stick together, and should be opened gently. After the bags have been used, the outside should be washed, dried with a duster and in the air, and powdered with French chalk. They should then be turned inside out and washed again, after which they should be dried with a cloth and in the air. The outer surface of each bag should then be painted with a thin layer of the preparation provided for the purpose.

Bags hung in a well-ventilated place should be ready for use again in about twelve hours. In a well-ventilated, dry, warm place the drying may be completed in four hours. The bags should be then thoroughly powdered with French chalk both inside and out. By this process the waterproofness of the bags—which is reduced by wear, specially after marches—is restored.

Mending of Holes.—The bags should be thoroughly clean and dry, and the parts surrounding the tear or hole should be painted with a thin, even layer of the preparation provided for the purpose. A piece of the repairing silk sufficiently large to cover the place, and allow a margin of at least half an inch all round, should then be well pressed upon the part which has just been painted, after a few minutes the patch should be painted again, allowed to dry for about one hour, and finally powdered with French chalk.

Storage.—Before the bags are put away they should be thoroughly cleaned, repaired, and dried. They should then be dusted with French chalk, both inside and out, and folded (altering, as far as possible, the position of the long creases), or rolled, beginning at the toes to facilitate the escape of air. They should preferably be kept in a dry place.

Bags carefully used and not handled roughly should last several weeks. To make them more lasting would add to their cost and weight. Each man should be provided with two pairs, one being repaired while the other is in use. If the inside of the soles of the boots is rough, a felt, linoleum, cork, or even plaited straw sole placed inside the boot would protect both the bag and the foot against injury during marching.

Testing.—The bag, quite dry, is turned inside out. Water is then poured into the bag to a height of 18 in. without wetting the outside. Serious defects in the foot part are at once indicated by dripping of water. Slight faults are shown by a wetting of the outer surface at defective places which can be marked with a copying pencil. The mouth of the bag is closed by clutching it tightly in the hand. The bag is then turned upside down before it is emptied; defects in the upper part are thus made evident. The defective parts which have been marked can be repaired when the bag is dry. Defective seams are very difficult to repair, but this defect should be quite exceptional.

CONCLUSION.

The use of a waterproof covering that can be worn inside the boot is recommended in this communication not because it is the only or even the best possible method. A waterproof top boot so devised as to leave a fairly wide air space between the boot and the greater part of the foot, ankle, and lower part of the leg would be more efficient and probably more convenient, provided the material used was light and did not interfere with movements. To obtain this result a new type of boots would be required.

The object of this paper is to show that it is possible to secure a sufficient amount of protection against the effects of wet cold without discarding the boots at present supplied to the army, provided the size of these boots is adequate.

REFERENCES.

¹ *Journal of the Royal Army Medical Corps*, May, 1915. ² *Lancet*, 1915, 1 p. 271.

A FASCICULUS of the *Philippine Journal of Science* has been devoted to the pathological anatomy of bubonic plague, for which Dr. Crowell, working in the Department Pathology and Bacteriology of the University of the Philippines and the Biological Laboratory of the Bureau of Science, Manila, P.I., is responsible. He states that the study is based on 75 cases examined *post mortem* in Manila between June, 1912, and June, 1914. The work has been carefully and methodically done, and as the material on which it is based is sufficiently extensive, the facts, though in many instances not new, are worthy of note.

THE CARRIER PROBLEM AT HOME IN TIME OF WAR.

By EDWARD C. HORT, F.R.C.P. EDIN.

WITH the consent of the Director-General of the Army Medical Service I have prepared the following sketch of the efforts that have been made in the past year to deal with the carrier problem at home in the Addington Park War Hospital, in so far as the enteric group of diseases is concerned.

The original idea in starting this hospital was the provision of suitable accommodation in the country near London for soldiers suffering from acute infective disorders, such as enteric fever, dysentery, and septicaemia; and a vital part of the scheme was the provision of a well-equipped laboratory in which bacteriological examinations could be systematically carried out. In order to give effect to this scheme three essentials had first to be secured by the civilian committee which had been called together for the purpose—the loan of suitable premises, the approval of the Director-General, and the necessary funds.

