

APPENDIX.

PART 1.—MEDICAL RESEARCH: SUMMARY OF WORK CARRIED OUT AT THE MEDICAL SCHOOL, OTAGO UNIVERSITY.

By Dr. C. M. HECTOR.

I BEG to submit herewith a summary of the research work carried out by me during the past three years.

1. POLIOMYELITIS RESEARCH.

This work was initiated in May, 1925. Material for the investigation was derived from the epidemic of 1924–25 and subsequent cases in Auckland and Dunedin. It consisted of spinal cords and other tissues preserved in glycerine. For the purposes of the investigation forty-six monkeys have been purchased. The cost of these was at first about £5 per head, but latterly they have been obtained direct from Calcutta at about £3 per head. The cost of feeding them has been about 4d. per head per day. The animals have been housed in a building specially built for them, with facilities for warming. So far only one monkey has shown evidence of tuberculosis—disease to which monkeys in captivity are, as a rule, very prone. Of the forty-six monkeys purchased, two died *en route* from India and two immediately after arrival, leaving forty-two monkeys for experimental purposes. Of these, twenty-five are still on hand. Of the seventeen dead, eight have died of a disease apparently of a contagious nature, accompanied by choreiform manifestations. Inoculation experiments and histological examinations have shown nothing definite in this condition. One monkey died of poliomyelitis after inoculation, and post-mortem showed characteristic lesions in the central nervous system. One monkey definitely paralytic after inoculation was killed with a view to transmitting the infection. It showed characteristic lesions in C.N.S. Another monkey suspected of a mild attack of poliomyelitis after inoculation was killed to verify the condition, and was found to have the characteristic lesions, together with tuberculosis, which accounted for its prolonged illness. Of the remaining monkeys, one died under an anæsthetic, one from post-operative hæmorrhage, and four were destroyed after inoculations.

Inoculation Experiments.—Twenty-five animals have been inoculated. Some of these have had repeated injections. Some have had, in addition to intra-cerebral, also intra-peritoneal and intrathecal injections. The material used has been emulsions of spinal cord, naso-pharyngeal washings, fæces, and scraps of nerve tissue. With this material eleven positive results have been obtained—three verified by post-mortem examination. Of these three, two were inoculated with emulsion of spinal cord from the same case (a patient from Wanganui) and one with fæces of an infant from Dunedin Hospital. Attempts at further transmissions from these cases failed. Naso-pharyngeal washings gave in all cases a negative result. The symptoms noted in those monkeys which were ill after inoculation and which recovered were drowsiness, shivering, loss of appetite, offensive motions, diarrhoea, transient weakness of the limbs, general excitability, and nervousness.

Rosenow's Test.—This test, which is a precipitin reaction, was devised by Rosenow for the purpose of detecting mild cases of poliomyelitis and carriers. We were favoured by Rosenow himself with a supply of serum for making the test, but the reactions, if positive, were so faint as to have little practical value. Search was also made for a diagnostic skin reaction, but no definite reaction was obtained.

Inoculation of Rabbits.—Inoculation with poliomyelitis material was attempted, both with and without the aid of depressants, but no infection resulted.

Worm Infection.—As some of the monkeys appeared to have died from infection with a Nematode worm (*Esophagostomum brumpti*), and as this worm has been known to produce fatal diarrhoea in man, it seemed desirable to inquire into the worm infections of the monkeys in hand. Cultures of fæces were made which revealed *Strongyloides intestinalis* and *Anguilulæ* (from tap-water probably), but no *Esophagostoma*. These last, however, were found in small numbers in some of the monkeys examined post-mortem—obviously not abundant enough to threaten our supply of monkeys or to produce risk of human infection.

In my report of March, 1927, I proposed a further examination of the poliomyelitis material on hand, in the hope of getting an active virus to test out the serum of various groups of the population. This examination has been carried through, but unfortunately no suitable virus has been recovered from the material. In fact, the work as a whole tends to show that, while the virus is undoubtedly present in the material, it is of a mild nature. I proposed also to test the hydrogen-ion concentration of the glycerine in which the poliomyelitis material was preserved. Tests were made with the usual colorimetric method, but it was found by experience and from the literature that the colorimetric method was not sufficiently sensitive or reliable with glycerine media.

2. INFLUENZA INOCULATIONS.

Several attempts were made to inoculate monkeys with filtrates derived from (a) bronchial secretion of fatal cases of influenza, (b) pleuritic effusion from an apparently epidemic pleurisy suspected to be influenzal. These materials were injected intra-tracheally, both singly and combined with dilute suspensions of *Staphylococcus aureus* to aid injections, but no infection followed in any of the animals injected. The objects of these tests was to determine the presence or otherwise of a filter-passing organism in influenzal secretions.

The above experiments were too few to determine the point.