examinations, and the isolated lesion found, appear to preclude dysentery. Again, the long-continued illness in association with so early an inflammatory lesion, and the absence of any infection elsewhere, negative tuberculosis.

The site of the lesion, duration of the disease, the soft boggy feeling of the affected segment of gut, coupled with the altered appearance of the mesentery and appendices epiploicae, are against new growth invasion; whereas the condition, and the smooth boggy enlargement of gut and its mesenteric attachment, with defined rolled edge, the scattered white plaques over the mesentery, and the pearly white appearance of the appendices epiploicae, are characteristic of intestinal syphilis.³

The rôle visceral syphilis plays may be very variable, giving rise to different groups of symptoms according to its site, virulence, and duration.⁴ That no actual intestinal obstruction had occurred in this case would suggest a very early phase.

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LOCAL VACCINE TREATMENT OF PYORRHOEA ALVEOLARIS.

BY

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In the summer of 1923 I met in Paris Dr. Goldenberg, who is professor at the Institut Pasteur and director of the Institut National de Vaccinothérapie, and became interested in a new vaccine prepared by him for the treatment of pyorrhoea alveolaris. He uses a polyvalent vaccine, injected locally into the gums in small but gradually increasing doses, any necessary local treatment being carried out at the same time. By the courtesy of Dr. Goldenberg, and of M. de Libouton, of the Ecole Odontotechnique in Paris, I was able to see numerous patients undergoing this treatment.

Goldenberg founds his treatment on Besredka's views as to the local vaccination of tissues: "When it is required to vaccinate against a bacterial disease," he wrote, "it will not suffice merely to employ the corresponding attenuated virus. It is necessary that the vaccine shall operate along the route it will have to follow. This route should be that which the virus itself takes through the tissues during the process of infection."¹ Goldenberg therefore decided to inject the vaccine directly into the mucous membrane of the gums. The local conditions are such that it is necessary to use a concentrated vaccine, since large quantities of fluid cannot be introduced. The method used was that devised by Mauté, in which the bacterial bodies are emulsified in an excipient consisting of similar bacteria dissolved in soda. Goldenberg² started the preparation of the vaccine with bacteria freshly isolated from the gums of cases of alveolar pyorrhoea—namely, streptococci, staphylococci, pneumococci, *Micrococcus tetragenus*, *Micrococcus catarrhalis*, and the pneumobacillus of Friedländer. A mixture is made of equal proportions of these organisms; this is divided into three unequal parts. One-half of the original mixture is used as the excipient: the microbes are treated with a solution of caustic soda (10 per cent.) for twenty-four hours at 37° C., and the solution is then neutralized with hydrochloric acid. One-quarter of the original mixture is heated to between 60° and 70° C., thus killing the bacteria. The bacteria in the remaining portion of the original mixture are killed by treatment with formal. These last two portions are then emulsified in the excipient, and 0.5 per cent. carbolic acid is added. The resulting fluid is diluted so that each cubic centimetre of the vaccine thus prepared shall be the equivalent of 20,000 million bacteria. Goldenberg used one drop of the fluid, which is the equivalent of 0.05 c.cm., and contains approximately

1,000 million organisms, as the initial dose. Subsequent doses are increased by one drop each time until a maximum of six drops is reached. This method was tried with very promising results at the Institut Pasteur and Ecole Odontotechnique. To prevent the occurrence of reactions arising from protein substances present in the culture media, the organisms are thoroughly washed with normal saline solution before being treated in the way described. Although spirochaetes play an active part in the disease they are strictly anaerobic, and so can only multiply in the presence of the pyorrhoea alveolaris organisms, which, being aerobes, remove the free oxygen which would otherwise kill the spirochaetes. When the bacteria disappear in consequence of the vaccine treatment the spirochaetes are thus destroyed indirectly.

Technique of Treatment.

The following method of treatment, which I have adopted on the experience gained by treating several cases, is a modification of that described by Drs. Frison and de Libouton to the French Association for the Advancement of Science last year. The vaccine is in ampoules, obtainable from Dr. Goldenberg, at the Institut National de Vaccinothérapie, Rue Pages, Paris.

