Intestinal obstruction due to a gall-stone is rare, but in 1914 Wagner¹⁶ collected 334 cases. The patients are usually fat women over 50 years of age, females being five times more numerous than male sufferers. The onset is sudden with vomiting, and at first pain and collapse are not prominent. The intestine, though obstructed, is not strangulated, as in a hernia, and since its vascular supply is unimpaired, paralytic distension does not occur, at any rate unless and until peritonitis supervenes. As the calculus travels down the small intestine the severity of vomiting diminishes. Without a history of gall-stones, and this is often absent, a correct diagnosis is very difficult; the gall-stone

¹⁶ Wagner, A.: Deutsche Ztschr. f. Chir., Leipzig, 1914, cxxx., 353.

has very seldom been felt before operation which, however, should be undertaken soon, as few patients operated on after the fourth day survive. The patients are not good subjects for operation, and of Wagner's 334 collected cases, 161 were operated upon with 62 per cent. mortality and 173 were not operated upon with 46 per cent. mortality. It has been urged, especially in the past, that medical measures only, such as morphine and atropine, to diminish spasm and so favour the onward passage of the gall-stone, should be employed; but although at first sight Wagner's figures suggest that operation is more fatal, it must be remembered that this procedure is often adopted late when the chances are much against recovery.

THE PREVENTION OF PUERPERAL SEPSIS.*

BY

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It is a fact only too well known to all of us that the mortality from causes connected with child-bearing is still high in this country, and that recent years have seen very little if any improvement in this respect. Of all the individual causes of puerperal mortality sepsis is the most important on account of the high proportion of the total mortality-rate which is due to this cause. I shall in a few moments show you some charts on the epidiascope demonstrating these and other points. I also want to show others which call attention to the remarkable seasonal variations and occasional irregularities which occur in the mortality curve of sepsis, as these have their bearing upon the question of causation.

When I began to consider how I might best present the subject of prevention to your notice it became clear that I could not avoid saying something about causation also, for we cannot achieve success in prevention without first having clear ideas of the cause of the disease which we wish to combat. If puerperal fever were due, like the acute specific fevers generally, to a specific organism, the problem would be a relatively simple one, but unfortunately it is not so, and there are still a good many gaps in our knowledge.

A study of the mortality statistics of puerperal sepsis will serve to show how complex this matter is, and even if it does not at present throw any definite light upon the problems of causation, certain facts emerge which suggest that the liability to this particular form of infection is to some extent influenced by factors the nature of which we can only at present vaguely surmise.

* An Address delivered to the Fellowship of Medicine on May 18th, 1925.

FIG. I.—This table (from Dame Janet Campbell) shows that during the 17 years 1907–23 the total mortality-rate has been practically stationary,

FIG. I.

MATERNAL MORTALITY OF CHILDBIRTH

YEAR		NUMBER OF DEATHS PER 1000 BIRTHS
1907	DEATH OF ONE MOTHER TO 261 BIRTHS	3.83
1908	" " 280 "	3.57
1909	" " 271 "	3.70
1910	" " 281 "	3.56
1911	" " 272 "	3.67
1912	" " 265 "	3.78
1913	" " 270 "	3.71
1914	" " 253 "	3.95
1915	" " 254 "	3.94
1916	" " 259 "	3.87
1917	" " 273 "	3.66
1918	" " 282 "	3.55
1919	" " 243 "	4.12
1920	" " 243 "	4.12
1921	" " 270 "	3.70
1922	" " 263 "	3.80
1923	" " 260 "	3.81

3.83 in 1907 and 3.81 in 1923. The year 1919 to 1920 showed a marked rise, to which further reference will have to be made.

FIG. II.—Shows the variation in the total mortality during the same period in the form of a graph.

