mucus is readily expressed, sometimes up to as much as a fluid drachm. If the erosion is examined under the microscope it is found to be a vascular partially-denuded patch with a varying degree of polyloid processes and glandular crypts. There is a very superficial infiltration of leucocytes especially in the polypi or in the areas in which the epithelium has been lost. The reaction is probably due to contact of the exposed tissue with the acid medium of the vagina. Bacteriological examination never shows anything but a pure growth of Döderlein’s bacillus. Here we have a typical case of non-infective leucorrhoea which I believe is due to an excess of oestrogenic influence on the cervix.

**Effect of oestrone on post-menopausal women.**—I have obtained further evidence by the injection of oestrone. I selected three post-menopausal women, between the ages of fifty-six and sixty-three, who were to have amputation of the cervix for prolapse. I gave each of them 400,000 units of oestrone during the three weeks before the operation. At the time of operation there was in each case a considerable quantity of mucus secretion, and the histology showed a condition similar to that of the fertile period. As a means of control I injected another woman with progesterone, which is a general sedative genital hormone, and did not find any alteration in the typical senile condition of the cervix.

**Leucorrhoea after labour.**—The commonest type of non-gonococcal leucorrhoea is that which begins after labour, especially if there is cervical laceration and eversion of the lips. Even in such cases there is not often any true sign of inflammation of the tissues around the canal, or pus in the glands. Culture from the mucus within the canal rarely yields any pathogenic organisms. Further, if the history of the labour is examined, the great majority of patients will be found not to have given any evidence of post-partum infection from which a subsequent alleged cervicitis might be derived. In these patients there is often considerable hypertrophy of all the tissue elements, including the glands. The secreting surface is much increased by enlargement of the canal and eversion. Perhaps the contact of the mucosa of the canal with the acid vaginal medium may stimulate an increased activity of the exposed glands. There is, therefore, much evidence in favour of the existence of a non-infective leucorrhoea, probably due to oestral influence.

*(The diagrams were devised by Dr. L. T. Bond, with whom these investigations were made.)*

**DISCUSSION**

Dr. Morna Rawlins asked if Mr. Bourne could give any information as to the treatment of such cases. She came into contact with them over and over again. She gave advice but the actual treatment was very difficult.

Major Marjorie Bolton said she was at present treating girls between 18 and 20, and many of them were suffering from minor discharges due to this condition and not due to infection.

Col. A. J. King said that in his experience of young women who complained of discharges, he had seen relatively few of the type of case described. An extraordinary proportion of young women with discharges had trichomonas infection. The frequency of the infection had been a complete revelation to him and it became quite monotonous. Whatever the clinical condition of the patients might be many of them had the typical appearance of trichomonas which Mr.
Bourne had described; others showed very few signs except a little inflammatory change high up in the fornicies. He was coming to regard trichomonas as one of the commonest causes of discharge in young women. It was almost an unavoidable idea would not receive general acceptance and would horrify some people. One was always told that trichomonas was contracted in swimming baths, but the ordinary slipper bath was a fruitful source. He never saw patients infected in this way, and he did not believe such contamination happened. In the type of case he saw symptoms and signs occurred almost always four to seven days after intercourse and were apparently the direct result of such events. A good proportion of these cases and a good proportion of the gonococcal cases were associated. The gonococcus was often found and in association with the trichomonas infection and he had the feeling when it could not be found that it was there, because he believed that the trichomonas infection hid the gonococcus.

Wing-cdr. McElligott said that Mr. Bourne, when he touched on trichomonas infection, mentioned that there was almost invariably an accompanying bacterial infection of the vagina and he thought that what caused the symptoms in these cases was not so much the infusoria which came across in cases in which there were very few symptoms, but the accompanying bacterial infection of the vagina. The latter might quite possibly account for some of the many cases of non-gonococcal urethritis now occurring in men. Did Mr. Bourne think that the accompanying bacterial infection of the vagina accounted for the signs and symptoms rather than the actual trichomonas itself?

Dr. Lynnette Hemmant asked what was the cause of the excessive leucorrhoea of pregnant women. In the ante-natal clinics a large number of women had excessive discharge and the question was whether the cause was hormonal or vascular or bad hygiene on the part of the patient.

