THE GERM-CONTENT OF THE UTERUS AND VAGINA DURING THE NORMAL PUERPERIUM.

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by

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The Study of the bacteriology of the genital passages may be said to have begun in 1887, with the publication of Gonner's article, in which he came to the conclusion that auto-infection was impossible and that puerperal septic troubles must be attributed to imperfect asepsis on the part of the lying-in woman's attendant, medical or otherwise.

Since then obstetricians have been divided into two camps, the one partly upholding the view just mentioned, the other declaring that auto-infection is possible, and that in conducting a labour one must be antiseptic as distinguished from aseptic. Very numerous and in many cases elaborate investigations have been undertaken with a view to settling this question, and although perhaps the aseptic view of the case has found more numerous supporters, it is by no means yet free from criticism.

The question is obviously one of extreme interest both from a practical and theoretical point of view, and this, combined with the still unsettled state of the discussion must be my excuse for adding one more to the already large number of investigations, which have been made in this connection.

As already indicated I take Gönner[1] as the real originator of the discussion.

He examined the secretion from the cervix and vagina of 31 healthy pregnant women. Though finding immense numbers of bacilli and cocci both by microscopic and cultural methods, these proved to be non-pathogenic, hence his conclusion as to the impossibility of auto-infection. This was in 1887. In 1889 he repeated his observations.[2] On this occasion he examined 100 women, 57 during pregnancy, 43 just at the beginning of labour and in 5 found Streptococci, which however proved to be non-pathogenic for white mice. He also found in many cases Staphylococci, but apparently paid no further attention to them, his purpose simply being to answer the question poopounded in the title of his article,viz:"Are there Streptococci in the Vaginal secretion of healthy women, pregnant and in labour? " He makes no remarks about treatment prophylactic or otherwise on this accasion.

Some time after the publication of Gonner's first article, Döderlein[3] came forward with a series of observations on which he founded and exactly contrary theory that auto-infection was possible, and that its possibility should be combatted by strict disinfection of the vagina during labour.

He obtained secretion both from the cavity of the uterus and from the vagina, and while the uterinal secretions were uniformly sterile,the vaginal lochia contained various species of organisms, and not infrequently pyogenic Streptococci and Staphylococci, even in cases which had not been vaginally

examined. With these results, and, considering as he did that micro-organisms could enter into the uterine cavity from the vagina spontaneously, i.e. without operative or other interference during labour, one can easily understand his attitude as regards prophylactic douching.

In 1892 Döderlein (4) again returned to the subject. On this occasion as a result of the examination of the vaginal lochia of 195 pregnant women, he divided the secretions into two types, which he called "normal" and "pathological" respectively.

"Normal" secretion is a thick, crumbly, dry material with an acid reaction and showing microscopically epithelial cells, a large number of long tolerably thick bacilli and a few yeast cells.

"Pathological" secretion is more fluid and purulent in appearance, less acid or sometimes neutral or alkaline and microscopically shows many leucocytes as well as epithelial cells and a great variety of bacteria, especially cocci and short bacilli.

On cultivation the "normal" secretion showed only occasional yeast colonies and large bacilli: in the "pathological" there grew various organisms, including pyogenic bacteria, among which were Streptococci in 10% of the cases.

He concluded (1) that auto-infection was impossible in "normal" cases, possible in "pathological" cases, (2) that vaginal examination was safe in "normal", dangerous in "pathological" cases, unless there had been thorough preliminary disinfection of the vagina.

In 1895, in discussing the subject in a further article (5) he had so far been converted that he advocated restricting the antiseptic douching to cases where operative interference was necessary.

In an article contributed along with Wintermitz (6) in 1900, he repeats his conclusion that the normal puerperal uterine cavity is sterile, but offers no remarks on the question of the therapeutics of labour.

Winter(7)mitz in 1888 found the normal uterine cavity uniformly germ-free. In 20 cases, 10 of which were pregnant, he was able to demonstrate in the secretion from the cervix and vagina 27 varieties of bacteria, including Streptococci, and all varieties of Staphylococci.

He accordingly declared for the doctrine of auto-infection and advocated preliminary vaginal douching.

In the same year von Ott (8) from an examination of the lochia of 9 puerperal women concluded that not only the uterus but the upper part of the vagina was germ-free in normal cases. Once he found a yeast fungus in a specimen from the vagina, but this he put down as a contamination.

Perhaps his uniformly negative results may have been in part due to the very thorough sterilization of the parts in proximity to the region examined, since the free use of antiseptics, viz: corrosive sublimate, alcohol and ether which was carried out in cleansing the cervical canal would be apt to interfere with growth of organisms from the specimens obtained.

Contemporaneously with these observers, Czerniewsky (9) came forward with another series of almost negative results from the examination of the uterine lochia in fever-free puerperal women. Of 57 cases, 56 gave negative results, one showed a streptococcus, pathogenic for rabbits. Here again the method of obtaining the secretion seems open to the same fallacy as was mentioned in von Ott's case, from a too free use of antiseptics.

These two observers make no remarks on the question of douching in connection with labour.

In 1890 Thomen (10) examined 7 pregnant women and found neither Staphylococci nor Streptococci in the cervix and vagina. There were numerous other micro-organisms of no pathological importance.

Among 13 cases examined with 5 days of labour, he found several with Streptococci either in the uterus or vagina or both. He also noted that micro-organisms were more numerous in the neighbourhood of the introitus than in the upper part of the vagina, and that the number of micro-organisms in the vagina was less immediately after labour than 24 hours later.

In the same year as Thomen, 1890, Steffeck (11) published his observations on the vaginal secretions of 29 pregnant women who had not been vaginally examined.

He used a Simon's Speculum and inoculated Slopes and plates of agar. He also injected dilute solutions of the vaginal secretion subcutaneously into rabbits. In 41% of the cases he produced subcutaneous abscesses and from these got Staphylococcus

albus in 9 cases, aureus in 3 and Streptococcus pyogenes in 1. The remaining 17 cases were negative.

His conclusion, therefore, was that the micro-organisms occurring the vagina of healthy women, who have not been vaginally examined, viz: the Staphylococcus albus, the Staphylococcus aureus, and the Streptococcus are pathogenic.

Hence he is a strong believer in the doctrine of auto-infection.

Two years later Burguburn (12) advocated the same view. He examined the vaginal secretion of 12 pregnant women, who had neither been examined vaginally, nor douched, obtaining his specimens with a pipette attached to an aspirater and he used Agar and Gelatine plates for cultures.

In 3 cases he found Staphylococci, in 1 Streptococci. In morphological and cultural appearances they resembled quite definitely the pyogenic cocci, but the Streptococci were harmless to animals and the virulence of the Staphylococci was also doubtful.

He nevertheless concluded that pyogenic types of bacteria, though with diminished virulence, frequently occur in the vagina of pregnant women.

The same view was upheld by Maslowsky (13). He after thorough disinfection of the external genitals, used a speculum to make the vagina accessible and took secretion with a sterile piece of cotton wool.

From inoculations on agar and into animals, he found in 8 cases

Staphylococcus albus, in 3 cases Staphylococcus citreus and at the same time Streptococcus pyogenes.

Next year, 1893, Witte, (14) adopting Döderleins classification of "normal" and "pathological" secretions, examined 53 women, of whom 9 were pregnant. He obtained the secretion by introducing a sterile porcelain speculum into the vagina, gathering the material from the anterior rim of the speculum, and inoculating part of it on culture media, while the rest was used for cover-glass specimens.

In the cases with "normal" secretion he found no Pathogenic microbes, while in "pathological" cases there were 15 times Staphylococci, 6 times Streptococci and 6 times gonococci.

In 2 cases the Staphylococci were pathogenic for white mice, the Streptococci on the contrary were not.

Another advocate of this view was found in 1893, in Whitridge Williams, (23) who published the results of 15 cases, which in a general way confirmed Döderleins conclusions.

Later, however, in 1898 the same observer, struck by Kronigs results and remarks on the imperfections in technique of most previous investigators, repeated his observations on 92 pregnant women with results which caused him to entirely change his views on the subject and to become a firm believer in the aseptic view of the question.

In his former observations he used a vaginal speculum, to which he attributes his positive results. In the later series he used a Menge's tube, a small double metal tube, the outer

part of which has an opening, which the inner tube can be made at will to close. This he introduced into the vagina, the lips of the vulva being held well apart with the fingers, and contact with the labia or margins of the hymen being in this easily avoided.

To prove the truth of his assertions he undertook the examination of 25 pregnant women as follows:

(1) With a platinum needle some of the secretions from the margins of the hymen and inner surface of the labia minora was obtained.

(2) Some vaginal secretion was removed with a Menge's tube as mentioned above.

(3) Vaginal secretion was obtained with the aid of a sterilized glass speculum from parts of the wall which had apparently not been in contact with the speculum.

In 4 of the 25 cases the same organism was found in all the three secretions. In the remaining 21 cases, staphylococci (either st.Albus or st.epidermidis albus) were found in the vulval secretion in 15 cases, in specular secretion in 10 cases, in the tubal secretion they were entirely absent.

Colon bacilli were demonstrated in 4 vulval, 2 specular and no tubal secretions; i.e.altogether pyogenic organisms in 19 vulval, 12 specular and no tubal secretions.

Yeast colonies in 2 vulval, 3 specular and 3 tubar specimens. Adding together this gives vulval and specular secretions either sterile or only containing yeast in 2 cases and in 8 cases respectively, while tubal secretion was sterile or only contained only yeast in 18.

He therefore considers that the practical results of this series are:

(1) To reconcile various results.

(2) To confirm the previous work of Krönig.

(3) Auto-infection is impossible, hence prophylactic douching is useless and harmful.

(4) To demonstrate the danger of vaginal examinations.

(5) Abdominal examination must largely substitute vaginal examinations.

Another contribution to the liturature on this subject appeared in 1893, under the name of von Franqué.(15) In 10 normal cases he found the uterus germ-free 8 times, in 1 case containing a definite Streptococcus, and also a bacillus, and in another case a possible streptococcus.

This observer, like von Ott and Czerniewsky took the most elaborate antiseptic precautions and possibly thereby to some extent nullifies his results.

Also in 1893 was published Stroganoff's paper.(16) He obtained his specimens with a speculum and inoculated on Gelatine-agar and Glycerin-agar.

In 11 pregnant women he found the secretion sterile in 9 cases, in the others colonies of bacteria grew, which he did not analyse further. He attributed the failure of organisms to grow to the bactericidal qualities of the secretions, and undertook a series of experiments on the influence of the secretions on the staphylococcus albus. He inoculated a pure culture of that organism with secretion obtained under aseptic

conditions, and found that the longer the culture remained mixed with the secretion and exposed to its action, the smaller was the number of colonies growing on his culture media, the reduction within 6 hours being 10 or even hundred-fold.

Next year Burckhardt (17) examined 116 pregnant women as regards the " normal" or "pathological" condition of their vaginal secretion.

He found 59% "normal", 27% "pathological" and 12% doubtful. His conclusion, from a study of the morbidity of these cases during the puerperium, was that the difference between "normal" and "pathyological" secretion is very pronounced and that the danger of illness during the puerperism is distinctly greater in the latter than in the former.

Early in the same year Krönig (18) published the results of an investigation into the vaginal secretion of 100 pregnant women.

His conclusion was that in pregnant women, who have not been vaginally examined, the vaginal secretion, be it "normal", pathological" or strongly"pathological" contains, except yeast and gonocci, no aerobic organisms, which grow on ordinary media at body temperature and consequently no pathogenic micro-organisms.

The vagina of every pregnant woman, he says, who has not been examined is aseptic.

Some months later in the same year he investigated the anti-bacterial action of the vaginal secretion of pregnant

women. He found that Bac-pyocyaneus, Staph.pyogenes albus and Streptococci were destroyed after their introduction into the vagina, all within 24 hours, the last within 6 hours. He concluded therefore that antiseptic vaginal douches are harmful by weakening the normal antiseptic power of the secretion.

In 1897 the same writer returned to the subject in that important work, Menge and Krönig's " Bakteriologie des Weiblichen Genitalkanales". (19) He examined the vaginal secretion of 167 pregnant women and found130 i.e.77.8% with no Saprophytes which would grow on slightly alkaline agar. Excluding the oidicum albicans 152 i.e, 92.8% were sterile when incubated on agar plates. A yeast fungus was also found in 2 cases. The oidicum albicans was cultivated from 22 cases equally often in "normal" and "pathological" cases.

In a series of 63 fever-free puerperal cases, he found the uterus germ-free in 50 cases; 3 times streptococci grew; 4 times gonococci, and 6 times different germs among which were some anaerobes. In these last 13 cases the lochia were, in some only slightly increased but normal in appearance, in some purulent amd smelling badly.

From these cases he decides that the uterus is normally grem-free. He further asserts that every case with germs in the uterus has in consequence either general disturbance or local inflammation, and that the normal endometrium of the puerperal uterus has strong bactericidal powers. In the chapter on auto-infection which closes the discussion in his book, he concludes that:

(1) In puerperal Septicaemia, infection with streptococcus pyogenes, Staphylococcus pyogenes aureus, or bacillus colicommunis is never the result of an autogenetic infection with endogenous bacteria of the vagina.

(2) Infection with anaerobic organisms probably does not occur through the endogenous saprophytes of the vagina since at least one kind of pathogenic anaerobe has been proved to be incapable of living saprophytically in the vaginal secretion of pregnant women.

As regards gonococci, of 50 puerperal women showing these organisms, 11 had symptoms of fever, but as a rule much less acute than the ordinary puerperal septicaemias due to streptococci.

(20)

The year 1895 saw Walthard in the field with the result of an investigation into the vaginal secretion of 100 pregant women, who had not been recently subjected to vaginal examination.

He used a sterilized glass speculum to make the secretion available, and took the specimen for examination from a place which the edge of the speculum had not touched.

Part he inoculated on agar plates, part in bouillon with 1% glucose.

He concluded that the vaginal secretion of pregnant women who have not been examined contains quite frequently micro-organisms such as Streptococci, Staphylococci, Gonococci and Bacterium coli, which can produce puerperal fever.

A year later Vahle (21) examined the vaginal secretion of 30 pregnant women. He obtained his specimens by introducing a sterilized Simon's Speculum and taking material from a part of the wall, which which the speculum had not been in contact.

Among other organisms he found Streptococci in 10% and Staphylococci in 33% of his cases..

In the same year in which Williams published his second paper, 1898, Kottmann (22) gave his views on the subject from an examination of the vaginal secretion of 54 pregnant women. He employed a peculiar arrangements of two tubes, one within the other. The inner tube 25 c.m. long and 11 m.m. in diameter had at its end a depression blown in so that it could be easily broken by a wire pushed down the inside and the secretion then collected. This tube fitted the much shorter outer tube tightly. the apparatus was introduced with the labia held apart by an assistant, the inner tube being protected by the outer one from contact with the vaginal walls and when the outer tube had been introduced some distance into the vagina, the inner was pushed forward, the glass was broken, and the secretion thus obtained.

Kottmann found Staphylococci in 70%, Streptococci in 13% and bac.coli in 11%. He was thus an auto-infectionist.

About the same time Burckhardt (25) concluded that at the 11th. and 12th days after the normal puerperium the uterus is not always germ-free, and that the presence in it of germs at that time is of no pathological significance. He had 24 positive results out of 38 cases examined. He attributes the slight

rise of temperature which often occurs after a patient has sat up or been out of bed for the first time to retention of the lochia and absorption of thier products, consequent on the sudden acute flexion of the uterus owing to the pressure of the abdominal wall.

He declares further that the cavity of the uterus is germ-free at the beginning of the puerperium, so that micro-organisms must find their way upwards from the vagina into the cavity of the uterus.

In the Centralblatt fur Gynak for 1899 is an abstract of a contribution by a French obstretrician Hallé.(26)

In the normal vulva, vagina and cervix uteri Hallé found numerous aerobes and anaerobes including a definite Streptococcus, non-pathogenic to animals.

He also investigated the secretions in cases of Bartholinitis, vulvo-vaginitis in young girls, retention of placenta, puerperal septic parametritis, and a septic ovarian cyst and found in a majority of cases gonococci and Streptococci. But his total of cases is too small for any definite conclusions.

In the same year there appeared a number of other articles. Stahler and Winckler (27) in their report begin by reviewing the work of previous writers and point out that most at least of the earlier investigations took no account of anaerobes. They then detail their methods of culture, which include media for both anaerobes and aerobes, as well as, where gonococci were suspected, those suitable for their growth.

In actually obtaining the specimens their methods involved the use of a speculum which was introduced directly into the uterus, a procedure which is obviously open to criticism. Otherwise their methods were aseptic rather than antiseptic, except that they kept their instruments, after boiling, in 96% alcohol.

They found in the cultures moulds sarcinae and a large motile coccus which stained by Gram and was non-pathogenic for rabbits. These they consider to be contaminations from the air of the room.

Apart from these, in 55 cases, examined for both aerobes and anaerobes they found 35 germ-free as to their uterine lochia and they sum up as follows:

(1) In the great majority of cases with a fever-free puerperium the uterus is germ-free; but it is possible for living saprophytic organisms to be found there under normal conditions, without their products having any deleterious effects.

(2) It is possible for certain germs, for the most part of slight virulence, to cause slight inflammation of the endometrium, without raising the temperature above 38 C.

(3) In about a third of all the cases in which the patient had a maximum temperature of 38 C. the uterine cavity was germ-containing, at least as regards anaerobes,.

Next year(1900), the same observers (28) published a series of observations on the vaginal secretion of pregnant women who previously had neither been bathed nor vaginally examined.

They took their specimens partly by aspiration into ordinary glass tubes, partly by Menge's tubes. The vagina was displayed by two retractors, which were introduced laterally to a depth of 5 c.m.

Of these examined 23 were "pathological" in Doderlein's sense, 17 "normal".

The conclusion come to was that in "pathological" vaginal secretion are found frequently facultative anaerobic streptococci, which are not a special sort of Streptococci but are pyogenic streptococci in more or less diminished virulence.

(30)
About the same time Bensis examined the vaginal secretion of 15 pregnant women both from the introitus and from the fundus of the vagina. In obtaining the secretion he employed in some cases a Menge's tube, in others a sterilized glass speculum, and though his results are similar by both methods, he considers that Menge's apparatus is distinctly preferable, and he ascribes to the use of the speculum the finding now and then of staphylococcus albus in secretion from the fundus of the vagina. The media used were suitable for both aerobic and anaerobic growths.

From the entrance to the vagina Bensis obtained in one case Staph.epidermidis albus and bacterum coli. These showed practically no pathogenicity. Staphylococcus pyogenes aureus, and streptococcus pyogenes were not found.

Quite otherwise were the results from the fundus of the vagina. Coverglass preparations often showed only one kind of bacillus. Yet when the cultures were examined great changes had

occurred in the organisms. Of Cocci, the Staph. epidermidis albus occurred twice, and was probably a contamination. Besides this two sorts of sarcinae and two fungi were found growing on alkaline media. An anaerobe which grew under special conditions anaerobically was noted. None of these organisms were pathogenic for animals.

Still in 1900 Franz (29) had set forth the views that slight fever in the puerperium is in most cases due to saprophytes obtaining entrance to the uterus and that this combined with some interference with the escape of the lochia gives rise to the disturbance. In all of 10 cases of normal puerperal women examined in the same way he found the uterus germ-containing.

His methods are severly critized by Doderlein- Winternitz (6) who expresses the opinion that they are even more open to criticism than those of Burckhardt.

Franz finds that such things as vaginal examination during labour, in the absence of injury to the vagina, and early rupture of the membranes, have no influence on the results. On the other hand slight fevers are commoner in primiparous than in multiparous women and after short than after long labours. He considers that the saprophytes found in the uterus in slight fevers, are probably identical with those of the vagina. This, though he does not say so himself, must place him among the auto-infectionists, at least up to a certain point.

In 1901 articles appeared under three different names, viz: Schauenstein, Vogel and Wormser.

Wormser (31) gave the results of the examinations of the uterine lochia lochia of 100 normal puerperal women(he excludes other 6 for various reasons) between the 12th. and 18th. days of the puerperium. 84 gave a positive result.

His method of obtaining the secretion was on strictly aseptic principles, and the culture methods were suitable for the growth of both aerobic and anaerobic bacteria.

He concludes that, in the normal puerperium on the days noted, the uterine cavity is germ- containing in the great majority of cases. On the other hand he considers it pathological if in the first week of the puerperium germs are found in such circumstances.

Schauenstein (33) made a most elaborate and careful investigation into the bacteriology of the puerperal uterus in 100 women who had"normal" puerperia. In proceeding to a detailed criticism of the work of Doderlein-Winternitz and Wormser, he explains that these are the only investigations which can be suitably compared with his one, from the coincidence in some measure, at least, of their methods. He then propounds three questions.

(1) Is the entire secretion content of the Döderlein tube equivalent in a bacteriological sense to that part in the middle of the tube or not?

(2) What influence has the quantity of the inoculated material on the culture results?

(3) Is the uterine cavity of a normalpuerperal woman germ-free or not?

The first question he answered in the negative, having found from a careful examination that in 39% of the cases the secretion from the middle of the tube was germ-free, while in only 21% the secretion which flowed first was sterile. Hence he concludes that Wormser's method of mixing the total secretion with water and using it all must give more numerous positive results than that of using only that from the middle of the tube. On the other hand he considers that Doderlein-Winternitz used too little secretion to obtain absolutely reliable results since the result of his investigation with a view to answer the second question was that positive results were more numerous, the more material he used for inoculation.

Before answering his third question he defines what he means by a "normal puerperal woman". Such is one who during the puerperium had a maximum temperature of 38° C. rectal while the lochia were free form bad smell or pus, the uterus free from tenderness and there was no tendency to subinvolution.

His results in 100 such cases, the lochia being obtained by Doderlein's method, on various days from the 9th. to the 13th. of the puerperium were as follows:

In 36 the uterine lochia were germ-free, while in 64 they were germ-constaining. Only typical pyogenic organisms were sought for, viz: Streptococci, Staphylococci and bac. Coli communis. In 50% of the germ-containing cases Streptococci and Staphylococci were demonstrated. The Streptococci were 15 times in pure culture, 13 times in Symbiose with other bacteria. Staphylococci albus was found alone in 4 cases.

Obligatory anaerobes were demonstrated in 11 cases. Comparing the positive results together, one finds that in all cases the results of anaerobic cultures were positive, while only 53 out of 64 grew aerobically.

(32)
Vogel divided his investigation of normal women into two sections, the first 15 being examined on the 3rd. and 4th., the second 15 on the 8th. and 9th. days of the puerperium. He also examined 25 women with fever in the puerperium.

In explaining the different results of different investigators he says that he considers the most important factor is the difference in the time of obtaining the secretion,—in contradiction to Doderlein whose statistics tend to prove the reverse—and the technique.

In the normal cases he found in the early puerperium 13 out of 15 germ-free and in the later days 5 out of 15 germ-free. He concludes therefore that while the uterus in the early puerperium is as a rule germ-free, in the later puerperium this is not so,

The bacteria found included Staph.Albus and aureus, Streptococcus and bac.putridus: no Gonococci.

In the 25 fever cases the uterus was germ-free 8 times, germ-containing 17, the bacteria being Streptococci, Staphylococci, gonococci with bacilli alone or mixed in varying ways: also Friedlanders pneumobacillus and bac. Coli & proteus. 13 of the women were primiparal, 12 multiparal.

In his final summing up, he concludes that in most cases of fever germs are to be found in the uterus; that in puerperal women with a positive bacterial find there is usually also a

clinical abnormality in the genitals, and often also retention of lochia which, he says, favors the development of organisms: that although the uterus in the early puerperium is usually germ-free, one may find Streptococci in it without any apparent effect, but that Streptococci are rarely found in feverless puerperal women.

Vogel used a specially constructed intra-uterine speculum, having introduced which, he obtained secretion with a tube and aspirator arrangement. He used antiseptics up to the cervix, then simply sterile gauze.

This brings us up to 1902 when Franz (36) returns to the subject. He examined 126 normal women in the first 9 daysof the puerperium with 71 positive results. He includes under normal cases only such as had a maximum temperature of 38°C. and who showed no sign of illness e.g. pain in uterus, increase or fetor of lochia. He made his method correspond as far as possible with those of Döderlein-Winternitz, Schauenstein and Wormser, and compares his results with theirs. He controverts Schauenstein's conclusions about the relative value of the different parts of the Döderlein tube as regards germ content. He considers that Döder lein-Winternitz used too little secretion. He himself always used as much as possible, at least 1 c.c.m. in all, and agrees with Schauenstein that the more secretion one uses, the more positive results one gets.

He concludes that the germs in the lochial secretion must as a general rule be comparatively trifling in number, but says he cannot explain the presence of pyogenic organisms in the puerperal uterus without injurious effects.

Also in 1902 appeared a long and careful description of a most elaborate investigagion into the bacteriology of the vagina in 40 pregnant women by Bergholm.(34)

Having devoted a considerable number of pages to a historical review of the subject he proceed to discuss the technique and decides that Menge's tubes are the best for the purpose. With these he examined 40 pregnant women, who had not been recently vaginally examined and had not had a bath; usually only such as had unruptured membranes. The necessary apparatus was sterilized by exposure to a temperature of 120 C. for 20 minutes. Introducing the tube well up into the posterior fornix, he always succeeded in obtaining quite sufficient material for examination. The culture media used included acid, alkaline, and neutral agar for aerobes and neutral agar with 1% glucose, also neutralglucose agar with ascitic fluid, overlayared according to Liborius's method for anaerobic organisms. The reaction of the secretion was always acid, though in varying degree.

Bergholm found practically no pathogenic types of bacteria, such as Streptococcus pyog. Staphylo.pyog.aureus, or albus, bac. Coli communis, in the vaginal secretion. The bacteria were mostly bacilli, a few Cocci, and Saccharomyces. Most preferred anaerobic culture, but only two were obligatory anaerobes. All grew best on acid media.

The bacteria of the vulval secretion were essentially different, most preferring alkaline media. The commonest were the Staph.cereus and bacterium Coli communis.

The most recent articles on the subject are those of Stolz (38) and Marx. (39)

Marx (39) took 15 consecutive i.e. unselected cases in the New York Maternity Hospital and examined bacteriologically the content of the Uterus on labour day and every other day thereafter for a varying period, making in all 48 bacteriological tests.

He used a Polk's cervical speculum, bullet forceps and a platinum loop, bent to suit the uterine curve. The patient was placed crosswise at the side of the bed and the external parts thoroughly scrubbed with antiseptics. No vaginal douching was used. A bivalve vaginal speculum was then inserted, the cervix grasped with the bullet forceps and drawn downwards and forwards. Then it was thoroughly scrubbed with carbolic solution. The Polk's speculum was now introduced past the internal os and the platinum loop, having been sterilized in the flame and allowed to cool, was inserted along the speculum up to the fundus uteri, bood-stained lochia being thus obtained and immediately inoculated on agar slopes.

If the first three examinations were negative no more were made unless the temperature rose.

Except in one case of acute septic poisoning beginning before the end of a lingering labour, positive results were obtained only in two cases and Marx considers that these were almost certainly contaminations from the cervix, occurring during the introduction of the speculum with the obturator out of action. This was done in 4 cases and in 2 of these Marx considers that the organisms almost certainly owed their presence to the edge of the speculum scraping the inner surface

of the cervix. The organisms found were Streptococci, Staphylococci and a few diplococci, as shown by film preparations from the agar slopes. Further examination was not made owing to accidental destruction of the tubes.

The conclusions come to were:

(1) The uterus during the first 6 days of labour is normally a sterile organ.

