Medical Society, May 11th, 1897.

7. Ipecacuanha or tartrate of antimony.
8. Turpentine internally.
9. Colchicum, veratrum viride, digitalis, stimulants and tonics.
10. Washing out the uterus."

The above includes the whole lecture upon the treatment, and, as you see, Sir James was decidedly brief.

The use of antiseptics in midwifery was not placed upon a scientific basis until the advent of Lister revolutionised the whole of surgical technique. It is difficult for us to realise the benefits conferred upon humanity by this man, whom the whole medical, and to some extent the lay, world is at the present time deservedly honouring. His name is one well worthy of a foremost place in the list of the greatest benefactors of the human race, and to rank with Galen, Harvey, Jenner, Morton, Simpson, and Pasteur.

In 1870, Bischoff and Stadfeldt began the use of carbolic acid in midwifery, obtaining marvellous results by so doing. Tarnier replaced this by corrosive sublimate in 1881, but its use was not generally adopted by the profession at large until later.

As proof of the use of Listerism in midwifery, allow me to give you a few statistics which are decidedly instructive if somewhat dry.

In the New York Maternity Hospital from 1875-1883, a period previous to the adoption of a strict antiseptic technique, 3,504 women were delivered with a mortality from puerperal septicæmia of 146; in other words 4.17 p. c.; 1 in 24 or 41.66 in 1000. During the last three months of 1883, however, corrosive sublimate was used in 102 confinements without one death from any cause whatever. This is too small a number of births from which to draw any conclusions as the good results may have been more from good luck than good management, but the following results obtained under strict antiseptic principles will negative any such suspicion. From 1884 to 1893, in this same institution, there were 3,789 deliveries, with seven deaths from sepsis, *i.e.*, .18 p.c. or 1 in 541.28, or 1.84 in 1000, and during the last three years of this period 1,059 confinements occurred without one death from sepsis.

What a difference these figures show! Without antiseptics 41.66 women died from sepsis out of every 1,000 deliveries, while with strict antiseptics the mortality was reduced to 1.84 per 1,000.

The writer of the article from which the above was quoted states that in New York or other large cities 1.12 per cent. or 11.2 women die from puerperal sepsis out of every 1,000 deliveries in private practice, thus showing that it is safer in such cities to be confined in a maternity hospital than in one's own house. It is hardly fair, how-

ever to make any comparison between the results obtained in a well conducted institution, where the patient has everything which can conduce to a safe confinement, with general private practice, as here there must be a large percentage of women confined either by no one at all or else by some ignorant midwife and whose surroundings render antiseptics almost an impossibility. If it occurs among the well-to-do, who can command the services of a skilled *accoucheur*, it is very seldom that it cannot be traced to the carelessness of either the doctor or nurse.

Let us turn, now, for a moment to some English and Canadian statistics. At the London General Lying-in-Hospital, antiseptics were not systematically employed until 1880. For the forty-five years previous to that, 9,606 deliveries took place with 244 deaths from sepsis, *i. e.*, 1 in 39.36 or 25.4 per 1,000. Between 1880 and 1887, carbolic acid, potassium permanganate and corrosive sublimate were successively employed with the result that 2,585 deliveries occurred with but 16 septic deaths, *i. e.*, 1 in 161.56 or 6.14 per 1,000. Corrosive sublimate was the only antiseptic employed from 1884 to 1889, during which time there were 2,150 deliveries with but 9 septic deaths, *i. e.*, 1 in 238.88 or 4.18 per 1,000.

Next, we will take up the city of London Lying-in Hospital. In this institution in the years from 1870 to July 1st, 1886, no antiseptics were used, and the deaths from sepsis varied from 1 in 24 to 1 in 287, and, except in 1879 and 1881, when they were 1 in 287 and 1 in 104½ respectively, the maximum and minimum were 1 in 24 and 1 in 50; truly a most appalling record!

Sublimate began to be systematically employed on July 1st, 1886, and during the next 10½ years, *i. e.*, up to Dec. 31st, 1896, there were 4,608 deliveries followed by only 11 deaths from sepsis, *i. e.*, 1 in 419 or 2.387 per 1,000. Of this period, from Jan. 1st, 1892 to Dec. 31st, 1896, there was not one death from sepsis although 2,392 confinements took place, *i. e.*, septic mortality fell from 1 in 24 in 1870 to nil in 1896.

Healthy surroundings, apart from the use of antiseptics, will do but little to stave off this disease, as was shown in the case of the above mentioned hospital, it having been placed in the best sanitary condition possible with almost no effect before strict Listerism was adopted.

While we cannot go back very far in Canada, it may be of interest to note the statistics from the only two provinces from which they were available, *viz.*, Ontario and Quebec.

Ontario, 1894—In the whole province 42,051 deliveries were followed by 19 deaths from sepsis, *i. e.* 1 in 2,213.21 or .45 per 1,000.

In the City of Toronto, 4,201 deliveries resulted in 3 deaths from sepsis, *i. e.* 1 in 1,400.36 or .71 per 1,000.

Hamilton had a septic mortality of 1 out of 1,028 deliveries or .97 per 1,000.

1895—In the whole province, 41,628 deliveries resulted in 22 septic deaths, *i. e.* 1 in 1,892.18 or .52 per 1,000.

During the same year, Toronto's mortality from sepsis following confinement was 4 in 4,131 births, *i. e.* 1 in 1,032.75 or .96 per 1,000.

Quebec, 1894—Here the mortality was as follows :

Whole Province—Births 53,495, deaths from sepsis 87, *i. e.* 1 in 614.88 or 1.62 per 1,000,

“ Exclusive of the three cities, Montreal, Quebec and Three Rivers.

Births 43,346, deaths from sepsis 49, *i. e.* 1 in 884.61 or 1.13 in 1,000.

City of Montreal “ “ “ 1 in 216.13 or 4.62 in 1,000.

City of Quebec “ “ “ 1 in 1,583 or .631 in 1,000.

City of Three Rivers—Births 343, deaths from sepsis 0.

1895.

Whole Province—Births 53,650, deaths from sepsis 168 *i. e.* 1 in 349.10 or 2.86 per 1,000.

“ Excluding three cities.

Births 47,247, deaths from sepsis 120 *i. e.* 1 in 393.72 or 2.53 in 1,000.

City of Montreal—Births 8,596, deaths from sepsis. 42 “ 1 in 204.63 or 4.88 in 1,000.

City of Quebec “ 2,454, “ “ “ 5 “ 1 in 490.80 or 2.03 in 1,000.

City of Three Rivers “ 353, “ “ “ 1 “ or 2.83 in 1,000.

It will be noticed that the city of Montreal has a comparatively high mortality from puerperal sepsis, but that, I think, can be accounted for in two ways.

The system of registration of births is not so complete among those not belonging to the Roman Catholic church, while that of the deaths is the same all through the province, irrespective of religion, so that, while all deaths from puerperal sepsis are recorded, many births, especially among the Protestants, are not, thus giving a higher percentage of deaths to births than actually exists. It follows that in districts containing the largest percentage of Roman Catholics the statistics will be the most accurate. From these facts, it will be seen that Montreal, having a larger percentage of non-Roman Catholic inhabitants than either of the cities of Quebec or Three Rivers or the rest of the province, will record all deaths from puerperal septicæmia while probably more births go unrecorded than elsewhere in the province, thus showing a higher mortality in child-birth than in other districts where births and deaths are equally recorded. Another reason is that many cases which originate in the country districts are sent into the city for treatment, at one of the city hospitals. In the “Woman's Hospital,” under the care of Prof. H. Reddy, there have been three deaths from puerperal septicæmia in the last

600 odd deliveries. This is a large death-rate, but all three occurred within one week in 1895, and Dr. Reddy thinks that the infection was directly communicated from the first case to the next two, the cubic space in the ward being insufficient.

Notwithstanding the proved efficacy of antiseptics in midwifery, there is little doubt but that they are not as regularly and thoroughly employed as they should be. Some practitioners do actual harm by their antiseptics as they use such weak solutions that they are inefficient, yet they believe so implicitly in them that they neglect the ordinary precautions of cleanliness. I have even heard a man, who was supposed to be a well educated physician, state in a medical society that he was not a great believer in the use of antiseptics during labour; that he very rarely employed them, and that he even did not always take the precaution of washing his hands previous to examining a parturient woman. That man must either be very fortunate or else have an appalling septic mortality. Many say that in the country antiseptics are not so necessary as in town, as the pure country air banishes the risk of infection, but is that really the case? Most emphatically no! It lessens, but by no means banishes the risk. Its effect is negatived to a great extent by the disadvantages under which the country practitioner works. For example, he has just opened an abscess containing very virulent streptococci, is ten miles from home, and is called hurriedly away to attend a woman in her confinement. He has no time to go home and change his coat and shirt, but has to proceed at once, perhaps, to apply forceps. I fear that all the pure country air in existence would not prevent that patient becoming septic unless it was assisted by thorough use of soap and water and antiseptics, although there is no doubt but that it would mitigate the effects of the infection.

It having been proved by both popular and scientific observation that women who are in a good state of health are less liable to suffer or if infected, to die from puerperal infection, it behoves us to get our patient into as good a condition as possible before confinement.

I have endeavoured to show, by the above statistics, both the utility of antiseptics and also the extent to which puerperal septicaemia prevails at the present day, and hope that you all will agree with me that the strictest antiseptics is absolutely necessary in conducting labour and that the death-rate from infection should be still lower than it is.

