

CHRONIC GONORRHOEA IN WOMEN  
AND ITS TREATMENT.

T H E S I S.

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## CHRONIC GONORRHOEA IN WOMEN AND ITS TREATMENT.

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### INTRODUCTION.

It is only in recent years that the medical profession has paid any serious attention to the question of chronic vaginal discharges in women though the importance of the subject cannot be overestimated. In fact it is one of the most important gynaecological diseases with which we have to deal to-day, both because of its frequency and its far-reaching effects on the health and bodily resistance of the patient. Neisser states that with the exception of measles, gonorrhoea is the most widespread of all diseases. "It is the most potent factor in the production of involuntary race suicide, and by sterilisation and abortion does more to depopulate the country than does any other cause." (Norris)

Noggerath said that in New York City 800 out of 1,000 married men have gonorrhoea; that 90% of all these have not been cured and can infect their wives; that in New York 80% of married women, at least, have gonorrhoea or the results of it. Polak's figures confirm the conclusions of Noggerath. Sanger says that

of the fact that she is suffering from any disease, much less an infectious one. This fact alone prevents many hundreds of women from seeking treatment in the early stages of the disease when it is a less difficult matter to prevent the innumerable possible sequelae that follow on a gonorrhoeal infection.

Diagnosis presents a further difficulty, for gonorrhoea in women is less prone to conform to type than in men, and as chronic infection of the genito-urinary tract in women seldom produces subjective symptoms, reliance must be placed on objective symptoms for a diagnosis. Very often in clinically positive cases the gonococcus is difficult to find or never found in smears of the discharges and one has to resort to the more elaborate methods of culture and the Complement Fixation tests. In still other cases the gonococcus can be demonstrated in cervical or urethral smears when there are no clinical signs of the disease whatever.

Gonorrhoea is the commonest disease that is neglected, and one of the chief causes for this is the unsatisfactory result that follows treatment and the difficulty of estimating whether a cure has resulted after treatment has been completed. The gonococcus may/

may be dormant in the cervical glands for a prolonged period and spring into activity under proper stimulus. Very often the gonococcus exists in the genital tract during pregnancy without any clinical signs, and becomes active during the puerperium, thus explaining some of the late post-partum infections. Again it has been proved that by passing through a second subject the gonococcus becomes more virulent and consequently an apparently cured subject of chronic or latent gonorrhoea may infect his or her partner. Menstruation and pregnancy increase the virulence of the organism and provide conditions favourable to the spread of the disease, thus complicating the existing difficulties of treatment. Married persons infected with the gonococcus may become immune to their own organism, so that the symptoms and signs of the disease may subside completely. If these persons live apart from each other for a considerable time and then resume sexual intercourse, a violent gonorrhoea may be set up in either one, although both have been virtuous during separation. Again, if the infection is transferred from a married couple to a third person and then again to one of the original subjects, the gonococcus is capable of becoming so virulent as to set up a violent fresh infection in either or both original partners. Further, the gonococcus gives no immunity as do most other microbic organisms and/

and many suffer from repeated attacks of the disease during a lifetime.

Gonorrhoea in mother or father is a frequent and deplorable source of infection to young children in a household and since the vulvo-vaginitis set up in female children is such an intractable condition associated with numerous disappointing relapses, one cannot fail to be impressed with the important part Infant Welfare work can be made to play in the early detection of this condition in infants and young children, and if the sources of the infection be investigated, they lead to the infected parents getting suitable treatment.

Abrahams stated that 20% of the total blindness in the world is due to gonorrhoea and from the point of view of prevention of Ophthalmia Neonatorum and Puerperal Sepsis caused by the gonococcus, the importance of the ante-natal clinic for mothers cannot be over-estimated.

It is my experience that a much larger proportion of women suffer from chronic gonorrhoea than has hitherto been believed. Comparatively few cases of acute gonorrhoea attend my clinic. The majority come six or more weeks after infection, because though exposed to the risk, the symptoms have been no more severe than a leucorrhoea. I have not found cystitis a common symptom. If examined for it, it is surprising how many of the women attending the/

the ante-natal clinic suffer from discharges which show the gonococcus in smears. The majority of them, too, are unaware of the nature of the discharge, assuming that to have a discharge is normal during a pregnancy. These would go untreated but for discovery at the pre-natal clinic, thus exposing not only themselves to the risk of sepsis, but their infants to ophthalmia and possible blindness. Lastly, the possibilities of cancer of the cervix resulting from a long-standing irritation by the gonococcus and secondary organisms cannot be overlooked. McCann says "There is more evidence in favour of gonorrhoea as a predisposing cause of cervical cancer, for by the production of chronic cervical gleet it favours those cell changes which lead to cancerous formation. I have met with several cases in which the relationship was clinically established."

In this thesis I propose to deal with the subject of Chronic Gonorrhoea in Women and its Treatment under the following headings :-

- I. Pathology and Symptomatology.
- II. Diagnosis.
- III. Treatment.
- IV. Evidence of, and Tests for, cure.
- V. Summary and Conclusions.
- VI. Bibliography.

## PATHOLOGY AND SYMPTOMATOLOGY.

The initial site of a fresh gonorrhoeal infection is usually the vulva and urethra from which it spreads to the Bartholin glands. A chronic urethritis is seldom met with in women. The urethra, however, may be sensitive or thickened and the urine may show shreds. Secondary organisms sometimes complicate the gonorrhoeal urethritis and a low grade suppurative infection drags on a tedious course. When the ducts alone are infected there is no swelling nor induration. There is an area of hyperaemia and possibly erosion or pouting round the duct opening. Pressure on the urethra by a finger in the vagina may express a bead of pus from the meatus. When the gland substance is involved, hard and slightly tender nodules are easily palpable. Purulent fluid in large amount can be expressed with numerous gonococci in it. These nodules are the seat of oft-recurring attacks of inflammation and are very difficult to cure. In addition there are numerous smaller follicles situated around the meatus which may become infected. These rupture into the urethra and fill up again. Very often there are no symptoms whatever of this condition. If present there is usually some local pain and/

and discomfort. Urination is painful and there is frequency of desire to urinate, involuntary urination and sometimes even pyuria and haematuria. The urethral glands of Skene are those most commonly seen infected in chronic gonorrhoeal cases. These are two small tubules which lie on each side near the floor of the female urethra and extend from the meatus for about three-quarters of an inch; these ducts open just anterior to the centre of the urethral lips.

From their position the Bartholin glands are very liable to infection. They are two oblong tubuloracimose mucous glands situated in the lower portion of the labia majora between the superficial and middle aponeurosis. In addition to the superficial perineal fascia their outer side is covered by the bulbocavernosus muscle, while the corpus cavernosus partly covers their upper portion. Their function is to lubricate the entrance to the vagina. They atrophy after the menopause and gonorrhoeal infection of them is consequently infrequent after that time. The ducts of these glands which are about  $\frac{3}{4}$ " in length and from  $\frac{1}{16}$ " to  $\frac{1}{8}$ " in diameter, run upward and inward to open on the inner surface of the labia minora in the sulcus between these structures and the hymen or its remains. Their orifice is but partly covered by an imperfect falciform valvular fold of mucous membrane and/

and they are lined by columnar epithelium. The latter is recognised as a favourite habitat of the gonococcus. Stevens and Heppner found 23% of their cases with infected Bartholin's glands. The gonococcus is the commonest organism that infects these glands and some workers hold that if these glands are infected the patient must have gonorrhoea. Diplococci, streptococci, and staphylococci have, however, also been found in these glands. Occlusion of the ducts is fairly frequent and results in the formation of an abscess or a cyst, depending on the presence or absence of infection in the gland. Usually it is impossible to palpate a normal Bartholin gland but an infected gland can be detected in the majority of instances. A palpable gland is usually an infected gland. Strictures of the duct are fairly common also. The occlusion of a duct may only be temporary and infection may be dormant in duct or gland for a long period of time and reinfection of the urethra, Skene's glands or cervix with subsequent extension to the pelvic organs eventually may occur. As a rule only one gland is affected and in my experience the left is more commonly affected than the right. Rarely both glands are involved.

Endocervicitis, however, is by far the commonest condition. I find in the cases of chronic gonorrhoea that have come under my notice, in fact in my opinion it is never/

never absent. Menge states that cervix infection is found in 80% of all acute cases and in 95% of chronic ones. Stephen and Heppner found the cervix involved in 47% of all their positive cases. The infection too may remain localised in the cervix or it may spread to the uterus, tubes and peritoneal cavity. The vagina usually escapes infection in the adult though in children vaginitis is common. This immunity is due probably to the presence of other organisms and the acid secretion and less delicate structure of the adult vaginal mucosa. Proctitis is a common accompaniment to endocervicitis from direct spread of the discharge and often acts as the focus of relapse to the genito-urinary conditions.

In the cervix and uterine mucosa when infected with the gonococcus the surface epithelium becomes swollen and the cells become separated from one another by the inflammatory exudate, desquamation takes place and many of the cells are replaced by a modified epithelium. In some cases cicatrical tissue results. The gonococci quickly gain access to the glands and similar changes occur in the investing cells. The exudate is poured out into the periglandular tissues, so that the gland openings become occluded and filled with the inflammatory exudate. Such are the occlusion cysts/

cysts of the cervix. If the process advances the epithelium and its basement membrane may be entirely destroyed and a true abscess may form. Long after a surface cure had been effected gonococci may persist in the gland and reinfect the patient from time to time. The chronicity of gonorrhoea is due to this fact and to the presence of the secondary organisms that invariably are found in cases of chronic gonorrhoea. Because the gonococcus can penetrate so deeply into the epithelial and glandular tissues it can be understood how it is that it escapes the gonococci-cides applied to mucous surfaces. From the surface and gland crypts the gonococcus escapes into the stroma and underlying muscular layer and in severe tubal infections even into the serous layer and adjacent structures. This process of attack excites a local tissue reaction, so that the submucous structures become swollen and infiltrated and the blood vessels in the area become congested. These changes vary with the severity of the infection, the stage of the disease and the character of the tissue infected. This underlying swelling and oedema are responsible for the desquamation of the surface epithelium and distortion of the parts and chronicity of symptoms after all signs of active inflammation has subsided. This is particularly evident in intraperitoneal pelvic lesions where adhesions and contractions/

contractions so distort the pelvic organs that frequently operative measures have to be undertaken for the comfort of the patient rather than the cure of the infection.