FIG. III.—This chart is an analysis of the figures for the year 1923 to show the local variations in the mortality from sepsis, as well as the total mortality. It will be noticed that as we get away from the great industrial centres such as Birmingham and Manchester to the agricultural counties, the total mortality falls to a considerable extent, while the mortality from sepsis is reduced to a strikingly low figure, about one-third of that found in the two industrial centres. The proportion of the total mortality which is due to sepsis is also shown in this table.

FIG. IV.—I am enabled to show this chart by the kindness of Dr. Stevenson, of the Registrar-

General's Department. The mortality from sepsis is here plotted out for the four quarters of the year, over a series of 13 years. The remarkable fact emerges that in England and Wales puerperal sepsis is more prevalent, or, at any rate, that it

FIG. II.

occasions a higher mortality, in the two winter quarters (4 and 1) than in the two summer quarters (2 and 3). This point is reproduced year by year with very little variation, and Dr. Stevenson tells me that the figures from certain of the American States, which together have a population equal to that of England and Wales, show an almost precisely similar seasonal variation. The Paris figures, as we shall see, also show a seasonal variation, but not so regular as in the case of England and Wales.

Another important point is brought out in Fig. IV.—viz., that there was a remarkably sharp rise in the mortality from sepsis in the years 1919 and 1920. The next two figures (Figs. V. and V. A), Dr. Stevenson believes, offer a possible explanation of this rise. In 1919 demobilised troops were returning in large numbers, and the figures, plotted out in months, show the numbers of troops demobilised each month during the year, and the remarkable outbreak of puerperal sepsis which occurred in the following year—roughly about nine months later. The two curves correspond in a remarkable manner; it will be seen that even the lesser demobilisation peak which occurred towards the end of 1919 is reproduced in the puerperal sepsis curve of the following year. The probable explanation is that large numbers of the men came home with septic urethral conditions following upon gonorrhœa, or were actually infected with gonorrhœa on their return. The secondary pyogenic organisms which follow in the track of the gonococcus and remain after its disappearance, are no doubt capable of setting up septic vaginal and cervical conditions which favour the occurrence of puerperal infection.

FIG. VI. shows that Paris experienced a great rise in mortality from puerperal sepsis at about the same time as we did in this country, and no doubt the causes were the same. It will be seen also from this figure that there is a seasonal variation in mortality similar to that in England and Wales, although it is not so regular as it is with us.

FIG. VII. is introduced to show the occurrence of what can only be called an epidemic of puerperal sepsis which occurred in the Welsh county boroughs in the year 1922, and to which Sir Ewen Maclean has recently called attention. The figure shows that, while, for the whole of Wales the mortality rate from sepsis was fairly uniform during the years 1921-23, the rate for the county boroughs rose sharply during 1922, and in the following year had not returned to the level of 1921, although a marked fall did actually occur. The figures for 1924 are not yet available. The Welsh county boroughs are all situated in the great industrial area in the south, and it is hoped that the causes of this outbreak will be the subject of further study.

The next point upon which we must be clear is that puerperal sepsis occurs in all kinds of midwifery practice, in cases attended privately by midwives, and doctors alike, in the homes of the well-to-do classes as well as those of the poor, in the country as well as in the town. Lastly, it is also to be found in the practice of our midwifery hospitals, both the large training hospitals and the recently established small municipal maternity homes.

From an examination of a series of the reports of one of our large lying-in hospitals I find that the work of the extern department—i.e., patients attended in their own homes—over a series of years covering 14,000 cases showed a mortality from puerperal sepsis of 0.75 per 1000. This, you remember, compares favourably with the rate for the whole of England and Wales, except that

FIG. III.

PUERPERAL MORTALITY IN 1923 PER 1000 BIRTHS.