Let us now consider both what antiseptic to use [and] how to employ it so as to best prevent the occurrence of puerperal infection. For the purpose of rendering the hands of doctor and nurse aseptic, carbolic

acid (1-40), corrosive sublimate (1-2000), potassium permanganate followed by oxalic acid (saturated solutions of each) and creoline are most often employed and are about equally efficacious, but all must be used thoroughly to be of any service whatever, and that too after well scrubbing the hands and forearms with a nail-brush and soap and water.

Personally, I prefer sublimate as it is very efficacious and convenient, but if you have been attending any septic cases, the potassium permanganate is better and the manner in which it is employed by Professor H. Reddy at the Women's Hospital is very good. The rules, which he advises the *accoucheur*, students and nurses to employ are as follows:

1. Scrub the hands and forearms with salicylic soft soap, nail-brush and water for five minutes by the clock.
2. Soak the hands in a strong solution of potassium permanganate until they are stained a mahogany brown.
3. Decolorise with a solution of oxalic acid.
4. Rinse off the acid in corrosive sublimate solution (1-2000) or creoline.

By careful attention to the above rules, you will render your hands perfectly aseptic, as I have proved upon several occasions by taking cultures from my own hands and those of my assistants before and after using the pot: permanganate, etc. those taken before being invariably septic while those taken after it have been sterile.

No matter what kind of antiseptic one employs, it is absolutely necessary to thoroughly use the nail-brush with soap and hot water as a preliminary, as not only do you remove a certain number of germs thereby but you also soften the skin and give the germicide a much better chance to act upon the deeper layers of the cuticle.

In some cases, the patient will be suffering from some infective discharge, such as gonorrhœa, and where you suspect such to be the case, you will find it to be of service to give a preliminary vaginal douche of sublimate (1-3000) or creolin, but this should be avoided unless there is some special indication for its use, as it removes the vaginal mucus which serves as a lubricant of the passages and also as a germicide.

This latter fact is one of the strongest arguments against the routine use of antiseptic douches after labour, the healthy vaginal discharge being quite capable of overcoming a large number of bacteria. These cannot be removed from the deeper layers of the mucosa by the douche although the natural germicide, i.e. the discharge, is and therefore the patient is deprived of its protecting in-

fluence, thus being much more liable to infection. These remarks only refer to the routine use of the douche.

Where instruments are used, the hand inserted into the uterus or a dead foetus is present, an intra-uterine douche of sublimate (1-4000) followed by boiled water will usually prevent any septic trouble, but otherwise no vaginal or intra-uterine douche should be given during the puerperium if everything is progressing favourably.

As an additional safeguard, we should, if possible, choose the room in which the patient is to be confined. In addition to its being light and airy, it should be as far off as possible from any water closet and ought not to contain any fixed-in basins, or, if these are present, they ought to be closely covered up, as one can never tell when the traps may become defective. That this is not an imaginary danger is clearly demonstrated in Playfair's "Science and Practice of Midwifery," where cases are quoted of infection by sewer-gas, and diagrams shown illustrating the way in which currents of air conveying infection passed. Cases where the infection has been traced to a defective drain and where recovery has followed the removal of the patient to another house or room, are now and then reported in medical papers.

Having considered the prevention of infection, let us now proceed to the methods employed to cure a case, once infection has occurred.

The number of the methods of treating this malady shows only too clearly that no specific has yet been discovered, not even the much talked of antistreptococcus serum.

One of the most important factors in the question is the early diagnosis of the case. To begin with, in all cases where you have the onset of the symptoms of puerperal septicæmia appearing, the parts should be carefully examined and any lacerations thoroughly cleansed and repaired to prevent further absorption from taking place through them. The interior of the uterus should likewise be carefully examined for the presence of retained products of conception, and, if found, they should be removed. The safest instrument with which to effect the removal is the finger, or, if this fails, the dull wire curette. A sharp curette may be used, but not unless the operator has had a great deal of experience with this instrument, as, unless one is very careful, it is liable to remove uterine substance.

At this point, I hope that I may be permitted to make a short digression from actual treatment in order to urge the importance of not placing too much reliance upon the temperature in diagnosing septic infection, no matter whether it be puerperal or not. The pulse will be found to be a much safer guide, as, while you almost never will see a case of

sepsis without a quickened pulse, you will not rarely run across cases in which there is almost no noticeable rise in temperature, I, myself, having seen several cases in which the temperature did not rise over 99.5° F. Where you have a rapid pulse, headache, foul tongue and a dry, hot skin in a puerperal woman look out for septic infection, no matter what the temperature indicates.

In the majority of cases where the patient develops a slight chill with rapid pulse, and possibly some rise in temperature on the 4th or 5th day after labour, an intra-uterine douche of sublimate (1-3000) will usually rapidly check the process. If the first one does not do so, it is well to repeat it in five or six hours, when thoroughly swabbing out the uterus with either pure carbolic acid or else iodized phenol in addition will often have marvellously beneficial results.

If the case is more severe, especially if the cervix and vagina are covered with false membrane, thorough curettage of the uterus and also even of the vagina is indicated and may require to be repeated as it is exceedingly difficult to get the curette up to the orifices of the Fallopian tubes. For this reason it is well to use a very small curette. This operation ought to be followed by a copious douche (intra-uterine) of sublimate (1-3000), which should be succeeded by one of boiled water, after which, the cavity should be carefully dried and then swabbed out with either pure carbolic acid or iodized phenol.

A word now in regard to sublimate douching. Many are afraid to use it, in case they cause sublimate poisoning. While not denying that this does occasionally occur, especially in blondes, the sublimate douche, when properly given, seldom is followed by any ill results.

Personally, when the intra-uterine douche is indicated, sublimate is what I always employ in a strength of 1-3000 both in public and private, and I have never yet seen any harmful effect follow, but great care is always taken to have a free exit for the fluid from the uterine cavity and the last drops are expelled by expression.

• In the City of London Lying-in Hospital, Clement Godson uses sublimate entirely, using 1-1000 for the hands and 1-2000 for vaginal irrigation. He gives a 1-2000 vaginal douche at 115°F., immediately after delivery of the placenta and repeats it three times with an interval of twelve hours between each, after which he replaces the sublimate with iodine. This method has been employed in over 4,500 deliveries without any sign of mercurial poisoning. Another British writer, Sharp, says that, "in a really serious septic case, corrosive sublimate is the only reliable antiseptic and should be used fearlessly in a strength of 1-2000." This, however, I think is too strong a solution,

as such a powerful one would destroy the tissues and so furnish pabulum for the germs.

In addition to local treatment, the patient's general condition will require attention. Her strength must be maintained by nourishing but easily digested food, such as milk, eggs, soups, juice expressed from beef, which has just been warmed through, etc. Stimulants are usually necessary, good brandy, whiskey or port, being the most serviceable of the alcoholic ones and strychnine of the truly medicinal ones, giving gr. $\frac{1}{10}$ - $\frac{1}{30}$ every 4, 6 or 8 hours, as the urgency of the case requires. The spirits may be beaten up with egg and milk once or twice daily, if the patient can stand these latter, in addition to taking them in water at whatever intervals are indicated.

The bowels and other emunctories should be kept active, and hot applications to the abdomen, especially turpentine stupes, are of great service in relieving the pain. For this latter purpose, Battley's solution is very useful, it acting somewhat as a stimulant in addition to its sedative properties.

It is not advisable to give antipyretics continuously, as they simply obscure the symptoms, but eight or ten grains of quinine may be given now and then if the temperature keeps up too high.

Serum therapy in the treatment of puerperal septicæmia has been receiving considerable attention of late and numerous cures by it have been reported, but Marinorek's antistreptococcus serum is still on its trial, and, I fear, will not turn out to be such a success as was at first hoped. In nearly all of the successful cases in which it has been used, the general and local treatment above recorded has been employed, which utterly negatives the results as far as testing the value of the serum is concerned. Certainly a few cases have been reported where its administration has been followed by rapid amelioration of the symptoms, although the older treatment had been thoroughly employed with no effect, so that there is no doubt but that it is sometimes of benefit. It must be remembered, however, that the majority of mild cases, if taken in hand early, get well under intra-uterine douching, and that many of the severer ones can be cured by curetting combined with the application of caustics and douching, while other cases, apparently no more severe, will result fatally, no matter what we do. The dose of the serum varies, rapid improvement having followed the injection of 3 c.cm., while 20 c. cm. have been used in other cases with absolutely no result. The dose ordinarily employed seems to be 10 c. cm. injected under the skin of the abdomen and repeated every six or eight hours, if required. When successful, an almost immediate fall of temperature and pulse

rate follow. The only complication which has been recorded is the occurrence occasionally of a bullous eruption near the seat of injection. Whether one uses the serum or not, it is absolutely necessary that he should not neglect to employ the older treatment in addition.

Personally, I have only used it in two cases and could not see that the slightest benefit resulted. The first case, however, can scarcely be considered to be a fair test, as the patient was first seen in consultation five days after the onset of the symptoms of infection. At this time there was nothing abnormal to be made out in the pelvis or abdomen, the doctor in charge having douched the uterus several times with a solution of 1-4000 of sublimate. Septic pneumonia was present, the base of the left lung being involved. The patient received three injections of 10 c. c.m. each, within thirty-six hours, but died neither the pulse nor temperature being influenced by the serum.