The most marked pathological changes are found near the surface, as the tissue in this locality seldom undergoes complete resolution. There is a persistent irritating leucorrhoeal discharge which the patient is unable to control and she complains usually of a dull aching pain in the back especially before and after the period.

Very often there is sterility, but several of my patients have become pregnant even after long-standing infection. The cervix is enlarged, soft and tender and is inclined to bleed easily when touched. A thick ropy, tenacious mucoid plug lies in the canal and a muco-purulent secretion is found in the posterior fornix. Erosion of the cervix is very often present. It is a velvety, raw, red area which is a hypertrophic condition produced by the irritating cervical discharge which causes a desquamation of the squamous epithelium around the external os. In some of the cervical glands the inflammatory process may cause a closure of a duct, The gland continuing to secrete without an outlet becomes a retention cyst called a Nabothian follicle. The endocervix is a favourite and treacherous place for the latent gonococcus to lurk, either in the folds of the lining membrane or/

or in the ducts of the glands ready to light up into later infectious activity under the hyperaemic influence of coitus, menstruation or childbirth.

Occasionally, in the course of a chronic gonorrhoea an acute infection of tubes and ovary is seen without marked involvement of the uterus itself, the endometrium being seemingly rather resistant to the gonococcus. If, as it does sometimes, the uterus gets infected it is invariably due to an extension upward of the cervical infection after a menstrual period, childbirth, miscarriage or abortion or after intrauterine applications or instrumentation. In such cases spread from the uterus to the tubes is certain. The endometrium, however, seems to recover more readily than the tubal epithelium and so one may find active tubal symptoms when the uterus is comparatively quiet. At the onset of the attack there is usually a mild rigor, followed by pelvic pain and a profuse discharge, thin, yellow, blood-stained, quite different from the thick mucoid discharge of an endocervicitis. On examination the uterus is soft and tender, the cervix is hypertrophied and the cervical canal patulous. If the condition settles down into a chronic endometritis it is difficult to distinguish it from a chronic endocervicitis. There are, however, menstrual irregularities especially dysmenorrhoea where regularity existed before. The uterus remains enlarged and/

and tender and menorrhagia is often severe. Backache and discharge are persistent. If the endometritis is very severe or the condition has gone on to a metritis, prolonged menstrual periods are the outstanding feature.

As mentioned above tubal gonorrhoea is usually an extension of infection from the uterine endometrium. The disease is a fairly common sequelae of gonorrhoea in the female. It is usually bilateral and a different degree of pathology may exist in each tube as one tube may be the seat of a suppurative salpingitis while in the other the infection may have terminated in a pyosalpinx. All cases of gonorrhoeal salpingitis are accompanied by a greater or less degree of pelvic peritonitis. At the commencement of an attack of salpingitis there is fever, pelvic pain, leucorrhoea and possibly a bloody vaginal discharge. Pain and tenderness are present over the lower abdomen and are often severe. Any muscular exertion or cough increases this pain and the blood shows a leucocytosis. Bimanually, the uterus is fixed and the examining finger in the fornices produces exquisite pain. Rectal tenesmus is often complained of owing to the tendency of the inflamed tube to fall into Douglas' pouch. As the condition subsides it is sometimes possible to recognise an inflammatory mass in the region of the Fallopian tubes.

A salpingitis may give rise to a chronic pelvic inflammation. In such cases there is a history of leucorrhoeal discharge of long standing; repeated attacks of sharp pain, recurring at intervals. There is a constant dragging pain in the lower abdomen, which is increased by the premenstrual congestion, and is relieved by the flow and returns when the flow ceases. Menstrual disturbances are common. Pain is increased by any muscular exertion, coitus or defaecation. Pain is often referred to distant regions, as headache, backache, etc. These patients are usually sterile, suffer from chronic constipation and indigestion and are markedly neurotic. Abdominal palpation shows marked tenderness on deep pressure over the lower abdomen. The uterus is fixed and there is a hard, irregular, sensitive mass behind the uterus or to either side of it. Pressure on the tubes always causes severe pain. The cervix is eroded and the leucorrhoea is profuse.

The gonococcus has an affinity for synovial membranes so that every now and again in the course of a chronic genito-urinary gonorrhoeal case an arthritis commences. Abraham puts the figure at 1% of women with gonorrhoea. One or more joints may be affected and in women/

women doing house-work the knee, wrist, ankle and small bones of the hands are usually involved. Traumas are often the exciting cause of an arthritis. It also sometimes occurs after injudicious dilation of the cervix in endocervicitis or in patients who have had a salpingitis. There is pain, swelling and tenderness of the joint or joints affected and sometimes this is followed by an effusion. Often on aspirating a joint the fluid is sterile. This is because the gonococcus is not present in the exudate but only in the synovial lining of the joint. Because the response to treatment by diathermy of the cervix and urethra was so rapid in cases of arthritis Dr. Robinson of London concluded that possibly the arthritis was often a reaction to a toxæmia and not to an actual secondary bacterial invasion of the joints and other structures. Dr. David Lees of Edinburgh, however, and McDonagh of London have found gonococci in the lining membrane of gonorrhoeal joints. It is likely that both conditions actually obtain in these cases. The tendency to ankylosis is very marked and as the gonococcus produces adhesions with contraction the ankylosis is often fibrous. When the condition is of long standing the joint or joints are more stiff than painful though the patient may be troubled with vague rheumatic pains over/



## DIAGNOSIS.

As the physical signs of a case of gonorrhoea vary from day to day and cases differ so much from each other the diagnosis of gonorrhoea is not always as easy as one might imagine.

In making a diagnosis I consider that the history given by the patient of the onset and progress of her trouble is most important and should be taken very carefully and in detail. Inquiry as to the partner's health is equally important and in many cases significant. Information as regards confinements, if any, should be ascertained as to whether any of the infants suffered from ophthalmia or the mother from sepsis. I then carry out a complete general and local examination in the Lithotomy position. Without cleansing the patient I take smears from the labia and urethral meatus with a sterile cotton-wool tipped applicator. The vulva is then thoroughly washed with soap and water and swabbed with 1 in 2000 Bichloride of Mercury and dried with methylated spirit. The patient is requested not to pass urine for at least three hours before examination and a specimen of this urine is centrifuged and examined for debris, pus and organisms in smear and cultures.

All/

All passages and glands are next inspected and palpated carefully. The size, shape and colour of the urethral meatus is noted and the presence or absence of secretion looked for, and if it be present, where it is coming from. The meatus is then palpated from the vestibule with mild pressure for frequently pus can be expressed from a quite normal looking urethra. Smears are taken of any exudate expressed from the meatus with a sterile cotton-wool tipped probe. I look for any swelling, redness or isolated lesion round the meatus. There may be a dull redness of the urethra or even a caruncle if the condition be of long standing. If the para-urethral ducts are infected they appear as red, pin-head points. With a finger in the vagina I note if there is any tenderness, sensitiveness or induration when palpating the whole length of the urethra from the anterior vaginal wall. A normal urethra rolls slightly from side to side beneath the finger and there is no complaint of pain. Next I look for inflammation in Skene's ducts and for the gonococcal macule at the orifice of Bartholin's glands and try and express pus from them. Smears are taken with cotton-wool tipped probes of any secretion expressed and examined microscopically for gonococci. After this a Cusco speculum is inserted into the vagina and the cervix, vagina and fornices inspected. Very carefully/

carefully and thoroughly I wipe out all discharge around and on the cervix with dry sterile pledgets of cotton-wool. Into the cervical canal I then insert a cotton-wool tipped applicator and take a smear for microscopical examination from that site. As proctitis is common I examine the rectum with a speculum in every case and take a smear of any discharge. If there is no discharge visible and the patient complains of no irritation or other symptom of proctitis I inject 50-100 cc. of sterile lukewarm water into the rectum, allow it to flow back again and examine any purulent floccules, which may be present, for gonococci. If a chronic proctitis is present the anal region will be sodden and the external sphincter hypertrophied. Ulcerated fissures may be present and pruritus due to the acrid discharge. The mucous membrane of the canal is dull and aedematous and in the later stages ulcerated.

Some workers use the urethroscope in diagnosis - Kelly's or a cystoscope with a head light. With the urethroscope the bladder can be examined and the walls of the urethra when the instrument is being withdrawn. I have never found it necessary to use an urethroscope for the purpose of diagnosis.

Finally, I carry out a bimanual examination of/

of the pelvic organs to note the condition of the uterus and appendages, i.e., their mobility, size and tenderness. Pelvic inflammatory disease is looked for and masses in Douglas' pouch.

If gonococci cannot be found in the first set of slides I give the patient a provocative vaccine and within twenty-four hours take another set of smears from the urethra, cervix and rectum and at the same time inoculate tubes of serum agar with material from the three sites and put them in an incubator immediately for the purpose of culture growing.

Fraser considers cultures of no value as all his attempts were sterile whatever media he used. Col. Harrison, Herrold, Lees and Clarkson stress the importance of cultures in the diagnosis of gonorrhoea and some of them consider that the failure to obtain satisfactory results by some workers is due to delay in incubating the preparations. At some clinics cultures are made as a routine in every case.

I have come to believe that in women every case of urethritis and most cases of chronic cervicitis are due primarily to infection by the gonococcus. In some chronic cases persistent negative reports are got on smears but if diligently sought for and frequently the/

the gonococcus will be found sooner or later in the majority of cases. The presence of the secondary septic organisms in the beginning mask the presence of the gonococcus so that sometimes it isn't till the purulent discharge has subsided that the gonococcus is demonstrated microscopically. If taken just after a menstrual period one is more likely to find the gonococcus in cervical smears than at any other time.

I do not use the Complement Fixation test for diagnosis as a routine as I consider that the majority of chronic gonorrhœa cases can be diagnosed satisfactorily without it. Fraser finds no place for the Complement Fixation test but other well known workers like Jacoby, Lees, Rawlins and Magner, all consider it a most useful and important method of diagnosis.

Wilson and Buckill consider that the Complement Fixation test alone is not reliable for diagnosis but that in chronic cases it gives the highest percentage of positive findings.