(2) The presence of bacteria in the uterus in the absence of general symptoms of a constitutional disturbance such as fever and pulse-rise etc. means the introduction of such bacteria by accidental contamination; moreover the presence of bacteria in the puerperal uterus accompanied by fever, rapid pulse and other disturbances means in all probability a sepsis arising from the uterus; and further the absence of bacteria in the puerperal uterus, in presence of general symptoms means the necessity of looking for the source of the disturbance in some organ other than the uterus- vagina or vulva or in some general disturbance independent of the puerperal condition.

He points out in choosing so-called noraml cases, former investigators e.g. Schauenstein, Vogel and Franz limited themselves too much to the temperature as a criterion. On the other hand an axillary temperature of 38 C. equals one of 39 C. rectal, a temperature which requires some explanation and this in his opinion accounts for the numerous positive results of these writers. In his own series nearly all showed some disturbance of temperature, which after careful examination was in every case referred to general causes quite distinct from the pelvis

organs, the chief being influenza of which an epidemic appears to have occurred in the wards at this time. Again Schauenstein's and Vogel's results were obtained in the later days of the puerperium when the opportunities for the entrance of bacteria into the uterus may have occurred.

Marx's final conclusion is that auto-infection is practically impossible from the normal vagina, which can be diagnosed by inspection and palpation from the clear sticky acid secretion. In such cases the only interference necessary is the cleansing of the vulva. When on the other hand the vaginal secretion is alkaline and purulent, indicating a probably gonorrhoea, active antiseptic measures are necessary.

Stolz (38) chose only cases which either had been examined with a hand clad in a sterile glove-"the sterile finger"- or had not been examined at all. His media were 1% peptone bonillon and glucose agar in form of slopes and also overlayared. He examined the vaginal secretion of 32 oregnant women, using a platinum needle and a soeculum. In secretions "normal", according to Döderlein, he found besides other organisms Streptococci in three cases. In "pathological" secretions there were streptococci in 7 cases.

The next series was from women examined during labour only with the "sterile" hand. In 156 normal uterine lochia in such cases, 101 gave negative results, 55 positive, of which 21 showed Streptococci. These examinations were made on the 9th. day. In cases not examined vaginally during labour 54 were bacteriologically tested on the 9th day and 10 showed Strept-cocci i.e. very similar proportion to those examined during labour.

75 uterine and 65 vaginal specimens were examined on the 4th day of normal puerperia. The uterine specimens were germ-containing in 60 of which more than a third contained streptococci. The 65 vaginal specimens all contained germs, which in nearly 20 cases were streptococci.

Comparing the germ content of the vaginal secretion in pregnancy with that on the 4th day after labour, we find that germs and streptococci are more numerous in the vagina of the puerperal than of the pregnant woman. On the other hand there were fewer bacteria in the lochia on the 9th than on the 4th day.

Such things as duration of labour, injuries to genitals etc. had little or no effect. Retention of lochia however seemed to encourage growth of germs.

My own series of cases was taken from the Maternity wards of the Dundee Royal Infirmary, with the kind permission of the physician in charge, Dr. R. Cochrane Buist,.

I examined 25 consecutive i.e. unselected cases on days varying from the 2nd. to the 12th. of the puerperium. Of these 5 developed temperatures over 100 F.(axillary) during their stay in hospital. They were therefore excluded from the series of normal cases and will be considered briefly in a separate section.

In nearly all cases both vaginal and uterine specimens were obtained at the same time. The chief difficulty experienced was due to objection on the part of the patients to what they considered unnecessary interference.

In obtaining vaginal specimens a Döderlein tube 5 m.m. in diameter and about 3 m.m. lumen was used, combined with an aspirating syringe, the whole apparatus being sterilized by boiling for 15 minutes at least. For the uterine specimens I employed Sim's speculum, a vulsellum and a "Doderlein" tube with aspirating syringe attached. No antiseptics were used except on the vulva which was cleansed with 1% lysol solution. The cervix was wiped dry with sterilized cotton wool. The specimens were taken to the laboratory of University College, Dundee, and there examined, both by direct microscopic films and by inoculation an agar slopes, Stabs and by the overlaying method of Liborius, as well as in bonillon.

The result of these examinations was that although no single specimen gave negative results by both direct microscopic and cultural investigation, yet the 37 uterine specimens showed only 3 (in 2 patients) in which a pyogenic organism was present, the gonococcceus, and the 42 vaginal specimens only 5 in which pathogenic bacteria occurred, viz: Gonococci twice bacillus coli communis and staph.pyogenes aureus once(the last only seen on an agar slope and almost certainly a contamination).

Taking the individual patients, out of 19 whose uterine lochia were examined 2 showed organisms resembling gonococci. Of 20 patients whose vaginal lochia were examined 1 showed gonococci, 1 bac. coli and 1 staph.pyog.aureus.

Of the cases with gonococci, 1 showed a maximum temperature of 98.4 F., the other a maximum of 99 F. The case with Staphylococcus had an absolutely normal temperature

throughout, while case 10 in which bac.coli communis was noted on two occasions was perfectly free from disturbance till the 9th and 10th days, when the evening temperature rose to 99.4 and 99,6 respectively, without any corresponding disturbance in the patient's feeling of wellbeing, or physical condition otherwise.

The other organisms noted were cocci and bacilli or various sizes, the bacilli being rather more common and in many cases showing Spores and numerous involution forms. None however had any resemblance either microscopically or in culture to pathogenic types. Most grew both aerobically and anaerobically. No obligatory anaerobes were noted.

A detailed account of the cases will be found further on.

In considering the results published on the subject of the bacteriology of the genital canal, one is immediately struck by the immense differences of opinion which are expressed by the various writers. To account for this one naturally looks to the technique of the investigations.

Vaginal lochia.

As regards vaginal secretion Williams, following Krönig, lays great stress on the fallacy originating from using a speculum. This in some form or other was done by Winter, Steffeck, Maslowsky, Stahler-Winckler,(Simon's) Thomen, Vahle(Sim's) Döderlein, Witte, Stroganoff, Burckhardt, Walthard and Stolz(either porcelain or glass cylindrical specula). The secretion was then taken either with a curette, tube, platinum loop, or Spatula. Williams himself in 1893 used a speculum. In 1898 he discarded it in favor of a Menge's tube. Kottman used a specially constructed double tube, fully described previously, and probably quite as open to objection as any speculum.

Burgubum used a pipette to suck up the secretion and Krönig also adopted this method in one series, using a platinum loop in another.

Bensis and Bergholm used Menge's tubes.

As I mentioned above I used a glass tube about 5 m.m. diameter attached to an aspirating syringe and found that by having the labia held well apart by an assistant, I ran little or no chance of contamination from the vulva or hymen.

The careful use of a platinum loop, a pipette or a Menge's tube should give equally accurate results.

William's very convincing demonstration of the possibility of contamination from the use of a speculum is confirmed by the fact that as a general rule those observers who used a speculum got positive results as regards pathogenic bacteria, those who adopted other methods mainly negative.

On the other hand it seems strange that so careful an observer as Döderlein should have obtained such definite differences between "normal" and "pathological" secretions, the "normal" giving in the great majority of cases negative results in spite of the use of a speculum, in exactly the same was as in the "pathological" cases. Thomen again obtained his material with the help of a speculum applied to the anterior vaginal wall, taking the specimen from the posterior wall, a proceeding which one would think could be done without contamination from the speculum. Yet Thomen found Streptococci in 3 out of 7 cases.

The following are some of the percentages for Streptococci:

Burckhardt	4%
Steffeck	4%
Doderlein	4½%
Burgubum	8½% (pipette)
Vahle	10%
Kottamnn	13% (special double tube)
Winter	15%
Williams (1893)	20%
Walthard	27%
Stolz	31%
Maslowsky	37½%
Thomen	43% (21% if we include a series of 7 pregnant women)

Various percentages for bac.coli and Staph pyogenes aureus are also given.

These writers along with Stahler-Winckler,(28) who in answer to the question" Are the Streptococci of the vaginal secretion a special variety?" declare that in "pathological" vaginal secretion there are frequently found facultative anaerobic streptococci, which are simply ordinary streptococci of diminished virulence, are of necessity auto-infectionists and advocate the antiseptic treatment of labour.

Williams in 1898 (23) shanged his ground and now joined with Krönig, Bensis, Bergholm and Gönner, discarded the speculum, though Bensis used it in some of his cases and it fact attributes to it his only two positive results as regards pathogenic microbes, in the vaginal secretion.

Krönig (09) declares confidently that(apart from gonococci) the vagina of a pregnant woman, who has not been vaginally examined, is aseptic.

Bergholm (34) found that neither Streptococcus nor staph. pyogenes aureus nor albus, nor bacilli coli communis, are normally present in the vagina of a healthy pregnant woman.

Williams in 92 cases found pyogenic cocci 3 times, twice staph.epidermidis albus, and once a strictly anaerobic streptococcus, his conclusion being that the vaginal secretion whether "normal" or "pathological" in Döderlein's sense does not, apart from gonococci,contain any pyogenic bacteria which could give rise to puerperial septicaemia.

Gönner's conclusions (1) are mentioned on the first page and are practically identical with those of Williams.

In my own cases, excluding gonococci and the doubtful

case of staph.pyogenes aureus, I found bac coli communis in 2 vaginal specimens, from the same patient, out of 42 specimens examined.

This I think justifies my conclusion that the vaginal secretion of a normal puerperial women only exceptionally contains organisms which could give rise to a puerperal septicaemia. That it does not contain organisms which may on accasion give rise to a slight fever in the puerperium I am not prepared to say.

The organisms generally found are non-pathogenic cocci and bacilli, especially the latter, of very variable shape and size and different capacities fro growth on aerobic and anaerobic media, according to the different observers.

Bergholm (34) for instance mentions 10 different varieties, practically all non-pathogenic.

Williams (23) has a still larger number of slightly varying types, the only one with any claim to a definite identity being the bacillus vaginal of Doderlein.

In my own series of vaginal specimens I was able to distinguish five different forms of organisms, not the ordinary pyogenic types, including yeast. This last has been found occasionally by several observers, notably Krönig (19) and Williams. (23) Krönig too, mentions the oidicum albicaus as an occasional inhabitant of the vagina.

I will give later a more detailed account of the organisms found in my own series, but nothing would be gained by a more particular comparison and classification of the various types described by the above authors than has already been done above.

Further explanation of the marked discrepancies in results

might be sought for in the different media used by the various observers. For instance a number especially of the earlier investigators took no account of anaerobic organisms. On the whole however I do not think that much can be made of this.

More important I consider the differences in sexual and social hygiene of the patients. But on this score much fuller information than is at present available would be necessary before one could form any conclusions of value. Up to the present, so far as I can gather, no attention has been devoted to this subject at all, at least from a statistical point of view.

The question of the quality of the discharge has received a great deal of attention. Döderlein (41) in 1892 first drew attention to two different varieties of vaginal secretion, which he described as "normal" and "pathological", terms of which I gave the definition previously. Döderlein found 55% of his cases "normal" and 45% "pathological", and considered auto-infection possible in the latter. In 1893 Witte (44) confirmed Döderlein's classification and Burckhardt (47) from a clinical study of the morbidity of 116 cases, 59,4% "normal", 27.5% "pathological" and 13% doubtful, concluded that the difference between "normal" and "pathological" secretion is very marked and that the danger of illness during the puerperium is much greater in the latter than in the former case. Krönig (18) while admitting that it was possible to distinguish two different kinds of discharge after this fashion, concluded that it was of no practical value to do so. Williams (23) was of the same opinion, while Bergholm (34) declares that such a distinction is

impracticable. Stolz (38) says the distinction is insufficient. Personally I could take no account of this question, my observations being made after labour, but it must be evident from the variety of opinions expressed that the subject has still to be settled and is consequently of little value in explaining the difference in the results of the various observers.

The majority of these vaginal observations have been made on pregnant women. Döderlein (3) however in 1887 examined puerperal women and as already indicated, concluded that vaginal lochia in such cases were frequently pathogenic germ-containing. In 1888 von Ott (8) found a colony of Yeast fungus in the lower part of the vagina once only, and is inclined to consider this a contamination. He concluded that not only the uterus but also the upper part of the vagina is usually germ-free in the puerperium. Thomen (39) in 1890 examined secretion from the posterior wall of the vagina at different levels, as well as from the uterine cavity in seven normal puerperal women, from which he concluded that while the vaginal lochia contained countless bacteria(in 3 cases streptococci were found) these were more numerous in the neighbourhood of the introitus than in the upper and were also more numerous by the end of the first day after labour that immediately after expulsion of the placenta.

In my own cases, owing to the rule of the Institution that cases are only admitted after labour has begun, I was able to make an observation of the vaginal secretion before labour only in one case. In it the bacteria were to all appearance the same before as after labour.

A series of such cases would I think prove interesting and instructive.

Stolz (38) briefly considers the question and expresses the opinion that the germ-content, including the streptococci, of the vaginal secretion is greater on the 4th. day of the puerperium than before labour.

Williams's (24) observations of the germ-content of the uterus in 13 women, whose vaginal secretion he had investigated during pregnancy, and who after labour developed a temperature of aver 101 F., is in a measure analagous. Of his 13 cases, 9 showed sterile uterine lochia, 4 contained bacteria; in 2 cases quite different from those of the vaginal secretion previously examined, in 2 showing the same appearances in film, but different growth in cultures.

UTERINE LOCHIA.

When one comes to look over the statistics of investigators into the uterine lochia as regards their bacterial content, one find the diversity of opinion quite as great as in relation to the vaginal secretion. Here again the question of technique takes first place in furnishing an explanation for this variety of opinion.

Döderlein's method of displaying the cervix with a speculum, drawing it down with a vulsellum, wiping it dry with a sterile swab, then introducing a glass tube bent to suit the uterine curve and withdrawing the secretion by suction with a syringe seems to me, on the whole, the least open to objection. It is comparatively easy to do, it is aseptic and practically free from danger to the patient and it almost invaraibly ensures a plentiful supply of secretion.

This was the method I adopted throughout my series of cases, Sim's being the speculum I used.

My results, however, are very far from coinciding with Döderlein's, since he found 90% of his cases germ-free, while I could not point to a single case which could be considered absolutely sterile. This discrepancy is not due to the media used, which were very similar in both cases; Döderlein moreover got plentiful growths on the same media from vaginal specimens staken at the same time. On the other hand, though in one or two of my cases, owing to nervousness on the part of the patient, there was some risk of contamination from the vagina, in the great majority I was able with comparative ease to carry out the necessary manipulations exactly as

Döderlein describes. Ofcourse in my case even a single colony on one of the media was considered equivalent to a positive result, whereas if I mistake not Döderlein made considerable limitations in that respect, as did most of the other investigators. Herein lies an obvious source of difference in results. Wormser (31) for instance only considered a result positive if (1) on agar plates more than 6 in all, or more than 10 on one, colonies appeared, (2) in bouillon if turbid throughout or a heavy deposit or a disagreeable smell occurred. (3) in agar tubes, if growth along the stroke or more than 6 colonies appeared. Schauenstein (33) examined with slight magnification if necessary, at the end of 8 days and made films from agar slopes or bouillon whether growth was visible or not. In overlayered cultures, at leasy 5 colonies were present it was considered positive.

Döderlein-Winternitz (6) made no definite statement on the subject. Franz (35) considered a result positive if altogether 10 colonies were visible.

As regards my results in the normal cases the uterine secretion gave entirely negative results in 9 cases, growth only in 9, on agar only in 1, and on both agar and bouillon in 19 cases. From vaginal secretions in normal cases there were none entirely negative. In two cases growth occurred only in the bouillon, in 3 only on agar, and in 37 both on agar and in bouillon. In no cases was there growth only in the anaerobic medium.

However the main object of my investigation was to answer the question whether or not the ordinary pyogenic

bacteria could be found in the Uterus in normal cases and on this my results tally very closely with those of Döderlein, except for the occurence of gonococci in two of my cases.

While I unfortunately did not use media suitable for the growth of gonococci and therefore lack this evidence of their presence, the morphological appearances of the organisms in the original films were so characteristic that I think myself justified in calling them gonococci, especially as in both cases the children showed signs of ophthalmia.

Among others who used a tube like Döderlein's were Krönig, Thomen, Döderlein-Winternitz, Schauenstein, Wormser, Franz, Vogel and Marx.

Of these Schauenstein, who found only 36% of his cases germ-free, was perhaps the most elaborately careful in his technique. He was, however, only interested in proving the presence or absence of pyogenic organisms and says himself that he paid no attention whatever to others. He concludes, as already indicated, that such pyogenic organisms can be present in the puerperal uterus without causing any obvious result, though he found them undoubtedly more frequently where there was a slight rise of temperature.

Schauenstein suggests another reason for the large number of sterile results obtained by Döderlein-Winternitz, viz: the use of too small a quantity of secretion for inoculation.

Wormser, on the other hand, who found bacteria present in the uterus even more frequently than Schauenstein, and who used the whole secretion-content of the tubes, he considers to have gone to the other extreme. He himself only used the

middle part of the secretion, a proceeding which, as far as possible, I followed. The wisdom of this is obvious, for especially in the later days of the puerperium when the cervix has regained the canal-like form more or less, one can easily see how contamination from its inner surface might occur in introducing or withdrawing the tube. The possibility of contamination would thus be greatest in the secretion which flows first and last, while that in the middle ought to be free from such objection. .

Vogel (32) lays great stress on the time at which the secretion is taken and finds that the uterus is much more often germ-free in the earlier than the later puerperium, though even in the former one may find Streptococci, without any apparent effect. In this, ofcourse, he is completely at variance with Doderlein-Winternitz, who, from a study of this question, consider it of no importance whatever.

The conclusions of Marx, (37) who declares that the normal uterus during the first six days of the puerperium is a sterile organ, are open to question on the ground of the poverty of culture media employed, for as I myself repeatedly found, while the agar slopes were sterile, there were plentiful growths on some of the other media used, and I am sure I am not alone in finding such results.

Stahler-Winckler (27) obtained a comparatively high bacterium-find, having only 83.6% germ free in their series of 55 cases. Their methods were open to question in more ways than one. In the first place the introduction of a speculum into the uterus is open to exactly the same objections as in the case of the vagina, viz: that organisms are apt to be carried in

from the outside, on the edge of the speculum and so to stultify the results. On the other hand the instruments used were, after boiling, kept in 96% alcohol, an undoubtedly strong antiseptic, which would be very apt to interfere with the growth of bacteria.

As regards Von Ott (8) and Czerniewski (9), one cannot help thinking that the amount of antiseptics applied to the vacinity of and actually to the cervix, must have contributed materially to their percentages of sterile results. The same objection, though perhaps to a less degree, holds good against the work of von Franque. (15)

However the question of real importance is undoubtedly not so much whether or not the uterine cavity is absolutely sterile in the normal puerperium, but whether it contains pyogenic cocci of any sort which could produce septicaemia.

Burckhardt (25) occupies a sort of middle position in as much as he finds the uterine cavity germ-free in the early puerperium but containing numerous pyococci in the later days. He considers that such organisms may be present without giving any clinical evidence of their presence. In both these views he is supported by Vogel. (32) Krönig (19) on the other hand declares that the presence of such organisms in the uterus is invariably accompanied by rise of temperature or some other disturbance. Schauenstein's observations were made between the 9th. and 10th. days of the puerperium, a point which Marx thinks of some importance in explaining his high bacterial find. The same remarks apply to Wormser, who expresses practically the same opinions as Burckhardt and Vogel. Franz and Stolz both find the Uterus containing germs, some

of them pyogenic, during apparently normal puerperia, and the latter finds that in the early puerperium, on the 4th. day it does so even more frequently than later, on the 9th. day. von Ott, Czerniewski and von Franqué, ofcourse, advocate the negative view.

One point about my own results I have not yet mentioned, and that is, that the great majority of the cases, the growths on the culture media were very much more profuse in the case of vaginal than uterine specimens. This ofcourse could to some extent be explained by the relatively larger number of bacteria present in the vagina. But in many cases it was quite evident from the direct films that there was as great a bacterial density in the one as in the other and yet the growths differed greatly, a number of the uterine specimens as noted above, giving entirely negative results in contrast to the profuse growths from the corresponding vaginal samples. Is there something in the different secretions to account for the variation or is there, as Krönig supposed, as anti-bacterial power in the normal puerperal endometrium?

To such subsidiary questions as the effect of the duration of labour etc. I could not from my small selection of cases give a full consideration, but so far as they went, nothing decisive could be made out. Nor do the results of many of the above writers help us, so hopelessly at variance are they. On one point however there is something like unanimity, viz: that retention of fragments of membranes or placenta encourage the growth or micro-organisms in the uterus.

I will conclude my remarks by summing up as follows:

(1) We may look on the genital passages of the female as normally free from pyogenic cocci which can cause puerperal septicaemia.

(2) The same cannot be said as regards organisms both aerobic and anaerobic, which while not actually pyogenic may yet be capable of causing the slighter fevers of the puerperium.

(3) Gonococci may be found in the puerperal uterus. This question I will discuss more fully below.

(4) Antiseptic douching before, during, or after labour, is in all ordinary cases, not only unnecessary but actually harmful and dangerous, since it has been amply proved that the normal secretions of the genital passages have distinct bactericidal powers, and if we remove those secretions by douching, we lower the powers of resistance of these parts and thus increase the dangers of infecting them by accidental contamination from the vulva or external agencies, in the process of douching.

The question of gonococcal infection is one of considerable difficulty, and the impossibility of avoiding the occasional presence of this organism in the vaginal and uterine secretion of pregnant and puerperal women is, to my mind, an argument in favour of the theory of auto-ingection which it is very difficult to answer. For although, scientifically speaking, it is not a natural inhabitant of the genital passages, yet with its capacity for living there for indefinite periods of time, it becomes such for all practical purposes and thus at labour is a distinct source of danger to the patient quite apart from her attendants, medical or otherwise.

Fruinsholz (36) discusses the question whether infection of the uterus with gonorrhoea is possible during pregnancy or must have occured before that began. Though he allows that the latter is undoubtedly more common he considers the former quite possible since, in the light of the well known capacity of the gonococcus for penetrating healthy epithelium he sees no reason why it should not penetrate the mucuo plug of the cervix.

He states that lochial discharge forms a favorable medium for development of the gonococcus, which always multiplies very rapidly in the first days of the puerperium. Further he holds that, while a true mixed infection is rare with the gonococcus on the contrary secondary invasions by other pyogenic bacteria are favored by its presence.

He finds the lochia generally abundant and often purulent. Often too, there is a slight rise of temperature, sometimes due to actual infiltration or at other times to absess formation

in the uterine wall. Still if his statement that 20-25% of pregnant women have gonorrhoea be true, there must be a large number in whom the condition fails to produce any effect on the course of the puerperium.

Krönig, 1897, found in 50 women showing gonococci in their lochia, that 43 had slight elevations of temperature in the puerperium. He concludes that even where we get a puerperal infection with gonococci, the results are less acute and more prolonged than in an ordinary puerperial septicaemia, due eg. to streptococci.

Perhaps more usual effects in such cases are the affections of the tubes etc. appearing seven or eight weeks after labour, these being the cases which came under the notice of the gynaecologist and are apt to be overlooked by the obstetrician.

As regards the treatment of a case of labour, showing a profuse yellowish green discharge, or where one has reason to know that the patient has gonorrohoea, the most obvious indication, at first sight, is vigorous antiseptic douching. But if one considers the difficulty in eradicating the disease from a non-pregnant women, it becomes evident that the value of such douching in connection with labour would be very doubtful. So, unless for considerations or ordinary personal cleanliness, or possibly in the interests of the child(though these can generally be well looked after by immediate attention after birth) I think such cases are best left alone and, as recommended in ordinary cases, treated on expectant lines.

In proceeding to a detailed account of the cases examined, I will consider first of all, those which showed a subfebrile temperature i.e. 100 F. throughout the puerperium, as far as it was passed in hospital.

The temperature was taken in ordinary cases twice daily viz: at 7 a.m. and 7 p.m. and if anything untoward occurred such as rigors, or rise of temperature above 100 °F, observations were then taken every 4 hours. The pulse was noted along with the temperature.

Out of 25 women examined 20 had subfebrile or normal temperatures, 5 showed a rise over 100 F. once or oftener. Most of the cases had absolutely normal temperatures.

Apart from the pelvis which was always the first region investigated if anything went wrong, one found a considerable number of patients showing increase of pulse rate or rise of temperature on being allowed up for the first time; whether due to the exertion, or excitement or, as suggested by Burckhardt, to retention of lochia and absorption due to sudden flexion of the uterus from the change in patient's position, it was not always easy to say. Breast troubles and constipation were the most frequent causes otherwise. Occasionally one was entirely at a loss to explain the apparent anomaly of a patient looking and feeling perfectly well in every respect and yet showing a disturbance of temperature or pulse or both.

Specimens were obtained on various days from the second to the 12th., as many from each patient as permission could be obtained for, this being a matter of considerable

difficulty at times, owing to the unreasoning objections offered by many.

In all 99 specimens were obtained during the puerperium, 42 from the uterus, and 47 from the vagina. 1 specimen was obtained from the vagina the day before labour began, and though not including it in the statistics of my results, I have inserted particulars of its examination in the course of the case.

The procedure adopted in obtaining specimens for examination was as follows:

A glass tube 15 c.m. long and 5.m.m. in diameter with a lumen of about 3 m.m. was bent about 5 c.m. from one end like a uterine sound. To it was attached by a piece of rubber tubing afout 4 c.m. long, a glass syringe of considerable aspirating capacity. Those along with a vulsellum, a Sim's speculum, and a pair of curved clamp-forceps were sterilized by boiling for about 15 minutes, and thereafter kept in sterile water.

The patient lay in the lateral position, left or right, according to convenience(except in the last 5 or 6 observations, when the dorsal position was adopted). The external genitals were well scrubbed with 1% lysol solution.

My hands were cleansed as if for a surgical operation. Vaginal specimens were obained thus. The lips of the vulva bing held apart by an assistant, the glass tube connected with the aspirator as noted above, was slipped into the vagina, avoiding contact with the labia or hymen. When it was well into the posterior fornix, secretion was aspirated

into the tube, which was then carefully withdrawn and immediately sealed with wax. The specimen thus obtained might be fairly considered to represent the secretion of the vagina above the hymen.

In obtaining the uterine secretion a Sim's speculum was introduced into the vagina so as to control the posterior wall. The anterior lip of the os was then siezed with a vulsellum and pulled down as far as possible . The lips of the cervix were then carefully wiped with a swab of sterile cotton-wool held in the forceps mentioned above. A fresh glass tube having been attached to the syringe, it was introduced into the cavity of the uterus and the contents of the latter aspirated into it by the syringe. The tube was now withdrawn and its ends immediately sealed with wax.

The tubes were thus air-tight and free from possibility of contamination and were taken to the laboratory of University College, Dundee, where they were examined.

To avoid using the secretion which had either entered the tube first or last, when a sufficient quantity was available, the tube was broken across at a point corresponding to the middle part of the secretion. The inoculations were throughout with the same large platinum loop, the idea being to use if possible, the same quantity of secretion for each inoculation.

The media used were as follows:

(1) Slightly alkaline agar slopes.

(2) Slightly alkaline agar for Stabs.