The second patient was brought into the gynæcological ward in the Montreal General Hospital nearly four months ago, signs of infection having shown themselves nearly one week previously. There were some small lacerations of the vagina, this organ, together with the cervix and interior of the uterus being covered by a greyish false membrane, a culture from which gave streptococci. The lacerations were thoroughly cleansed and repaired, the uterus and vagina were curetted, douched with one gallon of sublimate solution (1-3000), well swabbed with pure carbolic acid and lightly packed with iodoform gauze. Douching and packing were repeated twice daily for several days. On the second day, as there was not very marked improvement in the pulse and temperature, an injection of 10 c. c.m. of antistreptococcus serum was administered and, in order to be brief I will just say, was repeated every twelve hours during the next six days, 20 instead of 10 c. c.m. being twice given. After a day or two the temperature and pulse rate began to come down and would fall to nearly normal and then shoot up again during the night to between 102 and 103° F. The serum was discontinued and the temperature has continued to rise and fall almost daily ever since, but latterly it has remained down for perhaps two continuous days under the influence of five grains of quinine. Two abscesses, probably pyæmic, have developed in one arm and the left hip-joint appears to be affected. The patient's strength is keeping up well and she is slowly recovering.

From an analysis of the cases fully reported where it has been employed, the serum appears to give excellent results where cultures prove the presence of streptococci alone, but, where the infection is mixed, it is of but little use.

As regards operations for relief of the condition, I may say that curetting is the only one to be recommended although of course abscesses which develop should be opened. When a case is sufficiently severe to indicate hysterectomy, it is too late to operate, and, as so many cases get well after less heroic methods of treatment, I don't think that we are justified in removing the uterus, which in itself is a grave undertaking. If, however, you find that the uterus is greatly lacerated, inviting the absorption of infection as it were, the question of hysterectomy may be considered.

RETROSPECT OF CURRENT LITERATURE.

Medicine.

UNDER THE CHARGE OF JAMES STEWART.

Gastroptosis.

DR. LEOP KUTTNER, of Berlin, and DR. DYER, of Portland, Maine.
"Ueber Gastroptose."—*Berliner Klinische Wochenschrift*, Nos. 27, 21, 21, 1897.

Within the past few years much has been written on displacements of abdominal viscera, and abnormal positions of the same but perhaps not the least interest gathers about that displacement known by the name gastroptosis and the frequently associated condition of nephrop-tosis. While the writings of Glenard, Meinert, Hertz and others discuss the condition, etiology, and symptoms pretty thoroughly, there remain many points yet unsettled. The object of these observers whose article is now under review, is to present the results of observations made in the polyclinic of the Augusta Hospital, in Berlin, on numerous cases which were examined as well as to give a glance over the literature on this subject.

We regret that tabulated statements are not offered as summaries of these observations.

Touching the question of etiology they remark that no cases of congenital gastroptosis have been observed.

It appears that gastroptosis not only belongs to later life but that it develops gradually.

Theoretically, first, the stomach may be pressed down, *i. e.*, by corsets, waist bands, etc., by a low standing diaphragm, by pleurisy etc., and in the second place it may be pulled or dragged down.

It appears that the second method of displacement is the more common, this depending much upon the condition of the wall itself. Atonicity may induce such displacement according to Kussmaul, here quoted, by leading to a certain degree of stagnation of food, especially

in the pyloric end and thus this may act as a weight to drag the other portion of the organ downwards, hence displacement—gastroptosis.

The "individual differences," of tone may account somewhat for degrees of displacement. So frequently was movable kidney associated with a displaced stomach that these observers were almost decided in the view that even if not demonstrable, some degree of gastroptosis existed. Though it may be granted that a predisposition existed in such cases of ptosis of abdominal organs yet it seems that the *applied* causes are sufficient to produce the changes in position noted in a few cases at least.

A quotation from Stiller is added to strengthen the view that a predisposition exists in very many cases. Stiller has observed in many of these patients, subjects of enteroptosis, that the 10th rib is a free or floating rib, as the 11th and 12th are. By this, when discovered, he is led to suspect enteroptosis. In such cases, too, pronounced neurasthenia has been almost invariably observed.

Kuttner and Dyer have corroborated such observations in many instances. The etiological factors as sex, age, habit of dressing, pregnancies are in accord with those of other writers.

In 42 cases showing gastroptosis in females fifteen times the right kidney alone was dislocated, while in fifteen cases both were found displaced. The liver was found displaced in ten instances, the spleen in but four of the cases observed. In men and boys where the stomach was found displaced there was no demonstrable kidney, liver or splenic displacement. The symptoms when present are various and variable and therefore not characteristic. The appetite sometimes fails and then again is insatiable. There may be much epigastric distress and this in proportion to the amount of food taken. Constipation is common.

Kuttner and Dyer strongly urge that while muscular atony may be produced by gastroptosis such an atonic condition of muscles is in a large number of the cases preceded by the displacement of organs.

The function of gastric secretion may also be disturbed, giving rise to hyperacidity, subacidity or even achlorhydria.

The general nervous manifestations, as weakness, changed voice, dizziness, cold hands and feet, palpitation and restless sleep are common in such cases and doubtless bear a direct relation to the intestinal condition. How often a high degree of nervousness is associated with constipation and only relieved when this condition is properly and effectually treated!

Meinert's view of the relationship of chlorosis and gastroptosis in young girls is not accepted by these authors.

In 15 chlorotic girls only 6 showed any signs of gastric displacement. They would explain the frequency of association by saying that the chlorotic condition led to gastroptosis, most likely through atony of the muscle.

There seems to be no *immediate* relationship between gastroptosis and the condition of the blood as some have taught. Observations were made on 19 cases in which there was no displacement and 19 in which displacement was demonstrable, the ages corresponding pretty closely and no marked differences were discovered.

Whether the altered position of the stomach or associated condition of nutrition is the cause of any lowered hæmoglobin quantity is not decided.

In ascertaining the position of the stomach these observers have great faith in the evidence obtained by *percussion*. They recognize however, that great care is needed to eliminate errors. Gastrodiaphany is highly recommended.

When by percussion it is impossible to locate the stomach it may be distended by means of air pumped in. This method is preferable to that in which tartaric acid and sodium bicarbonate are used.

Under differential diagnosis nothing is added of special moment.

The treatment of gastroptosis consists in measures which prevent atonicity in abdominal muscles and downward pressure on the stomach. These refer to dress and care of patient during and after pregnancy. The bowels are to be kept free, the muscles may be toned up by massage, cold applications, faradism.

Secondly, the treatment of the condition itself. The wearing of a well fitted abdominal band is strongly recommended. Thus an artificial abdominal covering is made which helps to keep the organs in place by increasing the abdominal pressure.

Rest in bed for two or three weeks may be found advantageous and thereafter such cases are helped by rest in bed two hours after food-taking.

Medicinally strychnine is perhaps the best drug as it increases muscular tone. The bowels should be carefully regulated.

W. F. Hamilton.

Pathology.

UNDER THE CHARGE OF J. G. ADAMI.

The Definition of Inflammation.

KANTHACK, A. A. "Pathological Jottings. V. *Acute Inflammation.*"
—*St. Bartholomew's Hospital Journal*, April, 1897.

In the April number of a bright and varied periodical, the *St. Bartholomew's Hospital Journal*, my old friend and colleague, Dr. A. A. Kanthack, criticised at some little length my views upon acute inflammation, published in the first volume of Allbutt's System of Medicine. I must freely acknowledge the force of several of his arguments: indeed it was with very considerable diffidence that I ventured to pass beyond the old and time-honoured statements which, until now, have served as definitions. Could I have recognised that the reaction to injury in vascular and non-vascular tissues respectively differed in kind, and not merely in degree, I would gladly have continued to regard inflammation as a process essentially confined to vascular tissues. But this is not the case. The essential processes occurring in regions rich in vessels and those devoid of them are the same in nature. There is no line of demarcation between them, and this being the case, wishing, as a general pathologist, to establish myself upon broad principles, I could—and still can—see nothing but harm in raising what is, after all, but an arbitrary distinction and one devoid of any true inwardness, between two phases of one condition and in teaching that the processes which follow injury to a non-vascular part are to be considered vague and to remain unclassified, while the same processes, modified merely, as I say, in extent and not in kind, are, so soon as they occur in a vascular area, to be considered inflammatory and all important. To the ordinary practitioner the distinction is, I admit, most convenient, but for the pathologist striving, as he ought to strive, to pass beyond the surface of things and to grasp at the principles which govern morbid processes, the distinction is, I must contend, valueless. It may be convenient to separate the "reaction to injury" in non-vascular regions from the reaction to injury in vascular areas; indeed, could any one find an appropriate and acceptable terminology, I would gladly speak of "reaction to injury" (or attempt at repair) in general, and subdivide this into (1) the processes occurring in non-vascular animals and tissues, and (2) those seen

in tissues provided with vessels, and to this latter class alone apply the term inflammation. But, unfortunately, we do not possess the requisite terminology, hence when it became a question between convenience and philology on the one hand, and convenience and the broad principles of our science on the other, I was forced to give up the idea of inflammation which Dr. Kanthack would retain—for we as teachers of pathology should, above all things, be ministers, not of the letter, but of the spirit. Otherwise we fall into that same pit in which Dr. Kanthack would leave us to continue to flounder—of seeing in inflammation a process “*sui generis*” which is not to be elucidated by studies upon lower forms of life, which is so marvellously complex that observations upon the actions of leucocytes and the properties of individual cells of various tissues should not be invoked to clear our conceptions of the same. “To select phagocytosis or chemiotaxis or new formation and repair as essentials, and make them the corner stones of theories of inflammation which are rendered more attractive by an appeal to comparative anatomy and evolution is unjustifiable; phagocytosis, chemiotaxis and proliferation are concomitant, or it may be constant phenomena of acute inflammation, and each of them by itself can readily be traced back from the highest to the lowest forms of animals, but surely it is not sound reasoning to evolve the whole process of inflammation from one or two of its phenomena, especially where such phenomena are extremely primitive protoplasmic properties. Evolution may teach us how a property or a character has been acquired, it may tell us something of the philogenetic origin of an organ or a process; but it does not pretend to assert that a complex process in a higher animal type which perfectly or imperfectly can be traced back to some property or function in a low animal type is identical with this property or function. Without a blood vascular system inflammation is impossible.” This it seems to me is the gist of Dr. Kanthack’s criticism.