Gheorghin reports on 400 Complement Fixation tests he has done on patients with gonorrhœa. Of the 41 cases of urethritis lasting six days or less 35 reacted positively. Of 283 cases of urethritis lasting from twenty to thirty days all reacted positively. All cases/

cases of gonorrhoeal complications reacted positively. Control serums from non-gonorrhoeal patients and gonorrhoeal patients who had been cured gave negative reactions. He states that all patients in whom the gonococcus was demonstrated reacted positively. These findings also go to prove that the more chronic the infection the more likely is the Complement Fixation test to be positive. We do not know how long the antibodies may linger in the body after the period of actual infection has terminated so that a persistent slightly positive reaction may mean past, not present infection.

Tullock states that "70% of gonococcal strains conform to one serological type, while the work of Thomson and Vallmond show that Complement Fixation is not markedly specific in relation to the serological types of the gonococcus, so that it is unnecessary and adds complexity to the test to include more than one strain in the antigen." In preparing an antigen for the test he recommends the use of a strain belonging to the predominant type, and which on culture does not develop anticomplementary qualities. From his investigations in 501 cases he came to the following useful conclusions :- first, that sera giving a positive/

positive Wassermann reaction do not give false positive reactions when used for the gonococcus fixation test: secondly, that the test appears to give specific results and is one of considerable delicacy. In his group, cases in which a negative fixation test was obtained when the microscopical findings were positive were in the majority cases in the early stages of the disease. This investigation again bears out the fact that it is in chronic cases that the fixation test is most valuable.

In my opinion then the microscope is the best single method of diagnosis in chronic gonorrhoea and second in importance the presence of physical signs of the disease. Sometimes gonococci are absent from films from chronic gonorrhoea cases because insufficient care has been taken in obtaining them and the secondary septic organism mask the gonococcus. If there is any redness round Skene's ducts or the glands of Bartholin and pus can be expressed from them or from the urethra itself the case is suggestive of gonorrhoea. In nulliparous women a patulous os or a cervicitis are very likely to be of gonorrhoeal origin, especially when the os bleeds easily on touch or presents a granular appearance. In parous women sepsis due to lacerations of the cervix cause a difficulty in diagnosis in chronic cases for it is difficult to find the gonococcus in smears but by frequent and diligent search over a long period/

period very often it is possible to demonstrate the gonococcus microscopically. Cultures and the Complement Fixation test are both helpful in making a differential diagnosis in such cases as also the reponse of the patient's condition to the specific anti-gonococcal treatment given.

Even though all physical signs of the disease appear to have disappeared, and swabs from the urethra, urethra and rectum show no gonococci, and the Complement Fixation test be negative, for childhood may light up the whole condition afresh. Menstruation also adds to the difficulty of treatment as the hyperemia and activity of the genital tract at the time stimulates the growth of the gonococcus, and enable it to penetrate deeper into the tissues and possibly higher up the genital canal. The earlier in the infection, treatment is commenced the better, and it is a great mistake to wait for the acute stage to pass off before starting treatment. Early treatment brings rapid amelioration and if free drainage of the parts is secured, and profuse saline exudate promoted by the agents used, the case is very often saved from the possibility of becoming a chronic gonorrhoea when the chances of complete cure are remote.

## TREATMENT.

The treatment of chronic gonorrhoea in women is an intricate, difficult and very often most disheartening task, as one can never guarantee a complete cure even though all physical signs of the disease appear to have disappeared, and smears from the cervix, urethra and rectum show no gonococci, and the Complement Fixation test be negative, for childbirth may light up the whole condition afresh. Menstruation also adds to the difficulty of treatment as the hyperaemia and moisture of the genital tracts at the time stimulate the growth of the gonococcus, and enable it to penetrate deeper into the tissues and possibly higher up the genital canal. The earlier in the infection treatment is commenced the better, and it is a great mistake to wait for the acute stage to pass off before starting treatment. Early treatment brings rapid amelioration and if free drainage of the parts is secured, and profuse serous exudate promoted by the agents used, the case is very often saved from the calamity of becoming a chronic gonorrhoea when the chances of complete cure are remote.

Another very real difficulty in treating chronic gonorrhoea in women is that the average patient continues her sexual life during treatment even when warned that the treatment becomes practically futile if she is exposing herself to the possibilities of reinfection. Even where the partner wears a sheath during coitus, the stimulation of the female genital organs, the hyperaemia and moisture all help to stir into activity any latent gonococci there. Lastly, the treatment of a case of chronic gonorrhoea is so prolonged that many women cease to attend for treatment after a time and get careless about following the rules laid down for their general health and hygiene.

The following are the methods of treatment advocated by the workers mentioned :-

#### Fraser's Routine.

The patient sits in a hot lysol bath for 20 minutes. The external genitals are then swabbed with 1 in 1000 Acriflavine. If the urethra is involved it is probed with a dressed probe dipped in 1 in 1000 Acriflavine. A Sims' speculum is inserted in the vagina which is swabbed out with Acriflavine. Any diseased foci noted are destroyed. The vagina is packed/

packed with gauze soaked in Acriflavine which is left in 12 hours. The packing aids drainage, it separates the surfaces and permits the continued action of the drug. By absorbing the discharge it prevents condylomata. This is done twice daily. After 10 to 12 days he states all discharge ceases when he prescribes "Sanerin" pessaries night and morning. Vaccines are used from the start. He allows no douching except by a nurse, and emphasizes the importance of always leaving the vaginal vaults dry. He avoids styptics and powerful astringents as they protect the gonococcus in the coagulum. He recommends the use of agents which promote profuse serous exudate with energetic secretion of the mucous glands.

#### Abraham's Method.

To restore the acidity of the urine Abraham gives his patients 20-30 grs. of Acid Sed. Phos.  $\frac{1}{2}$  hour before meals. As local treatment for a urethritis he recommends a bladder lavage twice daily with acriflavine 1 in 4000 or Zinc Permanganate 1 in 600 and care is taken not to over-distend the bladder. In addition, the vulva is douched daily with a mild antiseptic. In resistant cases he inserts a self-retaining catheter through which irrigations can be done three or four times daily. The catheter is changed every two days.

For/

For ulcerated areas he uses 10% silver nitrate, Auto-genous vaccines, he has found, give good results, especially with the secondary organisms.

In cases of chronic endocervicitis, he carries out the following treatment once a week. After giving a vaginal douche the cervical canal is swabbed out with Peroxide of Hydrogen and Liquor Potassae, and then painted with Iodised Phenol or a saturated solution of Picric Acid. A tampon of 10% Glycerine and Ichthyol is then left in the vagina for twelve hours. After the tampon is removed the patient is given a vaginal douche. If the cervix is lacerated he recommends repair. If there are Nabothian follicles he punctures them. If there is a cervical erosion he smears it with 5% Silver Nitrate.

If there is no suggestion of salpingitis he uses Ionisation for the cervix and finds that the results are especially good in cases of endocervicitis associated with a flaccid uterus and sterility. It is dangerous in cases where there is a possibility of salpingitis, as it sets up an acute attack. He uses the method carried out by Dr. Sloan of Glasgow which is as follows :- The requirements are -

- A constant current of about 50 milliamperes.
- A pair of conducting wires.
- A malleable Zinc or Copper rod shaped like a Playfair probe. This is the positive electrode,
- A large flannel covered pad which is the negative pole.

A glass vaginal speculum.

A supply of Zinc or Copper solution grs.xx to the  
Some Saline Solution iii to the pint.

The patient is put in the dorsal position with the pelvis well raised so that the solution does not run out.

A glass Ferguson's speculum is used to prevent leakage of current. Pass the speculum into the vagina, and clear the vaginal vault of all discharge.

Clear the cervix of mucoid discharge by cotton-wool tipped probes. The copper, or zinc rod, sheathed to within 2 inches of its tip in rubber tubing, to prevent leakage of current, is introduced and connected with the positive pole of the galvanic current. The large flannel-covered electrode soaked in warm saline solution is placed on the abdomen and connected with the negative pole.

About an ounce of Copper Sulphate or Zinc Sulphate according to which electrode is used, is tilted into the speculum so as to settle around the os. The current is slowly turned on to 5 milli-amperes and increased to 20. It is reduced if the patient complains of pain. The great point is to increase slowly. Twenty minutes is the average time for treatment. The cervix gets its ~~Ious~~ from the rod and the vaginal vault from the fluid. The copper/

copper electrode sticks more than the Zinc one. To loosen it, reverse the current for a few minutes. This treatment is carried out once or twice weekly, and 8-12 applications clear up the simple cases.

In cases where the infection has spread to the endometrium, Abraham examines his patients 7-10 days before a period under an anaesthetic. If there are no tubal complications he dilates the cervix and cures the uterus and cervical canal thoroughly. He swabs out the uterine cavity with dry, sterile gauze to remove debris, and then treats the surface with Tr.Iodi. The uterus is lightly plugged with gauze smeared in iodised vaseline and the plug is left in for 24 hours. After the removal of the plug there is considerable discharge. Intrauterine douches are not required, only careful vaginal lavage with a mild antiseptic. The majority of his cases have been successful with this treatment. If the discharge persists after the first operation it is repeated at four monthly intervals till cure is achieved. He has tried ionisation for these cases but found it produced troublesome bleeding in cases of baggy, flaccid uteri.

For chronic Bartholinitis he uses 2-3 intramuscular/

intramuscular injections of Manganese butyrate 1 cc. weekly. If these do not clear up the condition, he removes the glands and their ducts.

If a chronic proctitis is associated he washes out the rectum daily, and uses Allen & Hanbury's rectal plugs.

#### Watson's Routine.

The external genitals are treated with 2% Protargol.

The urethra is injected with  $\frac{1}{2}$ -2% Protargol.

The vagina is swabbed with 1% Lactic Acid and the cervical canal treated with Protargol. The parts are dried and the cervix is lightly packed with lactic bacillus powder. A bacillus pessary is inserted high up in the vagina. Later he uses 1 or  $\frac{1}{2}$ % Lactic Acid for swabbing as well as the powder and pessaries.

#### Osgood.

Recommends a vaginal tampon of 2% Protargol twice daily.

He cleanses the vulva often with a .5% Protargol. He does not allow the patient to douche herself, and if the urethra is inflamed he does not pass a catheter, but injects into the bladder protargol, Silver Nitrate or Pot. Permang. 1 in 2000.