Subject to certain conditions designed to protect the interests of the legatees, the trustees of the Addington Park property generously placed the house and grounds at the disposal of the Committee for the purpose desired. The Director-General at once gave his cordial approval to the undertaking, and the entire cost of maintenance was guaranteed by the War Office, the cost of equipment of the hospital and laboratory being generously defrayed by private subscribers and by the Red Cross Society, on the recommendation, in the first place, of Sir Frederick Treves. Work was therefore at once set in hand, and the necessary staff appointed.

Before the opening of the hospital, however, in December, 1914, with accommodation for 130 beds, the Committee were asked by the Director-General if, for the time being, they would consent to admit convalescents of the enteric group (enterics, paratyphoids, dysenterics) instead of acute cases, in order that a search for carriers, and the necessary detention, should be systematically carried out. And for this purpose they were further invited to assume responsibility for additional accommodation to the extent of 200 beds in huts, the cost of erection, equipment, and maintenance being borne by the War Office.

The Committee without hesitation undertook the desired responsibility, and the Palace accommodation of 150 beds was at once taken up by convalescents who were submitted to periodical tests for "carriage." In a few weeks the huts were also ready for occupation, and up to the present date a total number of 330 resident convalescents, replaced at intervals by fresh arrivals, have been periodically examined.

In the early days of the war there was no justification for the provision of a much larger establishment than this to cope with possible emergencies. It was important, however, to make the existing accommodation as elastic as possible. Provisional arrangements were therefore made to use Addington as a clearing-house, with external provision for such convalescents as were proved to be innocent of "carriage" after repeated examinations over an average period of from six to eight weeks. This external provision included detention in secondary convalescent homes, where they were detained for a further period of some weeks, during which time the excreta were sent at stated intervals to the Addington laboratory for further examination. If still found to be free, patients were then discharged on furlough. No patients found to be carriers, whether convalescing or convalescent, were sent to these secondary houses. Under an Army Order true chronic carriers are eventually invalided out of the army and return to their homes. The medical officer of health of the district in which they reside is informed to this effect.

This arrangement of using Addington as a clearing-house, with the secondary convalescent homes as auxiliaries, still under bacteriological supervision, made it possible, not only to examine a considerably larger number of cases than would otherwise have been feasible, but also to increase the total period of supervision. The total number that have been passed through Addington in this way is at present over 2,000; and in more recent

months the work of the bacteriological departments has been considerably increased by the examination of specimens from convalescents who, for one reason or another, have not been through Addington. On the other hand, the work has been greatly assisted by the co-operation of pathologists attached to various hospitals, as regards patients who have been kept under their observation till vacancies occurred at Addington. In all such cases the search for carriers has been systematically carried out, and we have been regularly kept informed of the results.

The arrangement of secondary homes described, which was only made possible in many instances by the generosity of private individuals who, in some cases, assumed the entire financial responsibility, and by the invaluable help given by Lady Dudley, as head of the Convalescent Home department of the British Red Cross Society, had, however, certain disadvantages, which were accentuated by the increasing demand for beds. In view of this increased demand, which itself necessitated centralization of existing convalescent homes in the public interest, the Director-General again invited, and obtained, the consent of the Committee to assume the responsibility for fresh extension in Addington Park. The proposal involved fresh hut accommodation for 350 more beds, in addition to the existing 330, of which, by an arrangement with the Australian Commonwealth, 150 were set aside for the reception of Australian convalescents, the Government of Australia paying for maintenance. In addition, the Director-General proposed that a military dépôt should be established in Addington Park to admit 1,000 patients, in order to replace the auxiliary convalescent homes hitherto relied on to clear the beds at Addington.

Arrangements, therefore, are now being made on these lines, with the result that in a short time the increased accommodation available, capable of yet further extension, will allow for the reception and detention of approximately 1,700 potential carriers, who will be replaced as fast as the exigencies of the war demand, compatible with safety to the general population.

Instructions based on these considerations and with particular regard to continuance of bacteriological supervision for as long a period as is practicable, have recently been issued by the Director-General.