I know my old friend well enough to be assured that the ‘*suggestio falsi*’ of this passage is wholly unintentional and but a matter of ‘*trop de zèle*.’ Nay, in all probability I wrong him in supposing that it is applied directly to me and my article. Nevertheless, reading the criticism as a whole it would seem directed entirely against my teaching, and as a consequence I am bound to protest that it does not place that teaching in a right light. For in the first place I have not selected phagocytosis or chemiotaxis, or new formation and repair as essentials. What I attempted was—accepting with some reservation, that definition which for thirty and more years has been most widely accepted among English speaking people (namely Burdon-Sander-

son's)—to collect together all the observations bearing upon this subject. I attempted to bring these together in an orderly fashion, beginning with the lowest forms and advancing to the highest. In the second part of my essay I discussed all the phenomena recognized as being associated with the process of inflammation, the vascular changes, the part played by the leucocytes, the exudation, the nervous system, &c., the relationship of fibrosis to inflammation, and then, and only then, when I had marshalled all the facts, did I venture to give the definition to which a consideration of all these facts seemed to lead, namely, that inflammation (the reaction to injury) is *the local attempt at repair of actual or referred injury*. This surely is not selecting one or other process as the corner stone of my theory, nor is it evolving "the whole process of inflammation from one or two of its phenomena." And here let me in parenthesis state that Dr. Kanthack in more than one place would seem to wish to confuse 'attempt at repair' with 'repair.' They are no more to be interchanged than are 'war' and 'victory.'

That it is wrong to approach this subject from a comparative pathological aspect, Dr. Kanthack, pupil as he is of the founder of 'cellular pathology' cannot seriously propound. It is quite true that evolution does not pretend to assert that a complete *process* in a high animal type is identical with some one *property* or function in a low animal type. But no one has made this assertion. On the other hand if the endeavour be made to analyse the various factors which can be distinguished as playing some part in the complex process in the high animal type, and if by studying each separate factor it is seen to be in evidence more or less distinctly in a chain of lower animal types; or, contrariwise, if we can see that each factor acting in the lower acts also in the higher animal, then it is not illogical to group the simpler processes occurring in the lower and the more complex in the higher, into one common class.

If Dr. Kanthack's argument be correct then we must no longer venture to class together the gradual disappearance of the particle of food in the food vacuole of an amoeba and the complex processes which result in the assimilation of a human dinner under the common term of 'digestion.' I am inclined to employ the retort malicious and turn upon Dr. Kanthack's 'his own aphorism': "It is unsafe to be too philosophical."

As to the postulate that without a blood vascular system inflammation is impossible, let me repeat that the more I have studied, the less have I been able to recognise any essential difference between the processes which follow injury in a non-vascular and in a vascular area

respectively. The main results gained by the presence of vessels in a part seems to be this, that by their intermediation the reaction to injury is more prompt and more extensive, there is more rapid conveyance, to the injured area, of substances, cellular and otherwise which tend to counteract the irritant, more rapid removal of the irritant and of the products of its action; but this is merely an augmentation not an alteration of the means employed by the organism. The vessels and the vascular changes are seen to be adjuvant, not the essential features in the progress.

Dr. Kanthack, it is true, states that he is able to recognise a difference in kind between what occurs in (non-vascular) cartilage and in vascular tissues when these are injured. Were this so he would be possessed of the strongest argument in favour of his contention. But wherein the difference lies he does not say, and until he states clearly what fundamental peculiarities are to be made out in the behaviour of damaged cartilage, I can neither criticise, nor can I accept his contention.

While I urge these objections to Dr. Kanthack's polemic, I trust that I shall not be taken for one of those foolish individuals who, having at one period of their lives assumed a definite position, ever after, either from obstinacy or from an absurd sense of personal dignity, feel bound to defend the same blindly. I am very far from being unprepared to recognise defects in the definition I have given, for, with Dr. Kanthack, I acknowledge freely that to define inflammation is almost an impossibility. Vital processes, like "life" itself, evade definition. We can at most approximate to such, and that approximation must be accepted as best which is most helpful to an intimate comprehension of the process. Just as physiology may be defined as a study of the functions of the organisation in health, so is pathology a study of the functions in disease. There may be wide variations in those functions compatible with perfect health, wide variations, within physiological limits, of the various factors upon the interaction of which depends the due working of the different organs and tissues. But let any one factor be varied beyond a certain point, and the imperceptible limit between health and disease is passed. It is this same fact that renders it impossible, or almost impossible, to define health and disease; there is no set boundary between the two conditions. Thus to employ two somewhat unfortunate examples brought up by Dr. Kanthack against me: "If," says he, "we take Professor Adami literally, the constant renewal of the cuticle would be inflammation." This would be quite true if we did not all, in considering these matters, tacitly admit and leave out of account physio-

logical injury. The shedding of the cuticular epithelium is a physiological process. Neglecting for the moment the fact that physiologically it is only dead cuticle that is shed and that has to be renewed, and that it is peculiarly difficult to see where the injury comes in, and where, consequently, my definition is at fault, let us take it for granted that this renewal of the cuticle is the result of injury; then we must admit also that we pass by imperceptible gradations from such physiological casting off and renewal of the cuticle to the most intense dermatitis produced by agents whose power of inflicting injury we cannot fail to distinguish.

There is, and there can be, no absolute dividing lines between the processes constituting the renewal of physiological tissue waste, and the processes constituting inflammation, whether we limit this last term to processes occurring in vascular tissues or no. To this extent it is impossible to define inflammation. We thus—all of us—for the purposes of definition are led to assume, or imply, an imaginary boundary.

Or to quote Dr. Kanthack again "During lactation the cells lining the mammary alveoli are constantly losing part of their substance, but they immediately regain that loss. Is that inflammation?" Certainly it is not: we are attempting to define a pathological process and all employing our definition will tacitly leave out of the category of injuries, processes which all recognize as perfectly normal. What is normal cannot be satisfactorily classed as an injury. All the same while we do not admit that such cases can reasonably be said to be included in a definition which states that inflammation is the local attempt at repair after *injury*, actual or referred, the fact remains that alteration and destruction of cells occurring in the functional mammary gland is not to be distinguished from what is seen to occur in the gland which is the seat of injury, and while we do not consider the former class of cases to be reasonably or justly covered by my definition, I and all will admit that a careful study of these and similar examples of the physiological 'process of repair' is most valuable nay, necessary, in adding to our comprehension of the changes, cellular and otherwise, which manifest themselves in the pathological 'attempt at repair.'

The nearest approach to a definition given by Dr. Kanthack is that inflammation will be regarded as "a series of changes occurring only in vascular or vascularisable connective tissue, or in connective tissue which is in easy communication with the surrounding blood vessels" (as the result of injury actual or referred?) From this it will be seen that he considers it impossible to have inflammation of mucous or

epithelial surfaces or membranes. Here again I cannot follow him. I fail to see that any conceivable good is gained by narrowing our conception of the process so as to include connective tissues alone. The series of changes occurring in vascular and vascularisable connective tissues is alone to be termed inflammation. The like series occurring in non-vascularisable connective tissues is to be nameless, the like series in mucous membranes and epithelium is to be nameless. *Cui bono?*

The only ray of hope left visible in Dr. Kanthack's dangerous condition is this, that he is inevitably and implicitly led to acknowledge in the diagram with which he concludes his article that the proliferative processes, occurring in connective tissue cells as the result of acute inflammation—tend toward repair.

J. George Adami.

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 303 Dorchester street, Montreal.]

PERIODICALS.

MAY, 1897.

CANADA MEDICAL RECORD.

Notes on varicocele cirsocele : its pathology, clinical history and treatment—Thos. H. Manley, New York, p. 389.

Shock after abdominal operations and how to prevent it—A. L. Smith, Montreal, p. 393.

JUNE, 1897.

LA CLINIQUE.

No original article.

JULY, 1897.

THE CANADIAN PRACTITIONER.

Hyperchlorhydria—H. J. Hamilton, Toronto, p. 470.

A case of intra-laryngeal mycosis—Price-Brown, Toronto, p. 482.

A cent in a child's cesophagus for nearly two months ; skiagraph ; recovery—E. E. King, Toronto, p. 505.

Three cases of poisoning by methyl blue—A. J. Harrington, Toronto, p. 506.

Bromoform anæsthesia—J. W. Smuck, Toronto, p. 507.

THE CANADA LANCET.

Antitoxine in the treatment of laryngeal diphtheria—Dillon Brown, New York, p. 531.

THE CANADIAN MEDICAL REVIEW.

Viburnum in abortion—Wm. Graham, Toronto, p. 1.

THE DOMINION MEDICAL MONTHLY AND ONTARIO MEDICAL JOURNAL.

Difficult labours—D. G. Fleming, Chatham, Ont., p. 481.

THE CANADIAN JOURNAL OF MEDICINE AND SURGERY.

Anti-streptococic serum—W. J. Wilson, Toronto, p. 1.

Case of poisoning by corrosive sublimate—A. J. Harrington, Toronto, p. 4.