(3) Agar in tubes melted, inoculated at 40 C. or thereabout, allowed to solidify and then covered over

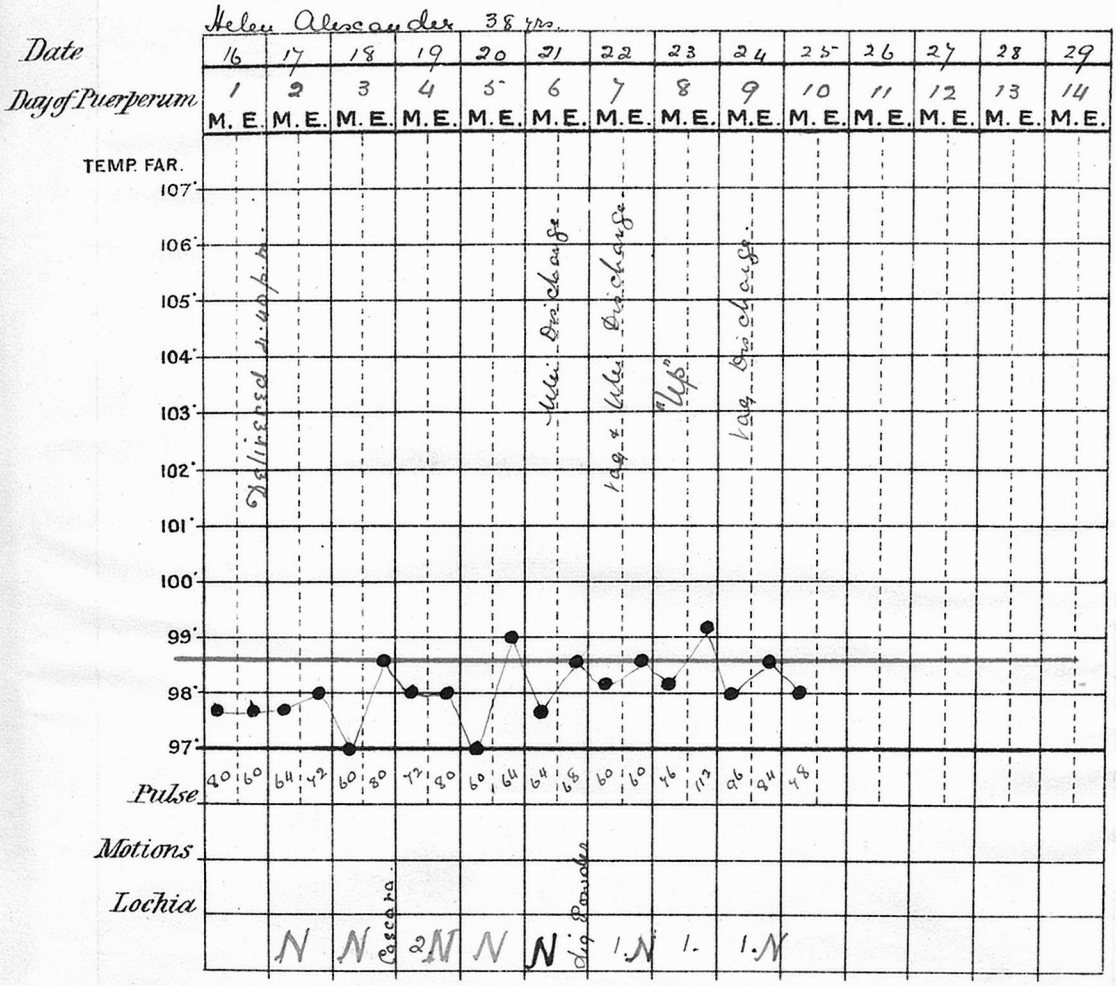
by pouring on the top a further quantity of melted agar. This was to test anaerobic growth.

(4) Bouillon.

The only exception to this proceeding was that in the first 12 observations gelatin was used for the 3rd. inoculation. It was thereafter discarded on account of its liability to contamination.

Cover-glass films were made and stained with saturated watery methylene blue in every case and also by the Gram-Weigart method in the last 56 observations. Methylene blue films were also made from every tube in which growth appeared, except most of the overlayered tubes.

The following are the details of the cases:



H.A. 38 unmarried II para. Delivery spontaneous. Duration of labour 16 hours. No excessive haemorrhage. Perineum slightly torn requiring one stitch. 3 vaginal exams during labour.

Presentation vertex: position L.O.A. Child mature, live.

Lochia during period of observation i.e. till 10th day, normal in macroscopic appearances.

As seen by Chart the maximum temperature 99.2°, and pulse 112 per min were noted in the evening of the /

the 8th day, during which patient had been up for the first time since delivery. Specimens were obtained from uterus on the 5th, 6th and 7th days, from vagina on the 7th and 9th days. The first uterine specimen was accidentally contaminated and therefore thrown aside.

(1) Uterine specimen obtained on 6th day, gave the following results.

1. Agar Slope. Faint whitish, growth in small colonies (3-4)
2. Agar Stab. Negative.
3. Gelatin. No evidence of growth beneath surface : well marked fungus on surface.
4. Bouillon. Turbid.

Direct film shows number of large cocci irregularly clumped.

Bouillon film. Ditto.

Agar film. Ditto.

(2) Uterine specimen obtained on 7th day, gave following results.

1. Agar Slope. Negative.
2. Agar Stab. Negative.
3. Gelatine. Negative.
4. Bouillon. Very turbid.

Direct film./

Direct film. Negative.

Broth : large sporing bacillus, resembling B. subtilis. (This specimen is illustrated by microphotograph.)

(3) Vaginal specimen obtained on 7th day, Shows:-

1. Agar Slope: three rounded whitish colonies about $\frac{3}{8}$ inch in diameter.
2. Agar Stab. Negative.
3. Gelatin. Negative.
4. Bouillon. Turbid.

Direct Film shows a few large deeply staining cocci, dividing freely. Similar to those in uterine specimen of 6th day.

Agar Slope film shows numerous large cocci with similar characters.

Broth Film: large numbers of a large apparently sporing bacillus, also a small number of cocci.

(4) Vaginal specimen obtained on 9th day, shows :-

1. Agar Slope. Number of round whitish yellow colonies.
2. Agar Stab. Growth in stab: no gas.
3. Agar overlayered Negative.
4. Broth. Turbid.

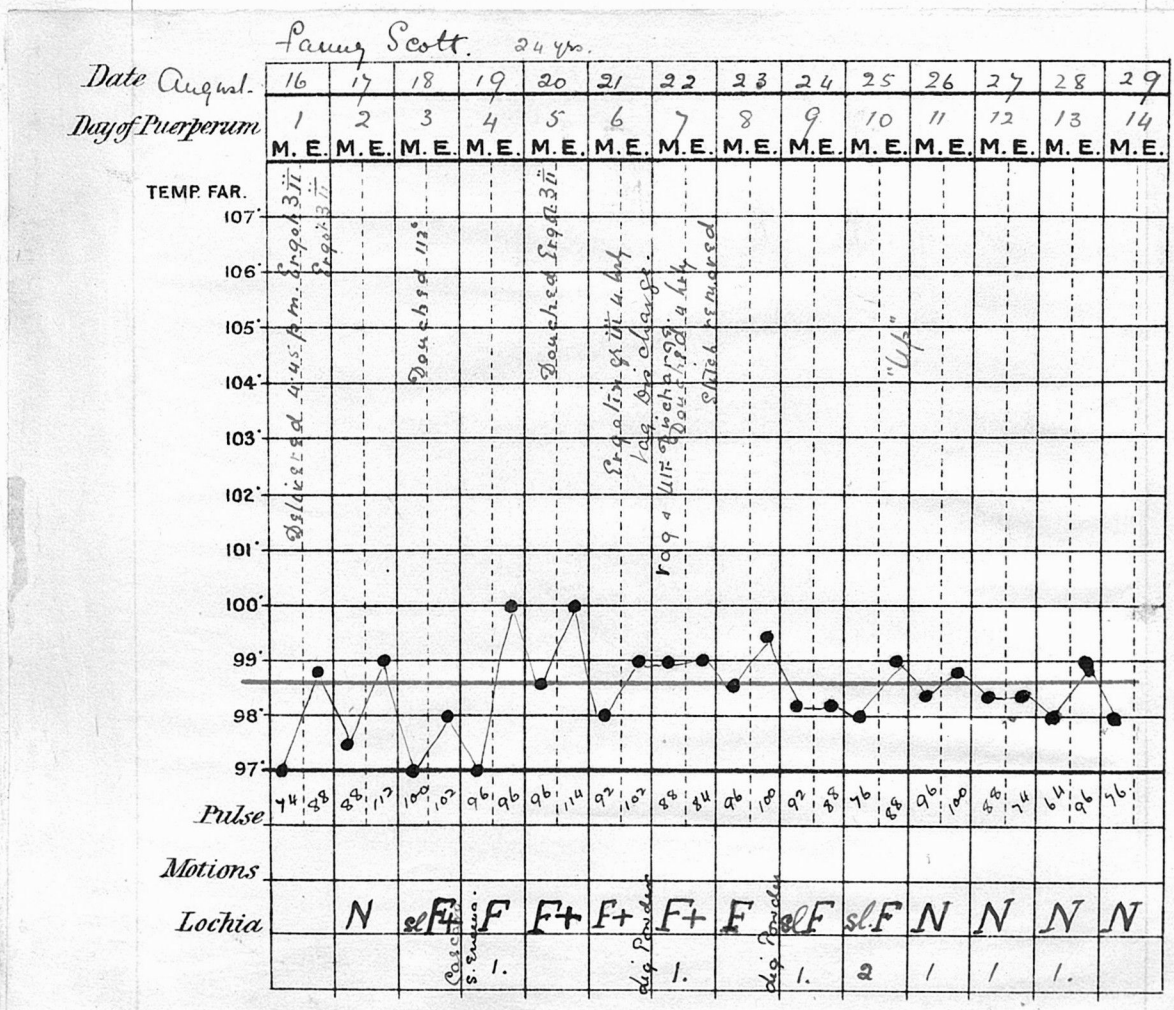
Direct Film : fair numbers of a similar coccus to the/

the previous one noted but staining a variable depth.

Agar Slope Film. Ditto.

Agar Stab Film. Similar organism but some forms rather oval and a number staining very faintly.

Bouillon Film: shows sporing bacillus as in bouillon of previous vaginal specimen.



II. Fanny S. 24, unmarried: primipara: delivery spontaneous:/

spontaneous: total duration 12 hours: considerable haemorrhage during 3rd stage with some laceration of vagina and perineum: one stitch in perineum. Presentation vertex: position L.O.A. Large live mature Child weight 9 lbs, 12 oz. As noted on the Chart, the lochia were fetid (F) or slightly fetid (sl.F) till a few days before patient's discharge from the ward.

The temperature was somewhat disturbed reaching 100°F on two occasions and 99° or over several times. The pulse was never seriously accelerated, 102 per min. being the maximum rate.

Involution of the uterus was considerably slower than normal and there was hardening and discomfort in the breasts for some days. On the 5th day a small piece of membrane came away. From the 6th till discharge, she had ergotin gr III 4 hourly, and frequent vaginal douches.

Specimens were obtained from the vagina on the 6th and 7th days and from uterus on the 7th day.

Patient refused to allow any further specimens to be obtained.

(5). Uterine specimen obtained on 7th day.

1. Agar Slope. Negative.
2. Agar Stab. Negative.
3. Gelatine. Negative.
4. Bouillon. Turbid.

Direct Film : very short bacillus mostly in pairs, showing distinct meta-chromasis: apparently a pure culture.

Bouillon Film: similar organisms.

(6) Vaginal specimen obtained on 6th day.

1. Agar Slope: two large round whitish colonies.
2. Agar Stab : Negative.
3. Gelatin : Fungus copions: no anaerobic growth.
4. Bouillon : Turbid, very.

Direct Film: shows short bacilli in pairs as in uterine specimen.

Agar Film : similar short bacilli: a few cocci.

(7) Vaginal specimen obtained on 7th day.

1. Agar Slope : numerous round whitish growths.
2. Agar Stab : some gas formation (?) profuse surface growth of similar appearance to (1)
3. Gelatine : growth.
4. Bouillon : turbid.

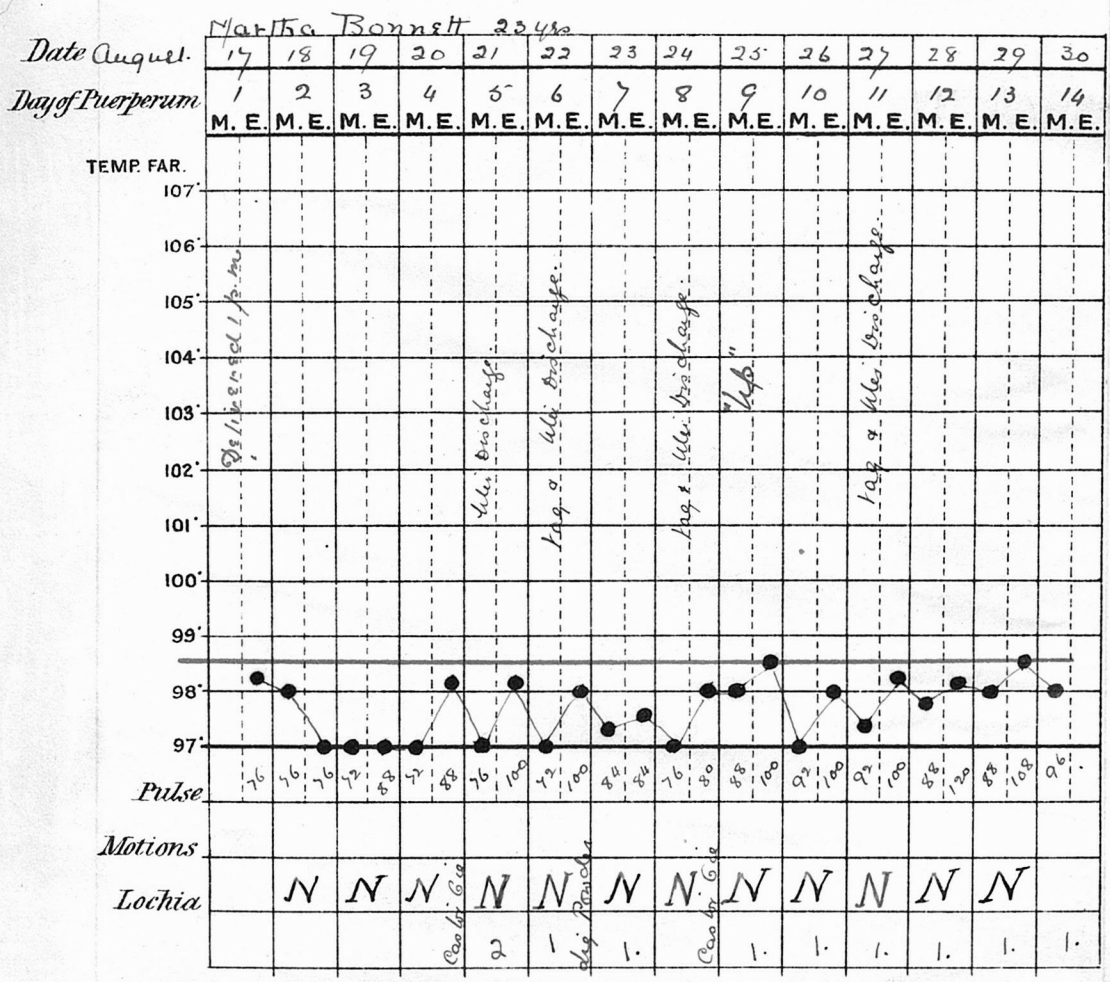
Direct Film: short bacillus often in pairs also some rounded and oval forms former abundant and generally in pairs.

Agar Slope Film: short bacillus of ten in pairs also number of large cocci in pairs roll shaped.

Stab Film /

Stab film: similar forms showing metachromasis : also large cocci and filaments.

Gelatine film: large oval sporing forms: other organisms similar to the above.



III. Martha B: unmarried, aet 23.

II para.

Delivery spontaneous: duration 15½ hours. No excessive haemorrhage : perineum intact.

Presentation/

Presentation vertex : position L.O.A. Child live and mature.

Temperature shows maximum of 98.4, maxim. pulse rate 120, after getting up. Lochia normal throughout.

Baby's eyes discharging pus from the 9th day: evidently ophthalmia neonatorum.

Specimens were obtained from the uterus on the 5th, 6th, 8th and 11th days, and from the vagina on the 6th, 8th and 11th days.

(8). Uterine specimen obtained on 5th day shows :-

1. Agar Slope: 3 or 4 round whitish colonies.
2. Agar Stab: slight growth, no gas.
3. Gelatin : surface contamination : no growth.
4. Bouillon : turbid.

Direct Film : shows a few small cocci irregularly grouped.

Agar Slope Film and Bouillon Film: similar organisms, slightly more numerous.

(9) Uterine specimen obtained on 6th day shows:-

1. Agar Slope. Negative to naked eye.
2. Agar Stab. Negative.
3. Gelatin. Negative.
4. Broth. Slightly turbid.

Direct films: shows no organisms.

Slope film. /

Slope Film. Staphylococcal forms as in preceding specimen, quite numerous.

Bouillon Film: same coccus, deeply staining, with a few slender rods: appearances like metachromasis: a few bacillary forms resembling those found in preceding case.

(10) Uterine specimen obtained on 8th day, shows :-

1. Agar Slope : one large whitish colony about ¼ inch in diameter.
2. Stab : Negative.
3. Agar overlayered. Negative.
4. Bouillon. Turbid.

Direct Film: much granular debris, simulating cocci.

Slope Film: shows similar organism to that found in preceding specimen but chains rather marked.

Bouillon Film: number of oval spores, few coccal forms.

(11) Uterine specimen obtained on 11th day shows :-

1. Agar Slope. Negative.
2. Agar Stab. Negative.
3. Agar overlayed. Negative.
4. Bouillon. Turbid.

Direct Film/

Direct Film: a few short bacilli: and a few oval spores.

Slope Film : a pure staphylococcus.

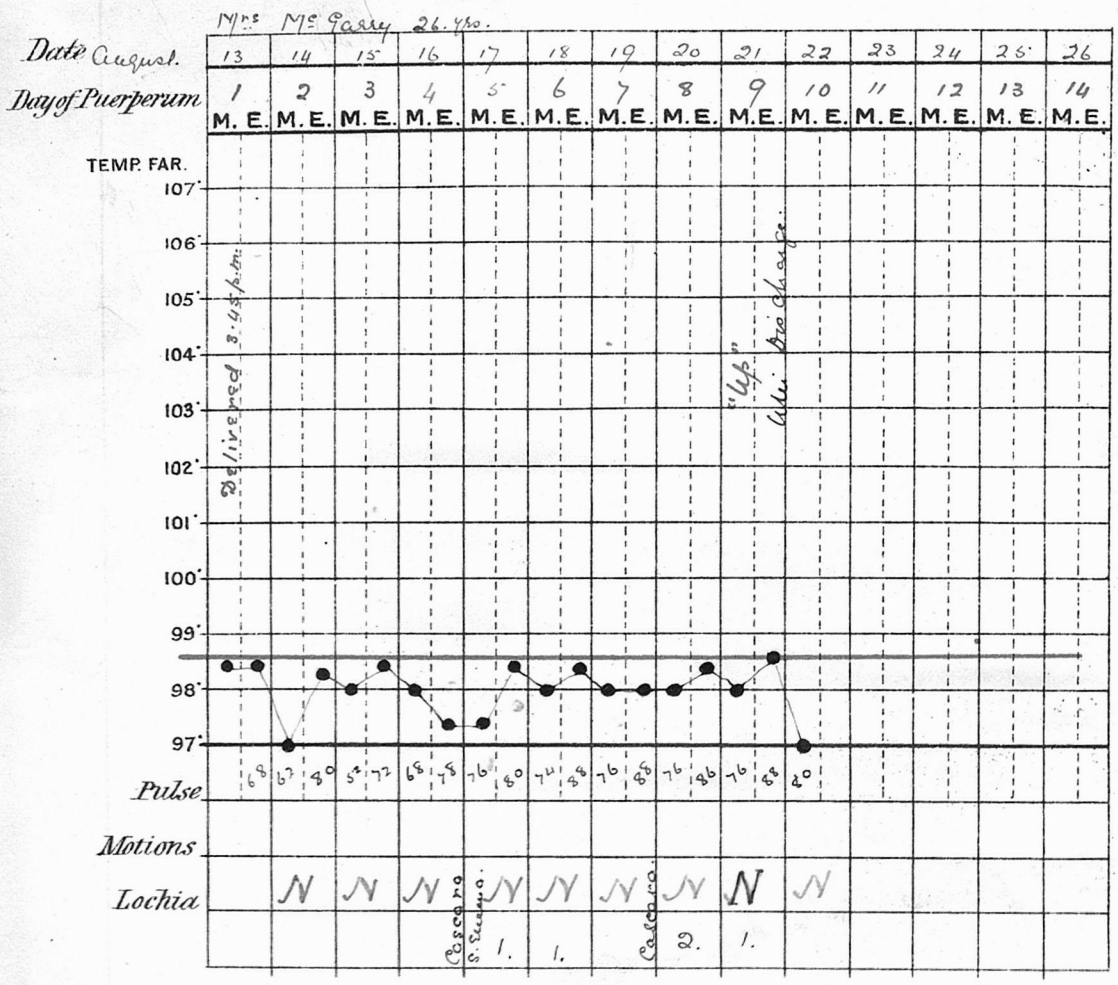
Bouillon Film : numbers of oval spores, a few bacillary forms and filaments.

(14) Vaginal specimen obtained on 11th day shows :-

1. Agar Slope: very slight growth.
2. Stab. Negative.
3. Agar overlayered Negative.
4. Bouillon. Very Turbid.

Direct Film: Cocci chiefly in pairs with occasional bacillary forms: appearances in places suggestive of spore formation.

Bouillon Film. Oval spores, bacilli and some coccal forms.



IV. Mrs. Mc.G (26) II para. delivered spontaneously: duration of labour 6 hours. No excessive haemorrhage. Perineum intact. Presentation vertex: position L. O. A. Child live and mature.

As the chart shows the temperature did not rise above 98.4, while patient remained in hospital: maximum pulse rate 88.

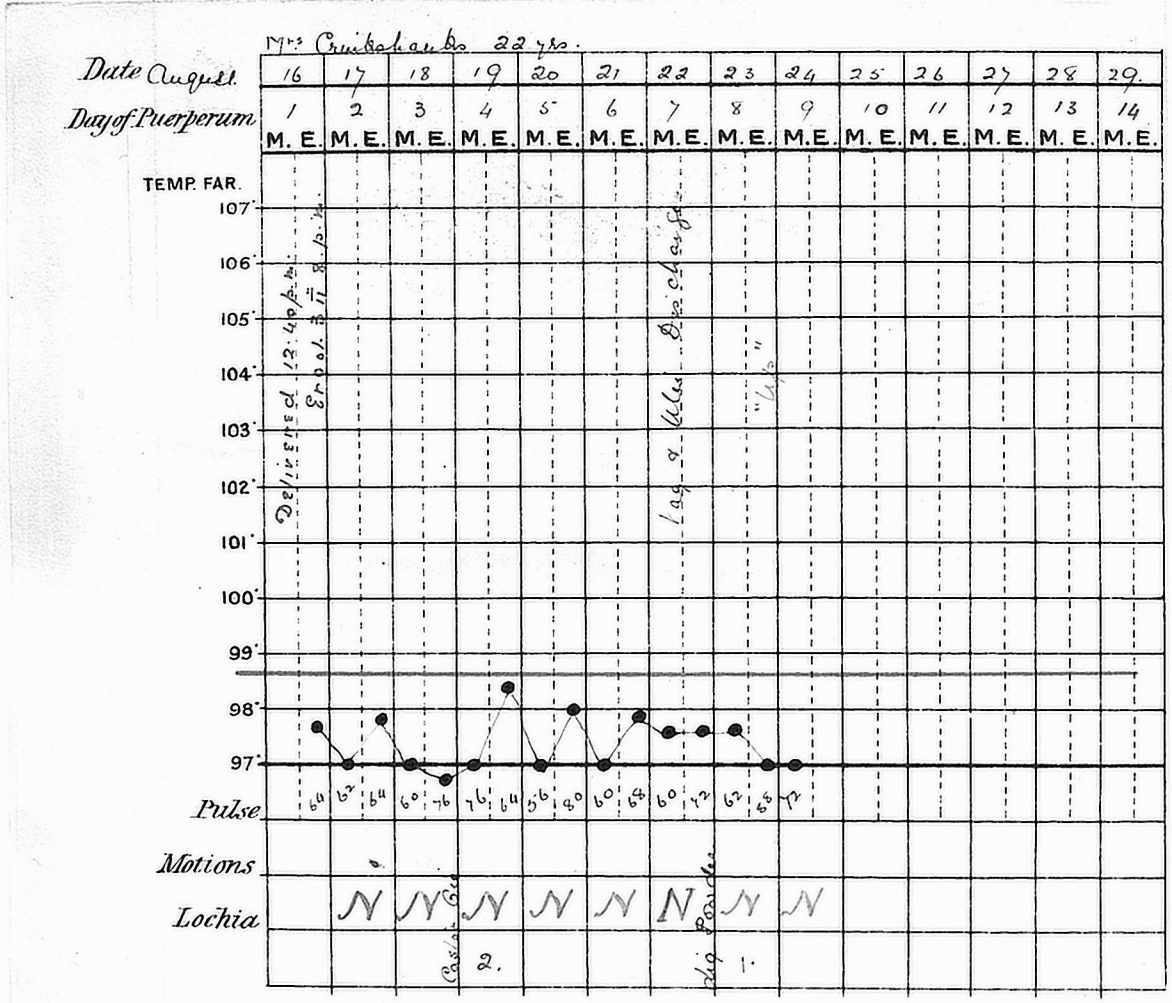
The lochia remained normal throughout. Only one specimen /

specimen was obtained, as patient was ready to leave hospital just when I began my observations.

(15) Uterine specimen obtained on 9th day shows :-

1. Agar Slope — Negative.
2. Agar Stab — Negative.
3. Gelatine. — Surface contamination.
4. Bouillon. — Negative.

Direct Film. — Large coccus, sometimes in pairs, with a halo.



V. Mrs. C/

Mrs. C. (22) III para.

Delivered spontaneously: duration of labour 8 hours.

No excessive haemorrhage: perineum intact.

Presentation vertex: position L.O.A. Child live and mature.

Maximum temperature during puerperium 98.4° : maxim pulse rate 88.

Lochia normal throughout. Uterine and vaginal specimens obtained on 7th day.

(16) Uterine specimen obtained on 7th day shows :-

1. Agar Slope — Negative.
2. Agar Stab. — Negative.
3. Gelatine. — Surface contamination.
4. Bouillon. — Negative.

Direct Film. — Large diplococcus similar to that found in preceding case not all with a halo.