Stevens and Heppner.

In chronic urethritis they use instillations of 1-3% solutions of Silver Nitrate, as well as local applications of stronger solutions of the same drug through a sharp female endoscope in the absence of glandular involvement or strictures. They found acriflavine and mercurochrome of little permanent value, though at first they seemed promising. If there are strictures they dilate or incise them. Infected ducts and glands are destroyed by the cautery or fulguration electrode, introduced through a skenescope. In the case of Bartholin's gland they found that treatment by injection of different solutions including acriflavine and mercurochrome proved of little or no value. They consider that excision in all acute or chronic pathologic conditions of the glands is the procedure of choice. The entire gland must be removed, otherwise subsequent abscess formation is liable to occur. Neither the absence of demonstrable gonococci nor occlusions or strictures of the ducts are contraindications to the removal of Bartholin's glands.

Guy's Hospital Routine.

The genitalia are cleansed. A Ferguson's speculum/

speculum is inserted in the vagina and the cervix, vagina and vulva are treated with Picric Acid in Glycerine 50%. Picric Acid is a most penetrating antiseptic, and glycerine promotes the flow of serum to the surface. If the infection is localised to the Bartholin glands or Skene's ducts they are injected with a blunt pointed needle.

#### Dr. Ballenger.

Recommends the use of the high frequency current to destroy the glands in the cervix. A small bulbous electrode is used and treatment may be repeated every 3 or 4 weeks. In his cases treated with the high frequency current a purulent discharge is quickly changed to a watery one.

#### Clinton-Smith Method.

The patient takes a hot sitz bath twice daily. The urethra is irrigated twice daily with 1 in 8000 to 5000 Pot. Permang. or Acriflavine 1 in 5000 to 10,000 alternately. Skene's tubules and Bartholin's ducts are stripped and instilled with 5% Silver Nitrate. These ducts are treated thus till they are free of pus. For the cervix uteri, he uses 20% Silver Nitrate followed in five minutes by Tr. Iodi which thus deposits in the cervix/

cervix a silver-iodide. This is repeated daily or every second or third day.

Dr. Hobbs' Method.

The vulva and vagina are swabbed daily with ether soap (3 $\frac{1}{2}$  to the pint), and then with saline after which they are dried. The bladder is next irrigated with Pot. Permang. 1 in 5000. Every fifth or seventh day the urethra and cervix are treated with Tr. Iodi. and Glycerine in equal parts. It has been found that with this treatment the local hyperaemia diminishes, the discharge and secretion become less purulent and more white and curdy. As the condition improves the swabbings are done at longer intervals, and eventually Iodine and Glycerine are replaced by the astringents Picric Acid and Silver. Should cervical catarrh persist, gauze soaked in three parts liniment of Iodine and one part Glycerine is passed into the cervical canal with a probe. This is left in for six hours and pulled out by the patient. The reaction is intense but good results are claimed. If the infection has spread to the endometrium and metrium Dr. Hobbs has had excellent results from the following procedure which can be carried out even when a pyosalpinx is present or soon after childbirth. "The patient is prepared as for a major/

major operation, the vulva and its surroundings, the vagina, and cervix being sterilised as thoroughly as possible. With the patient under a general anaesthetic, a Sims' speculum is passed, the cervix seized with volsellum forceps, and the cervical canal swabbed out with glycerine of carbolic acid (1%). The internal os is gently dilated to No.7 Hegar, a small-sized rubber catheter passed to the fundus, and the cavity gently syringed out with liniment of iodine. A strip of gauze 6 inches by  $1\frac{1}{2}$  inches, with 8 inches of tape attached, and with its upper end fashioned into a small hood to receive the end of a Playfair's probe, is soaked in equal parts of tincture of iodine and glycerine and pushed up to the fundus where it is left for 6 hours. At the end of this time the plug is removed by means of the tape which is left hanging out of the vagina. The patient remains in bed for about three days until the reaction, in the form of increased discharge, with perhaps, some pains, has died down. The operation is carried out monthly, while the vaginal and cervical applications are continued daily."

Jansion and Diot.

They give intravenous injections of 5 ccm. of a 1 in 50 watery solution of acriflavine three times a/

a week. Of 165 cases thus treated they report 153 cured; the smallest number of injections required being 5 in 22 cases, the largest 25-40 in 8 cases. One patient required 54 injections. No local treatment is given, and the treatment is ambulatory. The only complication which arose after treatment had been established was Iritis which was cured in less than a week by further injections and atropine locally. The effect on the general health they claim is excellent, and there is better disinfection of the genito-urinary system in the female than by any other method.

Ferron and Cosnier.

Have also carried out the intravenous acriflavine treatment with success. In 9 cases of urethritis 9-15 injections were required with an average duration of treatment of 26 days. Eight were cured, but in one, gonococci were still present in the pus after 15 injections. Two patients with severe gonococcal cystitis were cured after 5 injections given on alternate days. One patient with gonorrhoeal arthritis of 2 months had 8 injections in 14 days. After the fifth injection the pain disappeared, swelling diminished, and he was able to get up and walk. After 8 injections the patient was discharged cured.

Wolf.

Considers that stock vaccines are a useful adjuvant to local treatment in adnexal inflammation. They may provoke a latent gonorrhoea, and are therefore not therapeutically effective without local treatment. He thinks that freshly prepared, but not necessarily autogenous, vaccines are superior to all stock preparations. He gives them in high doses from 500 millions upwards twice a week. They speedily lose their efficacy with keeping, and should be discarded after a few weeks. Local and general reactions occur less frequently with fresh than stock vaccines possibly because the latter contain liberated endotoxin. In long standing chronic cases he has had good results from subcutaneous injections of living gonococci from another patient preferably, on one or two occasions. He uses a culture not more than one week old from a virulent strain, and gives 3 or 4 injections of .1 -.2 ccm. of a well shaken emulsion of a culture in 2 ccm. of distilled water. The sites of injection are about 6 ccm apart. A painful phlegmon develops and sometimes an abscess; the second injection must not be given until these had almost subsided. No metastatic abscesses have been noted/

noted, nor signs of arthritis or endocarditis. This vaccine treatment alone sufficed in many cases to cure chronic uterine gonorrhoea, but it did not appear to affect gonorrhoea of mucous membranes such as urethritis. In the latter cases local treatment was also required.

#### Major Lamkin and Co-workers.

Have been using a vaccine consisting of certain constituents of the gonococcus, i.e. the alpha-nucleo-protein and beta-nucleo-histone fractions of the polar bodies, which can be made to grow from some strains of gonococci if they be grown on a medium rich in animal nucleo-protein. Both these substances are antigenic and relatively non-toxic. For intradermal injection 1,000 million gonococci per c.c. in 2% salt solution are used.

For intra-urethral injection, the nucleo-protein of 100,000 million organisms is contained in 15 c.c. of a 2% salt solution. Much larger doses than the above, even to 3 or 4 times, he uses with better results. One per cent Sodium Tauro-cholate is added to the 15 c.c. and the reaction brought to a p.H of 7.2. Mucin is added to 100 c.c. The dose is 20 c.c. for intra-urethral injection, or the product of 20,000 million gonococci.

Only one-third of the strains of gonococci isolated produced antigenic polar bodies, and the antigenic properties of a gonorrhoeal vaccine are practically all contained in the alpha-nucleo-protein and the beta-nucleo-histone of the polar bodies.

After lavage with pot. permang. 1 in 20,000, 20 c.c. of the vaccine in mucin and taurocholate of soda are injected into the urethra and kept there three hours. At the same time the patient receives an intra-dermal injection of 1/5 c.c. of the same vaccine, corresponding to 200 millions of the original culture. The most favourable reaction of the tissues is when the p.H value of the urine is within the limits of 7.2 and 7.4. When the urine is on the acid side of this figure the gonococci are found in resistance formation. When on the alkaline, there is considerable autolysis with liberation of irritative endotoxin. The alkali found most useful was di-sodium-mono-hydrogen phosphate. A daily titration of the patient's urine is done. After the first injection daily observations are made of the urethral discharge, and the intra-urethral and intra-dermal injections are repeated as required. The intra-dermal injections are given every ten days. The inter-urethral injections are given daily till the discharge shows no gonococci.

The/

The intra-urethral injection is also repeated if the patient's urine reaches the optimum pH value from being acid at the start.

They have given 80,000 million organisms with promising results and no sign of provocation.

The results of this treatment have been encouraging. There has been a general and continued improvement in the cases as a whole. The urethral discharges decrease, the number of gonococci are reduced, and in favourable cases symptoms are very rapidly relieved. Complications such as arthritis have lessened and cases have not relapsed.

#### Carbus and O'Connor.

Have used diathermy for gonorrhoeal endocervicitis in 150 cases over a period of 6 years and consider it a valuable method of eliminating the disease. They state that the persistence of gonorrhoea in women is mainly due to the presence of the organism in the paraurethral, cervical, and endocervical glands, and that treatment should aim at destroying the gonococcus in situ without causing any permanent damage to the canal. This can be obtained by Diathermy as the gonococcus is instantly destroyed/

destroyed at 113°F or at 104°F prolonged for six or eight hours and normal epithelium can resist 118°F for an hour. The treatment is continued until the gonococcus can be proved to have been eliminated from the tissues. They consider Diathermy applied to the cervix is contra-indicated during pregnancy, in the early acute stages of the infection, or when evident active pelvic inflammatory changes such as salpingitis or pelvic cellulitis are present. The advantages of the method are that it is painless and devoid of medication. Strictures and cicatrices are avoided. The disadvantages are the cost of the apparatus, difficulty of conveyance and skill required in administration to gauge the strength and frequency of treatment.