Address in Medicine. By Prof. Austin Flint. Delivered at the Semi-Centennial of the American Medical Association, Philadelphia, June, 1897, p. 6.

THE MARITIME MEDICAL NEWS.

The relative value of excision and arthrectomy of the knee, with a report of four cases of excision—N. E. McKay, Halifax, p. 225.

L'UNION MÉDICALE DU CANADA.

De l'épilepsie jacksonnienne—Observations préliminaires sur les localisations cérébrales motrices—Etude clinique d'une cas de cette variété d'épilepsie compliquée de paralysie athrophique de la jambe et traitée avec succès par l'électricité—D. Brochu, Québec, p. 385.

Quelques notes sur un case de mortalité assez étrange à la suite d'une injection de serum antidiphthérique Roux—P. V. Faucher, Québec, p. 404.

LA REVUE MÉDICALE..

De l'intervention électro-thérapeutique dans le traitement de l'occlusion intestinale aiguë—M. D. Brochu, Québec, p. 1.

REPORTS, ETC.

Transactions of the Canadian Medical Association, Twenty-ninth Annual Meeting, Montreal, August 26th, 27th and 28th, 1896.

La Revue Médicale.

The old city of Quebec has now come forward as an aspirant for journalistic honors in medicine, by the appearance, in the French language, of *La Revue Médicale*. The editor is Dr. P. P. Boulanger, and is assisted by Drs. Ahern, Brochu, Simard, Vallée and others. They believe that although there are two journals in the province published in French, there is plenty of room for further work, and propose to produce, at a small cost, not only original articles, but the more important contributions which appear in the periodicals of Europe. The *Revue* presents two novel features in Canadian journalism. The form in which it appears is modelled after that so familiar among the majority of the journals of France, and it will further follow the custom of that country by appearing weekly. There must be plenty of good material to work upon in Quebec, and the editors deserve encouragement in their new and rather ambitious undertaking.

Kenneth Cameron.

Reviews and Notices of Books.

The Disorders of Digestion in Infancy and Childhood. By W. SOLTAU FENWICK, M.D., B.S., Lond., M.R.C.P. With illustrations. London: H. K. Lewis. 1897.

This is an eminently practical manual on the subject of dyspepsia in children, compiled chiefly from the notes of some five thousand cases of disordered digestion which have come under his notice at the Evelina Hospital and elsewhere. The work opens with chapters on the physiology of digestion in early life, and a statement of the important facts which should regulate the diet and hygiene of infancy; chapters in which we note a full recognition of the value of the recent work in this department of American specialists. After speaking of the dyspeptic conditions met with in infancy, there follows an excellent chapter on acute gastro-intestinal catarrh in infants. Referring to the treatment of this troublesome affection the author says, "The vomiting and diarrhoea which usually accompany the early stages of the complaint are of distinct value to the organism; they constitute, in fact, the first line of defense devised by nature against noxious materials, which find an entrance to the body through the digestive canal; and it is only when they persist after their work has been completed that they prove a curse rather than a blessing. The first indication, therefore, is to assist the alimentary canal to rid itself of those elements of danger which it contains. In infants the first attack of vomiting generally empties the stomach so that there is seldom any need for the employment of an emetic. Nevertheless if the breath smells sour, and masses of curd or fermenting food continue to be rejected, a full dose of ipecac or sulphate of zinc may be given. The presence in the stools of undigested food, of yeast like material or of small lumps of fecal matter, indicates that the intestines still contain the sources of irritation, and means should be taken to secure their expulsion. For this purpose he recommends a full dose of castor oil, followed up by the use for a day or two of a castor oil mixture combined at the same time with abstention from food. Afterwards the author endeavours to promote asepticity of the digestive tract. The drugs he specially recommends for this purpose are calomel in small doses from $\frac{1}{8}$ to $\frac{1}{4}$ of a grain, the solution of the perchloride of mercury, and resorcine. In the later stages he advises a combination of subnitrate of bismuth, in full doses combined with resorcine. Opium should be given in symptoms of collapse, and to relieve excessive pain and tenderness.

The chapters on digestive disorders in older children are very interesting and instructive, the whole subject being treated in a very thoughtful manner. We have much pleasure in recommending this work

strongly, especially to the young practitioner who often may find himself at a loss to know just how to treat these very troublesome affections of early life.

A. D. B.

A Manual of Materia Medica and Pharmacology, comprising all Organic and Inorganic Drugs which are and have been official in the United States Pharmacopeia; together with important allied species and useful synthetics. By DAVID M. R. CULBRETH, Ph.G., M.D., with 450 illustrations. Lea Brothers & Co., Philadelphia and New York. 1896.

This very excellent work on Materia Medica has been written with the view of supplying a text-book not only adapted to the needs of students in Colleges of Pharmacy, but also serviceable to the practical pharmacist, supplying the information necessary for the higher branches of his business. The work opens with an excellent introductory chapter giving definitions of terms and explaining the various modes of administration of remedies, with a brief note on the conditions which may modify their action. The drugs obtained from the vegetable kingdom are arranged and described in their natural orders, according to the classification of Bentham and Hooker. Animal drugs are also treated in the natural historic relationship of the animals from which obtained. Inorganic drugs are described according to their chemical relationship. Three additional chapters follow. One on the official organic carbon compounds. A second on the non-official organic carbon compounds, in which the chemistry of the open and closed chain compounds is explained. A short chapter on the Microscope and its use in Pharmacy closes the work. Of the many references we have made to this work all have been particularly satisfactory. One of its features deserving special commendation are the very numerous wood-cuts. Almost every plant is illustrated, some of the more important having several excellent illustrations. While a considerable amount of the information contained in this work cannot at the present day be considered as actually necessary for the medical student, to those who have time and inclination no study can be more interesting. It is to the students in pharmacy, however, that we would specially commend this volume, believing that it will fully supply all the requirements necessary in a text-book.

A. D. B.

A Manual of Infectious Diseases. By E. W. GOODALL, M.D., Lond., and J. W. WASHBOURN, M.D., London. 8vo. pp. 360. London. H. K. Lewis. 1896.

This book has been designed chiefly for the use of students, and treats of the specific fevers common to England and to this country. Much attention has been paid to diagnosis and treatment. Special chapters are devoted to the discussion of Fever, Contagion, and Disinfection, and owing to the frequent mistakes made in Diagnosis, a brief account of "Sore Throat" and of the rashes simulating those of the specific fevers is given.

A notable feature of the work is the diagrammatic representation of the distribution of the various rashes on the body. Photographs of the various micro-organisms at present recognised as the cause of disease are given. The temperature charts are numerous. We have much pleasure in recommending this work to both students and practitioners. The opportunities for students of the present day acquainting themselves thoroughly with infectious diseases must necessarily be very limited. The advantage of possessing a clearly written and well illustrated work on the subject is therefore manifest.

A. D. B.

Artificial Anæsthesia. A Manual of Anæsthetic Agents and their Employment in the Treatment of Disease. By LAURENCE TURNBULL, M.D., Ph.G. Fourth Edition. Revised and enlarged. With illustrations. Philadelphia. T. Blakiston, Son & Co. 1896.

This very excellent Manual on Anæsthesia and Anæsthetics reached its fourth edition on the fiftieth anniversary of the discovery and introduction of ether. The whole subject is thoroughly handled and well illustrated. No physician is justified in administering anæsthetics without thoroughly acquainting himself with the dangers connected with that state and the best means of avoiding or combatting them should they arise. We have much pleasure in recommending this manual as one which will supply all desirable information in a clear and happily expressed way.

A. D. B.

Braithwaite's Retrospect of Medicine. A half-yearly journal containing a retrospective view of every discovery and practical improvement in the medical sciences. Edited by JAMES BRAITHWAITE, M.D., Lond., assisted by E. F. TREVELYAN, M.D., Lond., M.R.C.P.

This work still commands our admiration. To most of our readers Braithwaite's retrospect is a household word, and is associated with their earliest recollections of medical literature. Although of such venerable memory, the retrospect still maintains its excellence. The present volume contains the usual careful selection of the most interesting papers culled from medical literature of all nations. We are glad to notice that Canadian authors are well represented.

A. D. B.

The Year-Book of Treatment for 1897. A Critical Review for Practitioners of Medicine and Surgery. Crown octavo, 488 pages. Philadelphia and New York. Lea Brothers & Co., 1897.

This excellent review, written almost entirely by English authors, and republished by Lea Brothers & Co., fills an important niche on our shelf. The present issue fully maintains the reputation which the book has won for itself as a carefully executed sifting of the work done in the practical departments of medicine in the course of the past year. Although occupying a comparatively small compass, careful examination shows how excellently the work has been done. No important acquisition to our knowledge is omitted.

A. D. B.

Teratogenesis ; An Inquiry into the Causes of Monstrosities.

By J. W. BALLANTYNE, M.D., F.R.C.P.E., F.R.S.E. Oliver & Boyd, Edinburgh, 1897. Pp. 62.

This little volume contains three essays which were originally intended to form the first part of a work on monstrosities, and deal with the Theories of the Past, as to the causation of monstrosities. These are divided into supernatural causes, physical causes and mental influence. The original intention of the author to publish a subsequent part dealing with the modern theories has been altered, and the Theories of the Present will be incorporated in his work on Diseases and Deformities of the Fœtus. The facts appear to be thought of less importance and receive scant attention.