BIRTHS		TOTAL DEATH-RATE	SEPSIS
758,131	ENGLAND & WALES	3.81‰	1.29‰
51,622	LONDON	2.88‰	1.37‰
19,074	BIRMINGHAM	3.40‰	1.78‰
17,048	MANCHESTER & SALFORD	4.39‰	1.46‰
20,695	LIVERPOOL	3.28‰	1.11‰
30,672	COUNTY OF LANCASHIRE	2.36‰	0.78‰
40,442	7 ENGLISH AGRICULTURAL COUNTIES	1.87‰	0.56‰
13,812	8 WELSH AGRICULTURAL COUNTIES	2.76‰	0.50‰

PROPORTION OF DEATHS DUE TO SEPSIS VARIES FROM 50% IN BIRMINGHAM TO UNDER 20% IN WELSH AGRICULTURAL COUNTIES.

in English agricultural counties where maternity hospitals are non-existent the sepsis-rate was only 0.50 per 1000.

From reports of a number of different maternity hospitals it is clear that there is also an appreciable mortality from sepsis in the cases which have been treated in the hospital from beginning to end. Many other cases of sepsis are dealt with where the patient was only sent to hospital after unsuccessful attempts to deliver had been made outside; and for these cases the hospitals clearly cannot be held responsible. I find, however, that in a series of

16,265 intern cases there were 21 deaths from sepsis in cases treated in hospital throughout. This is equivalent to a mortality of 1·20 per 1000, which compares with a mortality for the whole of England

FIG. IV.

and Wales of 1·29 per 1000. It must be recollected that these hospitals deal with a large proportion of difficult cases and that the number of operative deliveries is therefore high. But this is not the sole explanation, for in a recent paper the Master of the Rotunda Hospital, Dublin, showed that in four consecutive years 140 cases of puerperal fever originated in the practice of this hospital, the great majority of the cases being normal deliveries.

It is therefore clear that the burden of puerperal sepsis rests upon the broad shoulders of the whole profession, from the crowded hospital to the more scattered country practice, and the facts do not allow of the least recrimination as between one class of practice and another.

It is not necessary to say more than a word about the position of the midwives. A steadily increasing amount of work in England and Wales is being done by midwives, and in 1922 between 50 and 60 per cent. of all confinements were attended by them. A great deal of information is now available about the results of their work, and it must at once be said that their results appear to be quite up to the average. The figures for sepsis alone are not available, but it is known that in many districts the total mortality-rate for midwives' cases is well below the average of the towns in which they practise. There is no reason to suppose that sepsis is more prevalent in their work than in that of doctors.

BACTERIOLOGY.

I cannot entirely ignore it, and yet I have not time to say more than a few words on the bacteriology of puerperal sepsis. It is now generally agreed

that the organism chiefly responsible for severe cases is a hæmolytic streptococcus; other organisms may be present along with it, such as *Bacillus coli*, but their importance is secondary. Cases of mild infection which recover may show various other organisms than these, but we are not concerned so much with mild infections as with the severe ones from which the mortality arises. It is also generally agreed that the hæmolytic streptococcus gains access by external infection, and that instances of true endogenous infection, apart from gonorrhœa, are extremely rare.

At the same time it is established that the vagina of the pregnant woman is far from being sterile—indeed, it not infrequently harbours streptococci. Some observations were recently presented to the British Congress of Obstetrics and Gynaecology by Dr. Bigger, Professor of Bacteriology in the University of Dublin. He took swabs from the vagina of 50 women immediately after admission to hospital, most of them being in labour. His sole object was to note the presence or absence of streptococci, and in the former case, the variety present; he took no note of other bacteria which might be found. He found streptococci in varying numbers in two-thirds of the swabs examined; in only two out of 104 positive swabs were the streptococci hæmolytic, all the remainder were non-hæmolytic and therefore in his view non-pathogenic. Similar results have been obtained by other observers, and we can, I think, accept the foregoing facts as worthy of credence.

Bacteriologists have not yet finally settled the question whether non-hæmolytic streptococci can become hæmolytic from transference to a different environment; the general opinion seems to be that they cannot. Should the converse prove to be correct an entirely different significance will have to be placed upon the presence of non-hæmolytic strains in the vagina in pregnancy. The non-hæmolytic strains may, however, give rise to mild septic infection, and possibly in rare instances to a fatal result.