The injections are made by inserting the needle superficially into the reflection of the mucous membrane, above the apices of the bicuspid, or canines. Care should be taken that the needle does not penetrate too deeply; its orifice should be just covered by the mucous membrane; the most convenient syringe is one graduated to deliver drops of the dimension described (0.05 c.cm.), and must be carefully sterilized for use. A course of treatment consists of ten to twelve injections, given at intervals of not less than forty-eight hours nor greater than eight days. The only exception to this is that between the first and second injections a period of four days must elapse. The course will thus occupy about twenty-two days, the last five injections being of six drops each. The following table may be of assistance to those who adopt this treatment.

Day.	Drops.	Places.	Day.	Drops.	Places.
1st	1	1	12th	6	2 or 3
4th	2	1	14th	6	2 "
6th	3	2	16th	6	2 "
8th	4	2	18th	6	2 "
10th	5	2	20th	6	2 "

After the two-drops injection, I inject each dose in two or three places of the mucous membrane, thus obtaining the maximum activity whilst modifying the local reaction. No departure from these directions must be made; for instance, giving three drops after one drop would do harm and not good by bringing on a prolonged negative phase. If a reaction takes place all symptoms must disappear before the next dose is given, then the dose which caused the reaction should be repeated. Local treatment is absolutely essential, and must be carried on concurrently with the vaccine injections. At the second sitting the teeth should be thoroughly scaled, and this operation should be repeated at intervals during the course. Worthless and septic roots may be extracted after the third or fourth sitting. A mouth wash of salt (1 drachm to 8 ounces of water) should be prescribed, and also a simple tooth powder, such as precipitated, or camphorated, chalk. Soap must not be used.

Results of Treatment.

This treatment has met with very satisfactory results in the hands of several observers. M. de Libouton reported to the Congrès des Journées Médicales 41 cases treated by this method, in which cure resulted in 38. The cure has been maintained for more than two years. Frison and de Libouton, at the Congress of the French Association for the Advancement of Science (July 31st, 1923), stated that they had been successful in eliminating suppuration in 59 out of 62 cases, most of which were fully developed. Sir G. Valadier, Dr. Aguilar, and Dr. Spalding report equally favourable results, and my own cases bear out their experience. I notice that the first injection has a tonic action on the patient, and as the course—which generally consists of ten treatments—progresses the general health steadily improves. Foul odour and bad taste in the mouth disappear, the pus decreases, the gums become more firm, and the teeth tighten. I have noticed even that

roots discharging the pus characteristic of chronic alveolar abscess dry up, so to speak, and after extraction their sacs appear to be shrivelled and inert. There are cases too advanced for any cure except that of extraction; for example, if pyorrhoea involves as much as one-third of the membrane from the apex, the remaining part of the periodontium of the tooth, being necrosed, cannot be brought to life again, so the tooth involved could not be tightened up sufficiently to be useful for mastication, and the best treatment would be extraction. Even in such cases, however, a course of vaccine given before extraction is followed by much more rapid healing of the tissues after the operation and by less systemic disturbance. The treatment used before the operation acts preventively also where infection is expected to follow surgical action. The following are typical of many cases I have treated by this method.

Case 1.—A man of 56, suffering from dyspepsia, alimentary toxæmia, and a marked degree of pyorrhoea alveolaris; the mouth was fetid and pus pockets were present about all the teeth. After the first few injections the patient's general condition improved almost immediately. The languor, headache, and dyspeptic symptoms diminished, and by the end of the course there was no need of further medical treatment, the bad odour and pus having disappeared.

Case 2.—A young man of 23, who complained of vague rheumatic pains, accompanied by general malaise, but with no other objective signs than pyorrhoea alveolaris. This patient's general condition also improved from the commencement of treatment, and after twelve injections the pyorrhoea was cured, and he reported that he had never felt better.

Such results justify the hope that in the future pyorrhoea alveolaris will prove to be always curable, and that this treatment will serve as a prophylactic against toxæmia and systemic complications of pyorrhoea. Goldenberg, indeed, goes further, and holds that this local inoculation is not only indicated in pyorrhoea alveolaris, but also in all cases of dental infection—for example, the complication of infection due to the difficult eruption of wisdom teeth, and so forth. My own experience of the method has convinced me that it is of the greatest value, and marks the dawn of a new era in the treatment of pyorrhoea alveolaris, the most widespread and serious disease with which the dental practitioner has to grapple. If my article helps to spread knowledge of this last and most important advance in our methods of attack on this modern scourge of civilized people, it will have achieved its purpose.

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TREATMENT OF UTERINE HAEMORRHAGE NOT DUE TO PREGNANCY OR NEW GROWTH.