(17). Vaginal specimen obtained on 7th day shows :-

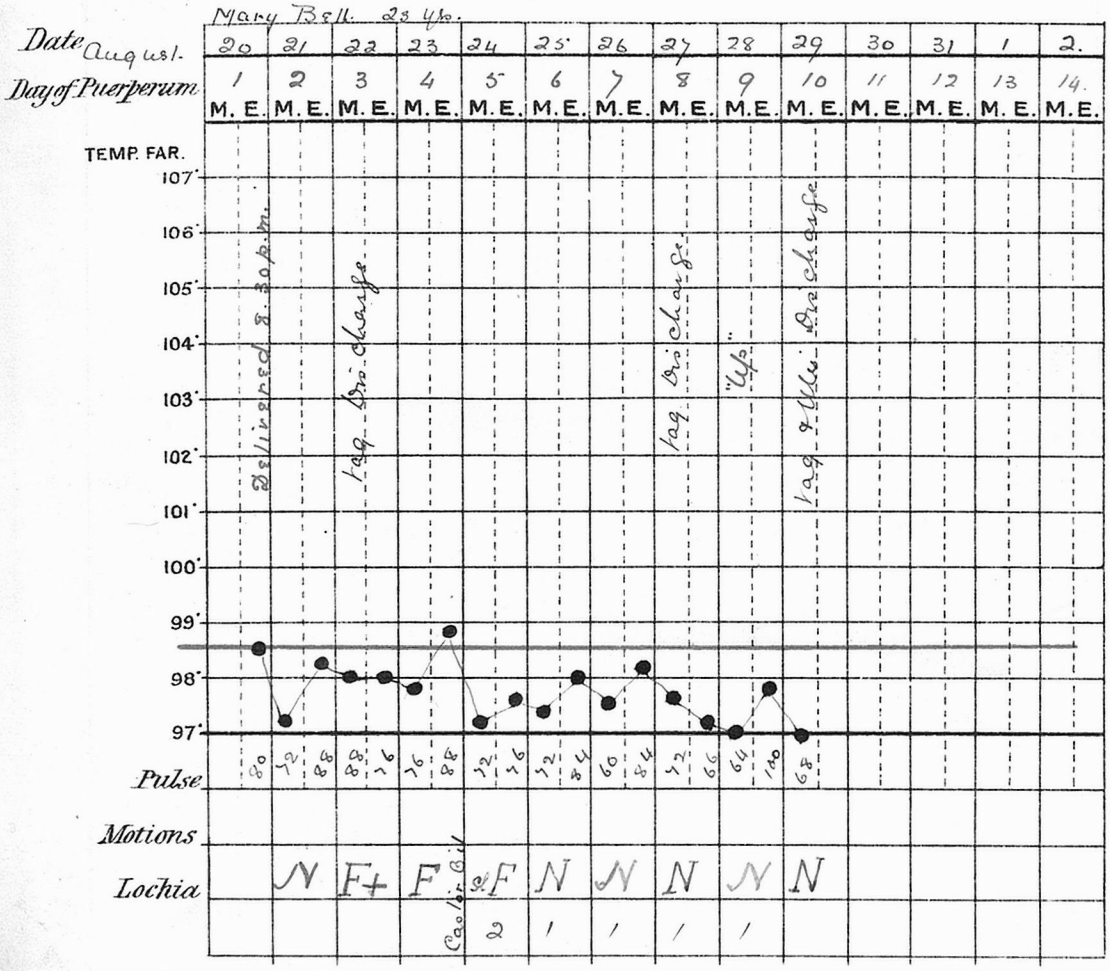
1. Agar Slope. — Single yellowish white colony about size of a pin head.
2. Agar Stab. — Negative.
3. Gelatine. — Negative.
4. Bouillon. — Very slight growth.

Direct Film. — Very occasional cocci.

Agar Slope Film. — Very short bacillus faintly staining.

Bouillon Film/

Bouillon Film. Distinct coccus in pairs and in groups: no bacilli.



VI. Mary B. (23) Primipara.

Delivery spontaneous: duration of labour 36 hours.

Perineum almost intact : no excessive haemorrhage.

Presentation vertex: position L.O.A.

Child live and mature.

Maximum temperature 98.8°: pulse 100 (after getting up)/

up.)

Lochia somewhat fetid on the 3rd, 4th and 5th days, and slightly more copious than normal.

Baby's eyes discharging on 9th day: gonococci demonstrated in pus.

Specimen obtained from uterus on the 10th day and specimens from vagina on the 3rd, 8th and 10th days.

(18) Uterine Specimen obtained on 10th day, shows :-

1. Agar Slope. Negative.
2. Agar Stab. Negative.
3. Agar overlayered. Doubtful.
4. Bouillon. Turbid.

Direct Film. Cocci and sporing forms bacilli long and short: some staining faintly: scanty.

Agar Film. Ditto.

Broth Film. Inconclusive.

(19) Vaginal Specimen obtained on 3rd day shows :-

1. Agar Slope. About a dozen small (pin head) round whitish colonies.
2. Agar Stab. Negative.
3. Gelatin. (Inoculated at same temperature as agar tubes) numerous round white colonies in liquefied gelatine.
4. Bouillon. Practically clear.

Direct Film. Very numerous bacilli and coccal forms, often in pairs, with metachromasis and sporing forms.

Slope Film. Large beaded and curved bacillus with metachromasis; large forms showing clubbing.

Gelatine Film. Small bacilli faintly staining: probable spore formation: large cocci in pairs and groups.

Broth Film. Cocci and small bacilli as in gelatine.

(20) Vaginal specimen obtained on 8th day shows :-

1. Agar Slope. Numerous small rounded whitish yellow colonies.

2. Agar Stab. Growth in stab : no gas: surface growth like that on slope.

3. Agar overlayered Numerous very small round growths beneath surface: copious surface growth as above.

4. Bouillon. Turbid.

Direct Film. Beaded and clubbed bacilli in large numbers: shorter bacilli with unequal staining: very occasional sporing. (This film is illustrated by photograph: no spores shown).

Agar Slope Film. Beaded and clubbed bacillus, not so abundant/

abundant.

Stab Film. Short bacilli, spores, clubbing metachromasis, cocci forms.

Bouillon Film. Beaded bacilli and large oval spores and some filaments : also cocci forms.

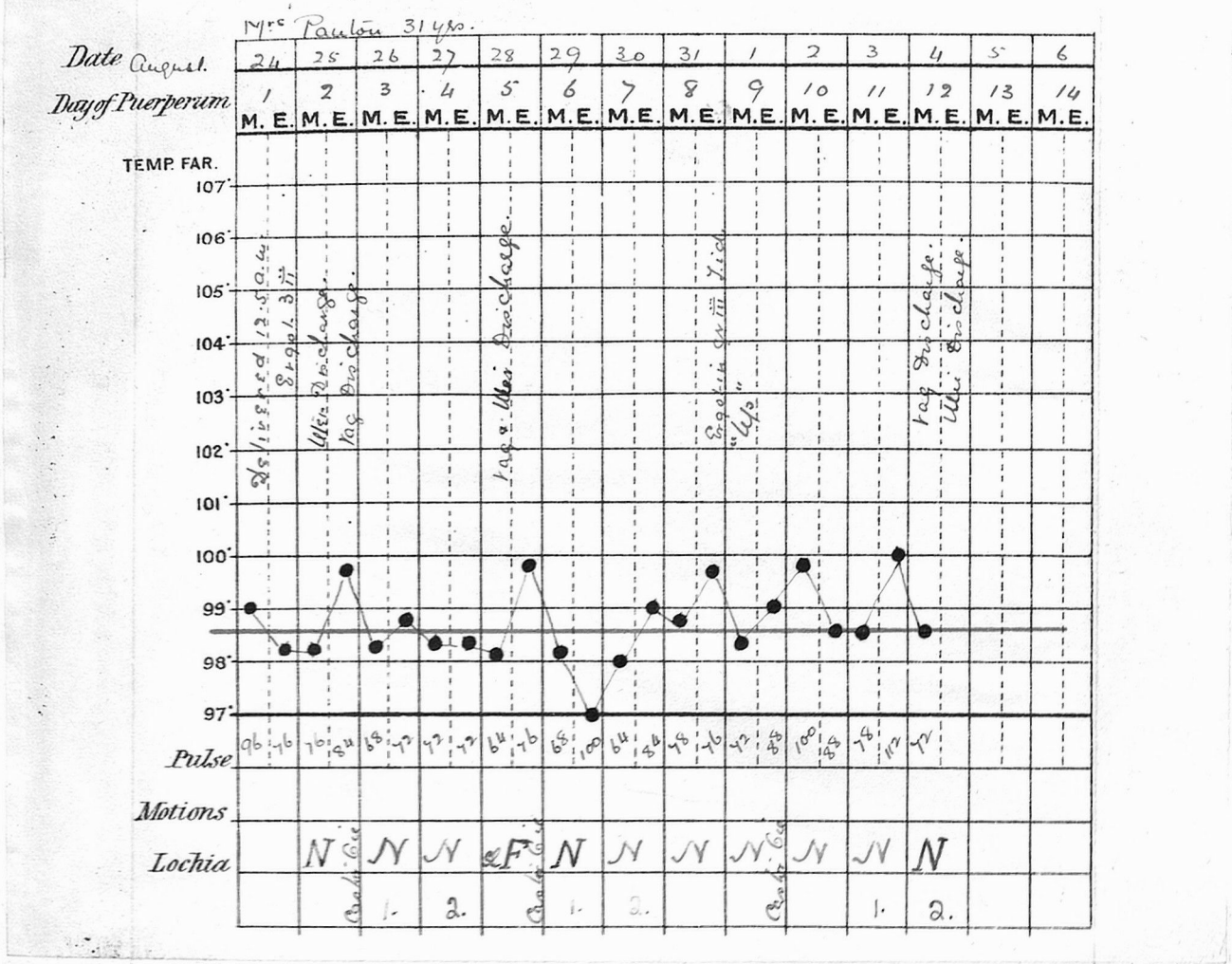
(21) Vaginal specimen obtained on 10th day shows :-

1. Agar Slope. Negative.
2. Agar Stab. Growth in stab: no gas.
3. Agar overlayered One or two small colonies.
4. Bouillon. Turbid.

Direct Film. Practically the same organisms as described in preceding specimen.

Stab Film. Cocci forms and sporing most marked: all other forms also present as in (20).

Bouillon Film. Very similar.



VII. Mrs. P. (32) III para.

Spontaneous delivery: duration of labour 2 hours.

Slight tendency to haemorrhage: perineum intact.

Presentation vertex: position L.O.A. Child live and mature.

Temperature here was disturbed on several occasions during puerperium without any evident cause: never however rose above 100°: the pulse rate 112 per/

per min, noted on the evening before discharge was easily accounted for by slight excitement. The lochia were only on one day slightly fetid, being normal otherwise. No trouble with breasts: Constipation may have been the cause of the temperature: at least a glance at the Chart, shows that movement of the bowels was on several occasions followed by a drop of temperature to normal.

Specimens of uterine discharge were obtained on the 2nd, 5th and 12th days and of vaginal discharge on same days.

(22). Uterine specimen obtained on 2nd day shows:-

1. Agar Slope. Negative.
2. Agar Stab. Negative.
3. Agar overlayered. No anaerobic growth: profuse surface growth.
4. Bouillon. Turbid.

Direct Film. Bacilli of various sizes, with curving, beading and meta-chromasis; cocci forms and occasional filaments.

Agar Film. Short stout bacillus: spores mainly free: no clubbing or filaments.

Bouillon Film. Long filaments, bacilli and occasional spores.

(23)/

(23) Uterine specimen obtained on 5th day shows :-

1. Agar Slope. Negative.
2. Agar Stab. Negative.
3. Agar overlayered Negative.
4. Bouillon. Turbid.

Direct Film. Long and short bacillary forms, occasional sporing.

Bouillon Film. Similar organism to that in bouillon of preceding (22)

(24) Uterine specimen obtained on 12th day shows :-

1. Agar Slope. Negative.
2. Agar Stab. Negative.
3. Agar overlayered. Negative.
4. Bouillon. Negative.

Direct Film. Very numerous organisms of similar type to those in(22) and (23) but smaller forms: no spores.

(25) Vaginal specimen obtained on 2nd day shows:-

1. Agar Slope Negative.
2. Agar Stab. Negative.
3. Agar overlayered Negative.
4. Bouillon . Turbid.

Direct Film. A few bacilli with unequal staining: no filaments or spores.

Bouillon Film. Bacilli long filaments and many free spores.

(26)/

(26) Vaginal secretion obtained on 5th day shows :-

1. Agar Slope — Single large yellowish white colony about ¼ inch diameter.
2. Agar Stab. — Profuse surface growths of similar nature: no anaerobic growth.
3. Agar overlayered — Numerous small disc shaped whitish yellow colonies.
4. Bouillon — Turbid.

Direct Film. — Abundant short bacillary forms, with beading and sporing - spores free - some short filaments. This film is illustrated by micro-photograph, but unfortunately no spores are shown.

Agar Slope Film. — Faintly staining short bacilli with beaded forms most numerous: occasional sporing and clubbing.

Stab Film. — Negative.

Agar overlayered Film. — Similar organisms shorter forms and occasional spores.

Bouillon Film. — Similar organisms, chiefly spores.

(27) Vaginal specimen obtained on 12th day shows :-

1. Agar Slope. — Number of round whitish yellow colonies.
2. Agar Stab. — Growth in stab: no gas.

3./

3. Agar overlayered. Two small disc-like colonies.

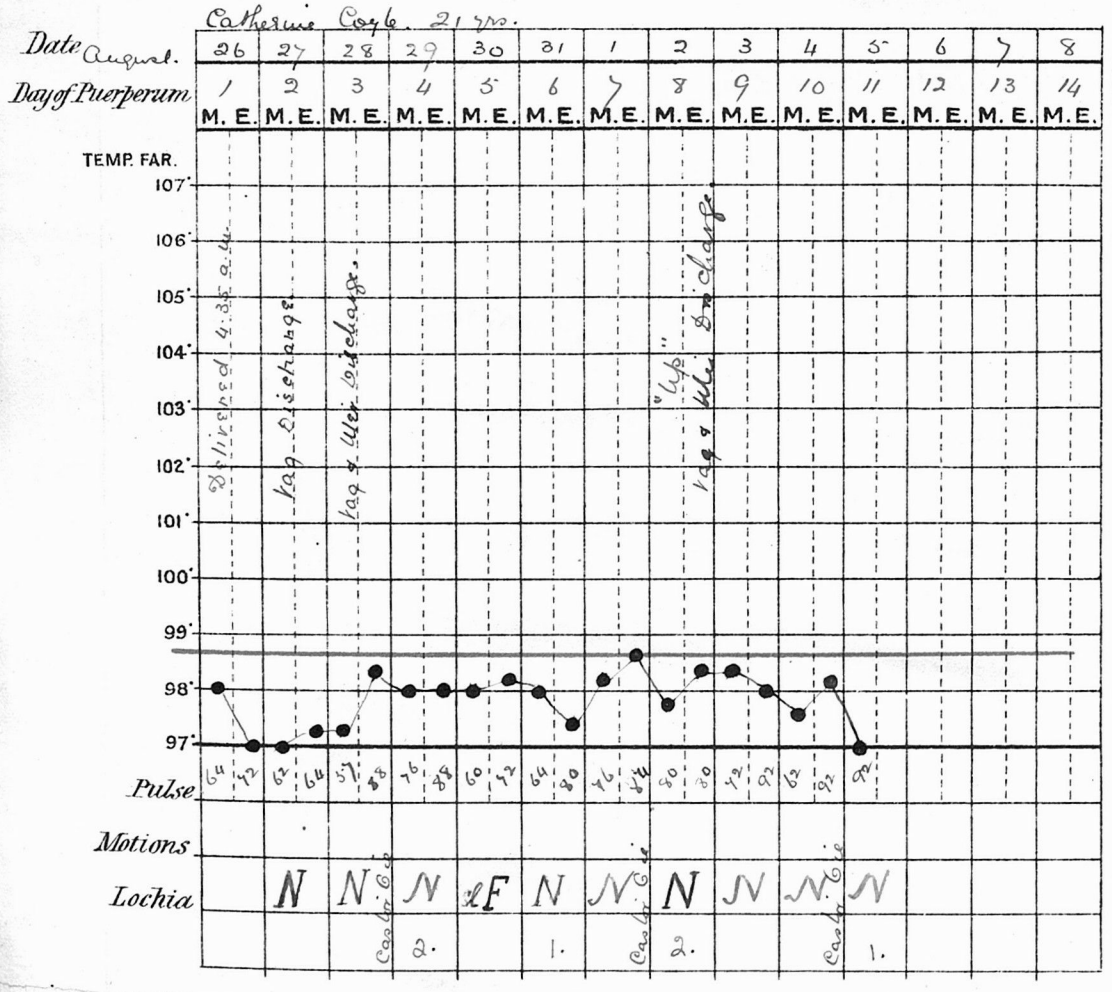
4. Bouillon. Turbid.

Direct Film. Short forms, and forms resembling diplococci: occasional free spores, and occasional fine filaments.

Agar Slope Film. Probably same organism: poor film.

Stab Film. Same organism, occasional free spores: large filaments.

Bouillon Film. Small beaded bacillus, simulating streptococci: occasional larger forms: very few spores.



VIII. Catherine C. (21) Primipara.

Spontaneous delivery: duration of labour 12 hours. No vaginal exams, child being born before patient could be got into bed. Head presentation. No haemorrhage. Perineum very slightly torn. Temperature did not rise above 98.4 maxim, pulse rate 92 day before discharge. Lochia slightly fetid on one day, otherwise practically normal.

Uterine specimens were obtained on the 3rd and 8th days, vaginal specimens on the 2nd, 3rd and 8th days.

(28) Uterine secretion obtained on 3rd day shows :-

1. Agar Slope. Negative.
2. Agar Stab. A number of very small whitish colonies just under surface.
3. Agar overlayered. Single yellowish disc.
4. Bouillon. Turbid.

Direct Film. Organisms with characteristics of gonococci in considerable numbers. (This film is illustrated by a microphotograph).

Stab Film. Beaded and clubbed bacilli with spores, somewhat resembling streptococci.

Agar overlayered Film. Large and small bacilli, especially latter: numerous free spores.

Bouillon Film. /

Bouillon Film. Free spores, filaments smaller cocci forms in order of frequency.

(29) Uterine specimen obtained on 8th day shows :-

1. Agar Slope. Negative.
2. Stab. Negative.
3. Agar overlayered. Negative.
4. Bouillon. Negative.

Direct Film. Forms like gonococci with smaller bacillary beaded forms, no spores.

(30) Vaginal specimen obtained on 2nd day shows :-

1. Agar Slope. Three small rounded whitish yellow colonies.
2. Agar Stab. Slight growth near surface and also some surface growth similar in colour to that on slope.
3. Agar overlayered. Number of very small whitish colonies.
4. Bouillon. Turbid.

Direct Film. Abundant small bacillary and cocci forms with metachromasis of clubbed ends.

Agar Slope Film. Beaded forms like almost identical with those in (19) with clubbing and metachromasis.

Stab Film./

Stab Film. Similar organisms to those in previous case: no free spores.

Agar overlayered Film. Smaller and larger forms of same with occasional free spores.

Bouillon Film. Mainly spores and filaments and faintly staining bacilli.

(31) Vaginal Secretion obtained on 3rd day shows :-

1. Agar Slope. Negative.
2. Agar Stab. Doubtful.
3. Agar overlayered. 3 or 4 rounded whitish colonies
4. Bouillon Turbid.

Direct Film. Smaller cocci forms and occasional bacilli with spores: a few gonococcal forms.

Bouillon Film. Free spores, filaments, small cocci forms in order of frequency.

(32) Vaginal specimen obtained on 8th day shows :-

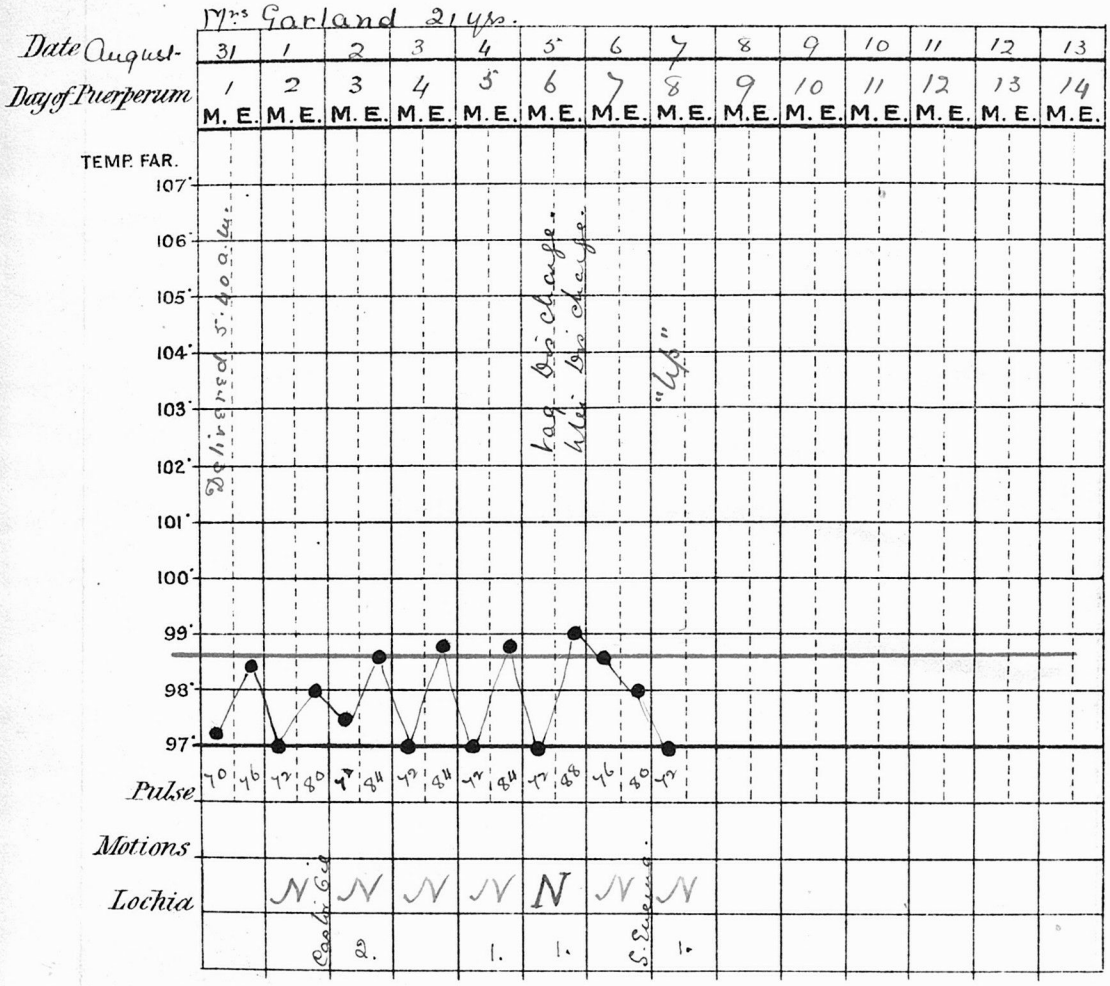
1. Agar Slope. Two large round whitish yellow colonies.
2. Agar Stab. Growth in stab: no gas.
3. Agar overlayered Numerous small whitish yellow disc-shaped colonies.
4. Bouillon. Turbid.

Direct Film. Small forms with bacilli and spores free and occasional forms resembling gonococci around nuclei.

Stab Film./

Stab Film. Beaded and clubbed bacilli especially latter: a few spores.

Bouillon Film. Beaded bacilli resembling streptococci with number of free spores.



IX. Mrs. G. (21) Primipara.

Spontaneous delivery: duration indefinite labour being painless till head appeared on perineum. No excessive/

excessive haemorrhage, perineum almost intact. Child premature, live, maximum temperature 99°, maxim pulse 88 per min. Lochia normal in appearance through out.

One uterine specimen was obtained on the 6th day and one vaginal specimen on same day.

A vaginal specimen was obtained three days before delivery, the details of which are as follows.

1. Agar Slope. Negative.
2. Agar Stab. Growth in stab: no gas.
3. Agar overlayered Negative.
4. Bouillon. Turbid.

Direct Film. Small bacilli often in pairs end to end: slight beading: early spore formation.

Stab Film. Scanty organisms practically same.

Bouillon Film. Bouillon was lost owing to breaking of test tube before film made.

(33). Uterine specimen obtained on 6th day was mostly blood with yellow flakes.

1. Agar Slope. Single small colony.
2. Agar Stab. Negative.
3. Agar overlayered Negative.
4. Bouillon. Slightly turbid.

Direct film. Cocci and short bacilli : forms with commencing spore formation.

Bouillon Film./

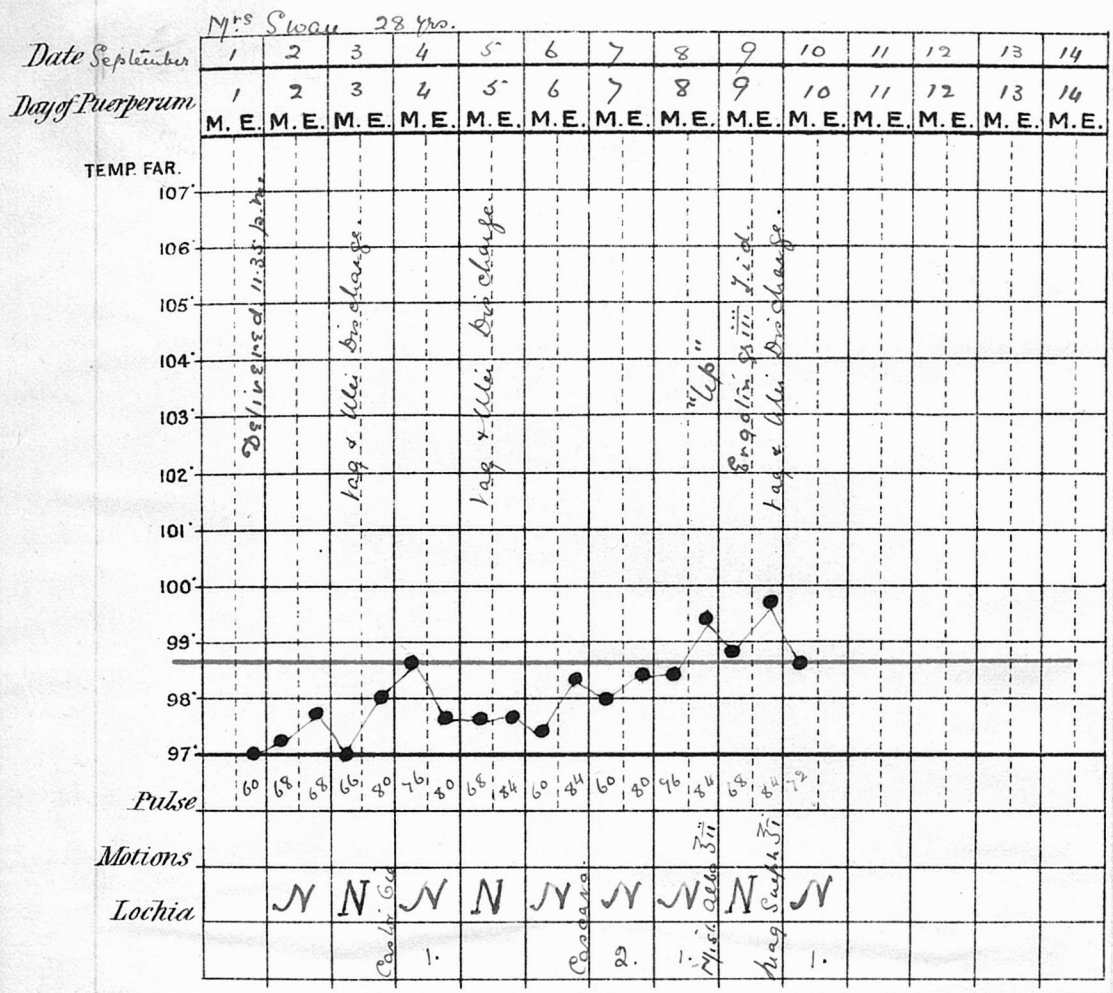
Bouillon Film. Filaments of bacilli, longest and most numerous noted so far :- occasional free spores.

(33) Vaginal specimen obtained on the 6th day, scanty blood stained glairy.

1. Agar Slope. Negative.
2. Agar Stab. Negative.
3. Agar overlayered Negative.
4. Bouillon. Slightly turbid.

Direct film. Mainly beaded bacillary forms with occasional cocci forms and clubbing: early spore formation.

Bouillon Film. Beaded bacillary forms, early spore formation.



X. Mrs. S. (28) III para.

Delivery spontaneous: duration 7 hours. No haemorrhage: perineum intact. Brow presentation. Child live and mature (?)

The maximum temperature of this patient was 99.8, and pulse rate 84: this occurred the night before discharge, and could only be accounted for by the excitement or constipation, the pelvic organs being to all appearances, normal.

Lochia/

Lochia normal throughout. The breasts were hard and slightly red on the 8th and 9th days, this being another possible cause of the disturbance of temperature.

Uterine and vaginal specimens were obtained on the 3rd, 5th and 9th days.