It comes to this, that while streptococci and other organisms may be found in the vagina during pregnancy they are non-pathogenic, and can do little if any harm. It is clear that if vaginal organisms were really pathogenic, puerperal infection would be the almost invariable result of childbirth.

PREVENTION.

We must, then, in considering prevention, accept as our basis the thesis that severe puerperal sepsis is an exogenous infection, similar to that of wound infection in general.

Wounds become infected by being allowed to come in contact with infective material; the two great sources of production of the infective organisms are infected wounds of the skin and infected mucous surfaces. The evidence is also fairly clear that the streptococci which cause erysipelas and

scarlet fever may cause uterine infection also. Is there any evidence that contact infection actually plays any considerable part in the causation of puerperal sepsis? I think there is, and I can lay it before you in a few words.

The difficulty in any given case of tracing the source of infection is well recognised, but now and then opportunities of clearly demonstrating the

that occasional cases arise in which the patient infects herself from an active focus in remote parts—such as an otitis media or a sore finger.

The subject of contact infection has been investigated from quite a different angle by Dr. George Geddes, of Heywood, Lancashire. For some years this observer has conducted a laborious and painstaking inquiry into the incidence of puerperal

FIG. V.

MONTHLY MATERNAL MORTALITY FROM PUERPERAL SEPSIS, 1919-1920
COMPARISON WITH DEMOBILISATION OF SAME DATE.

The interrupted line indicates demobilisation.

FIG. V. A.

MONTHLY MATERNAL MORTALITY FROM PUERPERAL SEPSIS 1919-1920
COMPARISON WITH DEMOBILISATION OF 9 MONTHS EARLIER.

source do occur. Occasionally a succession of cases will occur in a maternity hospital, amounting to a small epidemic, and clearly traceable to contact with an infected case. In one of the reports on puerperal sepsis recently presented to the British Congress of Obstetrics and Gynaecology mention is made of a series of six hospital cases, all of which were infected from a patient admitted in labour with an already developed infection, proved later to be due to a hæmolytic streptococcus. Dame Janet Campbell, of the Ministry of Health, has kindly furnished me with particulars of three outbreaks of puerperal fever in municipal maternity homes all due to contact infection.

One was a series of mild cases which were traced to a nurse suffering from atrophic rhinitis, who had nursed all the infected cases after delivery, but had not assisted at the deliveries. A hæmolytic streptococcus was grown from her nasal mucous membrane.

In another instance a series of ten cases occurred which were traced to a patient admitted with a developed infection. In another instance a series of five cases occurred within eight days; the nursing staff of the home had suffered from epidemic sore throat, which was stated to have been streptococcal in nature, and the epidemic began with the infection of one of the cases from the throat organisms of a nurse, the other cases arising from contact with the first. Further, it is quite clear

sepsis among the industrial population of Lancashire. His first essay on the subject, for which he has received all too little credit, was published in 1912, and last year a further series of observations was awarded the Nichols prize of the Royal Society of Medicine for the best contribution to the subject of puerperal sepsis. Dr. Geddes shows from elaborate statistical tables that the incidence of puerperal sepsis is highest in districts where industrial accidents are most frequent, and the converse. A large proportion of these accidents are of a minor character resulting in the occurrence of slowly healing infected wounds of the hands and feet. The doctors in these districts are accordingly frequently dressing infected wounds. The homes of the injured men furthermore become, so to speak, charged with the organisms of suppuration. What is more likely, says Dr. Geddes, than a high rate of puerperal sepsis under such conditions? Dr. Geddes's more recent observations are not yet published, but if they confirm, as he believes they do, his first contention, he will have made a most important contribution to our knowledge of the way in which lying-in women become infected.

It seems to me that these facts about contact infection, scanty as they admittedly are, suggest that we may have been too often looking far afield for sources of infection when in reality they lay close to hand. It is clear that any active focus

of infection in the patient herself, in any of her attendants, or in another patient with whom she comes in indirect contact through doctor or nurse, is the first thing for which we should look in searching for the cause of infection in any given case.

