TABLE II.—Cultural and Agglutinative Characters of Bacilli Isolated from Faeces.

No.	Bacillus Isolated from Faeces.	Lactose.	Gelatine.	Mannite.	Glucose.	Saccharose.	Litmus Milk.	Indol.	Motility.	Inulin.	Arabinose.	Agglutination Tests.							
												Control.	Shiga 1 : 2000.	Flexner 1 : 3000.	Y. 1 : 1000.	Typhoid 1 : 4000.	Paratyphoid A, 1 : 8000.	Paratyphoid B, 1 : 8000.	Geertner 1 : 4000.
42	---	0	0	0	0	0	A	0	0	0	0	0	0	0	0	0	0	0	0
14	---	0	0	0	0	0	0, then alk.	0	+	0	0	0	0	0	0	0	0	0	0
5	Inagglutinable Shiga	0	0	0	A	0	A, then alk.	0	0	-	A	0	0	0	0	0	0	0	0
17	Inagglutinable Shiga	0	0	0	A	0	A, then alk.	0	0	-	A	0	0	0	0	0	0	0	0
15	<i>B. typhosus</i>	0	0	A	A	0	A	0	+	0	A	0	0	slight	slight	+	0	0	0
30	<i>B. dysenteriae</i> (Strong)	0	0	A	A	A	slight A	0	0	0	A	0	0	0	0	0	0	0	0
8	<i>B. paratyphosus</i> B	0	0	A G	A G	0	A, then alk.	0	+	0	A G	0	0	0	0	0	0	+	0
2	---	0	0	A G	A G	0	A	0	0	0	A G	0	0	slight	+	0	0	0	0
9	---	A G	0	A G	A G	0	A, late C	0	0	G	A G	0	0	0	0	0	+	0	+
21	---	A G	0	A G	A G	A G	A	0	+	0	A G	0	0	0	0	0	0	0	+
32	---	A G	0	A G	A G	A G	A	0	0	G	A G	0	0	0	0	0	0	0	+

A = Acid; G = gas; C = clot. The concentration of serum employed is of one-half the maximum dilution capable of giving macroscopic agglutination in two to four hours at 37° C.

dysentery group). Neither entamoebae nor dysentery bacilli of the Shiga or Flexner type could be found in the stools of patients 32 and 41, who were undoubtedly suffering from subacute attacks of true dysentery, the dejecta containing abundance of slime and blood during the period of examination.

It would seem that when soldiers who have had dysentery are admitted into a base hospital the condition of their intestinal tract is ordinarily normal or rapidly becomes so, any dysenteric lesions quickly subsiding. The results of the above investigation emphasizes the danger of troops who are dysenteric subjects bringing dysentery into this country by the agency of carriers. The risk would presumably be greater among men leading a

more arduous existence, conducing to a recrudescence of their malady, such as obtains in camp life at the front, and it appears desirable that further examinations should be made under the latter conditions.

In conclusion, I desire to express my indebtedness to Major Sidney Rowland for the constant advice and assistance which I have received from him throughout the course of this investigation.

REFERENCES.

¹ Ledingham and Arkwright, *The Carrier Problem in Infectious Disease*, London, 1912. ² The Identification of the Pathogenic Members of the Typhoid-Colon Group of Bacilli, *BRITISH MEDICAL JOURNAL*, July 3rd, 1915, p. 1. ³ Cf. H. Chick, The Preparation and Use of Certain Agglutinating Sera, *Lancet*, 1916.

NOTE UPON A CASE OF JAUNDICE FROM TRINITROTOLUOL POISONING.

BY

HUGH THURSFIELD, M.A., M.D., F.R.C.P.,

ASSISTANT PHYSICIAN, ST. BARTHOLOMEW'S HOSPITAL; PHYSICIAN TO OUT-PATIENTS, HOSPITAL FOR SICK CHILDREN, GREAT ORMOND STREET.

BEFORE the war began the attention of the Home Office had already been drawn to the occurrence of poisoning among the men employed in the manufacture of high explosives belonging to the group of the nitro-derivatives of benzene and toluene, and in 1909 the Home Office issued regulations which were to be observed in the manufacture of these compounds. It was not, however, till the extended use of these bodies for war purposes began that it was realized that the handling of the finished product was also dangerous. The poison affects the persons employed in different manners, but it seems to be probable that no one is completely immune. The commonest symptoms are drowsiness, headache, and nausea, and to these are commonly added some degree of cyanosis, due probably to the conversion of the oxyhaemoglobin of the erythrocytes into methaemoglobin. Most of the workers show some of these symptoms in a greater or less degree, but fortunately the majority recover quickly and even gain some tolerance to the poison. Among the severer cases high grades of anaemia, methaemoglobinaemia, and jaundice occur, and of the cases of jaundice a proportion prove fatal. Another group of symptoms, which may be termed focal rather than constitutional, is the occurrence on the exposed surfaces of a dermatitis, which has been accurately described by Dr. Prosser White.¹