#### Cumberbach and Robinson.

In 1923 they reported good results in gonorrhoeal arthritis with Diathermy, and in 1923 and 1925 reported cases of gonorrhoeal cervicitis and urethritis treated by Diathermy. They state that they do not know the temperature most suitable for the growth of the gonococcus in living tissues nor the temperature to which it is necessary to heat the gonococcus in order/

order to kill it in living tissues, nor the temperature and time of exposure which will increase the self-protective power of the tissues to their maximum. They believe that the effect produced by Diathermy in gonorrhoea is not due to the direct effects of heat alone. In living tissues heat has direct and indirect effects, and they believe these may be due to the effects of heat upon blood, vessels, mucus producing cells and other cellular activities. In dealing with living tissues, the reactions affecting blood, and blood supply, and other tissue reactions, are set up after a short application, and continue for some time afterwards and increases the power of the tissues to exterminate the infecting organisms. Because of this direct and indirect effect, the temperature lethal to gonococci in the cervix and urethra in ten minutes does not produce pain or destruction of the tissues concerned. They have treated over 150 cases, and have found that heating the infected cervix uteri to  $114^{\circ}\text{F}$  for ten minutes and repeating the treatment twice at three-day intervals had often been sufficient to cure or arrest metastatic infection, and procure apparent freedom of the primary foci from gonococci.

In certain cases of gonorrhoeal arthritis in women they were unable to heat the cervix to  $114^{\circ}\text{F}$  because/

because the Fallopian tubes were infected, and heating the cervix to 114°F caused severe pelvic pain. Only half strength current was possible but effects on arthritis were just as good. To procure the direct action high temperatures are required, and relatively short exposures. The temperature of 114°F is the maximum that should be used, as sensation of heat changes to pain between 114° and 115°F. It is inadvisable to increase to the pain stage as infected tissues may lose their self-protective power. Wherever the infection be and whether metastatic infection is present as well as the primary they apply Diathermy to the urethra and cervix. These parts are treated whether the gonococcus is found in them or not, and whether the parts have already been treated by other methods or not. In married women the urethra is first subjected to Diathermy. A bougie electrode is inserted, and the circuit is completed by a belt electrode of sheet lead which is secured around the pelvis. The current is gradually increased till the patient feels pain instead of heat. The current is then reduced slightly till pain disappears. It is kept at this strength for ten minutes. The cervix is treated after the urethra. A bougie electrode is inserted/

inserted into the cervical canal after passing a speculum per vaginum, and the circuit is completed by a belt electrode. The cervix is insensitive to heat and pain, therefore the patient's sensations give no guide. The current used for the urethra is noted, and the area of contact which the urethral electrode makes with the mucous membrane is calculated. The length of insertion of the cervical electrode and the diameter of the latter are noted. The area of contact with the mucous membrane of the canal of the cervix is calculated. The current for the cervix, compared with that applied to the urethra, is reduced in direct proportion to the smaller area of contact made by the cervical electrode. When both electrodes have the same diameter the length of insertion only need be noted. If the length of insertion into the cervix is half the length of insertion into the urethra the current applied to the cervix should be half that applied to the urethra. At such treatment the current which produces the standard temperature of  $114^{\circ}\text{F}$  in the urethra must be ascertained afresh. It will be found to vary from time to time because the resistance of the pelvic tissues varies. At each session of treatment Diathermy is applied first to the urethra for ~~ten~~ minutes and then to the cervix for the same time. The treatment is repeated/

repeated twice weekly, and from 3-5 sessions are held.. It is seldom necessary to give further treatment to these parts.

When a vaginal speculum cannot be introduced, Diathermy can be applied to the cervix by passing an electrode into the rectum. The electrode which they have devised for applying Diathermy to the cervix by the rectum consists of a hollow metal case, eight inches long, oval in cross section and  $\frac{1}{2}$  inch wide at its broadest part. In its interior a tube is attached for holding a thermometer. One end of the electrode is rounded and closed. This end is passed through the anus and the electrode introduced for 4 inches into the rectum. The end which lies outside the body is depressed on to the couch on which the patient lies by means of a sand bag. The circuit is completed by means of the belt electrode already described. When the current is passing, the patient feels a sensation of heat within the rectum. The current is increased gradually until she feels a sensation of pain; it is then slightly reduced. We have found that the sensation changes from heat to pain at  $114^{\circ}\text{F}$ . This temperature is reached in the rectal wall. The cervix not being in contact with the electrode does not reach so high a temperature. The/

The current is allowed to pass for twenty minutes, and treatment is repeated twice weekly, until 3-5 sessions have been held. Treatment of the cervix is always preceded by treatment of the urethra. The results of treatment were as follows :- In 39 cases of Arthritis, with the exception of 2 in whom treatment could not be completed, pain and tenderness was abolished, swelling was reduced, and the range of movement increased. Cases of short duration, in which permanent organic changes had not taken place in the joints, lost all signs and symptoms, and cure was effected. In cases of long duration some physical signs of abnormality remained but pain and tenderness were abolished and the disability was reduced. In these the disease was arrested and the patient could undergo other treatment such as massage, movements, sinusoidal and galvanic currents without return of symptoms. From their experience they are justified in saying that the application of diathermy to the foci from which the infection is disseminated will cure or arrest gonococcal arthritis.

As regards urethritis and endocervicitis of 20 patients treated with Diathermy 18 showed no gonococci and the other two were probable reinfections. The length/

length of the course of treatment varied - two required six, one required nine and three required more than nine. In many patients the discharge from the cervix disappeared and the part regained its normal appearance. In four a purulent discharge remained but gonococci were absent. These were ionised with copper. This treatment caused the discharge to disappear in three cases and reduced it in the fourth. In private patients only five applications of Diathermy were necessary.

In cases of salpingitis the pain begins to subside after the first application. The treatment is done twice weekly, and usually after the fourth application there is no tenderness and the swelling is slight or impalpable.

In some cases of salpingitis heating of the cervix is followed by pain in the lower abdomen for 1-7 days. When this occurs the cervix treatment is stopped, and a special vaginal electrode is used to secure gentle heating of the pelvic organs. After four vaginal treatments the cervix may sometimes be treated without producing pain and results in the subsidence of the salpingitis. In certain cases removal of the tube is necessary.

Milner and MacLachlan.

They think no Diathermy electrode should be introduced into the urethra on any account. They treat gonococcal urethritis with the indifferent electrode well down on the pelvis, and after lavage and swabbing of the urethra an active electrode - a cylindrical metal rod  $\frac{5}{8}$  of an inch in diameter - is introduced  $2\frac{1}{2}$  inches into the vagina and pressed in an upward direction against the vestibule and urethra. More current is required than for the cervix, i.e.  $106^{\circ}\text{F}$  temperature got by  $1\frac{1}{2}$  amperes for ten minutes and this is repeated five or six times when a cure should be effected. Smears are taken the day after each treatment. They apply Diathermy to the cervix and uterus by introducing an electrode into the os uteri and maintaining a temperature of  $107^{\circ}\text{F}$  for ten minutes. The results are marked. Cervical erosions heal rapidly. The discharge becomes less and gonococci disappear from smears. With a continuation of treatment the mucopurulent ropy discharge disappears and quite a clear mucous secretion, without any gonococci in either smear or culture, is then left. Their results in In and Out Patients have been equally good. They do not think it is necessary to admit cases to hospital unless they get burnt though superficial burns/

burns of the cervix heal readily.

Henry Gluckmann of Johannesburg.

Has treated 60 patients with Diathermy, and says the results of treatment in cervicitis are encouraging. He states that there is no proof that Diathermy acts specifically though gonococci are very susceptible to heat. He considers that the active hyperaemia of the joint resulting from direct application or the flooding of the circulation with the endotoxins which results from the application to the primary focus, probably produce the beneficial results rather than the effect of the heat on the gonococci.

Professor Höffmann of Bonn University.

Recommends for gonorrhoea of the urethra Protargol 1-5% or Albargin  $\frac{1}{4}$ -3%.

For gonorrhoea of the cervix, glycerine tampons containing 10-20% Ichthyol and 2-10% Ichtharagon. He also uses gonostyli with protargol 1-3% for both urethritis and cervicitis.

Thomas Stellmagen.

Lays great stress on the importance of a bland diet, plenty of bland fluids and a quiet life for patients suffering from gonorrhoea. He thinks that/

that vaccines are of use in chronic cases. As regards treatment through the blood stream he has used hexamethylenamine with some success. With the colloids by hypo-dermic injection as recommended by McDonagh, he has seen some brilliant results in gonococcal complications obtained by Dr. McDowell. He has not found serum therapy adequate.

Miss Frances Ivens.

Recommends the subcutaneous injection of Nicoll's Serum in conjunction with surgery for gonococcal conditions of tubes and ovaries. The after history of her patients treated thus was satisfactory and several had since borne children. Though this serum treatment was in her opinion curative it was not prophylactic if the patient were exposed to reinfection.

Col. E. T. Burke.

As the organisms from a normal urethra are numerous when the urethra is injured the natural flora are stimulated in growth and virulence. In a case of gonorrhoea the gonococcus caused the initial damage and on it the other organisms flourished. He believes that if local treatment were pushed too vigorously it might by increasing the damage do more harm than the microbes.

In/



In cultures he had found that the gonococcus showed a marked tendency to deviate from the normal, i.e. there seemed a gradual change from the Neisserian gonococcus to the simple coccus. He considers early treatment important and avoids over-treatment, as he believes it to be the main cause of secondary infection. Gentleness in treatment, he thought very necessary. He renders the urine dilute, copious and alkaline by giving non-irritating alkaline fluids. He stimulates the protective forces by vaccines. Where a secondary infection had occurred he often found six months cessation of treatment more beneficial than active treatment.

Professor Matzenauer and Dr. Hans Weitgrasser.

Recommend suction treatment with an ordinary suction tube (saugglocke) consisting of a glass tube with a rubber tube attached to a syringe. The cervix is first cleaned and the upper vaginal walls and the suction tube is applied to the cervix and the syringe is then used to exhaust the tube. The patient feels a sensation of light pressure as the part is sucked downwards and the external orifice becomes dilated and everted and secretion is drawn from it into the syringe. The suction can be continued for half to one/

one hour. Combined with this suction treatment a local intra-uterine medication may be used, and after the removal of the suction apparatus, a dry tampon with vulvo-dermol or choleral is applied. The treatment may be continued for two or three months with intermissions at the menstrual periods. Their results have been remarkably satisfactory. The method, they affirm, is quite harmless, and cervical erosions have been found to be benefited.