It follows, further, that the first principle of prevention is to avoid all such contacts with the most scrupulous care. It appears from the facts I have laid before you that the isolation of infected cases in maternity hospitals and homes is not carried out as thoroughly as the circumstances require. An infected case being a source of the gravest danger to other parturient and lying-in women, ordinary methods of antiseptics do not provide a sufficient safeguard, and quite exceptional precautions are probably called for to avoid transference of the infection from one case to another. The same must be said of our own private work; to pass from an infected to a non-infected case without the most thorough precautionary prepara-

FIG. VI.

MORTALITY FROM PUERPERAL SEPSIS IN PARIS, 1916-1920
IN EACH QUARTER, OF THESE YEARS PER MILLION LIVING BIRTHS

tion is to incur a risk which on the part of either doctor, midwife, or nurse is a culpable one.

The importance of venereal discharges as a cause of infection is universally recognised, but as regards extra-genital sources of infection in the patient herself we have perhaps all of us been too little concerned. In suppurative conditions of the upper respiratory passages, or the ear, the direct transference of pathogenic bacteria to the vulva by means of the finger of the patient herself is only too easy,

unless she has been warned of the possibility of this occurrence and is careful to take the simple precautions which are necessary to avoid it. It may very well be the case that pathogenic organisms implanted in this way upon the vulva during or before the onset of labour afford an explanation of

FIG. VII.

WELSH STATISTICS

those puzzling cases in which sepsis occurs in women who were delivered naturally, and who were not ever examined vaginally during labour. These organisms, being kept alive by a favourable environment, may get their chance to attack when the appearance of the lochia provides them with an abundant and suitable medium for growth.

When speaking of possible methods of infection before labour reference must be made to the question of coitus. The possibility that coitus during the terminal weeks of pregnancy may be a source of puerperal infection has received a certain amount of attention during recent years, and such facts as are available I can lay before you in a few words. The point has no relation to the question of gonorrhoea; it is coitus by healthy persons that we are considering.

In 1923 a French writer (Broucha) made the statement that 50 per cent. of men are carriers of streptococci beneath the prepuce. Even if we do not accept this statement in its entirety, it must be admitted that there is nothing surprising in the view that streptococci, and no doubt many other organisms, may be found in this position. The subject has been approached by two British observers in a different manner—namely, by obtaining a careful list of the date of last coitus before labour in a series of hospital patients. Lockhart took the history of 61 cases, 10 of which became infected, but not all seriously. The average interval between the date of last coitus

and confinement in the cases which became infected was 32·5 days; in those which did not become infected it was 60·1 days. Prof. Blair Bell in a very careful analysis of the history of 54 cases obtained the following results:—

In 20 cases coitus occurred within seven days;	
11 became infected	55·50 %
In 12 cases coitus occurred within 7–21 days;	
5 became infected	41·5 %
In 22 cases coitus had not occurred for 28 days or more; 5 became infected	22·7 %

These two observers, approaching the subject from slightly different angles, have arrived at results which appear to be confirmatory of one another. The observations must, of course, be repeated and extended, but my own feeling is that we know enough to justify us in doing all we can to discountenance coitus during the last four weeks of pregnancy, and in explaining to our patients the reasons which lead us to give this advice. It is at least a reasonable hypothesis that many of the bacteria which have been found in the vagina of pregnant women have been introduced during coitus. It is well recognised that our duty as doctors is to avoid vaginal examination during the last weeks of pregnancy to the utmost of our power, and when it becomes unavoidable to carry it out as carefully as we should do were the patient in labour. What is the good of our taking these precautions if coitus is allowed to continue?

The points we have been so far considering are concerned mainly with principles, and we have seen the fundamental importance of such points as, first, the prevention of contact with known sources of infection, especially cases of puerperal sepsis and suppurating wounds or mucous surfaces; second, the avoidance of introduction of bacteria of any kind into the vagina during the last weeks of pregnancy.

