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## THE SEX RATIO IN LEPROSY

A feature of leprosy which, first and last, has caused a great deal of speculation is the fact that under what may be considered the normal conditions of a going endemic there are usually about twice as many males affected as females. A discussion of the subject by Lowe, of Calcutta, which cites the views of several workers, appears in this issue of the JOURNAL.

Not connected with leprosy is the statement ascribed to Stallybrass that differences in endocrine function in the two sexes may possibly have an influence on their susceptibility to infectious dis-

eases in general. Lowe himself points out that a slightly greater degree of immunity in females, not sufficient to cause much difference with respect to virulent, acute diseases, might possibly have a marked influence in the incidence of a disease like leprosy and give rise to more frustrated attacks and a milder form of the disease. However, he is not inclined to accept the hypothesis that under the same conditions females are less susceptible to leprosy than males, and in fact definitely concludes that in the light of present evidence a fundamental difference in susceptibility is improbable, and that the difference in incidence probably is due to environmental factors. In support of this view he marshals arguments that include certain data on the incidence of tuberculosis.

Correct though this conclusion may be, direct evidence would be preferable to indirect. Real direct evidence on the question in human leprosy would be difficult indeed to obtain; factors such as differences in activities, in contacts, and in habits of cleanliness usually interfere, and would do so even in asylum or prison populations. However, indirect experimental evidence possibly may be had if it be agreed that in rat leprosy, despite its peculiarities and differences, there are important similarities and relationships and that transmission may be included among these.

It is most striking that of the 2,157 wild rats examined by Asami in northeastern Japan (see the abstract in this number of the *JOURNAL*) 11 leprosy ones were found among the 907 males examined, and only 6 among the 1,257 females. Apparently Asami did not pursue the matter, but the figures give proportions of 1.15 per cent males and 0.48 per cent females, and a sex ratio of 2.4:1. The total number of diseased animals was small, of course—it would be most desirable could statistics be obtained from various regions on a larger scale—but the fact is decidedly suggestive.

Considering these figures, the familiar question of environment versus innate susceptibility arises. Though the conditions are relatively simple it still must be asked whether among wild rats there is an environmental factor to which such a sex difference can be ascribed. Marchoux concluded that natural infection of wild rats occurs through the wounds of battle among these savage little creatures, and it may be that the males are by so much the greater fighters—scar counts would perhaps show that. It would be highly desirable to investigate the matter experimentally. The opinion expressed by Marchoux, in his article on rat leprosy reprinted in this issue, that

the occurrence of rat leprosy among white rats reported by Dujardin-Beaumetz and by Borrel was due to insufficient separation from infected animals, suggests a possible epidemiological experiment that might be undertaken in some place where a sufficient stock of animals is available. Even if the suggested assumption as to the relationship of the two diseases is not fully granted—and probably few would be bold enough to do that—such an experiment would be of very real interest, and possibly of broader significance than with respect to the problem of leprosy alone.

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