In York the incidence of acute perforation has fallen 44% during the last two and a half years, but the mortality of those who do perforate remains disappointingly high—22%.

A patient who has perforated more than once needs prophylactic gastrectomy. It must be very radical (at least 90%).

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INOCULATION EXPERIMENTS AGAINST TYPHUS IN AFGHANISTAN

BY

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Mild and severe typhus can be seen outside Kabul throughout the year. During the summer cases are only sporadic, but they become more frequent in the autumn; in winter the disease reaches its maximum incidence, with a further exacerbation when the snow begins to melt. There are no marked differences in clinical characteristics in different seasons of the year, but cases with severe haemorrhagic eruptions and, on the other hand, those without exanthemata diagnosable only by serological examinations, are observed. In the hospital of the central prison, Kabul, in one year out of 249 cases of typhus 213 persons recovered and 36 (14.4%) died.

When sera of doubtful typhoid or typhus cases are sent from the hospitals or the city to the Bacteriological Institute here, agglutination tests are done in six rows of tubes with six different types of microbes—i.e., *Salm. typhi*, *Salm. paratyphi* A and B, and *Proteus* OX 19, OX 2, OX K. One hundred and twenty-three sera positive for one, two, or three types of microbes gave Weil-Felix reactions (W.F.R.) for *Proteus* OX 19 (116 sera positive and 7 negative), for OX 2 (73 positive and 50 negative), and for OX K (33 positive and 90 negative). If the result of agglutination with OX 19 was negative, but positive with OX 2 or OX K or both, it was a sign that the sera were from cases occurring during the month of May or the autumn. Thus although the patients were suffering from typhus, their sera in 5.7% of cases gave a negative W.F.R. with OX 19 but positive results with one or both of the other types. The Weil-Felix test must be done here with all the three strains of *Proteus*, as doubt will be created in cases with negative serological results to one strain.

In May, 1937, severe typhus broke out in the region of Aybak, but the physicians there thought it was plague because pasteurellae had been found in patients' sputa. The disease was very severe, but exanthemata were seen in only a few persons, on the medial side of the thigh. My assistant was sent with all necessary equipment, and after making bacteriological and serological examinations, and experimental inoculations of material brought from the patients, he established that they were not plague cases. The W.F.R. was done with nine types of *Proteus* from the Lister Institute, London, results being positive with the OX 2 type but negative with all the others. This and further observations led me to the conclusion that different strains of *Proteus* were necessary for the diagnosis of the typhus of this region. The literature to date does not show OX 2 of *Proteus* as an independent agglutinin but as a coagglutinin, while in the Institute of Bacteriology at Kabul it has been found that free OX 2 agglutinin exists in the serum of typhus patients.

Blood Vaccine

In the winter of 1941 typhus was observed in and around Kabul. Prophylactic inoculation was possible only in Allied armies. In some institutions hygienic measures were taken to arrest the disease, and I inoculated with my vaccine those who had not yet been infected. The Government also permitted me to make experiments on the prisoners. The blood used in the preparation of the vaccine was taken in the second week from otherwise healthy patients who had rashes before the tenth day of the disease, and had high fever, positive Weil-Felix and negative Kahn reactions. It was put into sterile

bottles, defibrinated, and then filtered through sterile gauze into cylindrical bottles, after addition of 0.5% carbolic acid (10 ml. of 5% solution acid in isotonic saline to 100 ml. blood), and kept one hour at 56° C. in a waterbath. I sometimes used 0.5 ml. of 5% formaldehyde in isotonic saline to 100 ml. of blood instead of carbolic acid. After checking its sterility, aerobically and anaerobically, this vaccine was kept in a refrigerator and warmed to blood-heat before use. It was inoculated three times subcutaneously into the abdominal wall 5 to 10 cm. from the navel, not more than once a week, the first dose being 2 ml., the second and third doses 4 ml. Four or five hours after the inoculation the patient began to feel unwell; the area of inoculation was hypersensitive to the touch and bluish in colour; but after about four days these signs disappeared.

In the prison at Kabul in 1942, 196 persons were inoculated in the spring and 368 in the autumn; other people who feared an infection or who found a louse on their bodies also came to the Institute of Bacteriology, Kabul, and were inoculated with my vaccine. Among the 196 prisoners not one case of infection was noted for six months. Between the sixth and seventh months 9 persons caught typhus; in 7 the disease had an uneventful course, but 2 died. Of the latter one was old, the other was weak and suffered from consumption. Of the batch of 368, 13 caught the disease; 11 of these recovered and 2 died. As the vaccine could not be prepared for more than 80 persons at a time only those who so wished and who had not previously had typhus were inoculated. Although all the prisoners lived together, out of 13 cases only two feeble treated patients died; but in the months of December and January, when the disease was very serious among the untreated, of 110 cases 89 recovered and 21 died. The result established the prophylactic efficacy of my vaccine, and these experiments showed that it could protect susceptible persons against the disease for 5 to 6 months. This experiment was made as a gesture of good will at a time when no better vaccine was available in the prison and in cases where there was no other way of giving active immunity.