#### McGlinn.

Considers that local treatment in chronic cases is usually a waste of time. The disease is latent in the cervix, Bartholin and Skene glands and the usual local applications are useless because the germs are so deeply embedded that they can only be destroyed by the actual cautery or the application of radium. If Skene's glands are involved, he lays them open and cauterizes their entire surface. If Bartholin's glands are infected he completely dissects them out or destroys them with the cautery. After cauterizing the cervix he allows post-operative treatment to prevent cervical stricture.

#### Rundle.

In an investigation of 100 cases with vaginal discharges caused by cervicitis and endometritis found intramine/

intramine pessaries of great value. They stopped the discharges and healed erosions if present. The pessaries contained 1% intramine in a stearine base. One was inserted per vaginum nightly for one month. In a later series of cases a douche of 1 in 1000 Zinc Sulphate was prescribed the morning after to prevent the incidence of dermatitis. All the cases were treated in hospital and then observed for some months as out-patients, being examined clinically and bacteriologically once a month. An improvement in all cases was noted at the end of the first week. Eight cases developed a local dermatitis caused by the sulphur. Two cases relapsed clinically but not bacteriologically and cleared up again after another month's treatment. The dermatitis commences with itching of the vulva followed by swelling of the mucous membrane and exudation of lymph. The lesion may stop at this or go on to produce an erythema of the thighs. Calamine lotion, however, soon clears up this condition.

Dr. Otto von Robden - Heinkendorf.

Thinks that intravenous injection treatment cannot be regarded as a definite cure of gonorrhoea, but the results are superior to those of local treatment.

He/

He has tried intravenous injections of Kollargol in 5 chronic cases, giving 8-10 injections of .08-.1 c.c. at intervals of two - three days. Two were definitely cured, two probably so, and one possibly so.

In 13 chronic cases he tried intravenous injections of Gonargin, a bacterial vaccine, giving ten injections of 5-20 million at 3-4 day intervals. Of these eight were definitely cured, three probably so, one possibly so and one was uncured.

In the six cases in which autogenous vaccines were given three were possibly cured, and three were uncured.

Professor Jadassohn of Breslau University.

He does not use internal remedies, such as vaccines and protein shock in simple urethritis and cervicitis, only in complications and uterine gonorrhoea. The urethra is treated daily with 1 or 2% Silver Nitrate after micturition, 1-3 times daily. The urine is then held as long as possible and a Pro-targol bougie left in the urethra. If the condition does not clear up he examines the passage with the urethroscope, and employs electrolysis and silver injections to the affected areas. The extra-urethral foci/

foci he destroys by electrolysis, galvano-cautery or injection with strong Silver Nitrate. If Bartholin's glands are infected an injection of 1-2% Silver Nitrate is given into the canal with a slightly bent fine cannula. If this does not succeed he injects the glands and surroundings with alcohol or protargol. If that fails he removes the glands with their ducts.

In gonococcal cervicitis he cleanses the parts with a vaginal irrigation and paints the cervix daily with 1-10% Silver Nitrate, Tincture of Iodine or Formalin on a Playfair's sound. Protargol or ichthyol tampons or bougies are then inserted in the vagina. If this treatment is without result after a long time the endometrium of the body of the uterus is treated similarly or by very careful instillation of several drops of one of the above solutions with a Brann's syringe or Guyser catheter.

In gonorrhoea of the rectum he gives irrigations with ichthyol, and uses suppositories and sometimes paints the rectum through a rectal speculum.

He advocates rest in women and avoidance of sexual intercourse, and stimulation of the breast.

No local treatment is carried out during menstruation.

Dr. Cochrane Logan.

Considers the following points of importance in the treatment of gonorrhoea in women - relief of worry, sufficient rest, food and fluids, regulation of the bowels, tonics, in short everything that will improve the patient's general health.

She uses a polyvalent stock vaccine made by Dr. Rosher and this is given even in cases that are negative if they are clinically positive. She avoids getting a reaction, local, focal or general. The dose is up to 1,000 millions. She always excludes salpingitis before giving vaccine. She tried detoxicated vaccines for two years, but did not get good results. An autogenous (secondary organisms) vaccine she found useful in some cases with persistent symptoms. Collosal Manganese had also been useful.

Locally, after swabbing the vulval surface, the urethra is swabbed, irrigating Skene's peri-urethral and Bartholin's ducts when indicated through a fine lacrimal cannula. The vagina is then mopped out through Cusco's speculum. The cervical canal is swabbed out with 10% Protargol and a vaginal pack treated with 10% Protargol inserted and removed in

12-24 hours. This pack is renewed daily or less according to the severity of the condition. Where the case is not responding, variety in treatment is essential and treatment ought to continue after symptoms subside for the condition will relapse if the treatment is stopped too soon.

Dr. Violet Russell.

Emphasizes the importance of personal cleanliness of the patient and improving her general health. She must be warned against getting overtired or overheated.

Locally, the vulva is swabbed with anti-septic, a warmed, oiled Ferguson's speculum is inserted. All discharge is swabbed away. The cervix is swabbed and the endocervix treated with a dressed Playfair's probe. The vagina is swabbed. The urethra is treated with a dressed probe and Skene's and Bartholin's ducts irrigated. A watery solution of protargol is used for irrigating by means of a hypodermic syringe, and a blunt-pointed needle, and if necessary with the help of a Parnell metal speculum. The para-urethral irrigation relieved the soreness or irritation round the urethra and clears up any rheumatic manifestations elsewhere. Irrigation has to be kept up for a long time in some cases. In chronic cases 25% Sulphur in Glycerine/

Glycerine is used for swabbing, and in some cases the results have been wonderful. Ichthyol, Picric Acid in Glycerine are also used. Dr. Russell was not impressed by the results obtained with acriflavine. In some cases cervical bougies are inserted. Tampons are used only in severe cases.

Gas-producing pessaries and bougies have given encouraging results. The patients use medicated pessaries at home, and are advised to take frequent sitz baths. Douches are not recommended. Stock or Detoxicated vaccines are used in every case, the chronic cases getting weekly doses of Stock vaccine 5-100 million.

#### Col. Harrison.

Belongs to the group of workers who, whilst not denying the value of local treatment, do not believe that there is any bactericidal remedy which can reach down to and destroy the gonococcus in the depths of the tissues. They try to cure gonorrhoea by raising the patient's resistance, and by securing and maintaining drainage. He disapproves of the use of Silver Nitrate as it only cauterizes the surface and so produces ideal conditions for the growth of secondary organisms. It leaves scars and fails to kill the gonococci in the deeper/

deeper layers. To assist the tissues to eliminate the gonococcus he injects intravenously Acriflamine in conjunction with local treatment and thinks it is a distinct help. He uses the neutral variety, and employs a 1% solution giving 4 c.c., 6 c.c. and 8 c.c. before proceeding to 10 c.c. at which dose the treatment is continued. He also believes in the method of stimulating the formation of anti-bodies to gonococcus in the body by means of vaccines. In his experience vaccine treated cases pursued a milder course, and were freer from complications than those untreated by vaccine. In some of his cases the giving of vaccine caused an exacerbation of symptoms, but he did not consider that this indicated that the patient had been made worse by the vaccine. The fact that discharge increased after the giving of vaccine showed that the tissues had been stimulated to throw out the germ. Patients differed in their reaction to vaccines and some made a very poor response. As regards Detoxicated Vaccines, he had seen some good results. He considers that protein shock therapy is useful in gonococcal complications, but sufficient was not yet known as regards the preparations and dosage that would give the best results. He had chiefly used electrargol and milk. His results with milk in combination with vaccine had not been as good as those of Tansard, but this may have been due to the fact/

fact that the milk used by the latter contained a larger proportion of bacteria. His results with Diathermy have not been so brilliant as those of Cumberbach and Robinson, as the cures have not been so rapid in females but the results have been sufficiently encouraging to justify perseverance. He does not think the best method of applying Diathermy has been discovered yet. He believes it acts by an auto-vaccine effect not by destroying gonococci by heat. As regards the treatment of gonorrhoeal arthritis by Diathermy, his results have confirmed the claims of Cumberbach and Robinson.

His routine treatment for cases at St. Thomas' Hospital is as follows :- If possible the patient attends daily for treatment by the nurse and less frequently by the medical officer. The urethra is irrigated with a glass catheter with a saturated solution of Soda Bicarbonate followed by Chloramine T. 1 oz., Sodium Chloride 1 oz. Water to 24 ozs., which is further diluted to 1 in 40 just before use.

The cervical canal is cleansed by swabbing with a saturated solution of Soda Bicarbonate followed by Chloramine T. solution. The cervical canal is then irrigated with the same solutions with a back flow metal instrument with spiral grooves.

The vagina is then packed with one yard of gauze/

gauze soaked in the following :-

First week - glycerine and Borax 10%

Second week - glycerine of anosol 5%.

Third week - glycerine of Eucalyptus 5% or with 1% solution of Di-chloramine T. in 20% chlorinated eucalyptus oil and 80% chlorinated paraffin.

Fourth week - same as first.

Fifth week - same as second, etc.

In some cases a wick of gauze soaked in one of the above glycerines is pushed into the cervical canal and left 24 hours.

Injections of detoxicated vaccine are given as follows :-

First week - 1,000 millions.

Second " - 1,000 "

Third " - 2,000 "

Fourth " - 3,000 "

Fifth " - 3,000 "

Sixth " - 5,000 "

Seventh " - 5,000 "

Eighth " - 5,000 "

In secondary infections the vaccine is gonococcal mixed with secondary organisms.

When patients do not clear up and it is obvious/

obvious the body of the uterus is infected Hobb's treatment is adopted, i.e. Liniment of Iodine with glycerine is injected through a No.3. English catheter which is removed in 6 hours.

In pregnant women no cervical treatment nor packing is done.

#### My own methods of treatment.

The methods I employ in cases of chronic gonorrhoea are local and general. The patients are requested to attend bi-weekly for treatment by myself and as many as can are encouraged to come daily for local treatment by the nurse. Locally, the vulva is swabbed with 1 in 5000 Pot. Permang. The urethra is irrigated through a glass catheter with 1 in 8000 Pot. Permang. solution. If the para-urethral ducts or Bartholin's ducts or both are affected these are also irrigated with the same solution through a lacrymal cannula. The vagina is likewise irrigated with about 2 pints of a 1 in 8,000 Pot. Permang. solution. A Cusco's speculum lubricated with glycerine is then passed into the vagina, which is thoroughly dried out with pledgets of cotton-wool. The cervix is then inspected. If any nabothian follicles are visible these are punctured and the mucoid secretion wiped away. The plug of mucus in the cervical canal is/

is removed by means of a ~~Sinus~~ forceps dressed with cotton-wool dipped in Liquor Potassae. Next with a dressed Playfair's probe dipped in 10% Protargol and Glycerine the cervical canal is swabbed out, care being taken not to push the probe beyond the internal os. If there is a cervical erosion it is painted with 10% Glycerine of Protargol. The vagina is packed with gauze soaked in 10% Glycerine and Protargol and left in for 12 hours. The patients are given pessaries of 10% Protargol and Glycerine which they insert at home after removing the vaginal packing.