Dr. W. N. Mascall said that there was no doubt about a hormonal influence in the types of discharge under discussion. It was to be seen in cases of vulvitis in children; when treatment was instituted the discharge ceased. The main cause of discharge in discharge cases was a considerable increase in the cervical discharge. Therefore it would be natural to suppose that the same process would take place in the adult. The speaker thought that a certain amount of the increase of cervical discharge might be due to its proximity to a closed infection which took place in the posterior fornix of the vagina in conditions of gonorrhoea, in which there would be some infection in that area. He had used a special cultural method, the result of which was that there was more space in which the gonococcus could grow, and he frequently managed to culture the gonococci from the posterior fornix. The cervix, trying to protect itself, threw out more mucus and thus increased the discharge.

Lt.-Col. Campbell said that his experience of vaginal discharges was considerably limited, especially since the outbreak of war, but recently under the scheme of diagnostic centres in the Auxiliary Territorial Service he had to deal with the gynaecological aspect of conditions. As other speakers had said, the excess of vaginal discharge was very severe in all types of girls, quite a number older than those about whom Mr. Bourne had spoken. Many were married women. Whether hygiene played any part, because female hygiene, difficult at any time, was more difficult under barrack conditions, perhaps Mr. Bourne could say. There must be definite hormonal alterations in the temporary amenorrhoea if there was no question of pregnancy, and those working in the gynaecological clinics frequently had to deal with such cases.

The presence of non-gonococcal urethritis in the male had become very much more noticeable in the Forces in the last year or two. It was his own custom in recurrent cases to try to persuade the consort (it was usually the wife) to seek medical advice and in several instances the wives, particularly in the Manchester area, had consulted a gynaecologist, and he had classified these cases from a sociological and medical standpoint. This practitioner wrote to him and said that he was completely nonplussed by recent cases in which women reported to him that the husband, each time he went home on leave, got a very marked urethritis. The gynaecologist considered that the wives concerned were clinically normal and bacteriologically sound and he could not understand the position at all. When it was remembered that quite a number of urethritis cases were those of married men who had not run the risk of extra-marital exposure and who for some years prior to the war had been married and had not had any post-coital urethritis of any sort, the question naturally arose whether the hormonal theory expressed by Mr. Bourne was not manifest in that there was an oestral increase in the female on the man's periodic visits home on leave. When there was added to that theory the fact that despite careful cultural and microscopic examination there was frequent failure to find any organisms at all in the male secretion, and also that quite a number of the cases cleared up on the very simple treatment by an alkaline diuretic, it seemed that the hormonal theory might explain a great deal of the work they had had to do recently.

Dr. R. C. L. Batchelor said that Mr. Bourne specially excluded the gonococcus, and of course as V.D. specialists it was gonococcal infection in which they were particularly interested. He wondered, after hearing Mr. Bourne's remarks on the infrequency of infection of the cervix, whether gonococcal infection of the cervix was as frequent as in the past. In testing for cure women suffering from gonorrhoea it was recommended sometimes, for example by Professor Lewis of New York, that the cervix should be squeezed before material was taken and that culture methods should be used rather than smears. They had always been taught to regard the cervix as one of the principal bases of attack in the woman; they had also been taught that the gonococcus pushed its way along the glands of the cervix and hid itself away in the recesses of those glands, but from what Mr. Bourne had said he began to doubt whether that was really the case and to consider whether or not gonococcal infection of the
Non-Gonococcal Vaginal Discharges

cervix was confined to the canal and did not penetrate into the recesses of the racemose glands. The paper was very interesting from the point of view of cure of gonorrhoea. They had always thought it best to take smear s after a menstrual period. After the period there was still a local flow, and Mr. Bourne had shown that that local flow would undoubtedly contain polymorph leucocytes, so that the presence of polymorphs would not be a criterion of the presence of infection. The test of cure for gonorrhoea was difficult and complicated. Quite recently, as one of the previous speakers had mentioned, the posterior fornix was often found to be infected in gonorrhoea. If that was so, what about the cervix, a site from which it was not easy to get positive cultures of gonorrhoea? The whole vaginal aspect was acutely inflamed sometimes, very soft, almost bleeding; there might be blood in the cervical mucus, but it was not easy to find the gonococci.