(35) Uterine specimen obtained on 3rd day shows :-

1. Agar Slope. Negative.
2. Agar Stab. Negative.
3. Agar overlayered Negative.
4. Bouillon. Slightly turbid.

Direct Film. Very scanty short forms with very occasional spores : thin film.

Bouillon Film. Inconclusive.

(36) Uterine specimen obtained on 5th day was fairly copious, somewhat fluid, bloody with yellow flakes: showed :-

1. Agar Slope. Negative.
2. Agar Stab. Negative.
3. Agar overlayered. Negative.
4. Bouillon. Slightly turbid.

Direct Film. Very occasional cocci forms, a few spores and bacilli.

Bouillon Film. Bacillary forms and spores.

(37) Uterine specimen obtained on 9th day, fairly copious, fluid, bloody, shows :-

1. Agar Slope. Negative.
2. Agar Stab. Negative.
3. Agar overlayered. Negative.
4. Bouillon. Negative.

Direct Film. Coccal forms, usually diplococci with capsules, partially decolorised by Gram.

(38) Vaginal specimen obtained on 3rd day shows :-

1. Agar Slope. Negative.
2. Agar Stab. Negative.
3. Agar overlayered. Negative.
4. Bouillon. Turbid.

Direct Film. Occasionally bacillary forms with spore formation.

Bouillon Film. Large filaments, free spores, metachromasis.

(39) Vaginal specimen obtained on 5th day scanty, blood-stained glairy fluid shows:-

1. Agar Slope. Profuse growth of small round whitish colonies.
2. Agar Stab. Growth in stab: no gas, whitish surface growth.
3. Agar overlayered. Growth on surface and immediately/

immediately beneath: bubble of gas at bottom of tube.

4. Bouillon. Turbid.

Direct Film. Long and short bacillary forms, occasional spores: cocci forms all tolerably abundant.

Slope Film. Short bacillus staining uniformly, resembling B. coli.

Stab Film. Short bacillary and coccal forms with beading and occasional spore formation.

Bouillon Film. Short and long bacilli, cocci forms : beading of bacilli giving appearance of streptococci.

(40) Vaginal specimen obtained on 9th day scanty blood stained.

1. Agar Slope. Several whitish yellow colonies coalescing rather irregularly and tending to spread in a manner resembling bac. coli.

2. Agar Stab. Well marked growth in stab: no gas.

3. Agar overlayered. Number of very small whitish disc-shaped colonies under surface: profuse surface growth.

4. Bouillon. Turbid.

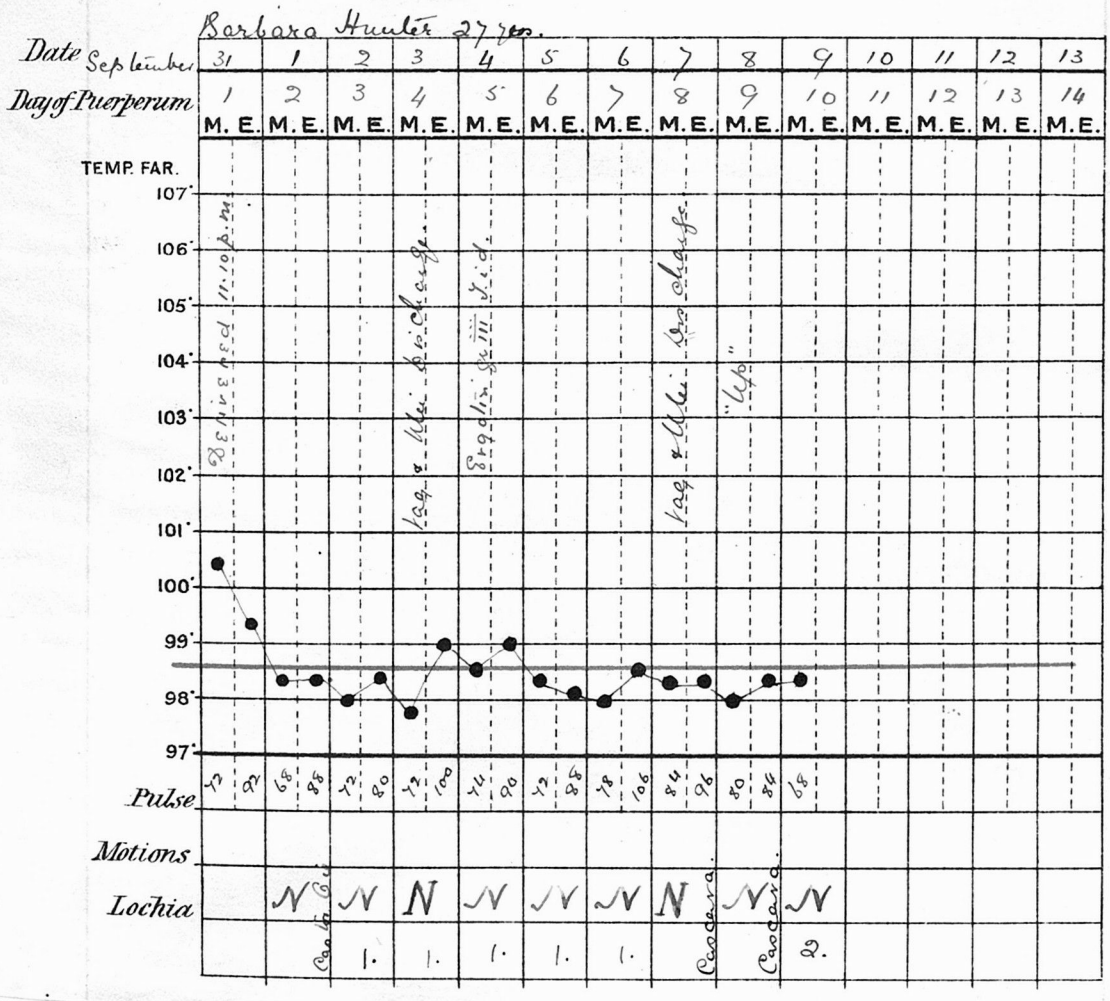
Direct Film. Short bacilli, beading: cocci forms abundant/

abundant: no spores. Stain by Gram-Weigart.

Slope Film. Short bacilli staining uniformly, resembling bac. coli. (This film is illustrated by a microphotograph).

Stab Film. Short bacillary forms, staining deeply: also faintly stained bacillary forms: appearances of spores: some beaded and cocci forms.

Bouillon form. similar to stab film.



XI. Barbara H./

XI. Barbara H. 27 unmarried II para.
Delivery spontaneous: duration 7 hours. No excessive haemorrhage; perineum intact . Presentation vertex: position L.O.A.. Child live and mature. Maximum temperature after day of delivery 99° P. 106. Lochia normal throughout.

Specimens obtained from uterus and vagina on the 4th and 8th days of puerperium.

For some days this patient complained of some pain and slight tenderness in left leg and thigh,— apparently superficial thrombosis.

(41) Uterine specimen obtained on 4th day shows :-

1. Agar Slope. Negative.
2. Agar Stab. Negative.
3. Agar overlayered Negative.
4. Bouillon. Clear.

Direct Film. Very occasional cocci and diplococci forms.

(42) Uterine specimen obtained on 8th day copious fluid reddish brown shows :-

1. Agar Slope. Negative.
2. Agar Stab. Negative.
3. Agar overlayered Negative.
4. Bouillon. Turbid.

Direct Film./

Direct Film. Fairly numerous short forms especially in pairs: organisms resembling gonococci.

Bouillon Film. Bacillary forms, beading and clubbing, with curving of rods and appearances suggestive of spore formation.

(43) Vaginal specimen obtained on 4th day, shows :-

1. Agar Slope. Single very small colony.
2. Agar Stab. Slight surface growth.
3. Agar overlayered. Negative.
4. Bouillon. Turbid.

Direct Film. Bacilli small and large with spores. Cocci forms abundant.

Slope Film. Cocci and beaded forms.

Bouillon Film. Mainly cocci forms: very few bacilli.

(44) Vaginal specimen obtained on 8th day, moderate quantity, leucorrhoeal in appearance, shows :-

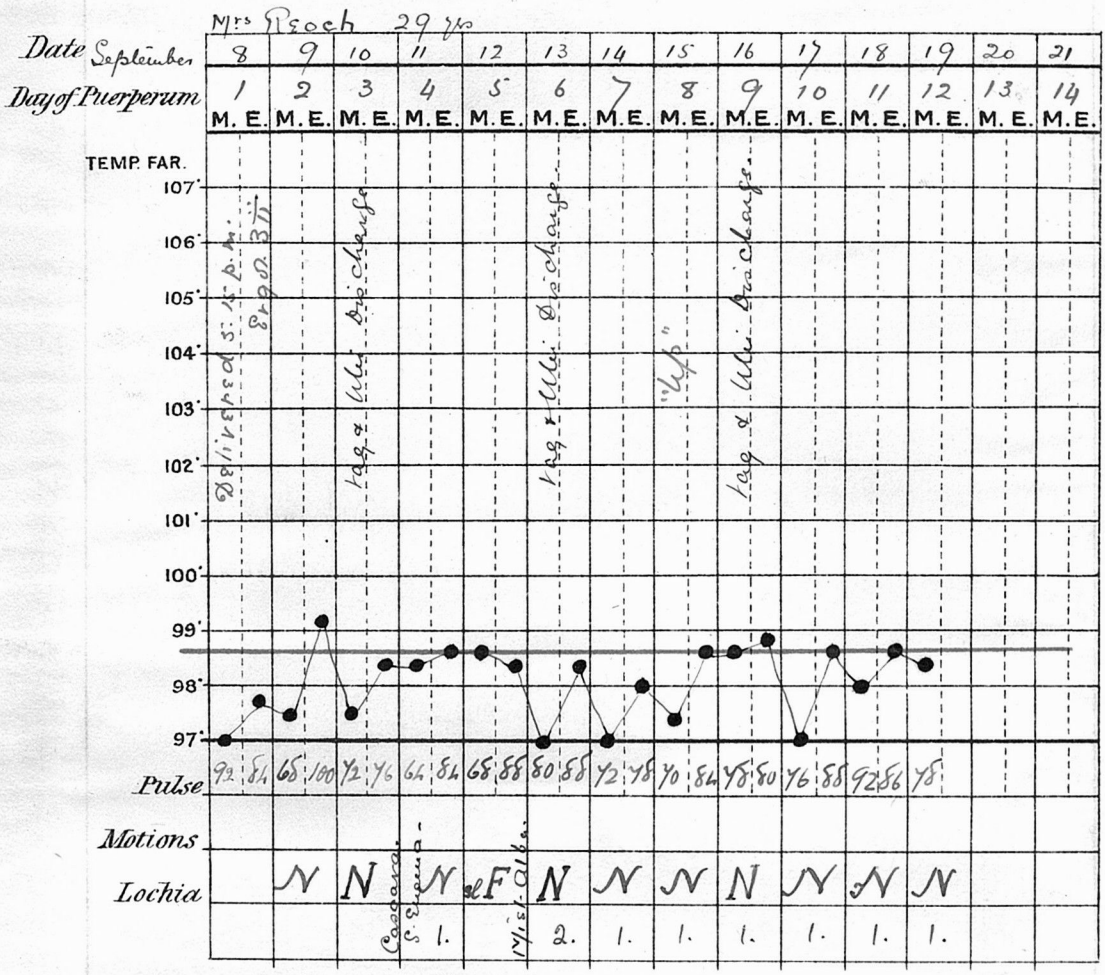
1. Agar Slope. Two round whitish colonies, about size of pin head and a pin point respectively.
2. Agar Stab. Negative.
3. Agar overlayered Negative.
4. Bouillon. Doubtful.

Direct Film.

Direct Film. Beaded bacilli and cocci chiefly in pairs: scanty.

Slope Film. Short bacillary forms with beading and occasional clubbing.

Bouillon Film. Negative.



XII. Mrs.R. (29) VI. para.

Spontaneous delivery: duration 7 hours. No excessive haemorrhage: perineum intact. Presentation vertex: position/

position L. O. A. Child live and premature. Pelvis generally contracted, maximum temperature 99.2°, pulse rate 100 on second day after labour; thereafter maximum temperature 98.8°. Lochia slightly fetid on 5th day, otherwise normal: On 5th day patient had a slight rigor and her breasts were a little hard. She was somewhat anaemic poorly nourished woman but made quite a good recovery.

Three specimens were obtained from the uterus and vagina on the 3rd, 6th and 9th days.

(45) Uterine specimen obtained on 3rd day, copious mixed blood and yellow flakes, shows :-

1. Agar Slope. Two whitish irregularly rounded colonies about $\frac{1}{8}$ inch in diameter.
2. Agar Stab. Negative.
3. Agar overlayered. Negative.
4. Bouillon. Turbid.

Direct Film. Very scanty cocci and diplococci forms.

Slope Film. Short bacilli with beaded forms and in pairs.

Bouillon Film. The same with well marked meta-chromasis.

(46) /

(46) Uterine specimen obtained on 6th day copious, fluid, bloody, not fetid. shows :-

1. Agar Slope. Negative.
2. Agar Stab. Negative.
3. Agar overlayered Negative.
4. Bouillon. Clear.

Direct Film. Short bacillary and cocci forms tolerable abundant. Stain by Gram especially diplococci forms.

(47) Uterine specimen obtained on 9th day, fairly copious, bloody with flakes, shows :-

1. Agar Slope. Four large round whitish colonies.
2. Agar Stab . Growth in Stab: no gas.
3. Agar overlayered. Two very small disc shaped colonies beneath surface: profuse surface growth similar in appearance to slope.
4. Bouillon. Turbid.

Direct Film. Occasional short bacillary forms: Stain by Gram.

Agar Slope Film. Cocci, beaded bacilli, with metachromasis.

Stab Film. Similar to slope film.

Bouillon Film. Debris: occasional bacilli.

(48) /

(48) Vaginal specimen obtained on 3rd day, scanty, resembling leucorrhoeal discharge, shows :-

1. Agar Slope. Five whitish rounded colonies.
2. Agar Stab. Negative.
3. Agar overlayered Several disc shaped whitish colonies, about 2 m.m diameter.
4. Bouillon. Clear.

Direct Film. Scanty cocci chiefly in pairs.
Slope Film. Short bacilli forms with beading and tendency in places to clubbing: no spores noted.

(49) Vaginal specimen obtained on 6th day. scanty, fluid, whitish, shows :-

1. Agar Slope. Profuse growth of small round whitish colonies.
2. Agar Stab. Growth in stab: no gas.
3. Agar overlayered Negative.
4. Bouillon. Turbid.

Direct Film. Beaded bacilli, cocci forms abundant: stain by Gram, and show with it appearances of sporing.
Slope Film. Same beaded organism with metachromasis and clubbing.
Bouillon Film. Same but smaller forms with diplococci forms and metachromasis.

(50) /

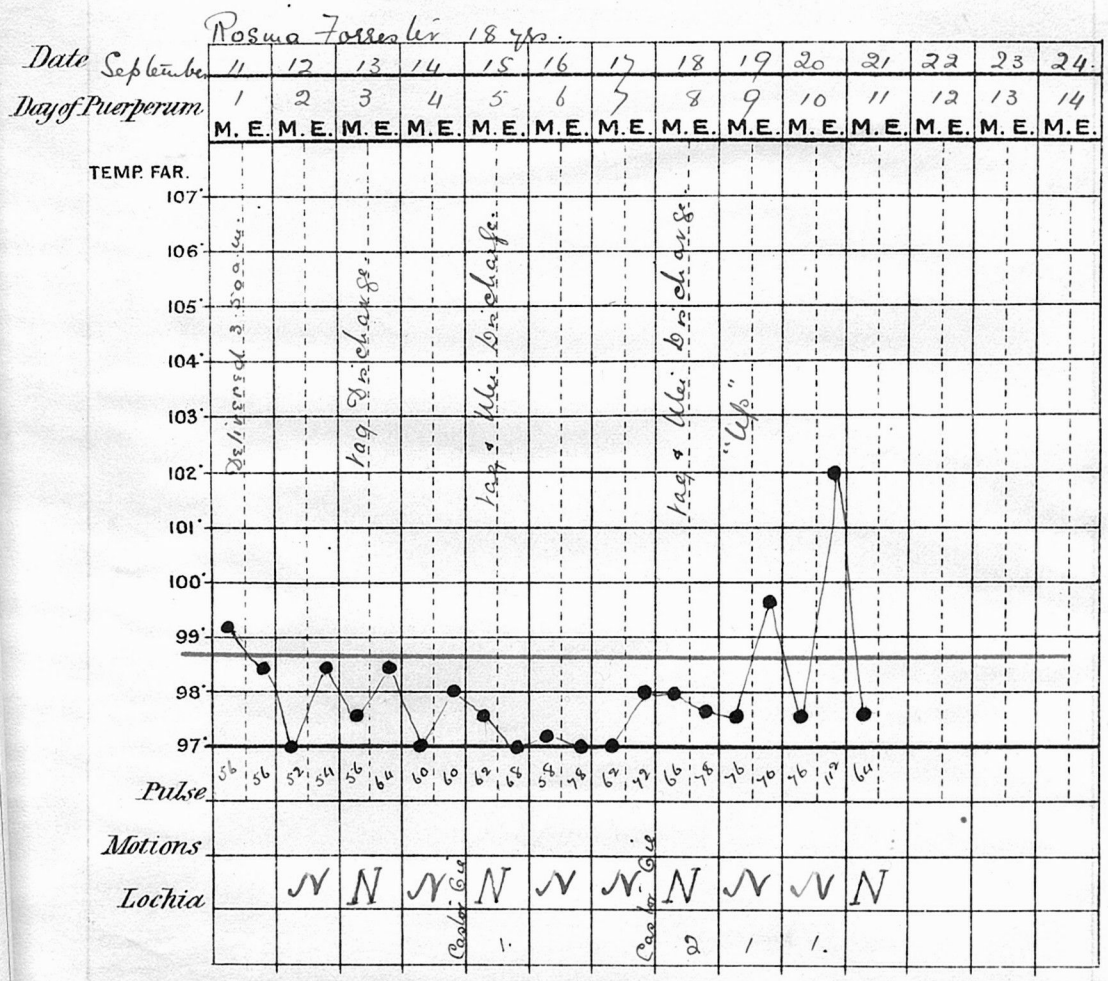
(50) Vaginal specimen obtained on 9th day: scanty, slightly fetid, blood stained, glairy, shows :-

1. Agar Slope. Negative.
2. Agar Stab. Growth in stab: no gas.
3. Agar overlayered. Negative.
4. Bouillon. Turbid.

Direct Film. Short bacillary and coccal forms: staining by Gram.

Stab Film. Cocci in groups and singly.

Bouillon Film. Short bacillary forms and cocci.



XIII. Rosina F.(18) primipara/

XIII. Rosina F. (18) Primipara.

Spontaneous delivery: duration of labour 6 hours. No excessive haemorrhage: perineum almost intact: no vaginal examinations during labour.

Presentation vertex: position L. O. A. Child live and mature.

This patient's temperature remained normal till the 9th and 10th days of puerperium when it rose to 99.6° and 102°F. respectively. Abdominal examination was negative: pelvic pain absent. Lochia normal. Examination of the throat, however, revealed a quite definite tonsillitis and pharyngitis, so that I think I may fairly include this case under the heading of patients with normal puerperium, having regard to the pelvic organs.

Uterine specimens were obtained on the 5th and 8th days and vaginal specimens on the 3rd, 5th and 8th days.

The Lochia were normal throughout.

(51) Uterine specimen obtained on the 5th day, fairly copious, dark blood stained with a few flakes, shows :-

1. Agar Slope. Negative.
2. Agar Stab. Negative.
3. Agar overlayered. Negative.
4. Bouillon. Negative.

Direct Film./

Direct Film. Very scanty bacillary forms, usually short: Stain by Gram.

(52) Uterine specimen obtained on the 8th day, copious, bloody, with flakes, not fetid, shows :-

1. Agar Slope. Negative.
2. Agar Stab. Negative.
3. Agar overlayered. Negative.
4. Bouillon. Negative.

Direct Film. (meth blue) quite negative; stained by Gram: oval and diplococci forms as in (51).

(53) Vaginal specimen obtained on 3rd day, scanty blood stained fluid, shows :-

1. Agar Slope. Negative.
2. Agar Stab. Growth: no gas.
3. Agar overlayered. Number of small disc shaped colonies just under surface.
4. Bouillon. Slightly turbid.

Direct Film. Slender and stout bacillary forms with uniform staining, occasionally bipolar, and occasionally in pairs. Stain by Gram.

Stab Film. (Made somewhat later than others) evidently overgrown, being almost entirely spores.

Bouillon. Inconclusive.

(54) Vaginal specimen obtained on 5th day, scanty, bloodstained fluid, not fetid, shows :-

1. Agar Slope. Negative.
2. Agar Stab. Growth in Stab: no gas.
3. Agar overlayered. Negative.
4. Bouillon. Slightly turbid.

Direct Film. Bacillary and coccal forms in pairs: Stain faintly by Gram.

Stab Film. Stout bacillary and coccal forms.

Bouillon Film. Ditto.

(55) Vaginal specimen obtained on 8th day, fairly copious, reddish brown fluid, shows :-

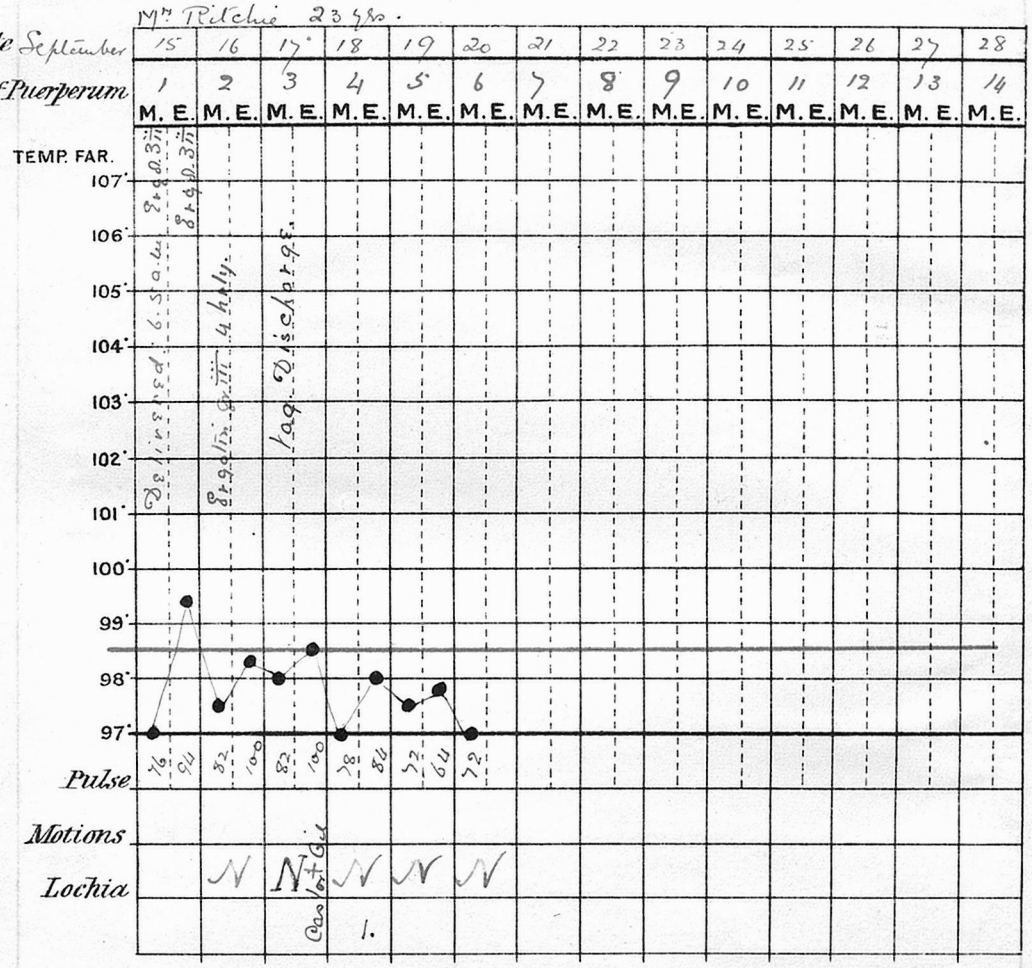
1. Agar Slope. Four rounded whitish colonies about $\frac{1}{8}$ inch diameter.
2. Agar Stab. Growth in stab: no gas.
3. Agar overlayered. Growth fairly copious.
4. Bouillon. Turbid.

Direct Film. Cocci mainly in pairs with short stout bacilli: stain by Gram.

Slope Film. Large and small coccal forms in pairs and chains.

Stab Film. Short bacillary forms in pairs, oval and cocci forms with metachromasis.

Bouillon Film. Very similar to stab film.



XIV. Mrs. R. (23) II para.

Spontaneous delivery: duration 8½ hours. No vaginal examinations. Perineum intact. No excessive haemorrhage.

Head presentation. Child live and mature.

This patient's maximum temperature of 99.4 occurred on the day of labour: thereafter, the thermometer never registered anything above 98.4: maxim pulse rate 100.

On/

On the third day after labour there was some tendency to haemorrhage, which was readily checked by ergot. The Lochia were normal, except for slight increase mentioned.

Owing to patient's objections only one vaginal specimen was obtained on the 3rd day.

(56) Vaginal specimen obtained on 3rd day, copious blood stained, not fetid.

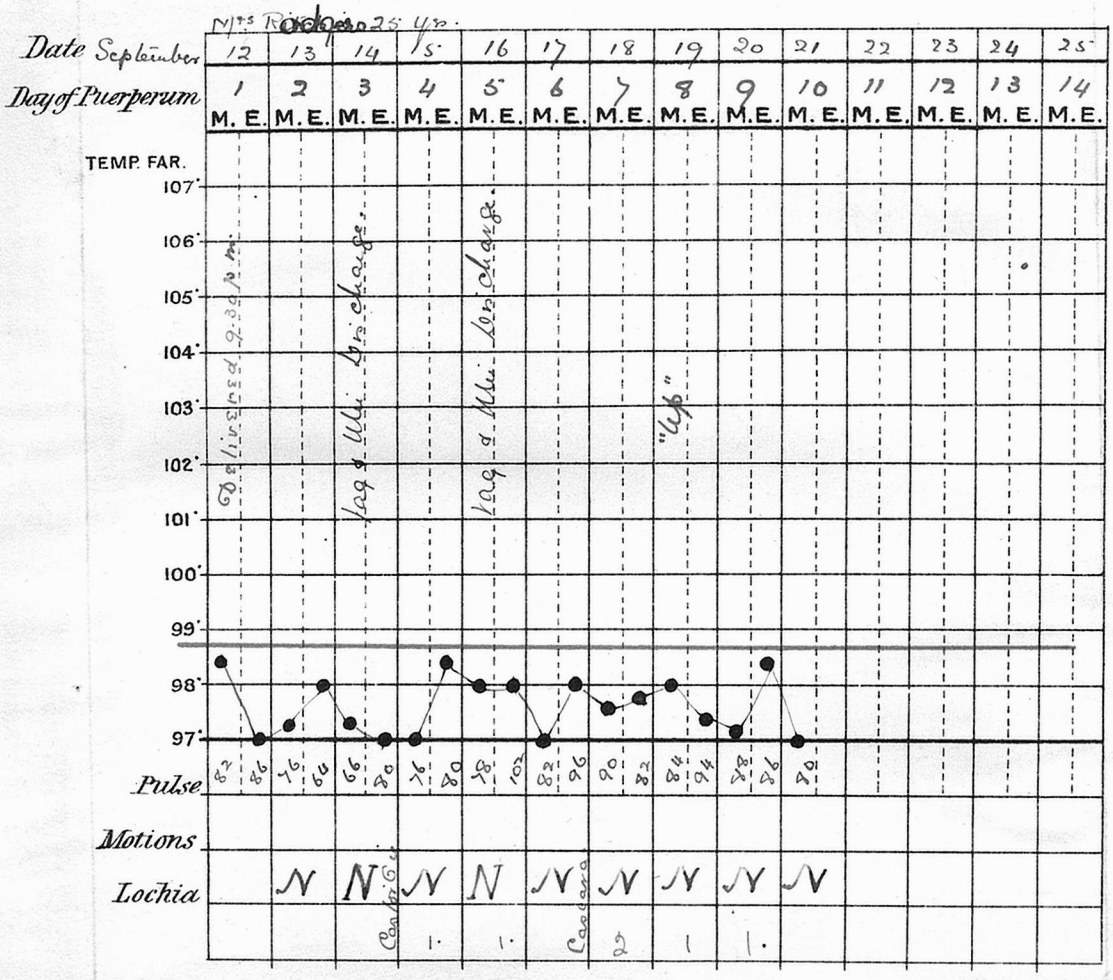
1. Agar Slope. Two small round whitish colonies
2. Agar Stab. Growth in Stab: no gas.
3. Agar overlayered. Two or three small colonies.
4. Bouillon. Turbid.