American (Cox Type) Vaccine

In 1943 it occurred to me to try American vaccine, obtained through the Legation, and experimental inoculations were given as follows: May 7, 124 persons in the detention houses, 195 persons in the general prison; June 12, 100 persons in the women's prison; July 31, 150 policemen and 353 police soldiers; in all, 922 persons. In the first week of September 691 soldiers of the First Division, and in the first week of October 851 soldiers of the Second Division—in all 1,542 persons—were inoculated (three inoculations, each of 1 ml. subcutaneously, at intervals of one week). Because the vaccine in the general prison was not sufficient, only those who consented, and among the soldiers only those recommended by the Surgeon Major, were treated with the preparation of the Bacteriological Institute. All the other persons living together with the inoculated remained under control. Among the inoculated persons in the detention houses and the women's prison not one case of typhus was recorded during the first six months. In the central prison, of the inoculated 2 fell ill but recovered; and of the uninoculated 15 caught the disease, 12 recovering and 3 dying. Among the inoculated policemen and armed police not one case was noted, but of the uninoculated 5 fell ill; 4 of these recovered and 1 died. In March, 1944, the American Legation again sent some vaccines, and 214 soldiers of the First Division, 237 of the Second Division, and 207 of the independent armed police troops—in all 658 persons—were inoculated. During one year after these inoculations not one case was noted among those protected, but among the unprotected in the First Division 23 caught the disease, 18 recovering and 5 dying; in the Second Division 11 fell ill, 10 recovering and 1 dying. Among the independent companies of the police soldiers 30 persons caught the disease; 27 of these recovered and 3 died. The result of these experiments—not one case occurring among the protected persons, but 9 deaths out of 64 unprotected—established the efficacy of the vaccine.

Summary

It has been established that in the typhus cases seen in and around Kabul, carrying a mortality of 14.4%, the sera taken from the

patients contain three types of agglutinin to *Proteus* in different proportions. One of them is the main type and the others exist as coagglutinins. In this region it has been found necessary to make the Weil-Felix test with all the three types of *Proteus*.

The vaccine prepared here has been efficacious.

In 1943, 3,122 persons—police soldiers, policemen, and prisoners—were inoculated with American typhus vaccine (Cox type), but, because sufficient vaccine was not available, controls were not inoculated, but remained in the same area. Although during that year the outbreak was not serious, cases and deaths were recorded among the uninoculated; among the inoculated, however, only mild cases were recorded, with no deaths.

Medical Memoranda

Two Unusual Clinical Manifestations of the Primary Phase of Syphilis

It has often been pointed out that many, if not the majority, of chancres do not conform to the textbook type. The following rather unusual cases which have recently occurred in one of H.M. ships show several points of interest.

CASE 1

This patient first attended on May 8, 1946, complaining of some soreness of the penis. He admitted having had intercourse eight days previously. On examination he was found to be suffering from a mild balanitis associated with a phimosis. The inflamed area was dressed with gauze soaked in eusol twice daily. All inflammation had subsided within 48 hours. A blood Wassermann was reported on as negative. Subsequently he was admitted to hospital, where circumcision was performed on May 15.

The patient next attended on June 21 complaining of a lump in the groin. He denied any further intercourse. The circumcision scar was found to be slightly oedematous and there was a moderate bilateral inguinal adenitis. The blood Wassermann reaction was reported as doubtful. On June 25 the surface of the scar was eroded and there was a distinct surrounding induration. Repeated dark-ground examinations were negative. On June 30 he complained of severe pain in the penis. The original scar had now developed into a deep craggy fissure encircling the glans, there was gross oedema and reddening of the whole penis, and the adenitis had increased. Dark-ground illumination revealed *Treponema pallidum* in large numbers, and the Wassermann reaction was now strongly positive.

CASE 2

This patient first attended on June 6, 1946, complaining of a lump in his right axilla and some upper abdominal aching. He denied having had intercourse during the preceding thirteen months. On examination a scab 1 mm. in diameter was found over the third right metacarpo-phalangeal joint; it was painless and showed no signs of any inflammatory changes. The right epitrochlear gland was enlarged to the size of a thrush's egg, painless, and of the consistency of rubber. The right axillary glands were also much enlarged, discrete, and painless. There was some tenderness over the splenic area.