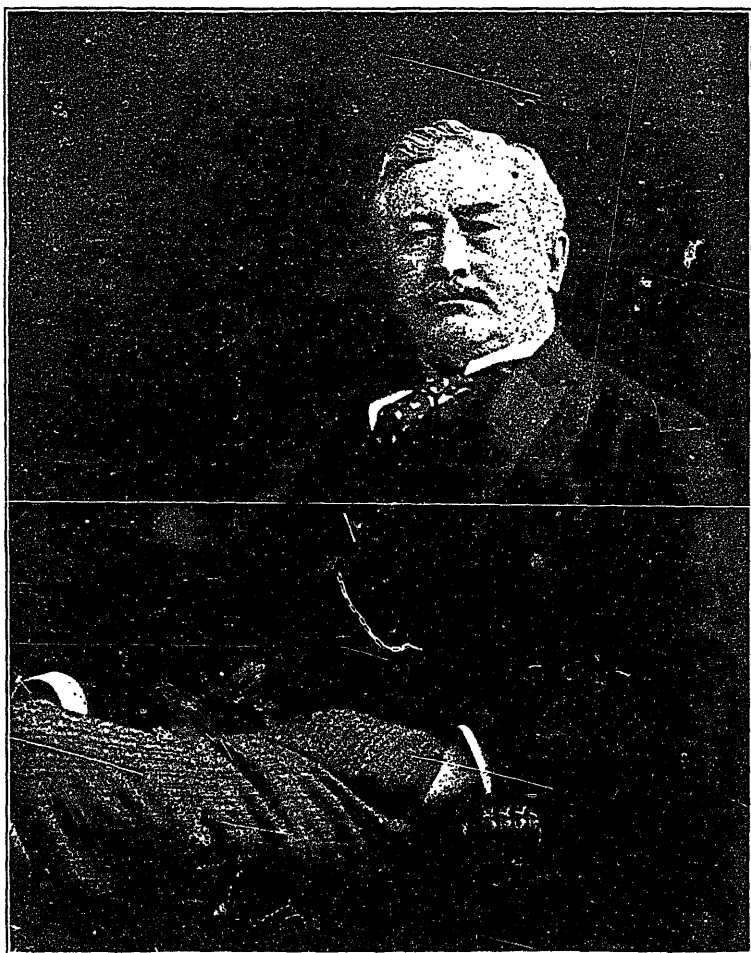
The fact that the contents of the present volume consist for the most part of imperfectly digested nonsense is due to the subject matter under consideration and to circumstances beyond the control of the author. That he appears to have escaped almost unscathed, and able to say in conclusion, "that the cases which have been advanced to prove the potency of maternal impressions have been accidental coincidences, and not the effects of their alleged causes," is a matter for congratulation. We quite agree with him that one case in a hundred presents phenomena which it is very difficult entirely to explain away, and that the mental condition of the mother during pregnancy may produce miscarriage or lead through general nutritive or vascular disturbances to irregularities in embryogenesis.

The case, however, where the circumstances of a mother having been impressed by the sight of a hair-lip is considered by Dr. Ballantyne to have some possible connection with the presence of a naevus on the child's neck at birth, is not, necessarily "far worthier of record than are those in which an impression is said to reproduce itself as regards form and situation on the infant's body."

It appears to disregard the main question as to whether the date of the impression is such as would make it possible for an adequate change in nutrition to have occurred at all. Thus the causes underlying a defective closure of the spinal canal must be operative, at the latest, prior to the sixth week of gestation, and probably before the woman was aware of the fact of her pregnancy. Whereas most of the recorded cases concern impressions imparted at a time too late to have any connection with the anomaly, and Dr. Ballantyne has not taken pains to state, in the cases quoted by him, whether this objection existed or not.

It is to be regretted that the collaboration of some pathologist has not been secured in connection with the large and valuable material collected in connection with the author's work on Diseases and Deformities of the Fœtus. About the former little is known, and all are anxious to learn. About the latter we have rather too much information of a certain sort.

Inaccurate pathology is responsible for much of what is strange in teratology.



T. G. RODDICK, M.D.



HENRY BARNES, M.D.

THE

Montreal Medical Journal.

A Monthly Record of the Progress of Medical and Surgical Science.

VOL. XXVI.

AUGUST, 1897.

No. 2.

BRITISH MEDICAL ASSOCIATION.

MONTREAL MEETING.

We have received from the Local Secretaries the following detail notes with reference to the forthcoming meeting, bearing more especially upon the attendance of members of the Association, upon hotel and lodging accommodation in Montreal, on reduced railway rates and the means of obtaining the same, and in brief upon all those matters in which it is well those who propose attending should be posted before their arrival in Montreal.

ATTENDANCE AT THE MEETING.

All those intending to be present at the Meeting of the British Medical Association upon August 31st, and the following days must be members of the Association or invited guests of the same.

MEMBERSHIP.

Membership in the Association is to be obtained upon terms which can be obtained from the Secretaries of the Branches throughout Canada.

These applications can be made to Dr. J. A. Springle, Montreal; Dr. G. C. Jones, Halifax; Dr. W. B. Thistle, Toronto; Dr. E. Crompton, Victoria; Dr. J. R. Jones, Winnipeg; Dr. C. P. Dewar, Ottawa; and Dr. A. Marois, Quebec; who are Secretaries of the various Canadian Branches.

The subscription to the Association is \$5.00 per annum together with an additional small sum for membership of the Branch, varying in the different Branches.

It is open to Members of the Profession to join on or after July 1st, and to pay the half subscription for the half year. Members receive a copy of the British Medical Journal weekly.

While it is possible for Members of the Profession who are British subjects to be elected Members of the Association at the time of the Meeting it is most desirable that as few as possible seek election by this means. Election in Montreal will be by the General Council of the Association. At least twenty-four hours must elapse between arrival in Montreal and election, during which period the intending member will have no privileges, while in addition each application will place an extra amount of work upon officials who will at that time probably have more than they can comfortably accomplish.

So as to add to the success of the Meeting and to the proper entertainment of each individual Member, the Local Executive begs that all those who propose attending will immediately forward their names to the Hon. Secretaries (at 2204 St. Catherine St., Montreal.)

TRANSPORT.

Canadian Members.

Members and their wives and children are given the privilege of travelling to Montreal for one half of one single first class fare, or one first class fare for the round trip. This advantage may be secured by the following methods:—

1. By buying a single first class ticket to Montreal for each traveller and obtaining a certificate from the ticket agent, at the point of departure, stating that such purchase has been made. Any ticket agent will furnish such certificate on request. On presentation of this certificate at the Reception Rooms in Montreal, a free pass will be given for the return journey over the same line.

2. By obtaining a certificate from the Secretary of the Excursion Committee (Dr. H. S. Birkett, 2204 St. Catherine St., Montreal) and upon presentation of the same at any ticket office of any Canadian Railway, the agent will sell bearer a ticket at the above reduced rates. In writing for the above certificate Members are requested to give name in full as also the full name of wife and child. Each individual requires a special certificate.

Children from five to twelve years of age will be charged half adult rates.

These privileges apply to Canadian Railways only and are good from July 1st, to Sept. 30th, 1897.

GUESTS OF THE ASSOCIATION.

The same privileges as are accorded to Members in the matter of Transport and Excursion in Canada will also be afforded to the invited guests of the Association.

Guests of the Association from points in the United States, east of

the Mississippi River, can secure round trip tickets to Montreal for one single first class fare and one-third.

To obtain this rate it is necessary to purchase at point of departure a single first class ticket to Montreal, at the same time securing from ticket agent a certificate stating that said purchase has been made, then upon presentation of such certificate to the Secretary of the Association in Montreal, a return ticket will be issued over the same line at one-third first class fare from August 27th to Sept. 7th inclusive.

This arrangement holds good only for those arriving in Montreal on or after August 28th, and leaving Montreal not later than September 7th.

DELEGATES TO THE MEETING.

The National and State Medical Societies of the United States have been invited to be represented, each by one delegate.

These delegates are requested to be present at the opening meeting, at which special seats will be reserved for them, in order that they be personally introduced to the President and to the Association.

EXCURSIONS.

These same privileges, namely, of obtaining a ticket for a single journey at one half a first class fare and a return journey at a single fare applies equally to excursions taken by Members and their families up to Sept. 30th, 1897.

It is to be noted that what is here stated concerning the railways on the St. Lawrence River applies also to many of the steamboat lines.—Niagara Falls Line, S.S. Empress of India, Muskoka & G. B. Nav. Co., Bay of Quinte Ry. & Nav. Co. We would especially call attention to the fact that the Canadian Pacific Railway offers free passes over all their branch lines in Manitoba, North-West Territories and British Columbia, and for all their steamboat lines in the Canadian North-West to all Members and guests of the Association who purchase tickets to Vancouver, B. C., and return. The fare for this trip is \$70.45. Members desiring to visit any point in Canada either before or after the meeting, from now until Sept. 30th, are privileged to obtain the above rates. Pullman and parlour cars are attached to each train.

We here note in somewhat fuller detail the excursions which may well be made and the approximate cost of the same.

The old city of Quebec, is one hundred and seventy-two miles from Montreal; fare, \$3.50. A very pleasant day can be spent in the old city visiting the different points of interest. From Quebec one can

go down the St. Lawrence and up the Saguenay, thence to Lake St. John. Here there is a comfortable hostelry known as the Hotel Roberval, and good Ouananiche fishing can be obtained in Lake St. John. Boats and guides are always to be had. From Lake St. John to Quebec, one can go by rail; distance, one hundred and ninety miles.

Montreal to Halifax, Nova Scotia, distance, seven hundred and fifty-six miles; single first-class fare, \$16.50. From Halifax one can visit the Annapolis Valley, and the Bras d'Or Lakes. There are two main lines of railroad leading from Montreal to Halifax passing through picturesque and fertile country.