The following is an abstract of these instructions:

Acute cases from overseas to be sent direct to the Royal Victoria Hospital, Netley, or to the Military Hospital, Devonport.

Convalescents are to be transferred to Addington Park War Hospital, if accommodation is available. If accommodation is not available they must be sent to suitable auxiliary hospitals (Class B)—formerly known as "Convalescent Homes"—for four weeks. If found to be free at the end of this time they will be granted furlough, and notifications will be issued to the proper authorities.

Acute cases occurring at home to be treated in isolation hospitals. Convalescents to be sent to Addington. If accommodation be not available there, they may be sent to one of the auxiliary hospitals attached to the hospital, provided they are proved at the time to be free. If carriers, they are to be sent to Addington as soon as fit to travel.

In no case must convalescents be pronounced as temporarily free until three negative examinations have been recorded at intervals of a week.

In all cases of transference to an auxiliary hospital, or of discharge to furlough, the Commandant at Addington must be at once informed, and a nominal roll of all cases, giving the date and address to which they have been dispatched, forwarded at the same time. A copy must also be sent to the War Office. Until the military dépôt in Addington Park for the reception of 1,000 additional convalescents is ready for occupation, convalescents to the number of 1,200 will be located in Woldingham Camp, and the excreta of these 1,200 will be periodically examined in the Addington Laboratory.

The personnel of the medical and bacteriological staffs is as follows:

MEDICAL STAFF.

Colonel H. J. W. Barrow, A.M.S., Commandant.
Sir John Broadbent, Bt., M.D., Honorary Physician.
Edward C. Hort, F.R.C.P. Edin., Honorary Physician.
W. J. J. Stewart, M.D., Medical Superintendent.
O. Polhill Turner, M.D., House-Physician.

BACTERIOLOGICAL STAFF.

Edward C. Hort, F.R.C.P. Edin., Director.
C. E. Lakin, M.D., Assistant Director.
T. H. C. Benians, F.R.C.S., Assistant Bacteriologist.
W. Collingwood, Esq., Assistant Bacteriologist.
Miss Delyell, M.D., Assistant Bacteriologist.
Trained lay lady assistants.

The medical and bacteriological staffs have lost through resignation the services of Dr. Williams and of Dr. Elizabeth Lepper.

It should perhaps here be added that in the interests of the patients themselves, as well as of the local population, every reasonable precaution has been taken since the opening of the hospital to prevent the spread of infection through carriers, whether detected or not, by systematic bactericidal treatment of the excreta and linen. These precautions were adopted after consultation with the Principal Medical Officer of the Local Government Board and the local medical officers of health. In all cases the faecal matter has been incinerated in a special form of destructor, the working of which has given excellent results. And the urine has been disinfected in special receptacles containing bactericidal fluid of proved efficiency in the dilutions employed relative to the time limit of exposure. In the case of linen suitable arrangements have been made for its disinfection. In future, owing to the larger numbers of cases requiring bacteriological supervision, the urine will be treated by the application of heat for sufficient periods to ensure destruction of non-spore-bearing organisms. In the hospital and in the huts the men are also instructed in such special methods of personal hygiene as are necessitated by the grouping together in one place of large numbers of convalescents from diseases of the enteric group.

ROUTINE EMPLOYED AT ADDINGTON IN THE SEARCH FOR CARRIERS OF THE ENTERIC GROUP OF ORGANISMS.

The following scheme of identification of these organisms is one that I drew up a year ago for general use at Addington, with one or two alterations since added. It is collated from several sources, particularly from Ledingham and Arkwright's classical handbook on the carrier problem in disease, to which, as well as to Semple and Greig's well-known memoirs on the subject, I am also indebted for much valuable information on other aspects of this problem. For the additions to the scheme referred to I am indebted to Dr. Henderson Smith's admirable paper and chart published in the BRITISH MEDICAL JOURNAL of July 3rd, 1915, p. 3. In no case has any convalescent examined at Addington been labelled as a carrier unless the incriminated organism has fulfilled in all essential respects the details given in this table under its respective name.

