

Thus indeed may be summed up succinctly the statistics of the epidemic. It remains now to sum briefly the observations made by various investigators during the epidemic.

Drs. Iver MacKenzie and W. B. Martin found the diplococcus intracellularis in the throat and nose of many cases of cerebrospinal meningitis and contacts in Glasgow. Frequent post mortem sagittal sections of the skull failed to reveal any direct extension of the disease from the nasal passages to the meninges. The organisms were found to be causative in two cases of malignant endocarditis and were present as a pure culture in the pericardium, the pleurae, the spleen and the joints, and were even found in the urine. Dr. Symmes, of Belfast, found in 15 blood cultures from cases of cerebrospinal meningitis the meningococcus to be present three times. It is of interest to collaborate the findings of Drs. Mackenzie and Martin with those of Dr. Kerchner on an epidemic, and Dr. Flexner in experimental work.

Dr. Kerchner found in 635 cases of cerebrospinal meningitis the diplococcus to be present in the naso-pharyngeal areas 146 times, and in 213 contacts it was present 26 times.

Dr. Flexner, in experimental cerebrospinal meningitis produced by the injection of the diplococcus intracellularis into the spinal sac of monkeys, found the infection to spread outward to the frontal sinuses by the olfactory lobe and membrane, and even the nasal mucous membrane to become congested.

Dr. Symmes found in post mortem examination, held by him in Belfast, on cerebrospinal meningitis cases, an intestinal hyperemia, enlarged markedly hyperemic or hemorrhagic mesenteric glands, a peculiarly yellow mottled surface of the liver, enlarged thymus gland, and a general prominence of lymphatic tissue. Similar post mortem conditions were, however, produced in a monkey by Dr. Stuart MacDonald, by injecting into its spinal cord the spinal fluid from a case of cerebrospinal meningitis.

Drs. MacKenzie and Martin found the blood to exert a markedly bactericidal action upon the meningococcus, while the serum of the cord showed very little such action indeed. So marked indeed was the difference that these two investigators used the blood serum of convalescent patients to inject into the meningeal sac of those in the acute stage, and in 14 unselected cases had 8 recoveries with 6 deaths. In two other acute cases they injected the serum from the patient himself into his own meningeal sac with recovery in both cases.

The above evidence goes to show that in Dr. Kerchner's statistics 23 per cent. of the cases give presumptive evidence of the source of infection being the naso-pharyngeal areas. The evidence, however, is that the course of infection is not by continuity of tissue to the meninges, but rather that the disease is a general