The woman whose case is here recorded was aged 24, and was strong, well-developed, and muscular. She had been engaged in munition work for a period of six

months, and four months before her fatal illness became an examiner in a munition factory. Her especial duty lay in examining the bags which were filled with the yellow powder, and this involved moving in an atmosphere filled with the dust, "enough," she said, "to make one sneeze." She also complained of the bitter taste which was always present in the mouth, and that all the food which she ate tasted of it. She wore a plate in the upper jaw, and, though she washed this regularly after her meals, she did not do so before eating. One month before her illness she noticed that she was passing dark-coloured urine, but it was not till a fortnight later that she began to feel ill, with loss of appetite and headache. She also had some vomiting after food with much retching. Four days later she felt worse and noticed that she was slightly yellow. This condition persisted, although she was sent to bed, and ten days later she was admitted to St. Bartholomew's Hospital.

She was deeply jaundiced, and the urine was stained almost black with bile pigments. There were one or two small petechiae on the body, but these were faded and did not appear to be of recent origin. The liver dullness began at the fifth rib, the organ could be felt just below the margin of the ribs, and there appeared to be some tenderness in the region of the gall bladder. The spleen could not be felt, nor on percussion did it seem to be enlarged. Her temperature was normal, and, apart from the jaundice and the vomiting, she did not appear to be ill.

On October 4th she was quite free from headache and nausea, but on October 6th she became very drowsy and vomited everything which she took. On October 7th she became very restless, and in the evening delirious, shouting and moaning. On the morning of October 8th she was quite unconscious and wildly delirious, and gradually sank and died in the evening.

At the *post-mortem* examination the chief features were

the exceeding abundance of haemorrhages in the omentum and on the surface of the peritoneum, which were splashed all over with bright red maculae; these were abundant also in the mesentery, especially close to its attachment to the gut. There were a few petechial haemorrhages in the pericardium, especially round the origin of the great vessels, and a few in both the visceral and parietal pleurae. The liver weighed only 29 oz.; it was dark red in colour, mottled with splotches of a yellowish tint, which were slightly raised above the surrounding tissue. Microscopical examination showed that these were patches of degenerating liver cells, and that the darker tissue was composed of connective tissue fibres, debris, and inflammatory cells. The bile ducts were patent and the gall bladder natural. The kidneys were soft and dark in colour, with a slightly yellow tinge; under the microscope they showed an abundance of fatty degeneration.

There were no cerebral or meningeal haemorrhages.

The history and the course of the illness are those of an acute toxæmic jaundice, non-obstructive in character, for her motions contained plenty of bile pigments. In view of the fact that T.N.T. frequently causes anaemia, it is of interest to record that she did not appear to be anaemic, and that her red blood corpuscles numbered 5,000,000 per c.mm. and the haemoglobin was 90 per cent. It is also of interest, in view of the profuse omental and mesenteric haemorrhages, to record that her red blood corpuscles showed an abnormal resistance to solutions of sodium chloride, unlike the abnormal fragility in many cases of haemolytic jaundice. In fact, in this respect her corpuscles behaved just as do those of patients who are the subjects of ordinary obstructive jaundice. Clinically, the most striking feature of the case was the suddenness of the onset of the fatal symptoms; less than two days before her death she seemed to be in good condition, without any serious symptoms pointing to a grave prognosis. Yet it is obvious from the condition of her liver at the time of the post-mortem examination that the toxæmia had already robbed her of any chance of survival.

REFERENCE.
Lancet, February 19th, 1916.

Memoranda:

MEDICAL, SURGICAL, OBSTETRICAL.

HEXAMINE IN ACUTE ANTERIOR POLIO-MYELITIS.

In the *JOURNAL* of September 30th Dr. Douglas Guthrie records two cases of meningitis in which hexamine was given. He comes to the conclusion that the administration of the drug by the mouth is useless. The following sporadic case of poliomyelitis is interesting with regard to this point.