Montreal to St. John, New Brunswick; distance, four hundred and eighty-one miles; cost, \$14.15, single fare first-class.

Montreal to Ottawa; distance, one hundred and twenty miles; single first-class fare, \$3.50. The Parliament Buildings in Ottawa are very handsome, and well-worth seeing.

A very pleasant trip would be from Montreal to Kingston by rail and down the St. Lawrence through the Thousand Islands by steamer. Montreal to Kingston, one hundred and seventy-five miles; first-class single fare, \$5.65.

Montreal to Toronto, three hundred and thirty-three miles, single first-class fare, \$10.40. Toronto is a very convenient point from which to visit the Falls of Niagara; distance, sixty miles from Toronto. A very pleasant trip would be from Montreal to Toronto by rail, from Toronto to Niagara and back to Montreal through the Thousand Islands and the different Rapids of the St. Lawrence by steamer.

Western trip, Montreal to Vancouver; distance, two thousand and nine hundred and ninety miles; time, five and a half days. The cost of a return ticket to members of the British Medical Association: first-class, \$70.45, instead of the usual rate of \$135.10. The sleeping cars cost each way \$20.00 for double berth. Meals in dining cars and restaurants, 75 cents each. This is a trip which we would advise all members and guests who can afford the time to take, as it will give them an impression of the vastness and resources of British North America that can be obtained in no other way. The trip is not tedious and every day is thoroughly enjoyable. The cars are comfortable, the scenery constantly changing, and of very great interest. Stop-over privileges are allowed at all points, from some of which interesting side trips can be made. From Rat Portage, the new gold fields of the Lake of the Woods, Rainy Lake and Seine River can be reached by steamer. The Canadian Pacific Railway have kindly offered to give to each member and guest of the Association going to Vancouver over their line, free passes over all their branch railway

and steamboat lines in Manitoba, the Canadian Northwest Territories and British Columbia, thus enabling those who desire to visit Rossland and other points of interest an opportunity to do so. Those who intend to take this trip are asked to apply early so that date and accommodation may be provided. By the payment of an extra \$5.00 members may return by the Great Northern or Northern Pacific. In this way the Yellowstone Park may be visited. The Yellowstone Park is a National United States reservation and requires five days to see it all. The expenses of the trip through the Park are not included in the railway fares. Members desiring to visit the Yellowstone disembark at Livingston on the Northern Pacific Railway. The trips from Livingston through the Yellowstone and return are as follows: Livingston to Mammoth Hot Springs and return, including transportation only, \$5.00; second, Livingston to Cinabar by rail thence by stage to the Mammoth Hot Springs, Norris, Lower and Upper Geyser Basins, Yellowstone Lake, Grand Cañon, and Falls of the Yellowstone, returning by the same route, including transportation and five and a half days board at the Park Association Hotels, \$49.50. The date for closing the Park is October 1st. No charge will be made for passengers returning viâ Portal and the Soo Pacific route to St. Paul, thence to Sault St. Marie where the Canadian Pacific is again reached.

For those members who prefer to go from Owen Sound to Fort William through Lakes Huron and Superior by the Canadian Pacific steamers instead of north of Lake Superior by rail, an extra charge of \$4.25 each way is made, which includes berths and meals. These steamers are large steel boats with all the comforts of ocean steamships. Members are recommended to go one way by these steamers.

This trip across the great prairies and the Canadian wheat fields will be at the time when the wheat is about ripe, and harvesting will be in progress. The scenery through the great lakes and the Rockies outrivals that of Switzerland. Banff Hotel and the Banff Hot Springs, four thousand five hundred feet high, are in the National Park. The great Glacier is said to contain more ice than all the Swiss Glaciers put together. The scenery along the Fraser River is of the wildest and most fascinating character.

The hotels at Banff, at Glacier, and at several other points, where members might care to stop, are thoroughly comfortable in every respect.

ACCOMMODATION IN MONTREAL.

Montreal is well supplied with hotels and lodging accommodation and is thoroughly prepared for receiving the Association and its

guests, but inasmuch as the meeting takes place at a time when there is a large influx of ordinary travellers into Montreal, and a liability for the best accommodation to be rapidly taken up, it is well that those intending to be present at the meeting secure their rooms beforehand, and we must strongly advise all such to communicate immediately with Dr. R. F. Ruttan, Secretary of the Reception Committee, 2204 St. Catherine street. Should, however, any member or guest fail to take this most advisable step, it is to be noted that the Reception Room at McGill University will be open from 9 a.m. upon Monday, August 30th, and those desirous will be able to obtain there full information concerning lodging and hotel accommodation.

HOTEL ACCOMMODATION.

By writing in advance, hotel accommodation can be secured at the following rates :

Windsor Hotel—Room with bath, \$4.00 to \$5.00 ; without bath, \$3.50 to \$4.00.

St. Lawrence Hall—Room with bath, \$3.00 to \$4.00 ; without, \$3.00.

Balmoral Hotel—Rooms, \$2.50 to \$3.00.

Queen's Hotel—Rooms, \$2.50 to \$3.00.

Richelieu Hotel—\$2.50.

Turkish Bath Hotel—Room for single person, \$1.75 to \$2.75 ; double bedded rooms, \$1.50 to \$2.00 per person per diem ; the bath rooms of the hotel and swimming baths are free.

Avenue Hotel—Single person, \$1.50 to \$2.00 ; double bedded rooms, \$1.50 to \$1.75 per person per diem. (These last two named are Temperance Hotels.)

All these prices are upon the American plan and include meals as well as lodgings.

LODGINGS.

In the neighbourhood of McGill College there are very numerous boarding and lodging houses where rooms and breakfast may be obtained at moderate rates. These vary from 75 cts. to \$1.50 per person per diem, and in most cases breakfast can be obtained but no other meal. The list of the lodging houses recommended by the Reception Committee can be obtained on application to Dr. Ruttan, or preferably, if those writing will state the nature of the accommodation wanted, the Reception Committee will allot the best rooms available at a given price in order of priority.

MEALS.

The Local Executive will provide an excellent lunch in the Drawing rooms of the Engineering Building, supplied by the best caterer in Montreal, at the rate of 50 cents per head. Tickets admitting to

luncheon will be procurable at the Reception Room and at the door of the McDonald Engineering Building. This lunch will be of several courses: and the price paid will include lemonade, tea, coffee, etc. Beer and light wines will be obtainable and will be charged extra. It is proposed that at an extra charge of \$1.00 per party, special tables can be secured in advance in a separate room, so that members and guests can form special parties, the extra charge will be for special service, etc. Apart from this there are numerous cafés situated on St. Catherine street, half-way between McGill College, where the morning meeting will be held, and the Windsor Hall where the general addresses will be given in the afternoon. The prices at these cafés are in general very moderate.

THE ARRANGEMENTS FOR THE MEETING.

Following upon precedent, the business of the meeting will consist of the work of the eleven sections, which will take place in the morning from 9.30 to 1, and the general meetings for the conduct of business and to hear general addresses in the afternoon. The Sectional meetings will take place in the various lecture theatres and halls in connection with McGill University, the business and general addresses will be conducted in the Windsor Hall upon Dominion Square each afternoon from 2.30 or 3.00 until 4.00 or 4.30. Local excursions and entertainments after 4 o'clock each afternoon. There will be each day a series of short excursions, receptions and garden parties; for each of these a limited number of tickets will be distributed. Among the more important of these may be mentioned Miss Roddick's reception at the Art Gallery on Tuesday, the 31st, a garden party at the Royal Victoria Hospital and the excursion by steamer down the river on Wednesday, the International Golf Match at Dixie, the excursion round the mountain and several garden parties on Thursday. The excursion down the Lachine Rapids and the laying of the foundation stone of the New Nurses Home at the General Hospital (it is to be hoped by Lord Lister) upon Friday.

Similarly each evening there will be one or more entertainments beginning with a smoking concert at the Masonic Hall on the Monday evening and including a reception at Laval University, reception by Sir Donald Smith, at 1157 Dorchester St., and a reception and evening garden party at McGill College on Friday evening.

Upon Saturday, Sept. 4th, several excursions may be taken. A party of from three to four hundred will be entertained by the Mayor and Corporation of Ottawa, and there will be a large excursion open not only to members and guests but also to their friends, to Lake Memphremagog.

Upon Thursday, Sept. 2nd, the Mayor and Corporation of Montreal have invited the Association and its guests to a lunch upon the Mountain.

ARRANGEMENTS FOR LADIES ACCOMPANYING MEMBERS.

Members, as it has been already stated, can obtain for their wives or daughters travelling with them, the same privileges with regard to travelling and excursions as are granted to members themselves. The garden parties and other receptions save in exceptional cases are open to the ladies accompanying the members and guests as well as to the members and guests themselves. One of these exceptions is the Annual Dinner. The receptions at Sir Donald A. Smith's and at the Laval and McGill Universities are for members and the ladies accompanying them. A Ladies Committee has been called together and is actively at work making arrangements for the ladies present at the meeting, more especially during the mornings when members and guests are engaged in the work of the various sections. The Redpath Library at McGill, a very beautiful building, will be set apart especially for their convenience, and here arrangements are being made to hold a general concert upon at least one morning. Also afternoon teas will be provided and ladies wishing to hold afternoon tea parties for their friends, can, upon application obtain comfortable private rooms. A matron will be placed in charge of the rooms set apart for these various purposes at the Redpath Library.

RECEPTION ROOMS.