Direct Film. Cocci, diplococci, short and long bacillary forms: abundant: Stain by Gram.

Slope Film. Cocci chiefly in pairs and oval forms; very occasional short bacilli.

Stab Film. Very similar to preceding one.

Bouillon Film. Same as Agar Slope and Stab: bacillary forms more pronounced.



XV. Mrs. R. (25) IV. para.

Delivery spontaneous: duration 18 hours. Well marked hydramnios, membranes being ruptured artificially 3½ hours before delivery. No excessive haemorrhage.

Perineum intact.

Presentation, vertex: position L. O. A.

Child live and mature.

Maximum/

Maximum temperature 98.4°, pulse 94 (after getting up) Lochia normal throughout.

Two uterine and two vaginal specimens obtained on the 3rd and 5th days.

(57) Uterine specimen obtained on 3rd day, scanty, flaky, blood stained, shows :-

1. Agar Slope. Negative.
2. Agar Stab. Growth in stab: no gas.
3. Agar overlayered. Negative.
4. Bouillon. Slightly turbid.

Direct Film. Cocci singly and in pairs, abundant short bacillary forms; stain by Gram.

Bouillon. Inconclusive.

(58) Uterine specimen obtained on 5th day, fairly copious, bloody, not fetid. shows :-

1. Agar Slope. Profuse white irregular growth.
2. Agar Stab. Negative.
3. Agar overlayered. A few small disc shaped colonies under surface: fairly profuse surface growth similar to that on Slope.
4. Bouillon. Turbid.

Direct Film./

Direct Film. Occasional stout bacilli with polar staining: stain faintly by Gram.

Slope Film. Short bacillary and coccal forms, with beading and metachromasis well marked.

Bouillon Film. Short bacilli, cocci singly and in pairs.

(59) Vaginal specimen obtained on 3rd day, scanty fluid, blood stained, not fetid, shows :-

1. Agar Slope. Copious growth of round whitish colonies increasing size from above downwards from small pins head to a small shirt button.
2. Agar Stab. Growth in stab: no gas.
3. Agar overlayered. Negative.
4. Bouillon. Turbid.

Direct Film. Diplococci and short bacillary forms abundant: diplococci stain by Gram.

Slope Film. Short bacilli like B. coli (faintly stained). occasional diplococcal forms.

Stab Film. Cocci singly, in pairs and chains.

Bouillon Film. Cocci and dilpococci with small bacillary forms.

(60)/

(60) Vaginal specimen obtained on 5th day very scanty whitish mucous shows :-

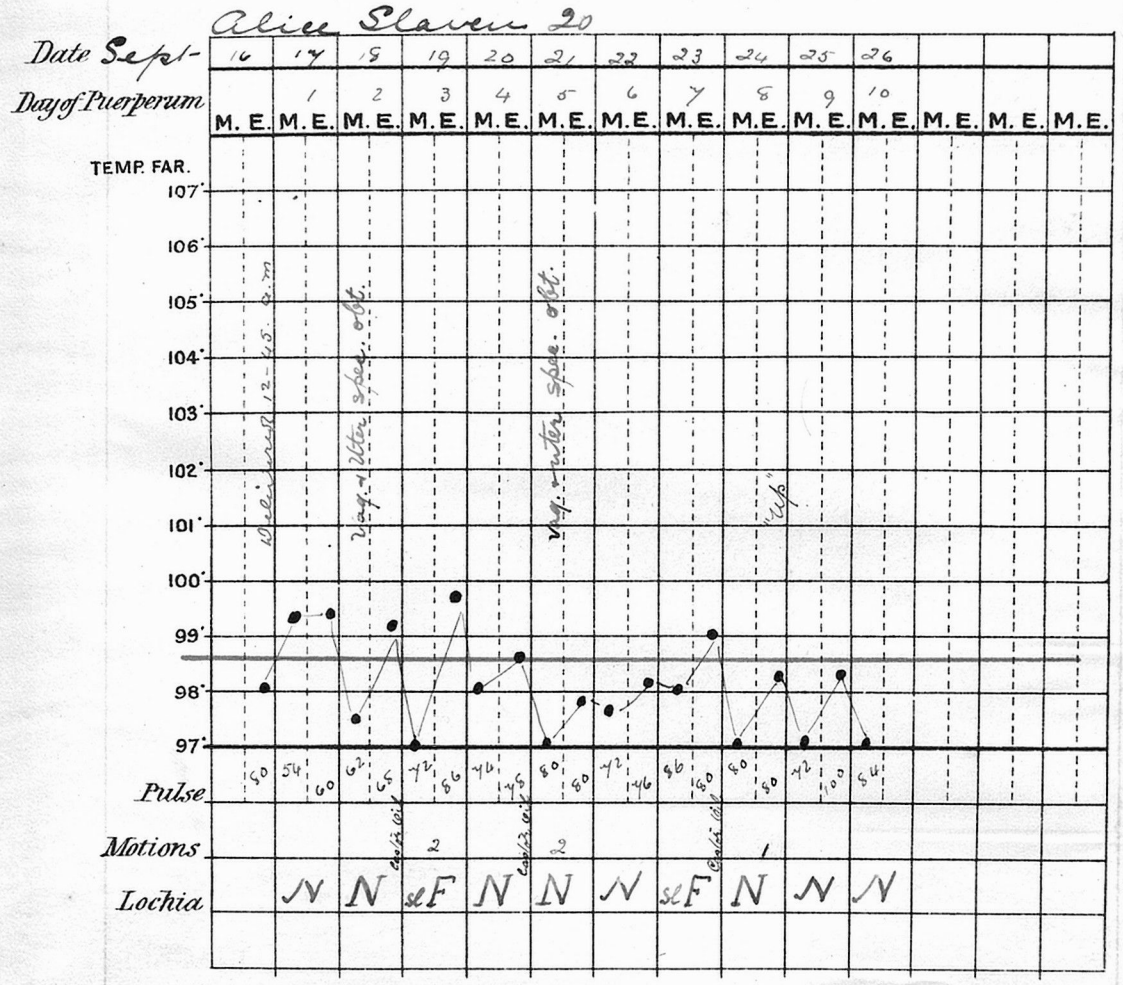
1. Agar Slope. Several large whitish round colonies.
2. Agar Stab. Growth in Stab: no gas.
3. Agar overlayered Profuse surface growth.
4. Bouillon. Turbid.

Direct Film. Abundant short bacilli often in pairs and showing beading: cocci also abundant: stain by Gram.

Slope Film. Short bacillary forms, and diplococci: staining faintly: no spores.

Stab Film. Short stout bacilli, usually uniformly staining with central light portion: considerable variety in size: some more slender forms and some cocci,also.

Bouillon Film. Bacilli forming filaments with beading and polar staining in places: cocci and diplococci: no spores noted.



XVI. Alice S. (20) unmarried: primipara. Delivery spontaneous: duration 10½ hours. No excessive haemorrhage: perineum almost intact. Presentation vertex: position L. O. A. Child live and mature.

For the first three days of the puerperium this patient's temperature was slightly disturbed, the maximum being on the 3rd day when the evening temperature/

temperature was 99.8°, the pulse rate being 86, this being the maximum rate except on the 9th day when it was 100 per min. after getting up.
The Lochia were slightly fetid on the 3rd and 7th days, otherwise normal.

For the four or five days patient was troubled with retention of urine, perhaps aggravated by the presence of an ovarian tumour on right side, about the size of an apple. Thereafter however patient did very well.

Uterine and vaginal specimens were obtained on the 2nd and 5th days.

(61) Uterine specimen obtained on 2nd day, scanty fluid bloody, shows :-

1. Agar Slope. Number of small round whitish colonies, about size of pin head.
2. Agar Stab. Growth in stab: no gas.
3. Agar overlayered. Negative.
4. Bouillon. Turbid.

Direct Film. Cocci, oval forms, short stout bacilli.

Slope Film. Cocci in groups somewhat like staphylococci.

Stab Film. Cocci large and small in pairs and in groups like Slope film.

Bouillon Film./

Bouillon Film. Large coccus in pairs and groups: small bacillus: occasional oval forms and long forms.

(62) Uterine specimen obtained on the 5th day: fairly copious, mixed blood and flakes shows:-

1. Agar Slope. Large round whitish colonies.
2. Agar Stab. No growth in stab: some surface growth similar to that on Slope.
3. Agar overlayered Doubtful.
4. Bouillon. Slightly turbid.

Direct Film. Very scanty cocci and oval forms, Staining by Gram.

Slope Film. Cocci: oval and short bacillary forms.

Bouillon Film. Similar appearances.

(63) Vaginal specimen obtained on 2nd day, copious, bloody, not fetid, shows :-

1. Agar Slope. Number of round whitish colonies about size of a pin's head.
2. Agar Stab. Negative.
3. Agar overlayered Negative.
4. Bouillon. Slightly turbid.

Direct Film. Cocci, oval and short bacilli tolerably abundant: Stain by Gram.

Slope Film. Cocci in groups like staphylococcus.

Bouillon Film. Cocci in groups (thin film).

(64) Vaginal specimen obtained on 5th day, fairly copious, flaky, shows :-

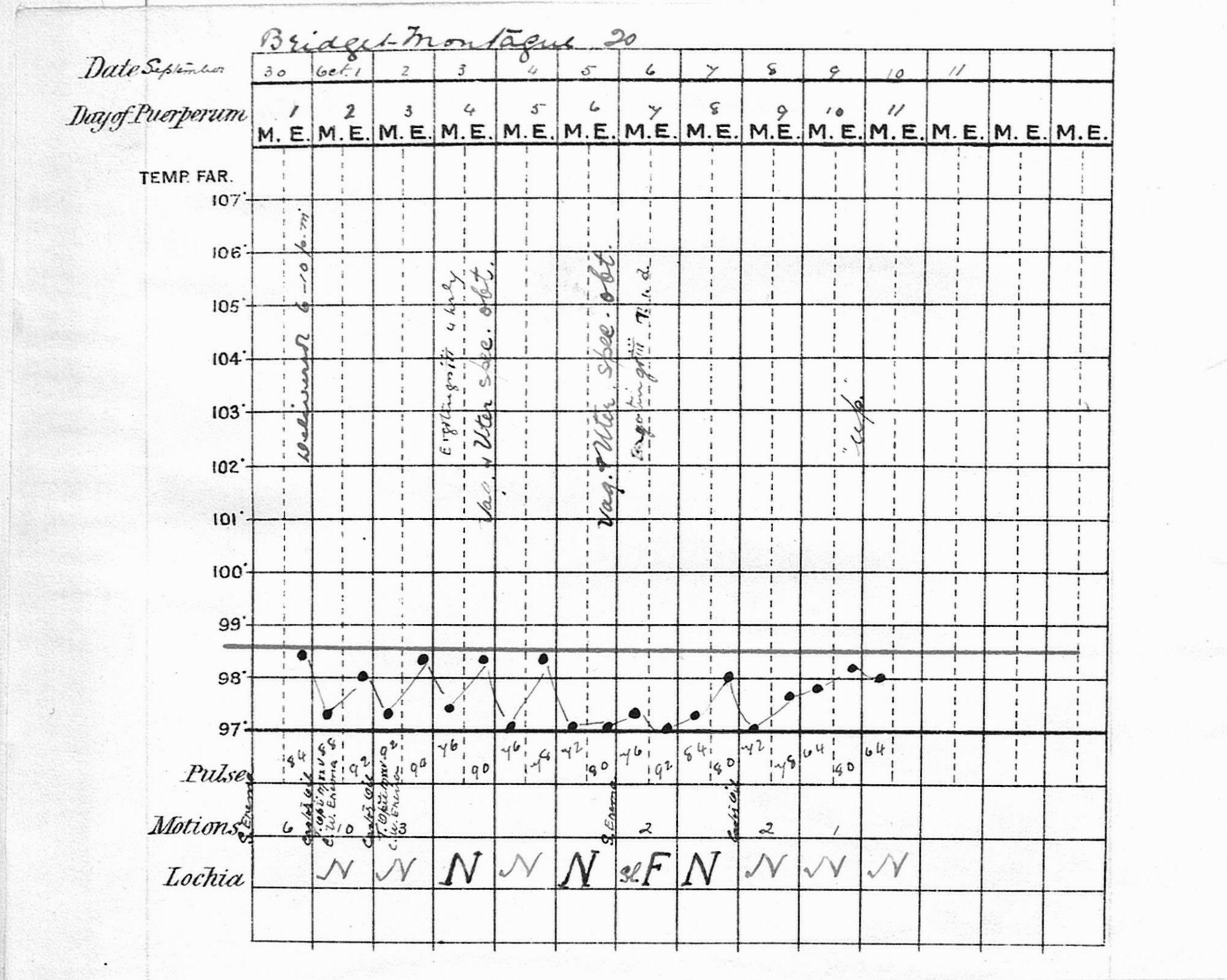
1. Agar Slope. Profuse yellowish white rounded colonies from size of pin's head to that of small shot.
2. Agar Stab. Growth in stab : no gas.
3. Agar overlayered Number of very small disc shaped colonies.
4. Bouillon. Turbid.

Direct Film. Short bacilli and oval forms in abundance: occasional cocci in pairs: Stain by Gram.

Slope Film. Short bacilli, oval forms and cocci.

Stab Film. Cocci oval forms with metachromasis very well marked: also short bacilli.

Bouillon Film. Short bacilli with oval forms and cocci (thin film).



XVII. Bridget M. 20 unmarried I-para.

Delivery spontaneous: duration of labour 28 hours.

No excessive haemorrhage: perineum very slightly torn.

Presentation, vertex: position L. O. A.

Child live and slightly premature. Maximum temperature was 98.4, pulse rate 92 per min.

Patient had a very severe attack of diarrhoea beginning the day before the onset of labour and lasting four days altogether. There was a good deal of/

of blood and mucus in some of the later stools, but nothing specially sharacteristic. Appropriate treatment soon effected a cure and thereafter patient went on very well, except for slight tendency to subinvolution.

The Lochia were slightly fetid on the 7th day, otherwise normal.

Uterine specimens were obtained on the 4th and 6th days, as also were vaginal specimens.

(65) Uterine specimen obtained on 3rd day: bloody slightly flaky, scanty shows :-

1. Agar Slope. Fairly profuse irregular whitish growth.
2. Agar Stab. Growth both in stab and on surface.
3. Agar overlayered Considerable number of whitish disc shaped colonies beneath surface.
4. Bouillon. Turbid.

Direct Film. Very scanty cocci, chiefly in pairs: Stain by Gram.

Slope Film. Cocci, bacillary and beaded forms, with clubbing and metachromasis.

Stab Film. Cocci, bacilli and oval forms, metachromasis well marked.

Bouillon Film. Cocci, oval forms and occasional bacilli.

(66)/

(66) Uterine specimen obtained on 6th day shows :-

1. Agar Slope. Profuse growth of rounded whitish colonies.
2. Agar Stab. Growth both in stab and on surface. No gas.
3. Agar overlayered. Number of colonies present growing anaerobically.
4. Bouillon. Turbid.

Direct Film. Very scanty cocci forms: Stain by Gram.

Slope Film. Cocci and oval forms: occasional short bacillary and beaded forms.

Stab Film. Similar organisms with metachromasis.

Bouillon Film. Same as stab film preceding.

(67) Vaginal specimen obtained on 6th day, shows :-

1. Agar Slope. Large numbers of round whitish colonies.
2. Agar Stab. Growth both in stab and on surface: no gas.
3. Agar overlayered. Large number of very small disc-shaped whitish colonies growing anaerobically.
4. Bouillon. Turbid.

Direct Film. Abundant cocci and short bacilli: Stain by Gram.

Slope Film./

Slope Film. Cocci large and small, oval forms and short bacilli.

Stab Film. Similar appearances.

Bouillon. Inconclusive.

(68) Vaginal specimen obtained on 3rd day, scanty, flaky, blood-stained, shows :-

1. Agar Slope. Three or four rounded whitish colonies, about size of diameter of small shot.

2. Agar Stab. Growth both in stab and on surface: no gas.

3. Agar overlayered. Single fairly large disc-shaped whitish colony.

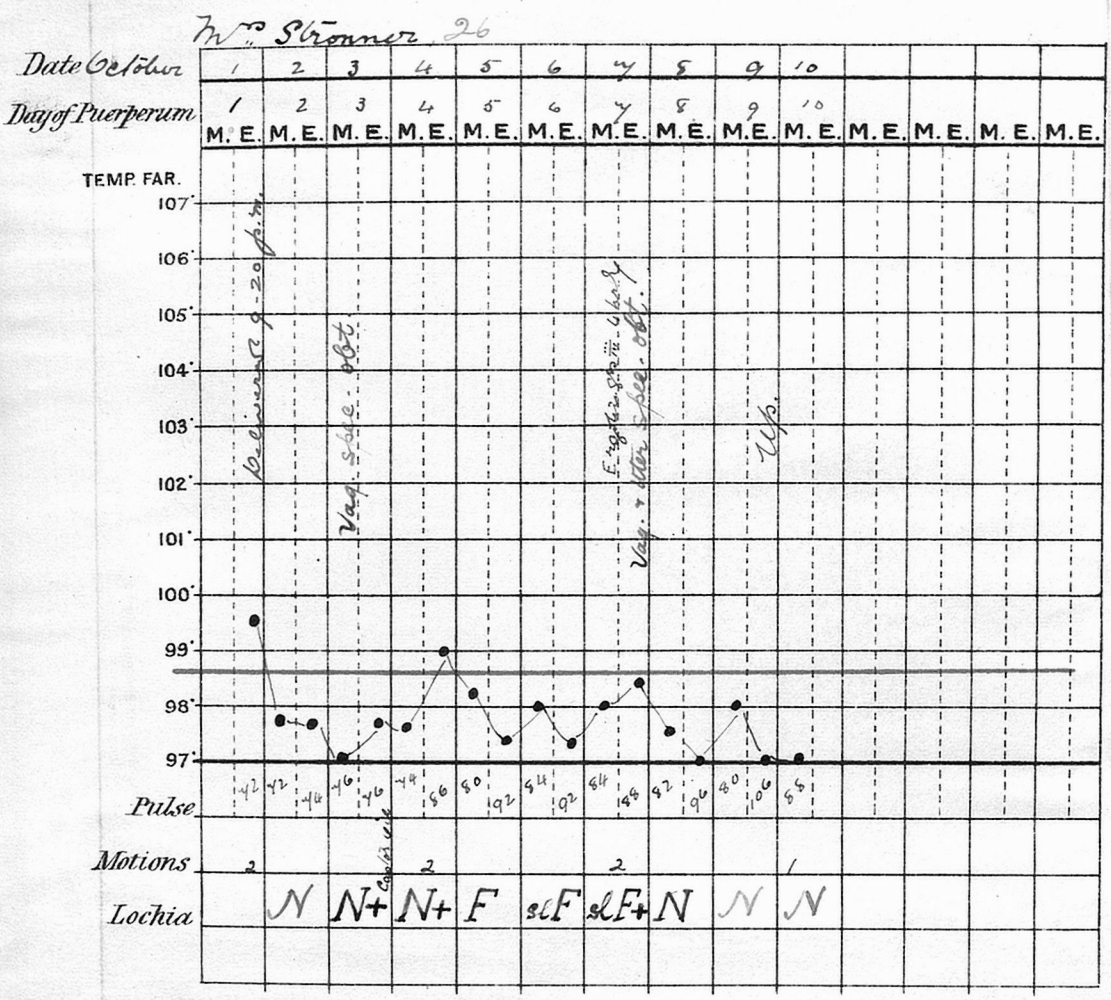
4. Bouillon. Clear.

Direct Film. Cocci chiefly in pairs: also oval forms: (scanty film) Stain by Gram.

Slope Film. Cocci and short oval forms, with marked metachromasis: some arranged in groups, others in chains.

Stab Film. Cocci oval forms and bacilli.

Bouillon Film. Negative.



XVIII. Mrs. S. (26) V. para.

Delivery spontaneous: duration of labour 21 hours. Slight ante partum haemorrhage, treated by rupture of membranes, after which delivery proceeded rapidly and spontaneously (under chloroform). Perineum intact.

Presentation vertex: position L. O. A.

Child/

Child live, and premature.

Labour was complicated by a large hydronephrosis about size of an ostrich egg. It was situated on the left side and subsided in two days after labour. Traces of blood albumen and pus were found in the urine, the albumen persisting till patient's discharge. Patient was a thin anaemic woman with old tuberculous scars in the neck.

The maximum temperature during puerperium was 99° maxim pulse rate 100 (after getting up.)

The Lochia were somewhat fetid on the 5th, 6th and 7th days and rather copious, but improved after that. The uterus tended to involute rather slowly.

A uterine specimen was obtained on the 7th day and vaginal specimens on the 3rd and 7th days.

(69) Uterine specimen obtained on 7th day, copious reddish yellow fluid rather fetid, shows :-

1. Agar Slope. Two small almost translucent colonies.
2. Agar Stab. Negative.
3. Agar overlayered Some surface growth, otherwise negative.
4. Bouillon. Turbid.

Direct Film. Scanty cocci single and in pairs: occasional uniformly staining bacilli: Stain sharply by Gram.

Slope Film./

Slope Film. Negative.

Bouillon Film. Cocci and oval forms with short bacilli: metachromasis and beading present.

(70) Vaginal specimen obtained on the 3rd day, copious bloody, shows :-

1. Agar Slope. Negative.
2. Agar Stab. Negative.
3. Agar overlayered Two small disc-shaped whitish colonies growing anaerobically: large very yellow growth on surface apparently contamination.
4. Bouillon. Slightly turbid.

Direct Film. Numerous cocci and oval forms: also short bacilli: some large diplococci: stain somewhat faintly by Gram.

Bouillon Film. Cocci singly and in pairs large oval forms, large bacilli, forming filaments: occasional forms like yeast, with branching filaments.

(71) Vaginal specimen obtained on 7th day, scanty, whitish, mucous, shows :-

1. Agar Slope. Very profuse growth of whitish colonies varying in diameter from 1 mm. to 5 mm.
2. Agar Stab./

2. Agar Stab. Slight growth in stab: no gas.

3. Agar overlayered Considerable number of small disc-shaped colonies growing anaerobically.

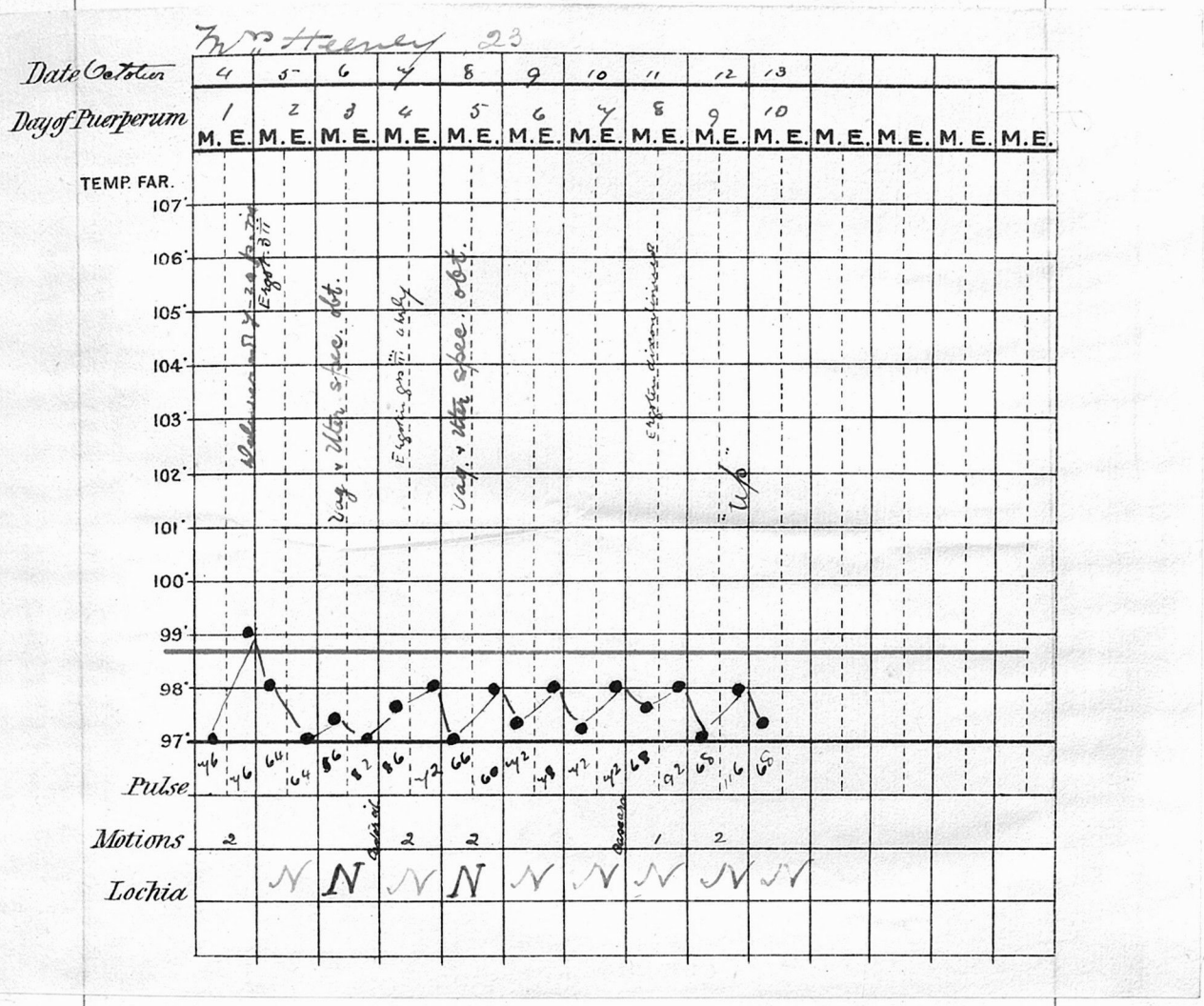
4. Bouillon. Turbid.

Direct Film. Cocci and diplococci, oval forms and short bacilli, somewhat scanty. Gram film inconclusive.

Slope Film. Cocci, oval forms and occasional bacilli.

Stab Film. Mainly oval and short bacillary forms, beading and occasional clubbing, with faint metachromasis.

Bouillon Film. Oval and bacillary forms with beading and metachromasis.



XIX. Mrs. H. (23) III para.

Delivery spontaneous: duration of labour 19½ hours.

No excessive haemorrhage: Perineum intact.

Presentation vertex: position L. O. A.

Maximum temperature 98°, maxim pulse rate 116 (after getting up).

Lochia normal throughout. Some tendency to sub-involution. Patient rather anaemic.

Uterine and vaginal specimens obtained on 3rd and 5th days.

