two minutes, whilst the third collapsed after about six minutes and then appeared unconscious, cold, and with a barely perceptible and irregular radial pulse. No convulsions were observed in any of the patients. The survivor was given 1 ml. of nikethamide subcutaneously, and artificial respiration was applied. She recovered consciousness and was detained for observation.

Post-mortem examinations were performed upon the two fatal cases, but nothing of note was discovered except a remarkable and quite unusual degree of flaccidity of the heart, the musculature appearing otherwise normal. In both cases the lungs were extremely congested. At this time the true nature of the accident was not realized and the livers were sent to the Government analyst, who subsequently reported the presence of bismuth therein.

Because of this report, the survivor was treated with "ametoxy" and intravenous salines, but signs of bismuth poisoning rapidly appeared and a blue line was visible on the gums on the third day. Diminution of urinary output occurred almost at once, and complete anuria resulted on the fifth day. Intravenous sodium sulphate solution caused excretion to recommence and increase daily until 16 oz. (450 ml.) was passed on the tenth day, when death occurred. All urine passed after admission contained albumin, red blood corpuscles, and casts. The blood-urea estimations showed a rapid rise to a maximum of 240 mg. per 100 ml. on the seventh day, falling to 208 mg. on the day of death.

Post-mortem examination disclosed marked blue gingivitis. The abdomen contained about a litre of clear pale amber fluid. The liver was enlarged, soft, and covered with recent fibrinous adhesions which anchored it to the surrounding viscera. The kidneys were both very pale and swollen, with fine punctate haemorrhages on the surface. The lower colon and rectum were inflamed, with small haemorrhagic spots. No other finding of note was discovered. Microscopy of the kidneys revealed almost complete destruction of the tubular epithelium, with many granular and fatty casts. The liver showed little histological change, but both kidneys and liver contained quantities of extremely finely divided fat throughout the tissue.

The relative quantities of bismuth given and demonstrated by the analyst were as follows :

	Mg. Sobita per kg. Body Weight	Mg. Bi per kg. Liver
Case 1 (immediate death)	13	40
Case 2 (" ")	10	30
Case 3 (delayed death)	11	23

I wish to record my thanks to the medical officers concerned for the courtesy of access to Case 3 and the clinical notes, to the Government analyst for the chemical estimations, and to the late Director of Medical Services, Gold Coast Colony, for his permission to publish this report.

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"The National Assistance Bill provides ample scope for the two classes of administrators—voluntary and governmental—to plan and work together," Mr. John Edwards, Parliamentary Secretary to the Ministry of Health, told the Lancashire County Citizens' Advice Bureau Conference at Manchester recently. He pointed out that after July 5 it would for the first time be possible to put up old folks' homes not to receive the destitute only but to house and provide care and attention to persons, whatever their financial resources, whose age, infirmity, or other circumstances required it. Under the Bill local authorities would also have to provide temporary accommodation for those in urgent need. "In these days of evictions, and with recent memories of flood, storms, and enemy action, I need not define this duty more precisely." The new Bill explicitly laid down that a local authority could contribute to the fund of any voluntary organization providing recreation or meals for old people.

A CASE OF MURINE TYPHUS IN LONDON

By:

T. B. DUNN, M.B., Ch.B.

In recent years there have been a small number of recorded cases of typhus fever in Britain, but all appear to have developed on board ship or within a few days of returning from an area of endemic typhus (Beach and Rennie, 1945 ; Agnew and Kyles, 1944). The following case is of interest as the patient had not been out of this country for over thirty years.

Case Report

The patient, a Russian-born Jew aged 61, was admitted to the Metropolitan Hospital under the care of Dr. Norman Hill on June 14, 1947, the ninth day of his illness. While at a cinema he had complained of sudden headache and was shivering. Next day he was confined to bed with fever, slight cough with scanty sputum, and severe headache, which remained the dominant symptom throughout his illness. He was treated at home with sulphadiazine, but the fever continued and he became delirious and prostrated. His breathing seemed to be "short" and difficult at times. On the seventh day a rash appeared, being first noticed on the arms.