Identification Table of Members of the Enteric Group.

<i>B. typhosus</i> (Motile).	Paratyphoid Group (Motile).	Dysentery Group (Non-motile).
— ...	<i>B. paratyphosus</i> A ...	<i>B. Shiga-Kruse</i> .
— ...	<i>B. paratyphosus</i> B ...	<i>B. Flexner</i> .
— ...	(<i>B. enteritidis</i> Gaertner) ...	<i>B. Strong</i> .
— ...	(<i>B. enteritidis</i> Aertryck) ...	<i>B. Y of Hiss</i> .
— ...	(<i>B. Morgan</i> 1).	

Group Characteristics (common also to *B. pestis*, the Pasteurellae group, *B. pseudo-tuberculosis*, and to the Gram-negative cocci—*M. melitensis*, gonococcus, *M. catarrhalis*, and the meningococcus of Weichselbaum).

- (1) Pleomorphic.
- (2) Gram-negative.
- (3) No liquefaction of gelatin.
- (4) No production of indol.
- (5) No clotting of milk.
- (6) No action on lactose, saccharose (inulin, salicin, amygdalin).

Individual Characteristics:

- (7) Produce alkalinity in milk, except *B. typhosus*, *B. paratyphosus* A and B, *Strong*, which produce acidity in milk.
- (8) Ferment glucose, mannite, dulcitol, sorbitol, maltose, galactose, laevulose, as follows:

<i>B. typhosus</i> and <i>B. Strong</i> ...	Acid in all.
Paratyphoid group, except <i>B. Morgan</i> ...	Acid and gas in all.
<i>B. Morgan</i> 1 ...	Acid and gas in glucose, galactose and laevulose only.
<i>B. Shiga-Kruse</i> ...	Acid in glucose, galactose and laevulose only.
<i>B. Flexner</i> ...	Acid in all but dulcitol and sorbitol.
<i>B. Y of Hiss</i> ...	Acid in all but dulcitol, sorbitol and maltose.
- (9) Agglutination tests (absorption when necessary): Use serum Y for *B. Y* and *B. Flexner*.

Exceptions to Group Characteristics:

- (1) The gonococcus and the *M. catarrhalis* are not known to be pleomorphic.
- (4) Indol is produced by *B. Morgan* 1, *B. Flexner*, *B. Y o' Hiss*, and *B. Strong*.
- (5) *B. Strong* clots milk late.
- (6) *B. Strong* produces acid in saccharose.

Note.—Dulcitol, sorbite, galactose, laevulose have been unobtainable in bulk owing to the war. Dulcitol is now being tested as a substitute for dulcitol.

To the list of organisms here given, for which systematic search is made, should be added the *M. melitensis*. The search for evidence of amoebic dysentery has not yet been made part of the routine.

In the case of strains of organisms from which from cultural and biochemical reactions a positive serum reaction might reasonably be anticipated, but in which, nevertheless, only negative results have been met with, such strains are not at once rejected. On the contrary, whenever practicable, repeated subcultures are made, if necessary, for a period from seven to fourteen days, and serum tests are again applied before final rejection is recommended. The necessity for this, especially with urinary strains, appears to be generally admitted.

On the other hand, numerous aberrant strains have been met with, which one is not really justified always in rejecting as of no pathogenic importance, but which, under the stress of a strenuous routine, it has not been possible further to examine. Some such strains have been reserved for further study in the hope of the advent of less laborious days.

Routine for Faecal Examinations.

Once a week, if possible, each patient provides a specimen after purgation. Notwithstanding this precaution, the number of solid specimens is surprising. An emulsion is made of the fresh specimen in 5 c.cm. of sterile broth, inoculated with two large loopfuls of material. It is then allowed to stand for one hour at room temperature, and a 5-in. MacConkey plate is inoculated with a large loopful of the supernatant fluid. From this plate a second is inoculated without recharging, and both plates are then incubated at 37° C. for about eighteen hours. Whenever possible, the plates are warmed before inoculation in order to diminish the amount of condensation water, and to obtain larger colonies than can be obtained in the cold. It is absolutely essential that the surface of the medium when inoculated should be free of condensation water. This we ensure by pouring the medium into warm plates, which, when the medium is set, are dried at 37° C. for some hours.