A large tent and an extensive suite of rooms have been set apart in the Arts Building at McGill to form the Reception Rooms. Here members and guests must register and obtain their cards admitting them to the various sections and meetings, and here will be also post, telegraph and telephone offices, counters for the distribution of tickets and invitation cards for the various entertainments, cloak rooms, office for sale of railroad and steamboat tickets, smoking and retiring rooms, etc., etc. Here also will be distributed each morning the daily programme.

CONTRIBUTIONS TO THE BUSINESS OF THE MEETING.

It is open to all members and indeed all guests of the Association, to offer papers to be read in the various sections, but owing to a large amount of time taken up by the various discussions, it is probable that in several sections some at least of the papers though accepted by the committee in charge of the work of those sections, will have to be read by title, although subsequently they can be published in full

in the Journal of the Association (*British Medical Journal*). It is especially desirable that Canadian work be well represented.

Papers read before the Association must not exceed 15 minutes in delivery. When accepted they become the property of the Association and must be published in the first place in the *British Medical Journal*. Those desirous of communicating papers are requested to notify the local Secretaries of their desire and the title of their paper as soon as possible. The list of those local Secretaries with their addresses will be found in any recent number of the *British Medical Journal*, where also will be found a programme of the work so far arranged in the various sections.

THE ANNUAL MUSEUM.

A leading feature of the coming Meeting will be the exhibition of medical and surgical apparatus, prepared foods, drugs, books, etc., in fact, of all that is of special interest to the medical man. This exhibition is an annual event in connection with the Meetings of the British Medical Association, but never before, not even at the London Meeting, will there have been so extensive and well-arranged an "Annual Museum." The Museum Committee under the Chairmanship of Dr. Perrigo has worked indefatigably, with the result that the spacious Victoria Skating Rink situated in the immediate neighbourhood of the Windsor Hall will be filled with interesting and important exhibits shown by the leading firms in this country, the States, Great Britain and by some of the best known firms in France and Germany. This will be open throughout the Meeting from 9 a.m. until 6.30 p.m. each day. Admission will be reserved until 3 o'clock each day for members of the medical profession, after that it will be open to the general public also.

NOTICE TO EXHIBITORS.

The same facilities for transport and travelling throughout Canada will be afforded to exhibitors as are granted to members and guests of the Association. The only additional requirement is that they present a certificate from Dr. James M. Jack, (Secy. of the Museum Committee) when they apply in Montreal to obtain these privileges.

TRANSPORT OF EXHIBITS.

Nearly all the railroad companies in Canada and east of the Mississippi are granting passes permitting the free return transport of exhibits. Full information with regard to these privileges can be obtained on writing to Dr. James M. Jack, (2204 St. Catherine St., Montreal).

ANNUAL PATHOLOGICAL AND PHYSIOLOGICAL MUSEUM.

It is hoped that as many as possible will, without delay, indicate their intention of contributing specimens, (Anatomical, Physiological and Pathological), apparatus, photographs of rare or well-marked conditions of disease, teaching models, etc., to the Annual Pathological Museum. These exhibits will be collected together in the large and well-lighted Pathological Laboratory at McGill College. It is especially intended to make an extensive exhibition of photographs and microphotographs. Those prepared to contribute to this department of the Annual Museum are requested to write immediately to Dr. C. F. Martin, McGill College, giving the names and a short description of the specimens they exhibit, for insertion in the Museum Catalogue.

P R E L I M I N A R Y P R O G R A M M E.

(Subject to Alteration.)

FOR THE WEEK BEGINNING MONDAY, AUGUST 30TH.

Monday, August 30th.

Afternoon—Meeting of the Canadian Medical Association and Address of the President, Dr. V. H. Moore, Brockville, Ont.

Evening—9.00 Smoking Concert at the Masonic Hall.

Tuesday, August 31st.

Morning—9.30 Meeting of the Canadian Medical Association at the Synod Hall (to discuss the subject of Interprovincial Registration of the Medical profession in Canada).

11.00 Opening Service of the British Medical Association at the English Cathedral.

Afternoon—2.30 Opening ceremonies at the Windsor Hall and address by the President.

5.00 Afternoon tea and reception at the Art Gallery by Miss Roddick.

9.30 Reception and Conversazione at Laval University; Address by Professor Charles Richet, Official Delegate of the French Government.

Wednesday, September 1st.

Morning—9.30 to 1.00 Sectional Meetings (11 in number) in the various lecture theatres at McGill College, Presbyterian and Diocesan Colleges, etc.

Afternoon—3.00 Address in Medicine at the Windsor Hall by Dr. Wm. Osler, of Baltimore.

4.15 Excursion to Lachine by special train and down the Lachine Rapids by the steel steamer "Sovereign": Garden Party in the grounds of the Royal Victoria Hospital.

Evening—9.00 Reception at 1157 Dorchester street by Sir Donald A. Smith, G.C.M.G.

Thursday, Sept. 2nd.

Morning—Sectional Meetings.

Afternoon—1.00 Lunch upon the Mountain given to the Association and its guests by the Mayor and Corporation of Montreal.

3.00 Address in Surgery by Mitchell Banks, Esq., F.R.C.S., of Liverpool.

4.00 International Golf Match and Reception at the Montreal Golf Club at Dixie. Garden parties, Afternoon teas, &c.

4.30 Excursion round the Mountain, afternoon tea at the Kennels (Montreal Hunt Club) at Outremont.

Evening—7.45 Annual Dinner of the Association at the Windsor Hotel.

Friday, Sept. 3rd.

Morning—Sectional Meetings, McGill College.

Afternoon—3.00 Address in Public Medicine at the Windsor Hall, by Dr. Herman Biggs, of New York. Concluding business of the Meeting.

4.15 Excursion to Lachine, Lake St. Louis, and down the Lachine Rapids.

Evening—6.45 Dinner given to Lord Lister and presentation of address by the Montreal Medico-Chirurgical Society.

9.00 Presentation of Honorary Degrees at McGill University, followed by a *Conversazione* in the University Buildings and grounds.

Saturday, Sept. 4th.

Excursions to Ottawa, Lake Memphremagog, etc., etc.

CANADIAN MEDICAL ASSOCIATION.

The Canadian Medical Association will hold its Thirtieth Annual Meeting at Montreal, on Monday and Tuesday, Aug. 30th and 31st, 1897.

The following programme has been arranged :

MONDAY, August 30th, 1897.

1 p.m.—Clinical Demonstration. Montreal General Hospital.

3 p.m.—General Session. (Synod Hall, No. 75 University St., cor. Burnside)

Address by Chairman of Local Committee.

The Reception of Visitors.

Election of Members.

Notices of Motion :

(1.) That the number comprising the Nominating Committee be increased

from 10 (as formerly decided by By-law) to 15, the latter permitting of a more general representation. T. G. RODDICK, Montreal.

- (2.) That the By-law relating to the Nominating Committee be amended to read: "That the Nominating Committee be elected by the Association, on the 1st day of each annual meeting by ballot after nomination." R. W. POWELL, Ottawa.

4 p.m.—President's Address. V. H. MOORE, Brockville, Ont.

4.30 p.m.—Address by W. WATSON CHEYNE, London, Eng.

Appointing of Nominating Committee.

Appointing of other Committees.

General Business.

8 p.m.—Smoking Concert in Windsor Hall.*

TUESDAY, August 31st.

9.30 a.m.—General Session. Synod Hall.

Report of Committee on Inter-Provincial Registration.

Report of Nominating Committee.

Reports of other Committees.

General Business.

For further particulars Address F. N. G. STARR, 471 College Street, Toronto.

* It is desired that a large number will be present, to extend a fraternal welcome to visitors from abroad.

There are still a few copies of the "Transactions" of the Canadian Medical Association for 1896, on hand. It is a volume of 194 pages. A copy will be mailed to you upon the receipt of the price, \$1.00.

F. N. G. STARR, *General Secretary*.

MISSISSIPPI VALLEY MEDICAL ASSOCIATION.—Meeting at Louisville, October 5, 6, 7, 8, 1897. The Railroads will make a round-trip rate of one and a-third fare, or probably one fare. The address on Surgery will be delivered by Dr. J. B. Murphy, Chicago; the address on Medicine by Dr. John V. Shoemaker, Philadelphia. Titles of papers should be sent to Dr. H. W. Loeb, Secretary, St. Louis, Me.

NEW BOOKS, ETC., RECEIVED AND NOTED.

Text-book of Diseases of Women. By Chas. B. Penrose, M.D., Ph.D. W. B. Saunders, Philadelphia, 1897.

The Roller Bandage. By Wm. Barton Hopkins, M.D. 4th edition. J. P. Lippincott Company, Philadelphia, 1897.

American System of Practical Medicine. Edited by Alfred L. Loomis, M.D., LL.D., and Wm. Gilman Thompson, M.D. Vol. 2. Lea Bros., Philadelphia.

Notes on Malaria in connection with Meteorological Conditions at Sierra Leone. By Surg.-Major E. M. Wilson, C.M.G. H. K. Lewis, London. 1897.

Spontaneous Rupture of the Aorta exclusive of Ruptured Aneurisms. By Delano Ames, A.B., M.D., and W. Guy Townsend, M.D. Reprint from Maryland Medical Journal, July 3rd and 10th, 1897.

The Position or Posture of the Patient during Parturition with special Reference to the Walcher Position. By A. F. Currier, M.D. Reprint from the Medical News, March 7th, 1896.

Ventral Hernia resulting after Abdominal Section, and its Treatment. By Andrew F. Currier, M.D. Reprint from Annals of Gynæcology and Pediatrics, July, Vol. X., Boston.