(72) Uterine specimen obtained on 3rd day, scanty, bloody. shows :-

1. Agar Slope. Growth apparently mixed, number of fairly large whitish colonies also numerous greyish small colonies about size of pin head.
2. Agar Stab. Growth in stab: a few small greyish white colonies on surface.
3. Agar overlayered Number of small whitish colonies growing anaerobically.
4. Bouillon. Turbid.

Direct Film. Occasional cocci and oval forms. Gram inconclusive.

Slope Film. Mainly spore forms with occasional cocci and oval forms.

Stab Film. Cocci, oval forms: spores doubtful.

Bouillon Film. Small cocci forms in pairs or fours resembling sarcinae: large diplo - cocci.

(73) Uterine specimen obtained on 5th day rather scanty bloody with a few flakes, shows :-

1. Agar Slope. Negative.
2. Agar Stab. Negative.
3. Agar overlayered Negative.
4. Bouillon. Slightly turbid.

Direct Film./

Direct Film. Occasional cocci and short bacillary forms. Gram doubtful

Bouillon Film. Cocci and oval forms: short bacillary forms : occasional large oval and round forms with metachromasis.

(74) Vaginal specimen obtained on 3rd day. Scanty, bloody, shows :-

1. Agar Slope. Single large whitish yellow colony: also numerous small greyish white colonies along line of stroke.

2. Agar Stab. Growth in stab with feathery appearance: profuse surface growth. No gas.

3. Agar overlayered. Number of very small colonies growing anaerobically.

4. Bouillon. Slightly turbid.

Direct Film. Occasional cocci and diplococci: Stain by Gram.

Slope Film. Mainly oval spores with remains of bacillary forms.

Bouillon Film. Small and large cocci in groups and chains: occasional bacilli.

Stab Film. Bacillary forms, abundant, sporing.

(75)/

(75) Vaginal specimen obtained on 5th day, rather scanty, bloody, shows :-

1. Agar Slope. Several moderate sized greyish colonies: one whitish yellow.

2. Agar Stab. Growth in stab: no gas.

3. Agar overlayered. Negative.

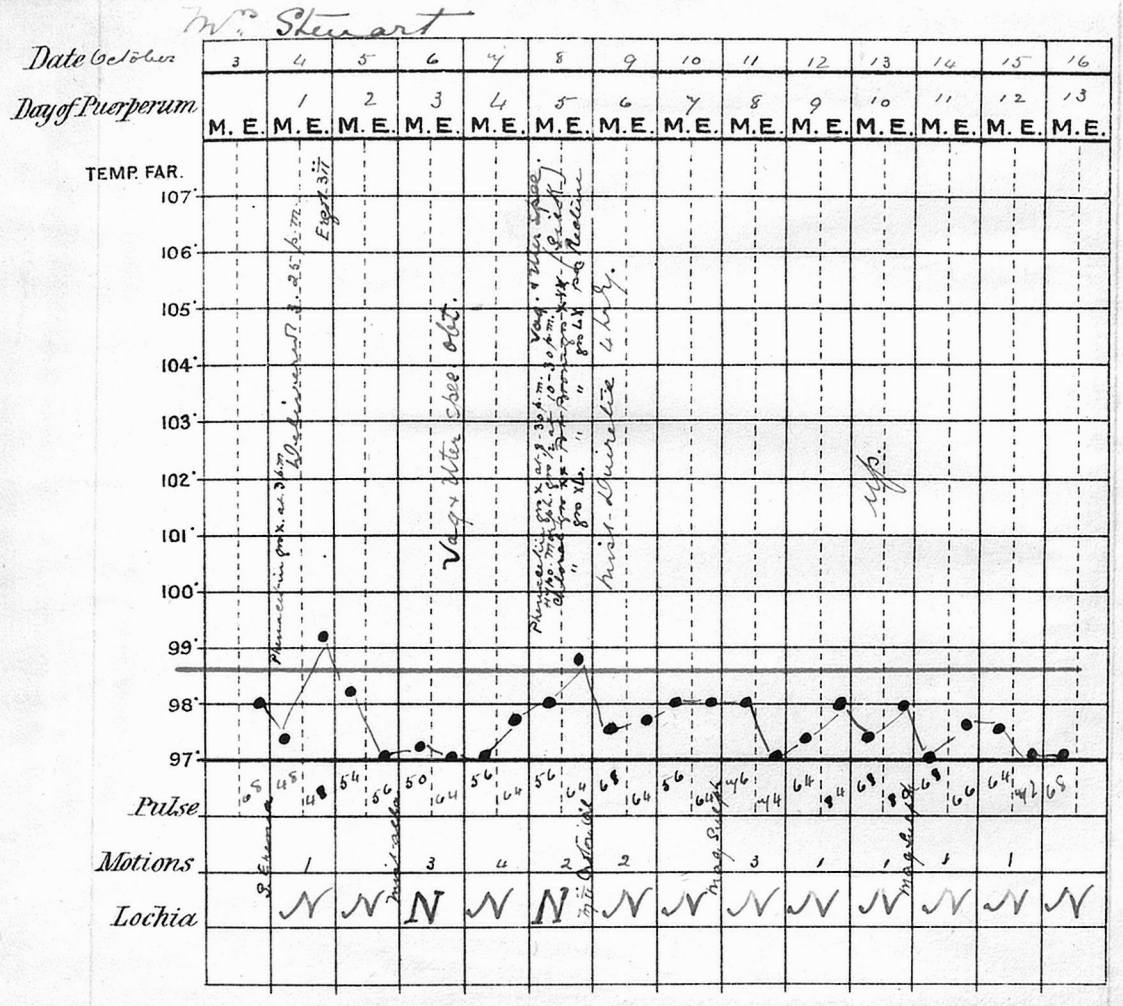
4. Bouillon. Slightly turbid.

Direct Film. Cocci in pairs and small chains: occasional short bacilli: also large diplococci: stain by Gram.

Slope Film. Mainly oval spores with remains of bacillary spores: staining faint.

Stab Film. Cocci, oval and bacillary forms with occasional spores: metachromasis shown.

Bouillon Film. Cocci and short bacillary forms with large yeast like forms.



XX. Mrs. St. (40) IX para.

Spontaneous delivery: duration of labour 8 hours.

No excessive haemorrhage. Perineum intact.

Presentation vertex: position L. O. A.

Maximum temperature 99.2 a few hours after delivery.

Pulse maxim 84 per min. Patient was admitted with marked general anasarca and considerable trace of albumen in the urine. Complained of headache for a day/

day or two and then had 2 eclampsic seizures on the 5th day. Reacted well to treatment by morphia and chloral and bromide followed by duiretics and left hospital quite free of oedema and passing good quantity of urine with specific gravity 1020, and free of albumen.

Uterine and vaginal specimens obtained on the 3rd and 5th days.

Lochia fairly copious but not abnormal.

(76) Uterine specimen obtained on 5th day, copious, viscid, bloody. shows :-

1. Agar Slope. Apparently mixed: two or three rather large whitish yellow colonies: very numerous, very fine almost translucent growths.
2. Agar Stab. Growth in stab, and slightly on surface : no gas.
3. Agar overlayered Slight growth.
4. Bouillon. Turbid.

Direct Film. Occasional cocci: stain by Gram.

Slope Film. Large cocci in pairs, groups and chains, occasional bacillary forms showing metachromasis, clubbing and beading.

Stab Film. Cocci and oval forms: larger deeply staining cocci: occasional short bacillary forms.

Bouillon Film /

Bouillon Film. Cocci, oval bacilli, with beading and metachromasis.

(77) Uterine secretion obtained on 3rd day, fairly copious, bloody slightly flaky, shows :-

1. Agar Slope. Large number of very thin whitish colonies with short branches radiating from the periphery.
2. Agar Stab. Growth in stab: no gas.
3. Agar overlayered. Negative.
4. Bouillon. Slightly turbid.

Direct Film. Scanty cocci and oval forms: stain faintly by Gram.

Slope Film. Bacillary forms with beading resembling streptococci: marked metachromasis especially in small and large rounded forms: appearances as of sporing in some bacilli: occasional cocci.

Bouillon Film. Large cocci and diplococci, small faintly staining bacilli.

(78) Vaginal specimen obtained on 3rd day, very fluid, brownish, slightly flaky, shows :-

1. Agar Slope. Number of similar colonies to those in Slope of uterine specimen of same date.
2. Agar Stab. /

2. Agar Stab. Doubtful.

3. Agar overlayered. Two very small disc-shaped colonies.

4. Bouillon. Slightly turbid.

Direct Film. Cocci and oval forms with occasional bacilli, all scanty, Stain by Gram.

Slope Film. Bacillary forms etc. exactly as in corresponding slope film (76)

Broth Film. Inconclusive.

(79) Vaginal specimen obtained on the 5th day, copious yellowish red fluid, shows :-

1. Agar Slope. Fairly copious irregular whitish colonies.

2. Agar Stab. Slight growth in stab: no gas.

3. Agar overlayered. Negative.

4. Bouillon. Slightly turbid.

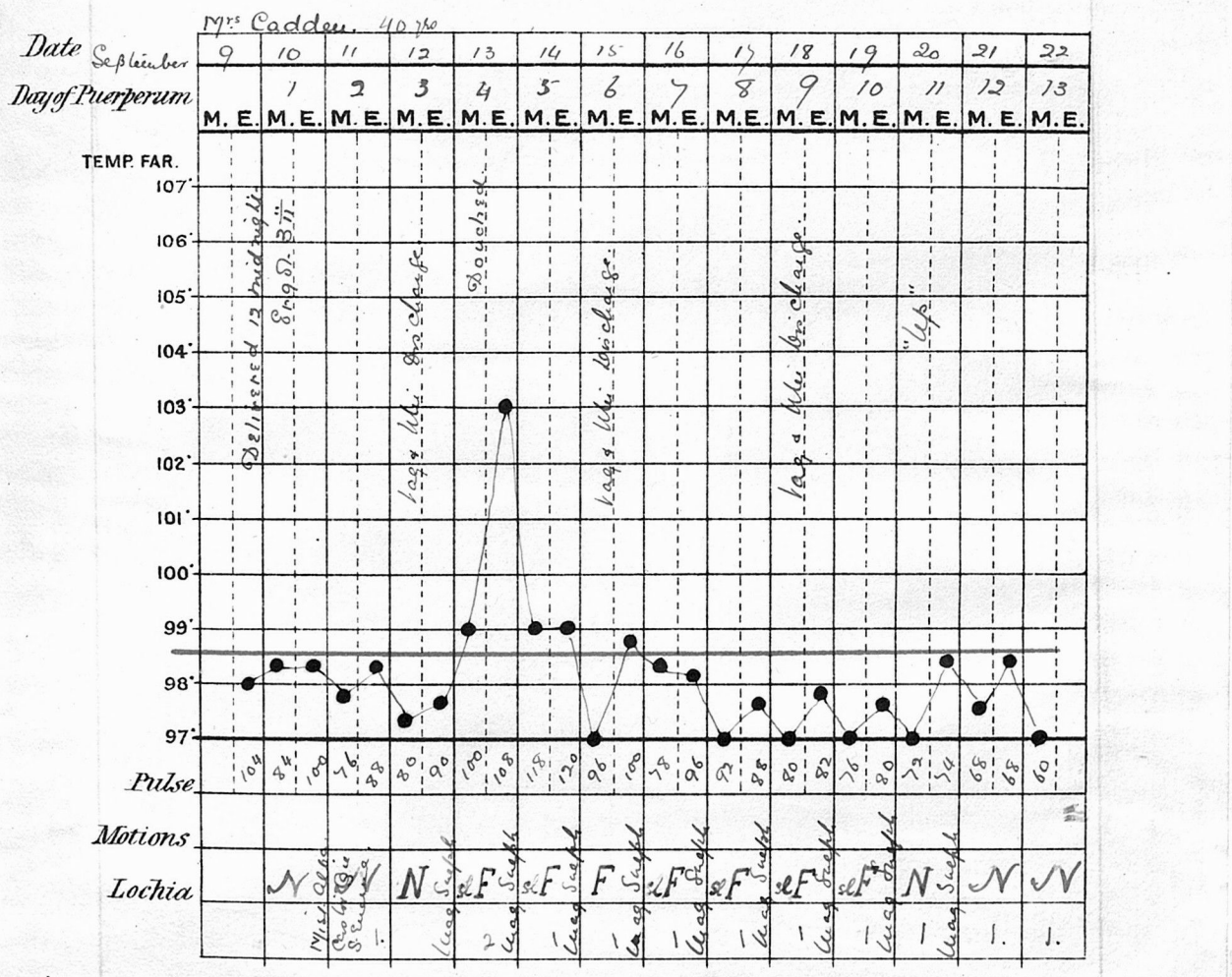
Direct Film. Scanty cocci and oval forms. Staining by Gram.

Slope Film. Cocci and oval forms with short bacilli: show beading and metachromasis.

Stab Film. Mainly large cocci and oval forms

Bouillon Film. Large cocci and diplococci in a granular matrix: cocci occasionally in groups.

The following series of observations on five patients who had febrile temperatures for a longer or shorter time with or without symptoms and signs referable to the pelvis, showed such a marked similarity as regards their bacteriological examination to most of the foregoing that I think it advisable to place them in continuity with the previous series.



XXI. Mrs. C.(40) XII para. /

XXI. Mrs. C. (40) XII Para.

Spontaneous delivery: duration of labour indefinite. Perineum intact.

This was a case of accidental haemorrhage treated by rupture of membranes, after which delivery proceeded rapidly and satisfactorily by nature's efforts only.

Presentation vertex: position L. O. A.

Child dead, premature but not macerated. Slight post partum haemorrhage.

On the 3rd day patient complained of a very small superficial abscess on the left thumb, which was then opened and dressed and gave no further trouble. The lochia were fetid more or less from the 4th to the 10th day.

On the 4th day patient's temperature rose to 103°, fell next day to 99 and thereafter to normal where it remained till patient left hospital, the fall of temperature being coincidental with a much needed free purgation. The urine was slightly albuminous with a trace of pus and some doubtful granular casts. Although patient had a slightly puffy anaemic look, she never complained of more than a trace of malaise when her temperature rose, being otherwise extremely cheerful.

Three uterine and vaginal specimens were obtained on the 3rd, 6th and 9th days. It may be noted/

noted that the rise of temperature occurred the day after the first specimens were obtained and on the fourth day of the puerperium. Again the case was one in which the child was born dead and labour was complicated by slight accidental haemorrhage, with a corresponding weakening of patient and slight interference (to the extent of artificial rupture of membranes). There would thus appear to be in one or other those circumstances a fairly evident cause for the temperature. But though the lochia were somewhat fetid, there was absolutely no abdominal or pelvic tenderness and as the pyrexia was of so transient a nature and disappeared coincidentally, as stated above, with free purgation and the bacteriological examination of the various specimens showed none of the ordinary organisms of pus formation to be present unless possibly the gonococcus, I think we might almost conclude that the constipation which was very marked was the most probable cause of the trouble.

(80) Uterine specimen obtained on the 3rd day, scanty, fluid, bloody, shows :-

1. Agar Slope. Negative.
2. Agar Stab. Growth in Stab: no gas.
3. Agar overlayered. Negative.
4. Bouillon. Turbid.

Direct Film. Occasional cocci and diplococci.

Gram poor but shows occasional cocci and diplococci also.

Bouillon. Inconclusive.

(81) Uterine specimen obtained on the 6th day, fairly copious, mixed blood and flakes shows:-

1. Agar Slope. Six very small whitish colonies.
2. Agar Stab. Growth in stab. No gas.
3. Agar overlayered. Negative.
4. Bouillon. Turbid.

Direct Film. Diplococci resembling gonococci in appearances. Stain by Gram.

Slope Film. Short bacillary forms: cocci

Bouillon Film. Similar organisms in smaller numbers, staining poorly.

(82) Uterine specimen obtained on 9th day, moderate quantity, slightly fetid, bloody with a few flakes., shows :-

1. Agar Slope. Negative.
2. Agar Stab. Growth in stab: no gas.
3. Agar overlayered. Negative.
4. Bouillon. Clear?

Direct Film. Abundant cocci, dilpococci and considerable numbers of uniformly staining bacilli.

Gram Film. /

Gram Film. Diplococci large forms.

Stab Film. Many cocci.

Bouillon. Inconclusive.

(83) Vaginal specimen obtained on 3rd day, mostly blood, shows :-

1. Agar Slope. Negative.
2. Agar Stab. Slight growth in stab: no gas.
3. Agar overlayered Negative.
4. Bouillon. Slightly turbid.

Direct Film. Diplococci as in other cases, also abundant diplococci having the characteristics of gonococci: latter decolorised by Gram.

Bouillon. Cocci of various sizes and in pairs.

(84). Vaginal specimen obtained on 6th day, fairly copious, fresh, mixed blood and flakes, shows:-

1. Agar Slope. Profuse whitish irregular rounded colonies.
2. Agar Stab. Growth both in stab and on surface: no gas.
3. Double Agar. Three or four disc-shaped colonies.
4. Bouillon. Turbid.

Direct Film. Ordinary diplococci also number of forms like gonococci former stain by Gram.

by Gram.

Slope Film. Short bacillary forms.

Stab Film. Short bacillary and coccal.

Bouillon. Inconclusive.

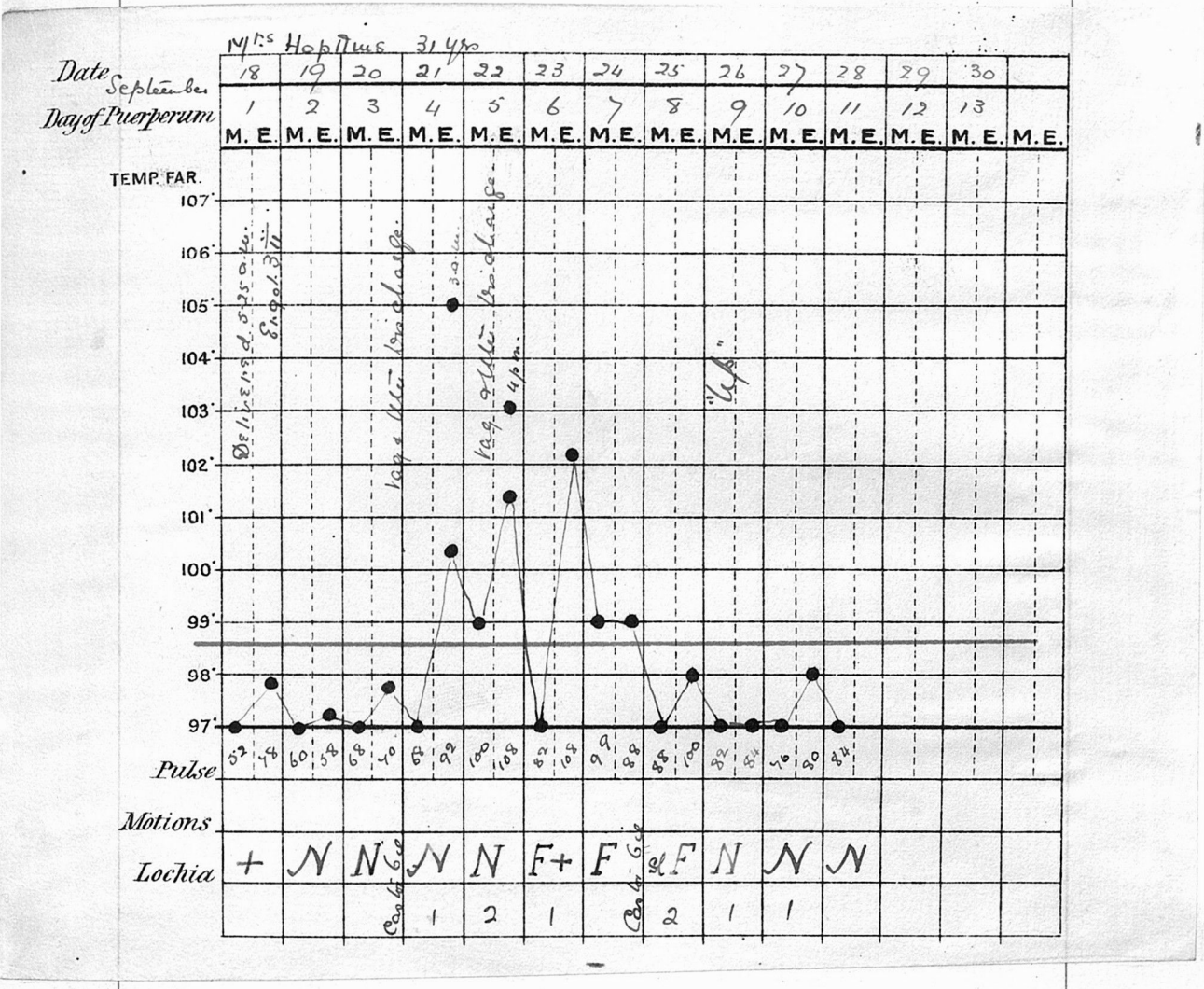
(85). Vaginal specimen obtained on 9th day, moderate quantity, slightly fetid, bloody with yellow flakes.

1. Agar Slope. Negative.
2. Agar Stab. Growth in Stab: no gas.
3. Agar overlayered. Negative.
4. Bouillon. Slightly turbid.

Direct Film. Short bacilli, uniformly staining, diplococci ordinary and like gonococci: all stain by Gram except last.

Stab Film. Short bacilli: cocci.

Bouillon Film. Inconclusive.



XXII. Mrs. Hopk. (31) III. para.

Delivery spontaneous: duration of labour indefinite. No vaginal examinations, baby being born before there was time to get patient into bed.

Head presentation. Child live and mature. Slight tendency to post partum haemorrhage. Perineum intact.

This patient seemed quite well and comfortable till/

till the 4th day when the temperature ran up to 105° with corresponding increase of pulse rate to 130 per min. Next day the maximum was 103° and gradually it fell till on the 8th day the maximum was 98.4; thereafter no rise occurred.

For some days there was considerable abdominal pain, tenderness and swelling in and around the uterus. The lochia were profuse and somewhat fetid. On the 5th day the breasts were hard and required to be exhausted with the pump. Treatment by the ice-bag to the abdomen and ergotin gr III four hourly was followed by good results and patient left hospital feeling quite well and comfortable and with no sign of pelvic inflammation.

In this case again the rise of temperature first occurred the day after specimens were obtained from the uterus and vagina, and on the 4th day of the puerperium. She was an extremely nervous person and the manipulations necessary to procure the uterine specimen were extremely difficult and I must admit might quite conceivably have been the cause of the trouble. The bacteria however found in the specimens were all of the non-pathogenic type, and in fact corresponded very closely with the varieties found in most of the former cases.

Uterine and vaginal specimens were obtained on the 3rd and 5th days.

(86) Uterine specimen obtained on the 3rd day, scanty, bloody not fetid, shows :-

1. Agar Slope. Number of fairly large round whitish colonies.
2. Agar Stab. Growth in stab and on surface: no gas.
3. Agar overlayered Number of small whitish disc-shaped colonies.

Direct Film. Bacilli short and in pairs also cocci: stain faintly by Gram.

Slope Film. Short bacillary forms in pairs, smaller cocci forms, with metachromasis in larger forms.

Stab Film. Cocci, oval forms and bacilli, occasional metachromasis.

Bouillon Film. Bacilli and cocci showing metachromasis.

(87) Uterine specimen obtained on 5th day, copious dark red, not fetid, shows :-

1. Agar Slope. Several large whitish yellow colonies about 4 m.m diameter: also an indefinite film of growth.
2. Agar Stab. Growth in stab: no gas.
3. Agar overlayered Negative.
4. Bouillon. Turbid.

Direct Film. Cocci and short bacilli: diplococci abundant/

abundant; stain by Gram.

Slope Film. Short bacilli and cocci.

Stab Film. Cocci, singly, in pairs and in chains: occasional bacilli.

Bouillon Film. Short bacillary forms and cocci singly and in chains, metachromasis bipolar staining of bacilli.

(88) Vaginal specimen obtained on 3rd day, scanty, fluid, bloody, shows :-

1. Agar Slope. Profuse whitish growth forming large colonies.
2. Agar Stab. Profuse growth both in stab and on surface: no gas.
3. Agar overlayered. Number of small whitish colonies.
4. Bouillon. Turbid.

Direct Film. Short stout bacilli: cocci and diplococci: stain by Gram.

Slope Film. Short bacilli and cocci, filaments and sporing like a fungus.

Stab Film. Short bacilli and cocci: occasional long bacilli.

Bouillon Film. Short bacilli and cocci.

(89) Vaginal specimen obtained on 5th day fairly copious, red blood not fetid, shows:-

1. Agar Slope./

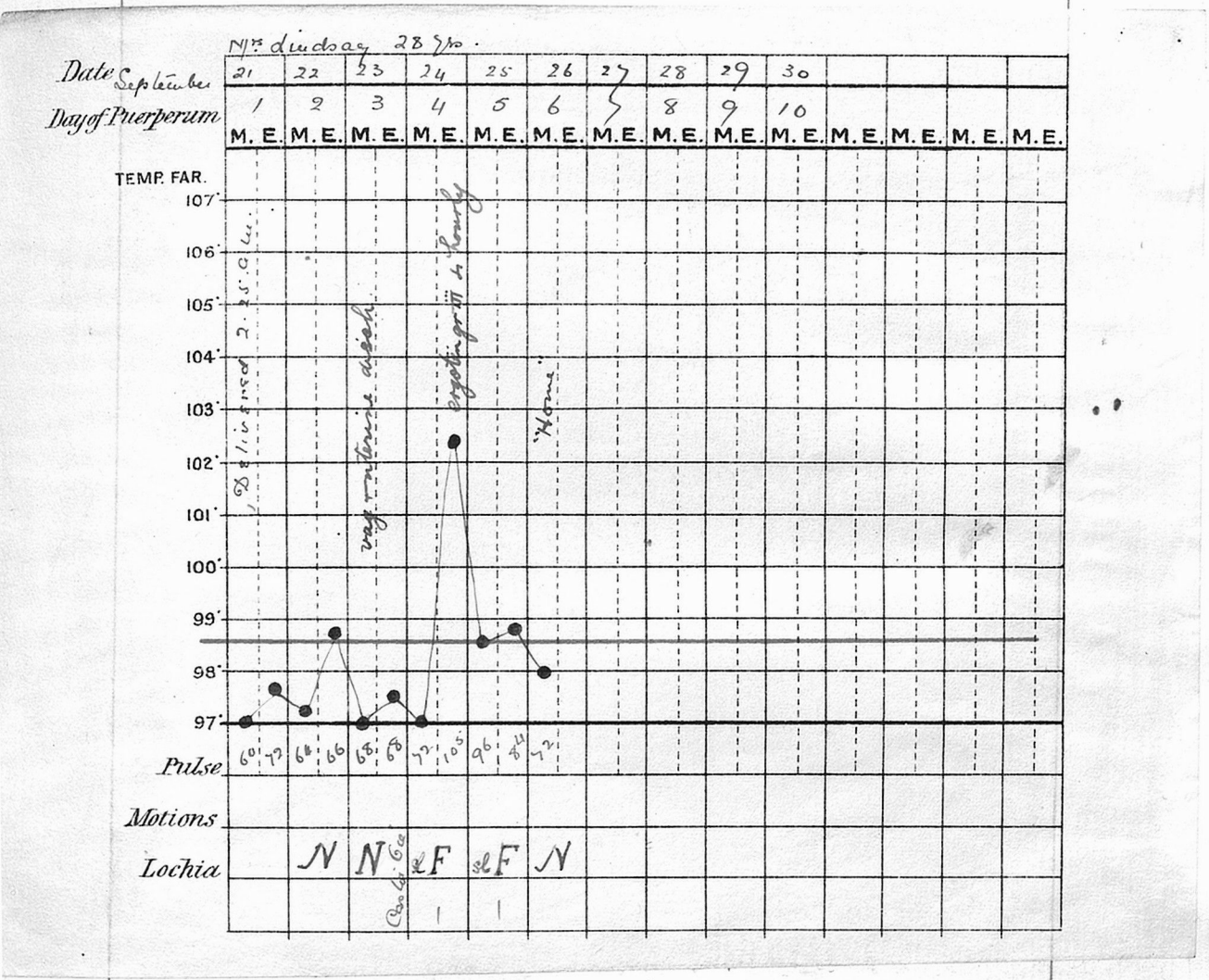
1.	Agar Slope.	Number of round whitish colonies about 3 m.m. diameter.
2.	Agar stab.	Growth in stab: no gas.
3.	Agar overlayered.	Number of small whitish disc-shaped colonies.
4.	Bouillon.	Turbid.