BY

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THE successful treatment of cases of uterine haemorrhage often becomes a difficult and urgent one, for there are many which do not respond to medicine or curetting. There then appears to be nothing left but the major operation of hysterectomy.

Being greatly impressed by the possibilities of radium in certain instances, I purchased, in 1920, 200 mg. of radium bromide, and during the past three years have treated a number of patients with it; amongst these were cases of uterine haemorrhage, and, as a perusal of the notes of nine consecutive cases will show, the treatment was completely successful in each instance. Some of them had already been curetted more than once without any improvement. Where the bleeding is due to fibroids this is generally best left to the surgeon to deal with, unless the fibroid be a submucous one, when radium will often bring about a cure.

The cases quoted are all those of menorrhagia and metrorrhagia; the etiology of this condition I do not propose to go into, as it is a question about which much controversy still exists.

Before undertaking radium treatment it is, of course, necessary to eliminate the possibility of malignant disease, and for this purpose it may be necessary for the patient to submit to a curetting; if this has to be done the radium may

be introduced into the cervix uteri at the time of the dilatation.

The most convenient form in which to have the radium is in a tube containing 50 or 100 mg. of radium bromide; the latter strength was used in my cases. In addition, a similar tube or applicator is often advantageous for applying to the abdominal wall to obtain a cross-fire action if required. The tube may be used either unscreened if inserted directly into the cervix, or screened if placed in the vaginal vault. In either case an outer covering of pure rubber tubing is used to cut off the alpha rays, which are non-penetrating and cause superficial burning of the tissues. The vagina is then lightly plugged with gauze and the radium left in position for the time determined upon.

The length of exposure is a most important factor with regard to the successful treatment, and will depend upon the amount of radium bromide used, the thickness of the screening, the age of the patient, and the severity of the condition present. It must be borne in mind that there is a danger of producing complete cessation of the menses; this fact should be carefully explained to the patient, her relations, and medical attendant. Women near the climacteric, where the haemorrhage is profuse and previous treatment has failed, often prefer this to the alternative of hysterectomy. If, however, the dosage is correctly estimated there is little fear of the menses ceasing.

It is best to start with a small dose, and, if this does not prove sufficient, to repeat it after the next period. In a young adult I have found it safe to commence with a tube of 100 mg. screened with 1 mm. silver *plus* rubber, and to leave this in for seven hours. The second dose will depend on the result of the first. It may even be necessary to give a third, but this seldom happens. The patient should stay in bed for the day, when the tube can be inserted in the morning and removed during the afternoon. There is no need for the patient to lie up afterwards as there are seldom any after-effects. Nausea and vomiting may occur, and there may be a feeling of general malaise with rise of temperature, but these symptoms disappear in the course of twenty-four hours, and are rare unless a prolonged application has been given; they should be treated on general lines.

The first period or two after the application may show no diminution in quantity, or may even be excessive, or the bleeding may continue for some days or even weeks before it finally ceases, as occurred in Case ix. This, however, is rare, the improvement as a rule being noticeable from the first.

In middle-aged women, where the bleeding is severe and has resisted all previous treatment, a longer exposure is necessary, and in these cases an external application should be given at the same time as the internal, either by means of an applicator or tube. In either case a screen of 1 mm. of silver and rubber is necessary, and in addition ten to twelve layers of lint must be interposed between the applicator and the abdominal wall in order to prevent burning of the skin. An exposure of from fourteen to sixteen hours will as a rule bring about the desired result. The after-treatment consists in ordering a simple vaginal douche daily for a few weeks.

The question naturally arises as to what effect this treatment may have on the possibility of pregnancy. It may be definitely stated that it has no deleterious effect, for although pregnancy is uncommon after treatment, it is no more so than in patients not so treated who are the subjects of these conditions.

Vaginal discharge is almost always associated with this type of haemorrhage, and is often profuse and offensive. Radium has a remarkably beneficial effect on this condition as well as on simple leucorrhoea, which rapidly clears up after one or two applications.

CASE I.—*Metrorrhagia.*

Mrs. B. H., aged 34; four children. Admitted December 1st, 1921, with the history that in November, 1918, laparotomy was performed for ruptured pyosalpinx; in April, 1919, she was curetted after a month's continuous loss; in September, 1921, she was readmitted to hospital for severe bleeding—bilateral salpingectomy and right oöphorectomy performed; this was followed by a normal period in October; in November, 1921, the loss was stated to have been