If possible, in each case presenting colourless or orange-tinted colonies, three colonies are picked off and individually emulsified in lactose litmus peptone water. If after incubation for one night growth has occurred and there is no change of colour, milk, peptone water and the available sugars are inoculated from each lactose tube. If growth has not occurred and if no change is noted in the lactose tubes, further incubation is allowed. The complete set of sugars is examined after a suitable period of incubation in order to determine the presence of late lactose fermenters and to reject them. The final examination is made in seven to eight days, and subcultures are then made from likely cultures in order to apply the necessary serum tests on the following day.

Our experience with the actinic rays, recommended by Dreyer on account of their reputed selective inhibition of *B. coli*, has been disappointing, and their use has therefore been abandoned by us, as by other observers. It appears, in fact, to have been unsafe to assume that a laboratory culture will necessarily react in the same way as a culture direct from the faeces, though in the hands of one of us even the former did not yield the results expected. Our experience with endo-fuchsin, and with malachite green, has so far not justified us in using either of these media as a routine optimum medium in preference to MacConkey's medium for faecal examination, though we preserve an open mind as to the possible superiority of brilliant green and other synthetic media not yet fully tested. In the meanwhile MacConkey's medium is the routine medium for faecal work.

Before leaving the subject of faecal examinations, it may be well to observe that we have deliberately chosen to make serum tests the end point of identification methods, in order to carry out in each case the fullest investigation possible with a view to the study of strains that might prove to differ biochemically from type. In the investigation of acute cases such deliberation is impossible owing to the necessity for early diagnosis. Time in our work, however, is not the primary consideration.

Moreover, a negative serum test early applied rather favours rejection of a strain that repeated subculture, the necessity for which has been indicated by biochemical orthodoxy, may eventually show, when a late serum test is applied, to have been only temporarily inagglutinable.

Routine for Urine Examination.

I have elsewhere shown that in the bacteriological examination of urine the time at which the urine is collected is of some importance. And this applies to haemic infections of the urine in convalescing cases as well as to tract infections in convalescent cases. If, for example, urine be examined which has only recently traversed the renal filter, as in specimens passed during the day after a short interval, the number of pathogenic organisms present per cubic centimetre may be insufficient to allow of their survival when transferred to a solid laboratory medium. On the other hand, if the first specimen after a night's rest be examined, the number of pathogenic organisms present per cubic centimetre is often sufficiently great to survive transference to a laboratory medium.

In the former case, incubation in the bladder has been cut short, and in the latter case incubation in the bladder has been prolonged. Hence the difference in the results obtained.

In other words, the urine in many cases of pathogenic infection is an excellent medium for growth of the organism causing the infection, and I showed by a large number of observations, published in 1914, that by the simple device of incubating the urine in the laboratory for a night before inoculation of the laboratory medium selected as an index of infection, far better results can often be obtained than if this precaution be omitted. We repeated these observations at Addington a year ago with a small number of urines suspected of containing members of the enteric group, and we found that, examined in this way, the percentage of ordinary carriers in a mixed population of inoculated and uninoculated typhoid convalescents was considerably higher than is commonly believed. This only applied, however, to the convalescing carrier within six weeks or so of his discharge from an enteric hospital, presumably because the degree of haemic infection was slight, requiring incubation for its intensification. In the case of the convalescent or true chronic carrier with a tract infection, incubation in the laboratory appears to be unnecessary if incubation in the bladder be first allowed, presumably because the degree of tract infection—allowing of free discharge of pathogenic organisms—is considerable. As a routine method, therefore, all the specimens of urine at Addington are incubated, usually for forty-eight hours, in the laboratory before inoculation of the medium selected for picking off colonies. In all other respects, except selection of medium, the procedure of urinary examination and identification is the same as for faecal examination.