Was it possible that contraceptives might bring about the discharge? Someone mentioned that trichomonas infection might be passed to the husband. Some work on this possibility had been done in Edinburgh and was being continued, but not so many positive results were found, probably because the smears were not examined by the same person.

Dr. F. C. Doble asked if Mr. Bourne had found any signs of seborrhoea in the vagina where the pH was about 3.5? Had he found it in the type of patient who had an acid urine of 5.5? He remembered cases of that description after the war of 1914-18 among patients who had been prisoners in Germany in the salt mines. He had to give them 8 ounces of bicarbonate before the urine became more or not patients with cervicitis would be helped if they were given alkali by the mouth, the carbohydrate being cut down as much as possible, together with irritations of alkalis. The cause of the trouble was and must be hormonal. The acid base of the body was kept at normal obviously by some gland but no one seemed to know which it was. Had Mr. Bourne been able to effect a cure on these lines?

Dr. Orpwood Price said that Mr. Bourne mentioned that in a number of cases organisms could not be grown from an inoculation from the cervical canal. He would like to know the technique of obtaining material from the cervical canal because that was very important. If Mr. Bourne could suggest a good technique (he did not) it might help considerably in the interpretation of many discharges which were met with in the laboratory itself.

Major Prebble thought Mr. Bourne had destroyed many of his ideas regarding the infectivity of the cervix. He had seen a case recently in which a large number of trichomonas organisms were found in the vaginal secretion, there was extensive vulvovaginitis but not any sign of gonococci. Was vulvovaginitis commonly seen after trichomonas infection?

Mr. Bourne, in reply, said that many questions were beyond his and he could do his best. Dr. Rawlinson suggested that the treatment of this oestral form of leucorrhoea was difficult—it was.

It should be possible to treat and cure it entirely and all the other associated conditions, such as the emotional restlessness of these young people, by progesterone. There was no doubt that progesterone was a universal pelvic sedative; nearly every pelvic activity was reduced by it. It stopped labour in animals, it stopped the abortion process, it stopped oestrous, it stopped the action of oestrogens and reduced the cervical secretion of mucus. Why were there so few results from its use? Almost certainly it was being used in too small doses. It was an expensive substance and when it could be cheapened, given in human units, there would be results unknown at present in gynaecological therapy. There was a very big future in progesterone therapy for the treatment of many conditions. In the absence of sufficient progesterone these conditions could only be treated in the ordinary way by deep electrical cautery of the cervical canal, or by the zinc chloride method. If the cervical canal was treated by either of these methods leucorrhoea would be diminished, but even when the treatment was quite deep, in some of the patients the discharge would reappear because the stimulus to gland formation and secretion was so strong. Such patients were difficult people to treat and he could not help feeling that the real method of treatment was to adjust their manner of life.

Col. King had seen many cases of trichomoniasis, which was a very frequent cause of discharge and it was often venereal. He would like to ask if trichomonas had been demonstrated in the male urethra or prostate. Was it common to find it? Trichomonas could be communicated by sexual intercourse but it must be a very large number of cases in which such intercourse had no part because he had seen the discharge in all ages—up to great old age as well as in childhood. Did Col. King maintain that trichomonas could be found in the vagina in which there was not any inflammation or excessive discharge?

Col. King said that he had not found it where there were not any signs of inflammation, but he had found it where there were few signs.

Mr. Bourne agreed that if the discharge was stringy and not so purulent there was less chance of trichomonas. The more fluid the discharge the more likely was trichomonas to be found.

Wing-cdr. McElligott asked a difficult question, how far trichomonas or its associated bacteria were the cause of vaginitis. The speaker found it very difficult to believe that vaginitis could occur in the fertile years without trichomonas being present. He did not think the bacteria could be the cause, because they were never found. The trichomonas might aggravate the condition, but practitioners knew whether they would find them or not because after seeing a number of such cases it was scarcely necessary to make the microscopic examination. It became more and more obvious by clinical appearances that one woman had trichomonas and another had not. What other organism was found with it? Was it not the general experience that the most common organism was the short-chain streptococcus which could grow in a medium of pH 5? He did not believe that it could cause vaginitis by itself and the methods of treating the condition suggested that trichomonas was the real cause.
Dr. Hemmatt asked about the cause of leucorrhoea in pregnant women. He thought it must be largely congestive. The mucus was very viscid and was of the pre-menstrual type. It was probably very largely increased by the congestion of the cervix which would increase the gland activity. There was so much hormonal activity during pregnancy that it could be connected with that. The oestral level rose during the three weeks before labour and sometimes increased leucorrhoea could be traced during that time, but he did not have any evidence as to this.