The patient was observed at daily intervals. On June 12 the Paul-Bunnell and Wassermann reactions were reported on as negative. On June 14 there was some reddening and pain, associated with slight surrounding oedema, over the scab on his knuckle. Pus-forming organisms were present, and within one week ulceration had taken place. There was now a round lesion 1.5 cm. in diameter with an ulcerated centre and indurated edge. Unfortunately syphilis was not reconsidered at this time, and dark-ground examinations were not carried out. The ulcer healed within three weeks and a thin papery scar remained. The adenitis persisted, however, and on further direct questioning the patient recalled that the original abrasion of his knuckle was caused through striking another rating on the teeth about ten days before first attending. The latter had been under my care for gonorrhoea and his blood Wassermann reaction had been negative, nor had he shown any clinical signs of syphilis. The Kahn reaction of both these patients was strongly positive.

COMMENT

Case 1 is of interest in that the site of inoculation was almost certainly removed at circumcision, yet the primary phase still developed in the circumcision scar. Case 2 is unusual in that the adenitis developed eight days before the chancre, thus throwing me off the scent. Burke states that about 50% of chancres are correctly diagnosed in the absence of any apparent associated adenitis; if the satellite bubo does appear it usually becomes evident about ten days after the chancre. Further, the case is a lesson that any sore on the hand of slow evolution should be repeatedly examined under dark-ground illumination.

I wish to express my thanks to the Medical Director-General of the Navy for permission to publish this paper.

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Reviews

A SWISS TEXTBOOK OF GYNAECOLOGY

Lehrbuch der Gynäkologie. By Prof. Dr. Hans Guggisberg. (Pp. 717; 354 illustrations. 72 Swiss francs.) Basel: Verlag von S. Karger. 1946.

This textbook is an excellent publication and reflects great credit on Switzerland. The publishers have been able to use exceptionally good paper and the print is of high quality. The coloured photographs are remarkable and most of the illustrations are well reproduced. The photomicrographs are perhaps not up to modern standards: many are over-exposed and some show failure to centre the illumination.

As in most Continental textbooks of gynaecology, much attention is paid to hygiene, constitution, and physiology, but less emphasis is placed upon the purely clinical side than is customary in this country; sixty pages are devoted to the chapter on affections of the urinary system, while only some nine pages are given to endometriosis. "Chocolate cysts" receive scant attention and there is little discussion of the conflicting theories. The treatment of prolapse is not dealt with in sufficient detail, and in this country we should regard the contribution as unsatisfactory in spite of the magnificent illustrations. The sections on carcinoma of the cervix and carcinoma of the body of the uterus are particularly good. Cervicitis is not described in adequate detail and too much emphasis is placed upon the chemical treatment of chronic cases. There is the usual difficulty in finding satisfactory illustrations of cervical erosions.

Apart from these minor criticisms the work contained in the book must be praised. The chapter by Prof. Neuweiler on gynaecological diagnosis is of exceptional merit and well worth careful study. Guggisberg's own contributions are well written and clearly expressed. It is a great pleasure to see again such an excellent specimen of a Continental textbook. The standard of comparison should be the British textbooks published before the war, and it must be admitted that such high quality was rarely, if ever, obtained in this country. In 696 pages there are over 350 illustrations, and the number of coloured plates is more than the average British publisher would allow. This new Swiss textbook should be able to compete with those of Stoeckel and Schröder.

PRODUCTION AND CONTROL OF MILK

Milk Production and Control. By Wm. Clunie Harvey, M.D., D.P.H., and Harry Hill, F.R.San.I. Second edition. (Pp. 512; 211 illustrations. 37s. 6d.) London: H. K. Lewis and Co. 1946.

Those who are familiar with the first edition of this book are aware of the wide field it attempts to cover. Even though it is restricted to liquid milk and avoids all consideration of milk products, it has nevertheless a long tale to tell. Broadly, it deals with the production of the milk on the farm, its transport to the dairy, its processing, and its final distribution. Special chapters are devoted to the nutritional value of milk, milk designations, milk legislation, and laboratory methods of control. In the new edition are included many of the changes that have occurred in the handling of milk during the last nine years. Not all the information has been brought up to date, but the authors may well plead that complete revision of any serious work in wartime was a major operation.

Though the book, in general, is on a high level, there are parts of it which in a future edition should be either omitted or edited by someone with specialized knowledge. This applies particularly to the chapter on laboratory control and to many of the bacteriological statements. Is it wise, for instance, to describe the method of isolation of pathogenic organisms from milk in a way that would have been adequate in 1910 but which now bears little relation to procedure in a modern laboratory? Why is there no mention of actinobacillosis, which is a much commoner disease in cows than actinomycosis? Why is it stated that the methylene blue is an all-or-nothing test, when the readings are taken every half-hour up to 4½ or 5½ hours? The same misleading comment could be made on the plate count. Several other criticisms might be put forward, but it