As regards the optimum solid medium for isolation of urinary organisms, we are not yet satisfied. MacConkey's medium in the commonest form of urinary carrier, the convalescing carrier, is certainly too severe a medium, however suitable it may be for isolation from the convalescent or tract carrier. And the fact that the convalescing carrier is commoner than the convalescent carrier makes this class potentially more dangerous, especially as by the ordinary routine method of examination, without preliminary incubation of his urine, he is more liable to be missed. Even, however, in the case of the incubated urine a MacConkey plate will often show no colourless colonies, or even no growth at all, whereas some of the nasgar plates inoculated in parallel will show colonies of non-lactose fermenting Gram-negative bacilli. For example, forty plates of MacConkey were inoculated from twenty samples of incubated urine, and the same number of nasgar plates were inoculated from the same urine at the same time in parallel. No less than 30 per cent. of the MacConkey plates showed no growth at all, even after prolonged incubation, whilst 5 per cent. of the nasgar plates gave colonies which subsequently proved to be non-lactose fermenters, and all showed growth after one night's incubation. The last fact would suggest that a medium such as nasgar favours the growth of extraneous organisms to such an extent as to make it useless as an isolation medium of pathogenic organisms from the urine. In practice this is not the case, since colonies of organisms of the coli-typhoid group are soon detected with a little experience. And, fortunately, lactose-fermenting coliform organisms are relatively rare in males convalescing from diseases of the enteric group. The expense involved is no doubt a serious item. Experiments with agar plates and with casein agar plates have not yet proved satisfactory, and, to repeat, the question of

the optimum isolation medium for urinary examination for our convalescents is still *sub judice*, as is also the question of the advisability of enriching the urine with albumin prior to incubation.

Serological Tests.

The routine method employed is macroscopical only. We have recently adopted Dreyer's suggestions of always incubating at 55° C., using his standard emulsions for all Widal reactions, and of using considerable volumes of diluted serum, bacterial emulsion and normal saline. The results so far obtained have been excellent. We do not find the drop method to be of sufficient accuracy for routine use on a large scale. In carrying out a reaction with *B. typhosus* we test the serum in triplicate against this organism, *paratyphosus* A and *paratyphosus* B, and we propose to employ Dreyer's method of curve-recording by multiple examinations at stated intervals. This procedure, of course, is not in our case so much for purposes of diagnosis as, by a systematic investigation of large numbers of convalescents in terms of Widal's reaction, of obtaining some light on several interesting problems that have emerged from our work. One of these is the question of the effect of inoculation on carriage, which, in the light of data we have already collected, appears to be favourable. Much further study, however, will be required before any definite statement can be made as to this. As regards Bordet-Durham reactions with strains of organisms isolated from convalescing and convalescent patients, we have used twenty-four hour emulsions heated at 58° C. for one hour. In all other respects the procedure is the same as in the case of Widal reactions. We do not find it necessary to check our macroscopical results by microscopy, because we are not aware that the latter procedure does more than intensify a well-marked end result already obtained by macroscopy alone.

This, roughly, is an outline of the attempts being made at Addington to deal with the carrier problem, and it is only designed to indicate here in a general way what is being done. Unfortunately, the experiences of the moment do not permit of a more elaborate statement, which must be reserved for our official report.

A PRELIMINARY NOTE ON CHRONIC POISONING BY EMETINE.

By H. H. DALE, M.D., F.R.S.

(From the Department of Biochemistry and Pharmacology, Medical Research Committee, the Lister Institute.)

A FEW weeks ago my opinion was asked as to the possibility of producing symptoms of poisoning by the long-continued administration of emetine in individually harmless doses. Those who have had experience of the treatment of amoebic dysentery with emetine have evidently been alive to the possibility of such a cumulative action. Dr. Low, for example, in a recent article in this JOURNAL (November 13th, p. 715), mentions diarrhoea, secondarily arising during treatment with emetine, as possibly caused by the alkaloid, and suggests that an unduly continued use of the latter in too high a dosage may eventually produce symptoms of intoxication. But there seems to be no certainty on the point, and little hope of attaining such by clinical observation alone, owing to the difficulty of deciding whether local effects on the alimentary canal, or more general effects of toxæmia, are to be attributed to emetine, or to the condition which has led to its being administered. On the other hand, I failed to discover any record of direct uncomplicated experiment on the point. It was evidently desirable, therefore, that the matter should be put to the test of experiment on healthy animals. The investigation is still in its initial stage, but the indications that a cumulative action can be produced are already so positive, that it seems desirable to make mention of the results even at this early period, in view of the practical importance of their implications.