On admission the patient presented a picture highly suggestive of typhus fever despite the fact that careful examination showed no signs of louse or flea infestation, flea-bites, or excoriations. He was in low delirium, from which he could be roused, but could give no history and complained only of severe headache. He had a vivid and profuse maculo-papular rash on limbs and trunk, but not on the face, palms, or soles. The rash at first faded on pressure, though later it did not. The conjunctivae were suffused. He was dehydrated, had a dry skin and a dry tongue with thick blackish fur, and passed a small quantity of highly concentrated urine. The pulse was rapid and feeble. B.P. 90/70, P. 110, T. 101° F. (38.3° C.). There was passive congestion of the lungs, with a poor percussion note and fine crepitations at both bases. There was slight stiffness of the neck and back, but no other C.N.S. signs were found.

The cerebrospinal fluid contained 17 cells per c.mm., mostly lymphocytes; protein, 40 mg. per 100 ml.; chlorides, 700 mg. per 100 ml. A blood count showed 11,000 white cells per c.mm. (polymorphs 71%). The blood urea amounted to 50 mg. per 100 ml. on the tenth day. A radiograph of the chest confirmed the passive lung congestion. The Weil-Felix reaction on the eleventh day of the illness showed agglutination with *Proteus OX* 19 at a dilution of 1 in 125. Three days later the titre had risen to 1 in 500, thus confirming the diagnosis. No agglutination was obtained against *OX* 2, and against *OX K* the titre remained at 1 in 25.

On the twelfth day the temperature fell by crisis to 96° F. (35.6° C.), and remained at that level for three days before returning slowly to normal. He vomited many times on the day of the crisis and became incontinent of urine and faeces. For two days he remained very ill and collapsed, but thereafter his general condition improved steadily. His mental state improved slowly, but one week after the crisis his cerebation was still very slow.

He was later transferred to the Park Hospital, Hither Green, under the care of Dr. H. S. Banks, at whose request an investigation of the patient's serological reactions was made by Dr. Janet S. F. Niven at the National Institute for Medical Research. Using rickettsial suspensions as antigens, a positive reaction for murine (flea-borne) typhus was obtained, the antibody titre against the murine rickettsiae being 1 in 2,560, against louse-borne (epidemic) rickettsiae 1 in 640. Sera taken at later stages during and after convalescence showed a steady fall in agglutinating antibody with approximation of homologous and heterologous titres. The complete results of these and tests with similar South African sera will be published later by Drs. Gear and Niven.

The patient had left Western Russia 36 years ago. He did not admit to having had typhus fever or any febrile illness while

in Russia. He was employed as an egg-tester at the London docks, and two weeks before the onset of his illness had been dealing with a cargo of eggs arriving by ship from Poland—a journey which took seven days. He was quite definite that he had never had any louse infestation, but did admit to being bitten frequently by fleas while at work. The Ministry of Health intended to carry out a rickettsial survey of the rats in the docks, but could find no rats in that area.

Comment

The fact that the patient was a Russian-born Jew with no louse or flea infestation was suggestive of Brill's disease, which occurs sporadically along the North-east American seaboard amongst immigrants born in Eastern Europe. In these cases no louse or flea infestation could be found despite an illness characteristic of typhus fever. They were thought to be examples of murine typhus, but Zinsser (1934) after prolonged epidemiological and clinical studies considered them to be recrudescences of louse-borne typhus fever acquired at an earlier time of life in endemic typhus areas of Eastern Europe. Plotz (1943) showed by complement-fixation tests that these cases were serologically identical with louse-borne typhus. It is surprising that similar cases have not been recorded in this country despite a steady influx of Eastern Europeans since the first world war.

The present case, however, was subsequently shown by agglutination tests to be of the murine (flea-borne) type. This is normally enzootic in rats and can be transmitted to man by the flea vector. Brigham (1943) has brought forward evidence suggesting that mice may also act as carriers. If this does occur it must be uncommon, as other workers have on many occasions been unable to demonstrate mice infection in areas of murine typhus where rats were infected. No examination of mice in the docks was made in this case.

