in adult and child contacts of infectious hepatitis in the U.S.A. but was ineffective in serum jaundice. In one experiment the convalescent serum of a patient infected with a known strain of serum jaundice virus failed to neutralize that same virus. Treatment of either infective hepatitis or so-called serum hepatitis has, for the most part, been ineffective. The only treatment that has given any promise whatever has been the intravenous injection of protein hydrolysate. Since we cannot detect these viruses, inactivation is the main safeguard in order to avoid them. The icterogenic agents concerned pass through Seitz filters and are not inactivated by heating at 56°-60° C. for half an hour or by the usual bacteriostatic or bactericidal chemicals used for preserving sera, such as phenol, tricresol, or merthiolate. Recent work has shown that irradiation of serum or plasma with a particular ultraviolet light under satisfactory conditions may be capable of inactivating any icterogenic or other virus present. This procedure is being adopted, as equipment becomes available in the U.S.A., Canada, and England, as a routine treatment for pooled human serum or plasma which is to be used for transfusion or other therapy or prophylactically against certain infectious diseases.

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RENUMERATION OF GENERAL PRACTITIONERS

A deputation from the British Medical Association, led by Dr. S. Wand, Chairman of the General Medical Services Committee, discussed with the officers of the Ministry of Health for more than three hours last Friday the evidence presented by the Ministry of what general practitioners in the National Health Service are now supposed to be earning. A further meeting with the Ministry will take place before, it is hoped, the Conference of Local Medical Committees to be held on October 27.

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STAPHYLOCOCCAL TOXEMIA

At Bundaberg in Australia in 1928, 12 children died after an injection of diphtheria prophylactic—a toxin-antitoxin mixture not containing antiseptic. This prophylactic had already been used on three different occasions without abnormal reaction. Three days later 21 children were inoculated, and within five to seven hours 16 became ill with high fever, vomiting, and diarrhea. In the fatal cases the children developed cyanosis, convulsions, and unconsciousness, and died in 15 to 36 hours. A Commission which was set up to inquire into the circumstances of this disaster reported briefly as follows: that the deaths were due to the injection of the diphtheria prophylactic; that the material contained no free diphtheria toxin; and that it did contain a culture of Staph. aureus. A similar staphylococcus was isolated from all the surviving children who developed abscesses at the site of injection. The cause of death was attributed to the toxemia induced by a copious formation of toxin resulting from the growth of the staphylococcus. The Commission showed that in the conditions prevailing at Bundaberg very little toxin was produced in vitro, and so the toxin must have been formed in vivo.

In 1930 Kellaway and his colleagues described a pharmacological study of the exotoxin of Staph. aureus. They injected agar-extracted toxin intravenously into young cats. After doses of more than 0.1 ml. per kg. the cats died rapidly, while doses of 0.04 ml. per kg. produced diarrhea and weakness lasting 2-3 hours, followed by recovery. In cats dying in 2-4 hours the earliest symptoms were dyspnea, vomiting, and diarrhea; these developed within 30 minutes and were accompanied by general weakness and ataxia. Later the animals became increasingly weak and collapsed, with convulsive movements; death followed respiratory failure. At post-mortem examination distension of the right side of the heart was observed and an empty left auricle and ventricle. Heart-lung preparations showed that there was constriction of the pulmonary vessels. When the lungs were replaced by an artificial pulmonary circulation it was found that the toxin had a direct toxic action on the heart: this was shown to be due to constriction of the coronary arteries.

Recently Olin and Lithander have reported from Stockholm four cases similar to those at Bundaberg. Three children fell ill after the injection of meso-convalescent serum: vomiting, diarrhea, fever, and cyanosis rapidly developed, and two of the children died. The bottle of serum, which contained quinolos and formalin as antiseptics, had been used eight months previously without ill effect. The fourth case was that of a child on whom a Mantoux test had been performed, 1 mg. of tuberculin having been injected intracutaneously. Within four hours the child became ill, with vomiting, diarrhea, and fever, and he died in 17 hours. From all four cases coagulase-positive staphylococci were isolated. Tests on rabbits showed a definite correlation between haemolysin titre, necrotic effect on the skin, and killing power. Burnett in 1929 noted the same correlation in the Bundaberg strain, and suggested, in fact, that the three effects were due to one toxin.

In cases such as these, in which the mortality rate is high and the onset of death rapid, early treatment is essential, and the ominous nature of the symptoms should be widely appreciated. Fatal cases have followed diphtheria immunization, injection of measles prophylactic, and Mantoux testing—procedures common in this country. In Sweden one case, that following the Mantoux test, was treated with penicillin, but treatment was begun only within 1/2 hours of the child's death. Prompt recognition of these symptoms after an injection would enable penicillin and staphylococcus antitoxin to be given at once. With early treatment there would be some hope of reducing the very high case-mortality rate of a condition which, admittedly rare, might occur in the practice of any doctor.

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1 Kellaway, C. H., MacCallum, P., and Tebbutt, A. H. Report of the Commission to the Governor of the Commonwealth of Australia, 1928. Melbourne.
2 J. Path. Bact., 1930, 33, 889.
3 Acta path. microbiol. scand., 1948, 28, 152.
4 J. Path. Bact., 1929, 22, 717.