Dr. Mascall asked whether the discharge was due to increased infection in the vaginal vault. This would be attributing to the cervix an almost conscious bacteriological activity which it hardly possessed. He thought the cervix was not infected in such cases because of the bactericidal effect of the mucus.

Col. Campbell had found excessive leucorrhoea in members of the Auxiliary Territorial Service who were suffering from temporary amenorrhoea. He thought they probably got amenorrhoea because of change of occupation, quite a common occurrence in young women. The speaker did not quite understand whether Col. Campbell was making any association between the non-gonococcal male urethritis and the leucorrhoea of such young people. Was it that they had a non-gonococcal discharge from coitus?

Col. Campbell said that that seemed to be the position.

Mr. Bourne asked whether or not it was trichomoniasis.

Col. Campbell thought it apparently was not. He wondered whether or not the alteration of hydrogen-ion concentration in the oestrous was sufficient to set up a male urethritis.

Mr. Bourne said he had heard that suggestion made on other occasions. He hardly thought it possible, but he had difficulty in understanding how the acid vagina, even at 4 or 3-5, could apply to or be operative upon the mucous membrane of the male urethra.

Dr. Batchelor raised a point which he had often wished to raise himself, that is, was a gonococcal cervix infected? Did anyone actually think of the gonococci lurking in the branched glands? How was it that they could never see them if they were there? Must they not keep an irritative leucocytic infiltration around the glands? He often found it difficult to believe that the cervix could harbour the gonoccus for so long—this was probably heretical! Dr. Doble asked if seborrhoea had been noticed in such cases; emphatically yes. Seborrhoea was a very common condition, accompanied by a greasy scalp, in such young people. With regard to alkalis by mouth the acid in the vagina was a condition outside the body. Most people thought that the acid was produced by the action on the glycogen and Mr. Bourne did not see how alkalinizing the alimentary tract could have any influence on the vaginal pH. It was worth trying, however.

Dr. Price had asked a question regarding that very difficult procedure of taking a sterile swab from the cervical canal. If there was much material in the cervix the speaker squeezed it out with the ring forceps after sterilizing chemically as carefully as possible the exposed cervix and the external os. If he could get the fluid squeezed out he took it on the forceps, if he could not he put a swab into the canal and took the utmost care in cleaning it. He thought that the absence of culture indicated that it could be done cleanly, although not always.

Major Prebble asked if he had seen vulvovaginitis due to trichomonas infection; he could not say that he had and he did not know anyone who had. All believed that vulvovaginitis could be due to other organisms than gonococcus but whether it was due to trichomonas he did not know.

TRAUMATIC ORCHITIS AND EPIDIDYMITIS

By A. E. W. McLACHLAN, M.B., Ch.B., F.R.S.Ed., D.P.H.
Clinical Medical Officer, Joint Committee’s Clinic and Medical Officer in Charge of Venereal Diseases, Newcastle General Hospital

The rarity of serious testicular lesions supervening on trauma alone, as opposed to the frequent influence of trauma or strain in the localizing in the testis or epididymis of a prostato-vesicular or haematogenous infection, or in reviving a pre-existing lesion, has long been recognized. M. B. Wesson (1928) aptly expresses the opinion of most clinicians in his title "Traumatic Orchitis": a Misnomer.

In a survey of the literature and in an analysis of seventy cases originally diagnosed as traumatic orchitis, Wesson found that a traumatic aetiology could be sustained in only three cases—two of haematocele and one of torsion of the testis. The infrequency of traumatic lesions is indicated by the fact that since 1929 only one case of orchitis and two of epididymitis, in which the primary aetiological factor was undoubtedly traumatic, have been recognized, by exclusion of all other possibilities, from among the miscellany of intrascrotal lesions met with in venereal disease clinic practice. In many of the cases direct or indirect trauma or strain has been advanced by the patient as the cause of such varied conditions as gonococcal, non-gonococcal, tuberculous or syphilitic epididymitis, gummatus...