A dressed probe dipped in 10% Glycerine and Protargol is passed into the urethra, and when necessary the ducts of Skene and Bartholin are injected with 10% Glycerine and Protargol by means of a hypodermic syringe and blunt needle.

The 10% Glycerine and Protargol is varied with a 5% solution of Glycerine and Eucalyptus and a 25% solution of Sulphur and Glycerine. Latterly, in a few cases, I have been using bougies of spumen, a CO<sub>2</sub> gas producing substance, in the urethra, cervix and vagina and the results so far have been encouraging.

Lastly, the rectum is inspected with a proctoscope and if there are any indications of infection it is swabbed/

swabbed out and painted with 10% Glycerine and Protargol.

If the infection of Skene's and Bartholin's ducts appears to resist the above treatment I destroy them with the electric cautery. If the glands of Bartholin are involved I excise them with their ducts. If the cervical infection has spread to the uterus I carry out the treatment recommended by Hobbs every month after the menstrual period, as described on Page 35 along with the routine treatment of the other parts.

If gonorrhoeal warts are present I excise them under a local anaesthetic and cauterize the surface with a Silver Nitrate stick. I always admit these patients to hospital as recurrence is very liable if the discharges are not properly controlled. The patient is required to urinate in the knee-elbow position, and the nurse swabs the vagina free of discharge three times daily, plugging it well after to prevent the discharge from trickling over the wart bearing area. The vulva is kept as dry as possible with frequent swabbing with spirit, and dusting with powder made of a mixture of bismuth, calomel and zinc.

In cases of chronic gonorrhoea with arthritis the local treatment is combined with small doses of Sulfarsenol given subcutaneously once a week. In one case so treated the results have been more than gratifying. The patient is a multipara and came under treatment/

treatment ten months after the birth of her third child. She had been bedridden during most of that time with a rapidly advancing arthritis which commenced in the small joints of the hands within ten days of the confinement and rapidly spread to the other joints of the upper and lower limbs and the spine. There was tenderness, swelling and pain in all the joints affected, and the patient was pale, thin and emaciated. She was found to have a purulent vaginal discharge with some erosion of the cervix and some redness round the urethra. Gonococci were found in the cervical smears. Local treatment was at once started in the cervix and urethra and weekly injections of No.3 Sulfarsenol subcutaneously. The patient is now able to walk without discomfort and use her hands to do many of her household duties. Her general condition has improved and she is putting on weight. The vaginal discharge is negligible now and the erosion has healed. The last few past menstrual smears from the cervix have shown no gonococci, but pus cells are still present. During a fortnight's cessation of treatment when the patient was unable to attend, she had a return of pain and stiffness in one ankle which again subsided when treatment was recommenced. Probably, with the use of Diathermy, which is not at my disposal, this condition could be cured, whereas at present/

present progress is slow and the chances of relapse great if treatment is stopped.

As regards general treatment, patients are advised to keep their bowels well opened with saline aperients, to drink large quantities of water and other bland fluids, to take simple non-stimulating food at regular hours and plenty of rest. Frequent sitz baths are also recommended, and patients are warned against the indulgence of sexual intercourse.

I have not found vaccines of any use in my chronic cases. I have used the stock and detoxicated varieties in large and small doses at varying intervals and have noted no appreciable change in the condition of the patients locally.

In conjunction with the local treatment described above I give bi-weekly or weekly intravenous injections of 5 c.c. of 2% solution of Acriflavine according to the number of times the patient is able to attend. Of a series of 30 patients suffering from long standing chronic gonorrhoea treated with intravenous Acriflavine all except 5 patients stated on their own initiative that they have felt better in themselves since having the injections. I have given these intravenous injections to pregnant as well as lactating women suffering from chronic gonorrhoea without any untoward/

untoward results to mother or child. The only reaction noted was a local urticaria near the site of injection in 4 patients and this did not occur on every occasion an injection was given. Several of the patients complain of a feeling of fullness and heat in the head, a constriction of the throat and a warmth about the perinaeum soon after the injection. They pass off, however, almost immediately. The results of this treatment have not in my hands been startling but the improvement in the general health and well being of the patients and the improvement in the local condition of some warrant its use in conjunction with local treatment. Of the 30 patients noted, 5 discontinued treatment before the first month, and 4 continued to have marital relations during treatment and had to be excluded. Of the 21 remaining the number of injections given varied from 5 to 34, before the discharge became definitely mucoid in appearance and films showed no gonococci. The average number of doses was 20. The patient that required 34 injections had some inflammation of Skene's ducts before treatment was commenced, but this has now cleared up. A second patient with inflammation of Skene's ducts required 24 injections. Two had cervical erosions which healed in one case after/

after 5, and in the other after 13 injections. All 21 films taken after menstrual periods still show some pus cells from time to time, and if local treatment is discontinued the leucorrhoea tends to increase. I cannot claim to have cured any case of chronic gonorrhoea with this treatment, as none have been sufficiently long under observation, which I fix at approximately two years, nor have they passed all the tests of cure. The results, however, have been sufficiently good to warrant perseverance in the treatment.

## EVIDENCES OF, AND TESTS FOR, CURE.

To determine whether a patient who has suffered from chronic gonorrhoea is definitely cured is extremely difficult, for we know that gonococci appear intermittently in the discharge. This entails a prolonged period of search and observation. Sometimes numerous gonococci are found in a normal looking secretion when no physical signs of the disease are apparent. At other times the organism cannot be found either microscopically or culturally in cases with a definite infection, where the partner is also suffering from the disease. Again, it is possible for a woman with a purulent vaginal discharge not to infect her partner. Noeggerath believed that a woman once infected with gonorrhoea could never be cured, and as comparatively few patients with chronic gonorrhoea have the moral rectitude and requisite will-power to persevere with the lengthy course of treatment and observation required, and its consequent restrictions on their pleasure, he comes perilously near stating a fact, at any rate with regard to those women who come for treatment in the chronic stage of the disease.

The only two certain testing media are the mucous membrane of the male urethra and the conjunctiva of/

of the child, and as these are impossible, one has to lay down a fair workable standard of cure as arrived at by other means. We ought to be able to assure the patient that unless reinfected her condition will not relapse nor will she suffer from any of the sequelae of the disease, and that urogenitally she is non-infectious.

The following are the standards of cure laid down by the workers mentioned :-

Watson.

Before discharging a patient as cured he insists that there must be an absence of all abnormal appearances in the uro-genital tract. There must be no purulent discharge or areas of redness as far as the cervix. The gonococcus must be absent from cervical and urethral smears after repeated search. In doubtful cases he applies 1 in 1000 Silver Nitrate solution to the cervix as a provocative, or uses 5-10 millions of a provocative vaccine.

Professor Jadassohn of Breslau University.

Considers that the determination of cure is very difficult, and should be carried out very carefully. After each menstrual period every part of the genito-urinary system is searched for gonococci. After the first/

first menses treatment is not suspended even after a negative report. If gonococci are absent after the second or third period he uses a provocative vaccine, or paints the cervix with Lugol's Solution as a provocative. He suggests the use of cultures as well.

#### Jacoby's Standard.

He considers a patient cured if gonococci are absent in smears taken on six occasions some time preceding, and a short time following, menstruation, from the cervix, urethra, Skene's ducts and Bartholin's glands. These smears must be negative for gonococci even after provocative irritants have been used to the orifices. The Complement Fixation test must be negative. If the patient passes all the above tests she is left without treatment for a month when the tests are repeated. If they are again all negative the patient is discharged as cured.

#### Magian.

Makes a very thorough examination of the urogenital tracts locally and bimanually, and satisfies himself that the uterus, tubes and surrounding tissues are free from infection. He examines smears from the urethra, cervix, vaginal wall, and Bartholin's glands, and/

and puts up cultures. The urine is examined, and culture tubes are inoculated with the centrifuged deposit. The rectum is also examined, and slides and cultures made from the contents. If results of all these examinations are negative the patient is considered cured.

#### Fraser's Standard.

He insists on the disappearance of all clinical signs of the disease, i.e. there must be no meatal discharge nor turbid urine. No gonococci must be found in smears taken from the urethra, cervix and rectum. The urethra must be dilatable and the genital tract must be reported as healthy by a gynaecologist. In the case of patients in hospital, a 12 days observation is instituted when vigorous exercises are given. If an out-patient, she is allowed emotional excitants such as novels, male company, etc., and if cured should remain free of discharge and the urine should remain clear.

One week after the cessation of treatment he gives a provocative vaccine either 100 millions of a Polyvalent Stock Vaccine, or 10,000 million Detoxicated Gonococcal Vaccine. No focal reaction should follow if the patient is cured.

Smears from the urethra, cervix and rectum should/

induration of Bartholin's gland and no inflammation round orifices. The urethra must be normal in appearance on palpation through the vagina, and on inspection through the urethroscope. The para-urethral crypts, especially Skene's tubules, must show no inflammatory signs. The vaginal introitus must be normal in colour and have no tags or crypts present around it, and there must be no complaint of pain when passing a speculum. The cervix must appear normal, the secretion clear and without erosion. Bimanually, the uterus and tubes must appear to be free from disease. The ~~anal~~ orifice must seem normal with no signs of inflammation or discharge in the ~~anal~~ canal on passing a speculum.