A. B., aged 11, went to bed quite well on the night of July 8th, 1914. Next morning he complained of much difficulty in walking and slight pain in the legs. I saw him about midday; he was then acutely ill, with a temperature of 104°. There was marked weakness of both legs but no affection of the joints. Hexamine, in 10-grain doses every four hours, was prescribed. On July 10th the temperature was lower but the paralysis was more marked, the patient being quite unable to move the left and only very slightly the right leg. When seen on July 11th there was a distinct improvement in the paralysis and the temperature was normal, but in the evening, after 150 grains in all of hexamine had been given, haematuria with considerable strangury occurred. The hexamine was stopped and an alkaline mixture given. By July 14th the paralysis had completely cleared but the renal symptoms continued, finally disappearing in about another week.

Here, I think, there is an example of hexamine being of value, particularly if it be remembered that complete recovery in sporadic cases is extremely rare.

N. FOX EDWARDS, M.B., Ch.B. Vict.

Broseley, Shropshire.

A SIMPLE ASEPTIC WAY OF PERFORMING VACCINATION.

It is common to see patients suffering from a so-called "bad arm" after vaccination. The various degrees of inflammation, from a mildly septic arm to those serious

cases, fortunately rare, of septic poisoning, are so well known that a description is unnecessary.

The following is a simple method that I have employed with good results on recruits:

1. The patient's arm is first thoroughly rubbed by an orderly with methylated spirit to disinfect the skin.

2. A tube of calf lymph is taken and one end broken off; the broken end is held for a moment in the flame to sterilize it, as it may touch the patient's skin during the operation. A lighted match is then applied to the other end of the tube of lymph, which always contains an air bubble. The heat of this causes the air to expand, and, if held over the patient's arm, it blows the lymph on to the arm.

3. A needle is taken with a point that has been slightly blunted, and held for a moment in the spirit flame to sterilize it. The lymph is spread from the drop on the patient's arm with the sterile needle to as many points as it is desired to vaccinate, usually four. The skin is then scratched by the needle sufficiently to draw a little of the patient's lymph but not sufficiently to draw blood.

4. A pad of sterile white gauze is immediately and firmly strapped on in the following way:—A towel wrung out in 1 in 40 carbolic is spread out on a table, and on it is a roll of sterile gauze ten yards long. A piece of gauze is cut off and folded twice or three times, and applied to the patient's arm in such a way that the inside of the gauze comes next his skin, and no part which has been touched by the operator's fingers lies near the vaccination wounds. Then a strip of 1 in. self-adhesive plaster is wound round and round the arm over the dressing to keep it secure.

5. The patient is told on no account to let the dressing get loose, and to have it dressed immediately should it show signs of slipping. He is ordered light work not necessitating using his arm, and he is directed to come up in five days. The second and any subsequent dressings are of boric lint.

The results were as follows: Of the first eighty-five patients eighty-one took; no really bad arms were observed; four slightly inflamed arms became normal after one or two boric fomentations. It appeared that the gauze had been used rather too sparingly, and the strapping had in some cases only been put on in strips instead of being wound round the arm, and in some cases the dressings had got loose.

In the next batch there were forty-five men. In these rather more gauze was used as a dressing, and the strapping was carefully wound round and round the arm over the gauze; out of these, forty-four took. Not a single case needed a boracic fomentation.

This method sounds rather laborious, but with a little method it is not so. The 180 men took 231 minutes to vaccinate, or well under two minutes each. Each roll of gauze ten yards long sufficed for from twenty-five to thirty men, so that the expense was not great.

The conclusions drawn are that every bad arm following vaccination is really a septic arm, that these simple aseptic precautions are effective, and that they do not prevent the arm taking properly.

Bournemouth.

ECHLIN S. MOLYNEUX,
Lieut. R.A.M.C.

Reports of Societies.

SANITATION OF CAMPS.

At a meeting of the Section of Epidemiology and State Medicine of the Royal Society of Medicine on October 27th, Lieutenant-Colonel Sir SHIRLEY F. MURPHY, R.A.M.C., in the chair, Captain C. G. Moor, City of London Sanitary Company, R.A.M.C.T., read a paper on army sanitation at a base camp. After describing the organization of a sanitary section, Captain Moor dwelt upon certain aspects of sanitary work at a base. In the case of water supplies he advocated double sterilization, the source of supply being treated, in co-operation with the civil authorities, and the water bottles of the men being also systematically dealt with. In the disposal of manure he had found that the most satisfactory plan was to construct a narrow gauge tram line to the yard, a convenient gauge being 18 in., and the weight of rails 12 lb. to 18 lb. Sleepers should be placed not more than 2 ft. apart, and properly packed. By this method manure could easily be removed to a distance of a mile or a mile and a half from the camp. When, as often happened, it was necessary to burn the manure, this was best carried out by means of a cross trench incinerator. A good method of keeping down flies from collections of manure accumulated under conditions rendering either burning or close packing impracticable