As there was no rat infestation in that area of the docks, and as the disease is endemic in Poland, it seems reasonable to assume that the source of infection was the Polish ship. The egg-packing cases may possibly have been flea-contaminated either before loading or during transit. None of the patient's fellow workers were infected.

Although the man had a large number of contacts during the incubation period the risk of further human spread was small, as the typhus was of the murine type and flea infestation was apparently transient. No further cases were reported.

My thanks are due to Dr. Norman H. Hill and Dr. H. S. Banks for their help and advice, and to Dr. Janet S. F. Niven for her help with the serological results.

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The Finance Bill now before Parliament exempts certain drugs and medicines from purchase tax. The relevant provisions, which will take effect from June 1, are set out in detail in Notice No. 78M of April, 1948, issued by the Commissioners of Customs and Excise. In general terms and subject to conditions about the containers and their labels the preparations exempted are those which consist of one or more substances described in: (a) any monograph in any edition of the *British Pharmacopoeia*; or (b) any monograph, or the Formulary, in any edition of the *British Pharmaceutical Codex*; or (c) the National (War) Formulary, issued by His Majesty's Stationery Office; or (d) any Formulary approved by the Minister of Health for the purposes of the National Health Service. These substances may be compounded in the ordinary way with excipients, vehicles, bases, or preservatives.

TWO CASES OF TETANUS NEONATORUM

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Tetanus neonatorum is a rare condition in this country and reports of its occurrence are hard to find. While occasional cases are recorded in foreign literature, the latest reported in this country appear to be those of Johnston (1928) and Renton (1918). The occurrence, therefore, of two cases within two months prompted us to put them on record, together with an indication of the possible source of infection in one case.

Case Reports

Case 1.—The patient was a normally delivered male child, born at home under the care of a district midwife. He was admitted on the eighth day with a 24-hours history of difficulty in feeding, apparently due to trismus. On examination he was seen to be extremely rigid, and the examination itself stimulated the onset of spasms of tetanic type. The umbilicus, from which the cord had separated before admission, showed a slight purulent discharge with surrounding inflammatory reaction. Aerobic culture of the pus produced a profuse growth of *Staph. aureus*, but anaerobic culture revealed no *Clostridium tetani* at this stage. The case was diagnosed as tetanus neonatorum, and vigorous antitetanic treatment was started. The infant appeared to improve for two days, but collapsed and died on the third day after admission.

Post-mortem examination showed the picture of death from asphyxia. There was, in addition, evidence of mild inflammatory reaction around the umbilicus, while beneath the umbilical scar was a small bead of thick pus. The Gram-stained films from the pus failed to reveal *Cl. tetani*, but anaerobic culture of the umbilicus and ligamentum teres produced a mixed growth of organisms from which virulent *Cl. tetani* was isolated.

Case 2.—This case occurred about seven weeks after that just described, and affected a male child 9 days old, also born at home. In this case labour had been difficult and there was at first some suspicion that the symptoms were due to birth injury. However, after admission to hospital the clinical symptoms became typical. This child also died on the third day after admission in spite of vigorous treatment. Post-mortem examination revealed essentially the same picture as that seen in Case 1, but *Cl. tetani* was not isolated from the post-mortem material.

Investigation

The occurrence of these two cases, both delivered by different district midwives, led to investigations into the origin of infection. These were carried out by Dr. Ruby Bell, senior assistant medical officer of health in charge of maternity and child welfare, and Prof. D. T. Robinson, Liverpool City bacteriologist, to whom our thanks are due for the information given below.

The instruments, gauze, lint, ligatures, and dressings used by midwives were all cultured, but failed to reveal the presence of *Cl. tetani*. Both mothers, however, had sprinkled their infants' umbilical stumps with baby powder—of a different make in the two cases. These were obtained and cultured. The powder used on Case 2 gave a good growth of virulent *Cl. tetani*, but none of these organisms were isolated from the powder used on Case 1. Accordingly several samples of powder of the same brand as that used by the mother of Case 2 were obtained from various chemists in the city. In addition several other