Secondly, all bacteriological signs of disease must be absent. Urethral smears must be negative 24 hours after a provocative injection of 1 c.c. of gonococcal Proteose. The urethra is gently massaged before the loop is inserted, and the patient must not have passed water for some hours previously. The urine, held for some hours before examination, should be clear, acid, free from albumen, and contain no gonococci or pus cells, when centrifugalised sediment is examined microscopically. Smears from the orifices of Bartholin's glands and from Skene's tubules, after massage, should be/

be negative. Smears from the cervix with the platinum loop should be negative for gonococci and pus cells just after the menses, and 24 hours after a provocative injection of 1 c.c. gonococcal Proteose. Smears from the anal canal must be negative.

Abraham considers cultures from smears in women useless because they are negative when smears are positive.

He is doubtful as regards the practicality of using the Complement Fixation test as a sign of cure, as the anti-bodies do not develop sufficiently rapidly in the early days of the disease to influence the reaction, and they persist for months after active disease has ceased, and so give a positive result. The test should be negative three months after infection has ceased, but this is doubtful.

Abraham depends chiefly on the clinical and bacteriological findings. If the first two sets of tests, i.e. the clinical and bacteriological, are negative the patient is asked to return in two months, and all the tests are repeated. If the results are again satisfactory, she returns in four months. If at the end of six months without treatment the patient shows no signs of a return of the disease, either clinically or bacteriologically, she is considered cured. A year later, if a repetition of the tests are/

are negative she can safely resume marital life. If fresh manifestations show after such a series of tests, a reinfection has occurred.

### Col. Harrison.

Smears and cultures of the urethral secretion after massage through the anterior vaginal wall should show no gonococci, the patient having held her urine for at least 4 hours.

The centrifuged urine deposit must show no gonococci when examined under the microscope.

Smears and cultures from the cervix taken one or two days after the cessation of the menses, and preferably 24 hours after the cervical canal has been painted with tincture of iodine in glycerine, or 5% protargol in glycerine, must show no gonococci.

If the patient has not been treated by vaccines, he ~~he~~ believes that a positive Complement Fixation test obtained by a good pathologist is significant. If the patient has been treated with vaccines and is considered cured, the positive reaction of the fixation test should steadily diminish in strength after cessation of treatment, "since the properties of the blood serum which are responsible for the complement fixation reaction gradually disappear after the stimulus to their production - the vaccine/

vaccine, or the infecting organisms - ceases to operate."

If the patient has passed the above tests satisfactorily, she is asked to report for re-examination in a month. If all the tests are again satisfactory she is re-examined a third time at the end of another month. Before pronouncing her cured a fourth examination is carried out at the end of a further six months.

#### Major Lambkin and Co-workers.

Have been using with success, as a test of cure, an endotoxin prepared from strains of gonococci which do not throw out the polar bodies employed in their special vaccine. It is made up to a strength of 250 million gonococci in 1 c.c. of prepared colloidal silver. An intra-urethral injection of this preparation provokes a quiescent case of gonorrhoea into temporary activity, causing the reappearance of gonococci in the urethral discharge. They have employed this endo-toxin as a routine for four years as a test of cure before discharging patients. The provocative reaction is evident from 12 hours to 7 days after an injection, so patients are kept under observation for one week. If the endotoxin injection provokes a reaction the majority of cases do better, and it is rare to have to give three or four injections of endotoxin at the end of observation periods/

periods for test of cure. If any provocation is observed after an endotoxin injection the special intra-urethral vaccine is immediately injected. No relapses have occurred in their discharged cases.

Carbus and O'Connor.

Examine smears of the cervical discharge at each heat application of Diathermy. They continue treatment till they have five successive negative smears. Then the patient returns twice a month for examination of the cervix and urethra, one of these 48 hours after cessation of the menses. If no gonococci are found in the first two months an endocervical application of 5% Silver Nitrate is made, and smears obtained twice during the following week. If negative, the patient is declared cured.

Dr. Otto von Robden - Heinkendorf.

For the cases he treated by intravenous injection of Kollargol, Chrysolgon, Gonargin and Autogenous Vaccines, he had the following tests of cure.

After completion of treatment ten smears from the urethra and cervix were taken twice weekly.

1. If these showed gonococci the cases were placed in Group I = not cured.
2. If occasional or rare gonococci present - these/

these cases were then subjected to provocation, viz., mechanical, chemical and biological. After these provocative tests had been made, a further ten smears each from the cervix and urethra were examined.

If any of the twenty slides showed :

- (a) Many gonococci - cases relegated to Group I = not cured.
- (b) Rare and doubtfully positive gonococci - cases were put in Group 2 = Doubtful.
- (c) No gonococci - cases were put in Group 3 = Probable cure.

3. If no gonococci present in the twenty

slides he used provocation. If after provocation :-

- (a) Many gonococci were present - cases put in Group I = Not cured.
- (b) Doubtful gonococci were present - cases put in Group 2 = Doubtful.
- (c) No gonococci were present - cases put in Group 4 = Cured.

#### My own Standard.

I consider a period of observation for two years after an apparent cure has been effected as necessary in cases suffering from chronic gonorrhoea, but few patients co-operate in its accomplishment. It is essential that all clinical signs of the disease must have disappeared. This includes the absence of all/

all signs of inflammation as well as discharge from the para-urethral glands and urethra. I examine the urethra with an urethroscope and see if it is at all sagged, grained, for if so the patient is not fit for discharge. All inflammation, including discharge, must have ceased from Bartholin's glands, and the cervix and its glands. No discomfort must be present during instrumentation and bimanual palpation of the genito-urinary organs, which should all appear free from infection.

There must be no appearance of a Proctitis.

The deposit from a centrifuged specimen of urine must show no gonococci, and cultures from the same must be negative for that organism.

All smears from the urethra, Skene's ducts, Bartholin's glands, cervix and rectum must show no gonococci; those from the cervix must be free of pus cells as well. The smears must have been taken soon after a menstrual period, and 24 hours after 10,000 millions of a Detoxicated Vaccine have been given as a provocative.

All cultures from the same sites must show no gonococci. The Complement Fixation test must be negative.

If the patient passes all the above tests

all/

all treatment is suspended for a month during which the patient is asked to resume all her usual activities, and even indulge in vigorous exercise like tennis or swimming. At the end of the month, after menstruation, another dose of Provocative Vaccine is given, and in 24 hours a complete re-examination of the patient is done as before, i.e. clinical, gynaecological, microscopical, cultural and serological. During the month there must have been no return of symptoms of any sort.

If the patient successfully passes this second examination she returns again for a third examination at the end of another month.

If all the tests are again negative she is over-hauled three times in the remaining nine months of the first year at three monthly intervals, and twice during the second year at six monthly intervals.

If all the tests have remained negative throughout the two years observation, the patient is discharged cured.

at  
If/any stage the tests are positive for gonococci, or symptoms return, treatment is recommenced.

This is the minimum standard I would consider adequate in cases that have suffered from chronic gonorrhoea, but as mentioned above the co-operation of the/

the patients leaves much to be desired, and with the limited methods of treatment at my disposal the result has been that during the last three years not one patient suffering from chronic gonorrhoea attending my clinic has qualified for discharge as cured.

It is possible I have required an impossible standard, but I am inclined to think that the reason lies in the fact that we have still to find a really adequate method of treatment that will ensure no recurrence and a real and complete immunisation of the patient to the gonococcus within a reasonable time. Amongst my chronic cases some of those under treatment with intravenous injections of Acriflavine plus Local Treatment have cleared up clinically and show no gonococci, but pus cells still appear in films from the cervix after menstruation and provocation with vaccine, and the Complement Fixation tests are still positive.

## SUMMARY AND CONCLUSIONS.

1. Chronic gonorrhoea is next to measles the most widespread disease in the world.
2. Until recently it has received the scantiest attention.
3. It is the commonest cause of sterility and chronic invalidism in women.
4. It is the cause of 50% of the gynaecological operations in women and the cause of a certain proportion of Puerperal Sepsis.
5. It is responsible for 20% of the blindness in the world.
6. The gonococcus gives no immunity.
7. Infection of glands in the vicinity of the genito-urinary organs, infection of the rectum and the presence of secondary septic organisms are the causes of relapse and the chronicity of gonorrhoea in women.
8. The endocervix is most frequently infected in chronic cases.
9. It is a possible cause of Cancer of the Cervix.
10. Painstaking and numerous microscopical examinations of discharges before and after menstruation and a thorough clinical examination are the most helpful methods of diagnosis.

11. Cultures, the urethroscope and the Complement Fixation test are useful additional diagnostic procedures.
12. Salpingitis, Endometritis, Proctitis, Arthritis and Warts are the commonest sequelae of chronic gonorrhoea in women.
13. Treatment is general and local.

A. General. Help the patient to resist her own organisms.

- (1) The endotoxin of Major Lambkin appears to be the most satisfactory vaccine therapy yet instituted.
- (2) Other workers recommend stock and detoxicated vaccines.
- (3) I have found stock and detoxicated vaccines of no use in chronic cases.
- (4) Some workers use Protein Stock Therapy combined with vaccines.
- (5) Intravenous injections of Acriflanine are useful.
- (6) I have found small doses of Sulfarsenol useful in arthritis.

B. Local. Promote drainage from all orifices of the genito-urinary tract including gland orifices.

- (1) Glycerine combined with various mild antiseptics are best for topical application.
- (2) These antiseptics should be varied and used in turn.
- (3) Diathermy arrests arthritis and causes a disappearance of symptoms in chronic endocervicitis.

- (4) Ionisation of the endocervix is also useful for chronic endocervicitis.
- (5) Some have had good results with the suction apparatus in chronic endocervicitis.
- (6) Some have had good results with Intramine in cervicitis and endometritis.
14. A long period of observation is required before a patient can be declared cured.
15. Microscopical examinations of smears and cultures, the clinical signs and Complement Fixation test should be negative after repeated examinations before and after menstruation and after provocative vaccine injections at intervals during the whole period of observation.

In conclusion it would appear that since chronic gonorrhoea in women is so intractable a disease the best method of dealing with it is to prevent its occurrence by immediate treatment of early cases. Examinations of men and women before marriage and the giving of certificates by venerealogists stating the freedom of the contracting parties from gonorrhoea would also limit the number of innocent infections.

If/

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If women could be taught to assert themselves more with regard to the irregularities of men, there might be less infection brought into homes after marriage.

The stimulation of Public Opinion against the spread of the disease by education and propaganda is a helpful method of combating the dread disease..

Prophylactic treatment for men may limit the incidence of the disease to some extent.

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