Direct Film. Short bacilli, chiefly in pairs also oval forms and cocci, tolerably abundant: stain by Gram.

Slope Film. Short bacilli in pairs, cocci diplococci, polar staining of bacilli in places.

Stab Film. Bacilli, oval forms and cocci.

Bouillon Film. As in Slope Film.



XXIII. Mrs. L. (28) V. para.

Delivery spontaneous: duration of labour 4 hours. No vaginal examinations, perineum intact. No excessive haemorrhage. Head presentation. Child live and mature.

This patient had a sudden rise of temperature to 102° and pulse to 105 per min. on the 4th day of her puerperium, the 2nd day after specimens had been/

been obtained from the uterus and vagina. No rigor or discomfort. Discharge somewhat scanty and slightly fetid for several days (3rd to 5th). On the 6th day patient went home directly contrary to advice. Temperature was now normal and patient feeling well.

To account for the single but marked rise of temperature here was not easy. There had been no vaginal examination at time of labour and the manipulations necessary for obtaining specimens were extremely easy and were carried out so far as one could reasonably judge, absolutely without a chance of contamination. Constipation could not be held accountable for the trouble and the breasts were quite normal. Here again the bacteria discovered on examination proved to be of the same type as so many of the others, apparently non-pathogenic. I must confess I am at a loss to give an adequate cause for the trouble.

(90) Uterine specimen obtained on the 3rd day, scanty, bloody, not fetid, shows :-

1. Agar Slope. Numerous small whitish colonies
2. Agar Stab. Growth in stab: also number of colonies on surface: no gas.
3. Agar overlayered. Numerous very small disc-shaped colonies.
4. Bouillon. Turbid.

Direct film. Scanty cocci chiefly in pairs. Stain by Gram.

Slope Film. Cocci in groups and pairs also oval forms.

Stab Film. Large and small cocci, oval forms, with metachromasis and clubbing.

Bouillon Film. Cocci and beaded bacilli, with clubbing and metachromasis, also oval forms.

(91) Vaginal specimen obtained on 3rd day, scanty, fluid, bloody, shows :-

1. Agar Slope. Number of whitish round colonies varying from 1 m.m. to 4 m.m. in diameter.
2. Agar Stab. Growth in stab: no gas.
3. Agar overlayered. Number of very small colonies growing anaerobically.
4. Bouillon. Turbid.

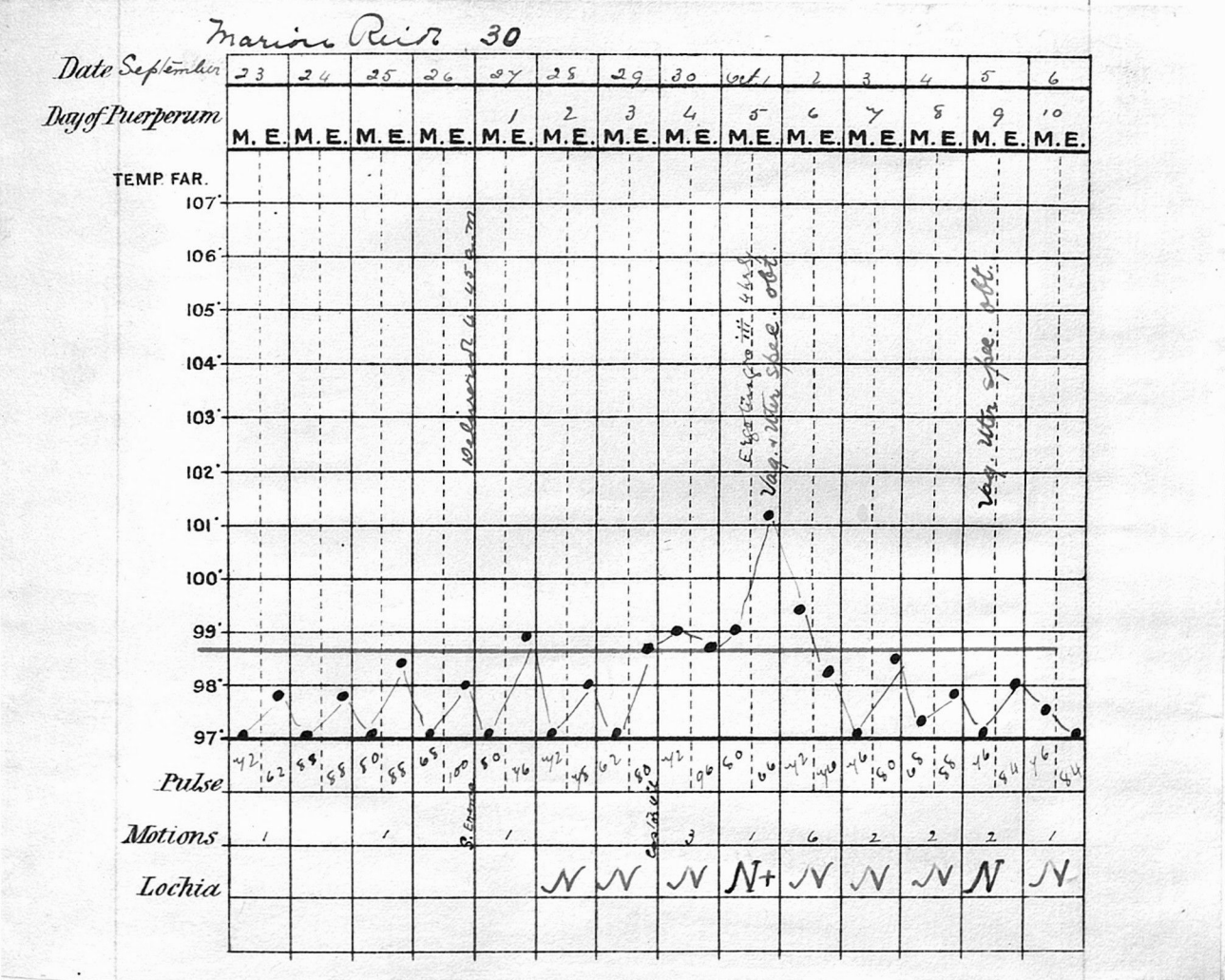
Direct Film. Large and small cocci in twos and threes, some diplococci with capsules: also small uniformly staining bacilli: Stain by Gram.

Slope Film. Bacillary forms with bipolar staining and metachromasis: cocci and oval forms, former in groups and chains.

Stab Film./

Stab Film. Cocci in pairs and small chains: occasional oval forms.

Bouillon Film. Cocci in groups and chains with metachromasis: some oval forms.



XXIV. Marion R. (30) unmarried primipara.

Delivery spontaneous: duration of labour 26 hours.

No/

No excessive haemorrhage. Perineum slightly torn. One vaginal examination at labour.

Presentation vertex: position L. O. A.

This patient was quite well till the 5th day when her temperature rose to 101.2, without however any corresponding increase in pulse rate. The uterus on examination was found to be considerably larger and softer than normal at this state and the specimen obtained from it on the same day was distinctly copious, but quite fresh. Ergotin gr III 4 hourly was then ordered. The temperature fell immediately and reached normal in another day remaining normal till patient was dismissed. Patient had no complaints, the breasts seemed normal, the bowels were acting freely and bacteriological examination gave no evidence of pathogenic organisms. The only cause assignable, as far as I can see, was the flabbiness of the uterus and retention and reabsorption of elements of the lochia possibly analogous to the socalled " a septic" fever one sees in surgical wards e.g. after fractures.

Specimens were obtained from the uterus and vagina on the 5th and 9th days.

(92) Uterine specimen obtained on the 5th day, very copious, fluid brownish red, not fetid, shows:-

1. Agar Slope./

1. Agar Slope. Negative.

2. Agar Stab. Negative.

3. Agar overlayered. Negative.

4. Bouillon. Very slight deposit.

Direct Film. A few cocci single and in pairs: a few bacilli: stain by Gram.

Bouillon Film. A very few cocci and oval forms.

(93) Uterine specimen obtained on the 9th day shows:-

1. Agar Slope. Three round whitish colonies about 2 m.m. in diameter.

2. Agar Stab. Negative.

3. Agar overlayered. Negative.

4. Bouillon. Very slightly turbid.

Direct Film. Very scanty cocci: stain by Gram.

Slope Film. Scanty cocci.

Bouillon. Inconclusive.

(94) Vaginal specimen obtained on 5th day, scanty, whitish, mucous, shows :-

1. Agar Slope. Negative.

2. Agar Stab. Growth in stab: no gas.

3. Agar overlayered. Negative.

4. Bouillon. Turbid.

Direct Film./

Direct Film. Cocci mainly in pairs: some oval forms: Stain by Gram.

Stab Film. Cocci chiefly in pairs.

Bouillon Film. Cocci and oval forms, showing metachromasis: scanty film.

(95) Vaginal specimen obtained on 9th day, shows:-

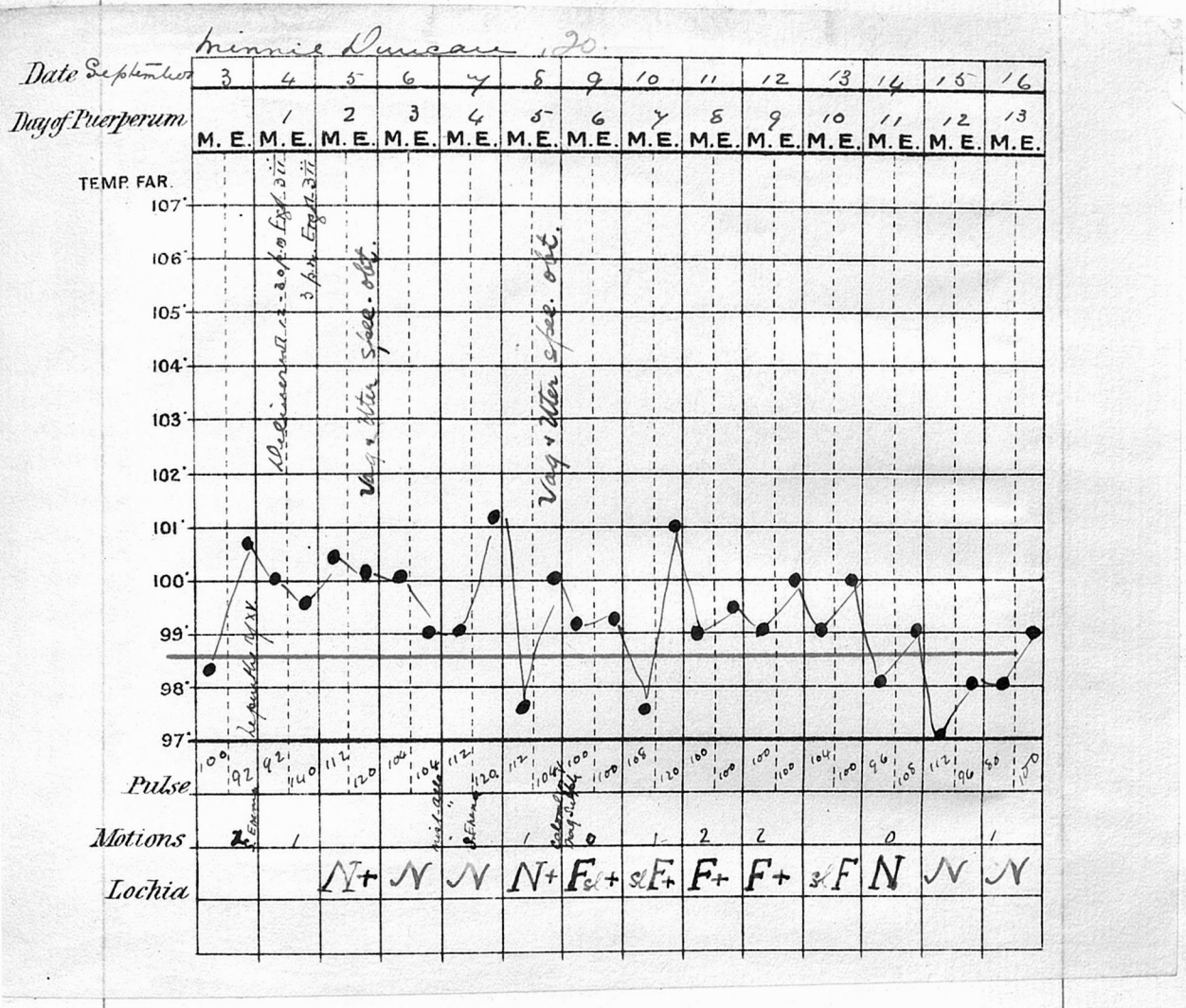
1. Agar Slope. Two large whitish colonies about 6 - 7 m.m. diameter.
2. Agar Stab. Very slight growth in stab: some growth on surface: no gas.
3. Agar overlayered Three small disc-shaped colonies.
4. Bouillon. Turbid.

Direct Film. Cocci singly and in pairs, large and small: a few resembling gonococci: except last stain by Gram.

Slope Film. Cocci and oval forms: short bacilli.

Stab Film. Same organisms as in Slope Film.

Bouillon Film. Cocci and bacilli: oval forms metachromasis and some beading.



XXV. Minnie D. (20) unmarried, primipara. Spontaneous delivery: duration of labour somewhat indefinite. No excessive haemorrhage. Perineum slightly torn requiring one stitch. Three vaginal examinations. Presentation vertex: position L.O.A. Membranes said to have ruptured a week before the onset of painful contractions though patient complained of pain in the back all that time. This interfered/

interfered greatly with sleep and led to a considerable degree of exhaustion, patient being to begin with very anaemic.

Child large, born dead, but not macerated.

The evening temperature on the day before labour was completed was 100.6 and pulse 92: and both continued to be very markedly disturbed till patient went home (at her own request), though there were distinct signs then that they were returning to normal. The lochia almost from the start were more copious than normal and for nearly a week were distinctly fetid, (from 6th to 10th day).

During the same period there was distinct abdominal pain and tenderness relieved fairly readily by application of an ice-bag.

Here as in case XXII there was evidently some inflammatory mischief in or around the uterus. As to how organisms could have entered, one of course must consider the fact of the membranes having been ruptured for a week before labour was completed; and this in fact seems much the most likely cause.

The temperature fortunately never went very high and the patient although very anaemic, was always cheerful about herself, and never looked seriously ill. The blood was examined for the widal reaction, and a negative result obtained. The bowels reacted only fairly freely on the whole.

Specimens/

Specimens were obtained from the uterus and vagina on the 2nd and 5th days.

(96) Uterine specimen obtained on the 2nd day, copious, bloody with a very few flakes, shows:-

1. Agar Slope. Negative.
2. Agar Stab. Negative.
3. Agar overlayered. Single colony, growing anaerobically.
4. Bouillon. Slightly turbid.

Direct Film. Small number of diplococci.

Gram Film. Negative.

Bouillon Film. Small cocci and oval forms, short bacilli, beaded forms: also large cocci with metachromasis.

(97) Uterine specimen obtained of 5th day, copious, bloody with considerable flaky admixture, shows:-

1. Agar Slope. Negative?
2. Agar Stab. Negative.
3. Agar overlayered. Negative.
4. Bouillon. Slightly turbid.

Direct Film. Cocci, diplococci, oval and bacillary forms, the last staining uniformly, with occasional beading. Stain by Gram.

Slope Film./

Slope Film. Inconclusive.

Bouillon Film. Inconclusive.

(98) Vaginal specimen obtained on 2nd day, copious, bloody, not fetid, shows :-

1. Agar Slope. Negative.
2. Agar Stab. Negative except for slight surface growth.
3. Agar overlayered. Negative.
4. Bouillon. Slightly turbid.

Direct Film. Very abundant short bacilli, occasional cocci in pairs, looking like stage of development of bacilli almost always diplococci: no spores. Stain by Gram, especially the diplococci.

Bouillon Film. Small cocci and oval forms.

(99) Vaginal specimen obtained on 5th day fairly copious, rather fetid, mixed blood and yellow flakes, shows :-

1. Agar Slope. Negative.
2. Agar Stab. Negative.
3. Agar overlayered. Negative.
4. Bouillon. Negative.

Direct Film. Isolated and grouped cocci; diplococci/

cocci; bacillary forms beaded and clubbed forms abundant. Stain by Gram.

Bouillon Film. Cocci and oval forms.

Considering now the organisms found in the first 20 cases we find

A in the 37 uterine specimens:-

(1) A bacillus of somewhat variable size, which in process of development takes a spore formation and shows a great variety of what are apparently involution forms e.g. beading, giving an appearance at times almost like chains of streptococci, clubbing, bipolar staining, and formation of filaments of various lengths, never, however, branching. Though in many respects resembling somewhat closely bacillus subtilis, it appears to grow both aerobically and anaerobically, for in films taken both from the agar stabs and from tubes in which the over-layering method was adopted all froms of the organism are seen, in a number of cases. They can also be made out in many cases in direct films from specimens which failed to produce growth on any of the media used. The organism is rather larger, too, and somewhat coarser both in its bacillary and spore forms than B. subtilis.

It stains by Gram's method and also takes on the Methylen blue very readily.

It occurs in 26 specimens, in one or all of its various forms, sometimes alone, sometimes in mixed growth with II, III, IV and V.

(2) A short bacillus, generally in pairs, often showing distinct metachromasis; grew in bomillon only, and appeared to be in pure culture in one case. Occurred twice. In the other case was in symbrose with I.

(3). A large coccus, occurring sometimes in pairs, at other times in groups like a streptococcus. Appeared in 2 or 3 cases in pure culture, in other growing alongside of I. Occurred altogether 8 times. Had not the appearance of any of the pathogenic organisms.

(4). A small coccus, occurring singly, in pairs, or groups, generally along with I; often showed distinct metachromasis. Was observed in 23 specimens.

(5). A diplococcus having the morphological characteristics and staining reactions of the gonoccus; appeared along with numbers of I in 3 specimens, in cases VIII & XI.

B. In the 42 vaginal specimens there occurred:-

(1) The same bacillus as occurred in the majority of the uterine specimens, the only difference being that growth was much more constant on the various media, and usually much more profuse. The bacillus occurred in one form or another in 40 specimens. Sometimes alone, sometimes alongside of others, II, III, etc.

(2) The same short bacillus as in II of the uterine series: always alongside of I; was noted in 3 specimens.

(3) A large coccus, apparently the same as in III of the uterine series. Sometimes it showed a halo when o occurring in pairs. Was noted 7 times.

(4). A small coccus similar to IV of the uterine series; always mixed with I; occurred in 3 specimens.

(5) A diplococcus with the morphological characters and

staining reactions of the gonoccus. Occurred in case VIII in 2 specimens.

(6) A coccus occurred in the film from the agar slope of specimen 13 from case III, having the characteristics of staphylococcus pyogenes aureus. The makroscopic appearances of the growth suggested the same organism. It appeared to be in pure culture on the slope but did not give any evidence of its presence either pure or mixed in the other tubes or in the direct film. I consider it to have been an accidental contamination of the agar slope. This was the only occasion on which this organism was noted.

(7) A bacillus, staining uniformly and both in microscopic and in makroscopic appearance on the agar slope, resembling closely bacillus coli communis, occurred in the vaginal specimens from the same patient on 2 different occasions.

(8) Forms like yeast fungi appeared in the bomillon from 2 different specimens in cases XVIII and XIX.

In Tabular Form we get :- 1414.

	Uterine	Vaginal
(1) Sporing bacilkus resembling C. subtilis	26	40
(2) Small bacillus, generally in pairs.	2	3
(3) Large coccus, appearing singly, in pairs or groups	8	7
(4) Small coccus, appearing singly, in pairs or groups	23	32
(5) Gonococcal form	3	2
(6) Staphylococcus pyogenes aureus	0	1
(7) Bac. coli communis	0	2
(8) Yeast	0	2

Of the five cases which showed febrile temperatures, in only one was there found a pyogenic organism, the gonococcus . In the other 4 the microorganisms found were to all appearances simply the same cocci and bacilli as were so frequently found in the other 20 cases. In one case, XXII, they grew very profusely, in the others, not particularly so. In one of these, XXIV, an organism with some resemblance to the gonococcus was found in one of the films, but it did not appear to be decolorised by Gram, so I exclude it from the list of pyogenic bacteria found.

Though, ofcourse, forming a very small number, this group of cases would seem to suggest that pelvic troubles in the puerperium are by no means always due to what are termed the pyogenic bacteria, and I can entirely agree with Marx, in strongly emphasising the necessity for considering every puerperal case with disturbance of temperature from a general as well as a local standpoint.

In one of these 5 cases, XXI, I feel sure that the severe constipation was the chief cause among the numerous possibilities of disturbance, which she offered.

In another, XXIV, the rise of temperature was so comparatively slight and so evanescent that, taking into consideration the evidence of subinvolution with retention of copious, fresh lochia, I think that one may possibly look on it as analogous to the so-called " aseptic fever" of surgical wards eg. in simple fracture of limbs, where one often finds a rise of temperature without any evident possible point of entrance for bacteria, or any trace of inflammatory

mischief.

In case XXIII, I am, as I mentioned before, really at a loss to explain the trouble. But the rise of temperature was so evanescent, that in the entire absence of local pelvic symptoms, except slight fetor of the lochia, one can almost certainly exclude the uterus as the source of the mischief.

The other two cases, XXII and XXV, gave sufficient evidence of pelvic inflammatory trouble to account for their disturbance of temperature, though here again the bacteria found were not such as usually give rise to puerperal septic troubles.

Still with such evidence before us, the question comes to be " Were these disturbances due to the organisms which were found on bacteriological examination?". If so, one must take it, that, while as a general rule the organisms in question do not give rise to trouble, yet they may, on occasion, cause fever and pelvic inflammation.

Thus, up to this point, my results are in favour of the theory of autoinfection. On the other hand, from them and from a careful study of the views expressed by the numerous writers I have mentioned, I consider that the normal genital passages of pregnant and puerperal women are free from bacteria which could cause "puerperal septicaemia." My position, therefore, is that labour should be conducted on strictly aseptic principles; that as far as possible vaginal examinations should be avoided; and that douches should only be used for haemostatic purposes, and should then be carried out with the strictest surgical precautions.

In conclusion I must express my thanks to Dr. R. Cochrane Buist for his kind permission to use the patients under his charge, and for many kind suggestions, which he made during my investigations; and also to Professor L. R. Sutherland, University College, Dundee, for his invaluable and ungrudging assistance in the bacteriological work.

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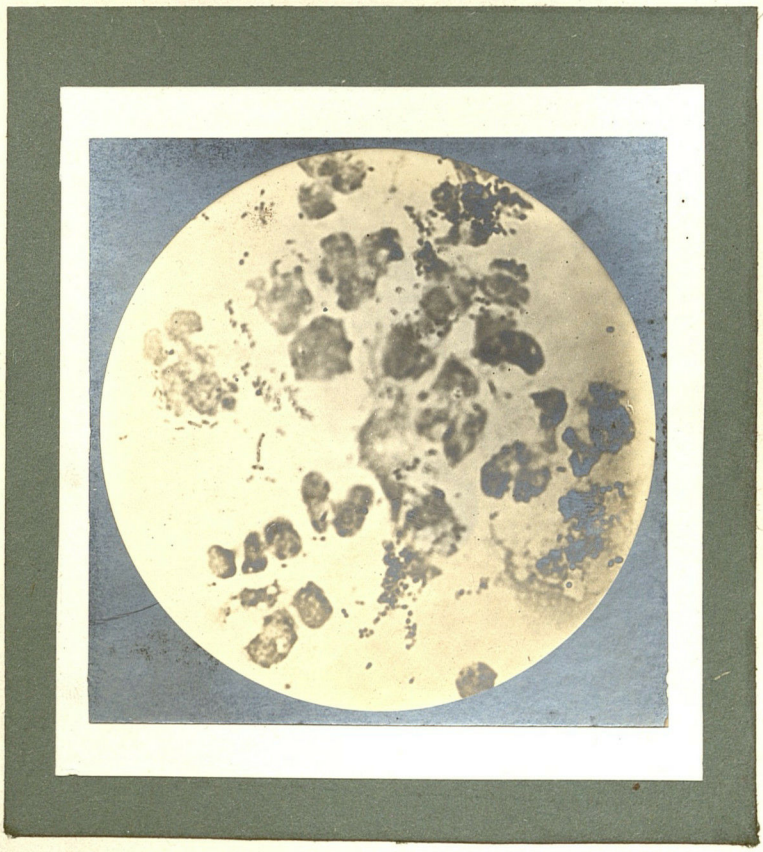
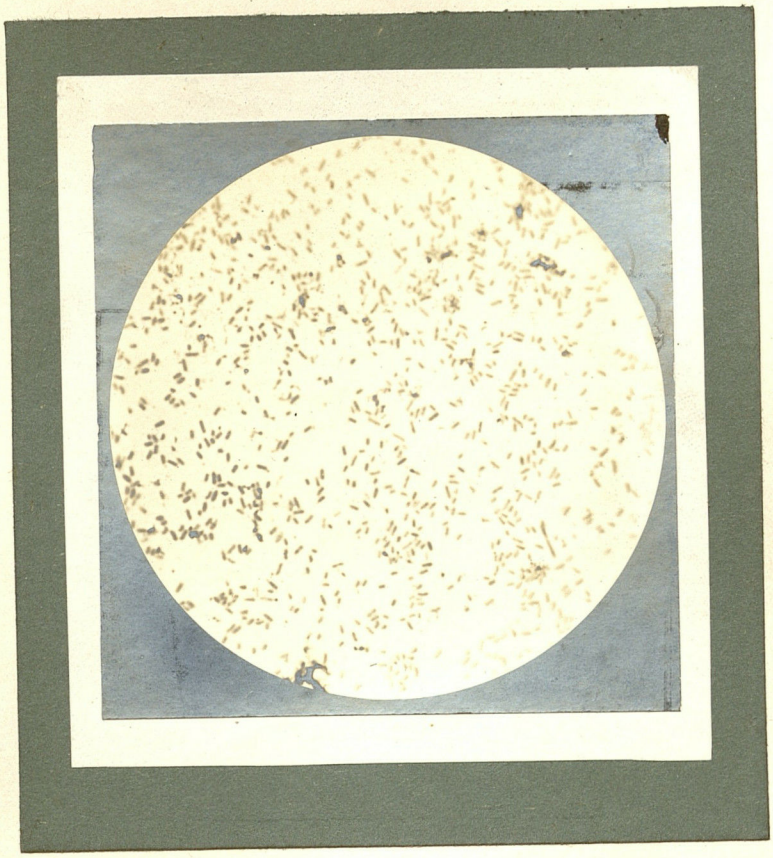
Helen A. uterine specimen 7th day
bouillon film (no (2))



Mary B. Vaginal spec. Direct film 5th day.

Mrs P. vaginal specimen of 5th day
direct film (No 24) no spores shown

Catherine C. Uterine specimen showing orgs. resembling gonococci: (direct film no 24)



Mrs S. Vaginal specimen showing organisms resembling Bacillus coli comm. (agar slope film No 39)