I have so far said nothing about the conduct of labour and the puerperium and I do not propose to do so. I have every reason to believe that my present audience does not look for instruction in these details. In my opinion safety does not lie in the practice of an elaborate aseptic technique, but in the conscientious application of the simple principles of surgical cleanliness with which we are all very well acquainted. I must, however, add that when any form of operative procedure is employed our technique should be as careful and complete as if we were about to perform an ordinary surgical operation.

It is impossible to leave the question of the conduct of labour without saying a word or two about the individual known as the “handy woman,” whom I believe to be a source of infection of the most blatant character. The mothers employ her because she does not ask much remuneration, and is willing to do the house work and cook the husband’s dinner while the wife is in bed. As a domestic

help she might have a sphere of usefulness, but she is in all cases absolutely untrained, and generally speaking, does not know the mere rudiments of what is meant by surgical cleanliness. Still worse, she may be in some instances totally opposed both by precept and example to personal cleanliness also. Yet she is allowed to do the work of an obstetric nurse during the lying-in, and to do what is required for both patient and baby just as if she were a properly trained nurse. In point of fact she is the lineal descendant of the Sairey Gamps of the days of Charles Dickens.

The handy woman can be prevented from acting as a midwife—i.e., from undertaking to attend confinement by herself if she takes payment for it. But she cannot under our present law be prevented from acting as a nurse under the supervision of a doctor. The responsibility for her existence then depends very largely upon doctors, for if they would refuse to work with her, she could be suppressed without difficulty. Unfortunately, there are many doctors who not only raise no objection to these women acting as nurses in cases for which they have been themselves engaged, and there are few who even go so far as to allow them to deliver women in the absence of the doctor who is nominally in charge of the case. This is known as “covering” and is an indictable offence if it can be proved. I am afraid it cannot be denied that the profession must bear a good deal of the responsibility for the continued existence of this survival of a bad age. It is not only the practising doctors who are to blame. The medical officer of health of a large urban centre has recently proposed to certify the handy women in his area. I regard this proposal as a deplorable one, for, although it would not make them midwives, it would put the seal of official approval on their work, and the public would be justified in concluding that they could safely employ them instead of trained nurses.

In my opinion one of the most urgently needed preventive measures at the moment is the complete and final suppression of the obstetric handy woman. Perhaps the new Minister of Health will kindly see to it.

The foregoing considerations show that there are three lines of defence against puerperal infection. The first lies in the efficient antenatal care and instruction of the expectant mother; the sources from which infection in childbirth are most to be feared should be explained to her. The second line consists in guarding her from all possible sources of infection during and after labour. The third line of defence is the proper management of infection when it does arise. Time will only permit of my dealing with the third line of defence very briefly. There can, I think, be no doubt that if puerperal infection were promptly recognised and efficiently handled from the onset the proportion of severe cases would be reduced, and the case mortality would fall. A still more important result would follow—viz., there would be fewer contacts and less risk of other women becoming infected.

It is most unlikely that puerperal infection will ever be completely stamped out, any more than other types of wound infection, and adequate provision for dealing with it as it arises is a preventive measure that demands our most serious attention. Nothing could well be more unsatisfactory than the present state of affairs. Our system of notification of puerperal fever has completely broken down; in some districts the number of certified deaths actually exceeds the number of cases notified. In the Manchester district, Prof. Fothergill has stated his belief that not more than 4 or 5 per cent. of cases are certified. The causes of this breakdown were fully discussed at a recent joint meeting of the Obstetric Section of this Society with the medical officers of health and the epidemiologists, and certain recommendations have in consequence been brought to the notice of the Ministry of Health. One of the most important recommendations was that notification should be made in future not of "puerperal fever" but of "continued puerperal pyrexia," a term which involves no exact diagnosis, and could be employed after 48 hours delay. There for the moment the question rests, but the time for action in this matter is really long overdue. Until we can get cases notified early it is obvious that they cannot be dealt with early; until they are properly dealt with they must be regarded as centres from which infection may be carried to other lying-in women, just as an unisolated child suffering from scarlet fever is a potential centre of infection for all the other children who come into even indirect contact with it.