At present I have made experiments only on a small number of cats and rabbits. The question as to what doses, in either of these species, can be regarded as physiologically equivalent to the doses normally employed in human therapeutics, can only be answered by further experiment. Up to the present I have used a dosage which, in proportion to the weight of the subject, would be

regarded as rather high for continued administration to man. If we take 65 kg. as the weight of an average man, a dose of 1 grain for such a patient is about 1 mg. per kilogram. So that 5 mg. for a cat weighing 3 kg. corresponds to rather more than 1½ grains for the average man. This is the order of dosage with which I have experimented up to the present—individual hypodermic injections of 5, or occasionally 10 mg., for animals of 2.5 to 3.5 kg. Such a dose, given once only, has no perceptible action of any kind on the animal, and it may be repeated daily, up to a point, without obvious effect. There is considerable individual variation in respect of the number of such daily injections which can be tolerated with full maintenance of health. It has been as few as three in one case, and as many as ten in another. But in all the experiments which hitherto have been carried on as long as a fortnight, symptoms of intoxication have sooner or later appeared, have become rapidly intensified with persistence in the daily injections, and have terminated fatally. In rabbits a profuse diarrhoea, attended with rapid emaciation, has been the most prominent effect. In cats this symptom has been seen, but is apparently of secondary importance, and may be absent altogether; the most prominent effect in this species is pronounced lethargy and somnolence, deepening to a terminal coma. The pathological examination of the material, in which I am fortunate in having the co-operation of Dr. P. P. Laidlaw, has barely been begun. It is only possible to mention, therefore, with all reserve, that there is evidence of damage to the liver and kidneys, in addition to the expected signs of intestinal irritation.

I am aware that the dosage above indicated is somewhat, though not greatly, in excess of that which is habitually employed in human treatment. I deliberately so chose it in order to obtain evidence with a minimum delay on the important question, whether a repetition of individually subtoxic doses of emetine can produce a cumulative poisoning of serious importance. The answer is already very definitely affirmative. I am fully conscious, also, of the care needed in applying results, obtained with experiments on different species, to human therapeutics. But, with all allowance for differences in dosage and conditions, I cannot believe that these results are without significance in indicating a serious danger in pushing the administration of emetine beyond a certain point. My object is not to suggest any modification in the accepted dosage and rate of administration, but rather to reinforce, with the aid of direct evidence, the warning, which has already been sounded from other quarters, against the indiscriminate and unguarded use of emetine beyond the limits which expert observation has laid down for its employment with safety and benefit.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

METHOD FOR QUICK DETECTION OF *S. PALLIDA*.

WITH reference to the method of detecting spirochaetes described by Dr. Alfred C. Coles in the BRITISH MEDICAL JOURNAL of November 27th, p. 777, the following is a simple method of demonstrating *S. pallida* which may be of interest. It is well known, but I am unable to say whose original method it is.

Take a smear of blood and serum from the sore, the exudate being obtained after cleaning and rubbing or scraping the sore, or making a small incision in its margin. The sore should not previously have been treated with antiseptics, or, if it has, should be dressed for several days with a simple saline dressing.

1. Fix in 1 per cent. glacial acetic acid and 8 per cent. formalin. Rough dry the slide.
2. Wash in alcohol and flame off.
3. Gently heat in a 5 per cent. solution of tannic acid.
4. Wash in water and stain with slightly warmed ammoniated silver nitrate solution. (To a 5 per cent. solution of silver nitrate add ammonia solution until the precipitate first formed is just dissolved; add a few more drops of silver nitrate solution until the precipitate just reappears.)
5. Wash in distilled water and dry.

The films should be chestnut coloured. If they have