

cultures of plague, they having the peculiar glistening appearance, being of extremely sticky consistency, and morphologically showing all the peculiarities of bacilli grown on artificial media. An attempt was then made to ascertain if this were simply a bacillus with very feeble virulence, and a guinea-pig was inoculated with a fresh sub-culture, *plus* a sub-culture of diphtheria bacillus recently isolated. As a result death ensued in slightly over five days, the body showing *post mortem* all the characteristic lesions of a guinea-pig dead of the disease after that lapse of time—*i.e.*, enormously enlarged gland above the seat of inoculation, swollen and mottled spleen, but lungs and pleura healthy. This last series of experiments is, I venture to submit, of some importance. The patient was affected with a simple bubo, and was isolated on the clinical features of the case, at most as a case of *pestis minor*. Before the above experiments had been completed the patient had completely recovered, and had been discharged. The value of clinical evidence and the possibility of an incorrect conclusion being arrived at through the failure of experimental proof by ordinary methods are thus amply demonstrated.

RATS.

During the past few months, consequent on the recrudescence of bubonic plague in Australia and the few cases in New Zealand, thanks principally to the officials of the Wellington Corporation, 150 rats, chiefly from various parts of the City of Wellington, have been carefully examined *post mortem* at the laboratory. These rats had been killed by various means—such as dogs, poison, &c.—and naturally a number were too far advanced in putrefaction for satisfactory results to be obtained on examination. Nevertheless, all have been subjected to very careful *post-mortem* examination, in every case portions of the spleen and external lymphatic glands being submitted to the microscopical test. In all instances where the slightest suspicion existed after the microscopical examination—and these were numerous—further tests were made by the inoculation of various culture-media, and in several instances these were further supplemented by experiments on rats and guinea-pigs. It is pleasing to be able to report that in no instance did we succeed in demonstrating that a single plague-infected rat had been found in the City of Wellington or its vicinity.

In spite of that fact, in virtue of my previous experience in regard to the examination of rodents for this disease, I do not consider it proof that the disease has not been present amongst the rats of this or other centres where similar examinations have been made with like results. Animals afflicted with any disease are prone to separate themselves from their fellows and seek seclusion, and it is unlikely that a rat affected with plague, unless in the earlier stages, would readily partake of poisoned bait or feel so inquisitive as to enter a trap. Hence the above negative results should not induce any municipality to relax their efforts in the destruction of these four-footed plague-carriers.

For the information of those who are interested in the investigation of this disease in the lower animal, I would point out that, although enlarged skeletal lymphatic glands and enlarged spleen are nearly always found in plague, and are always to be regarded with grave suspicion, these abnormal conditions may occur without any apparent cause. My observations led me to the conclusion that the nature of the food, particularly decaying animal food, materially affects the size of the rat's spleen. Enlarged lymphatic glands are often more difficult to explain, but the frequency with which rats fight amongst themselves, and so receive wounds and contusions, may to a certain extent be responsible. In any case, the enlargement of these organs in practically normal rats is a point of some importance.

Besides the number of rats examined, two dead cats were received for examination as to the presence of the bacilli of plague, with negative results.

EXPERIMENTS WITH DR. DANYSZ'S RAT-MICROBE.

In the *Annales de l'Institut Pasteur* of April, 1900, Dr. Danysz described fully a bacillus which he had isolated from field-mice during an epidemic amongst those animals. The bacillus bore a great resemblance to the *B. coli*, and even at the beginning was slightly pathogenic for the grey rat. But for mice even he found the microbe soon lost its virulence on passing from animal to animal under ordinary circumstances.

By an ingenious innovation in the methods of cultivation he was so able to augment the virulence as to make it strongly pathogenic, first for grey, then for black, then for white rats, to such an extent that they succumbed in from five to twelve days after ingestion of cultures mixed with bread or grain.

Following his successes experimentally in the laboratory, Dr. Danysz continued his researches by mixing bait with his cultures and distributing it in such a manner that rats living under normal conditions would partake of it.

Samples of cultures were sent to different parts of France and elsewhere, and several hundreds of reports were received of the results. These reports showed that in the half of the cases a complete disappearance of rats in the affected buildings, &c., was effected. In 20 per cent. the results seemed completely negative, and in the remaining 30 there was reported a veritable diminution of the rodents in the localities treated. In some rare cases the extension of the epidemic from the locality treated to a certain number of neighbouring localities was observed.

When in Paris last year I had the pleasure of meeting Dr. Danysz, and he courteously discussed the whole question with me, explained his methods of procedure in the preparation and distribution of the cultures, and provided me with specimens for the purposes of experiment here. Unfortunately, four months elapsed between the time I received these specimens and the date on which, after my return to the colony, I was able to commence experiments. They had been forwarded here with all care, however, and preserved under the best conditions, as recommended by Dr. Danysz.