There are several reasons for the failure of notification, but I have no time to refer to more than one of them. Under present conditions doctors find the greatest difficulty in obtaining admission to hospital for their cases of puerperal infection; even if they notify them this difficulty is in no way diminished, and consequently one of the great inducements to notify is wanting. If a case of diphtheria is notified a doctor knows that the patient can be transferred to hospital without delay. If the same held good for puerperal fever, cases would probably be notified as soon as the practitioner knew or even suspected that they were infectious.

The bacteriological diagnosis of puerperal infection is unfortunately a much more complicated matter than the detection of the K.L. bacillus in a throat swab, the taking of which is quite a simple procedure. The lochia for examination must be carefully taken from the uterine cavity with extreme precautions against vaginal contamination *en route*, and it is clear that it will be necessary to afford skilled assistance to doctors in this matter. Dr. Fairbairn has recently suggested that a good way to deal with this difficulty would be to establish municipal laboratory centres which would undertake the necessary investigation in cases reported as suspect, or as suffering from "continued puerperal pyrexia." If general practi-

tioners knew that machinery of this kind could be set going by notification of puerperal complications they would no doubt gladly avail themselves of this assistance.

Notification is, however, only a means to an end; of itself it can accomplish nothing, and therefore schemes of notification are of no value unless they are accompanied by the provision of ample means of isolating and treating the cases notified. It must be clear, however, that we are using the word isolation in a somewhat restricted sense. It implies that the patient must be completely withdrawn from contact with pregnant, parturient, and lying-in women, or with the subjects of surgical operation, because the discharges from a case of puerperal infection are infective to these persons in a high degree although others run little risk.

Imagine the consequences of leaving a case of infection for a few days in the care of a handy woman. She would inevitably succeed in most thoroughly infecting herself and all her clothing. She is under no compulsion to disinfect anything, for she is responsible to no one, and she would without doubt carry infection to the next case, or it may be to more than one, for which she was engaged.

The difficulty of precise diagnosis, already referred to, has this effect—that observation wards are required to which cases of puerperal pyrexia can be sent at the onset of the illness, at a stage when it would be impracticable to notify the disease as "puerperal fever" or "puerperal septicæmia." Many would recover in a few days, the remainder would pass into one or other of the various forms of blood infection and would be certified by the institution concerned. The course of the illness would then be followed by skilled laboratory and clinical observers, and opportunities of surgical interference would be recognised promptly and dealt with at once. And here may I say that there is reason to believe that the surgery of puerperal septicæmia is capable of considerable development under more favourable conditions than exist at present. Beyond ensuring that the uterus contains no retained tissues and is well drained, this organ is better left alone; many apparently mild cases of infection have undergone immediate transformation into an acute form after the use of the curette, after digital examination of the uterine cavity, or even after an intra-uterine douche. The results of removal of the infected puerperal uterus were so discouraging that the procedure has rightly been abandoned. Certain of the direct extensions of infection from the uterus are, however, capable of being dealt with by surgical means, such as collections of pus in the tubes, the pouch of Douglas, or the cellular tissue; further, pelvic veins affected by spreading thrombophlebitis can be excised, while pelvic or general peritonitis, if recognised early, can be dealt with by operative measures. In regard to the latter complication surgeons now report much better results from laparotomy than we believed were possible

20 years ago. According to Mr. Jeans, of Liverpool, the surgical mortality of general peritonitis has fallen from 80 per cent. to 20 per cent. as the result of early operation, suprapubic drainage, Fowler's position, and the administration of salines.

The provision of such observation wards would also make it practicable to carry out a systematic study of puerperal infection: its clinical features from start to finish, its bacteriology, its morbid anatomy, the different lines upon which extension from the uterus may occur. There are also many other points which up to now have not been elucidated because the necessary material has not been available on a sufficiently large scale. Puerperal infection has never, in this country, perhaps not in any country, been subjected to that systematic investigation which will certainly have to be undertaken before its complexities are properly unravelled.

I said a little while ago that the third line of defence against puerperal infection was to be found in the prompt isolation and in the efficient treatment of all cases of infection as and when they arise. I should like to try and put the somewhat discursive remarks I have since made upon this part of the subject into the form of a series of propositions which I believe will meet with general agreement:—

1. Cases of mild infection are fairly frequent; this is shown by the fact that the puerperal morbidity-rate in lying-in hospitals ranges from 50 to 80 per 1000, which compares with a mortality from sepsis of about 1.3 per 1000. The great bulk of cases included in morbidity statistics are infections, but not all.

2. Cases which begin as apparently mild infections may spontaneously, or by unsuitable management, become transformed into severe blood infections.

3. The complete diagnosis of puerperal infection requires the assistance of laboratory investigation and cannot be made by bedside observation alone.

4. Cases of puerperal infection should at once be placed in complete obstetric isolation—i.e., all contact, direct or indirect, with pregnant, parturient, or lying-in women should be avoided. No single point is of greater value as a preventive measure than this.

5. Such cases when isolated require, besides skilled nursing, proper food, and ventilation, the constant supervision of a medical officer with sufficient gynaecological experience to recognise and deal with abdominal and pelvic foci of infection when they appear.

6. Isolation is impracticable without an adequate supply of beds available for puerperal complication; these should be provided in hospitals properly staffed and equipped for laboratory investigation and surgical work.

7. In order that cases of puerperal infection may be brought under observation in the early stages radical change in the present system of notification is essential.

Reviews

THE TREATMENT OF INTERSTITIAL KERATITIS.

By R. LINDSAY REA, M.D., F.R.C.S., Ophthalmic Surgeon to West End Hospital for Nervous Diseases; Assistant Surgeon to Western Ophthalmic Hospital, &c. London: H. K. Lewis and Co., Ltd. Price 2s. 6d.

Mr. Lindsay Rea introduces his little book as a "preliminary" report. He began the special study of the treatment of this disease to establish in his own mind the most satisfactory method of treatment, and from personal observation of 91 cases in the last five years he has come to very definite conclusions.

This attractive little work—only 20 pages of text—has considerably more than an ophthalmic interest. There are some excellent generalisations upon hereditary syphilis with a timely reminder that the character of the lesions as seen at the present day has undergone considerable change from the earlier descriptions. Some excellent plates are appended illustrating the facies of a congenital syphilis, a really striking example of Hutchinsonian and peg teeth, and coloured reproductions of the corneal lesions.

We confess to having read this little work with considerable pleasure and profit.

MODERN TECHNIQUE IN TREATMENT.

Vol. I. London: THE LANCET Office, 1, Bedford-street, W.C. Price 10s. 6d. net.

DURING the past two and a half years, THE LANCET has published weekly a signed article upon modern methods in treatment by selected authorities who have written at special invitation. A wise decision to collect these into a convenient form of reference has resulted in the present volume, which comprises the first 76 articles in the order of their original appearance. Vol. II. is promised for publication early in 1926, and doubtless succeeding volumes will be issued at convenient intervals. Recommendation of such a work is superfluous. No member of the profession can have failed to observe some at any rate of the individual articles and to have been struck by their uniform excellence. Each article gives in a compact but eminently readable form a detailed account of what a recognised authority has found to be productive of the best results, together with such introductory anatomical, pathological, or clinical details as are desirable for the better understanding of the treatment. The value of the articles is greatly enhanced by the addition of an exhaustive index, the whole therefore comprising the first volume of what will eventually become an unequalled system of modern treatment.

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