Medical Memoranda

Is the Rat (*Rattus rattus*) ever a Permanent Reservoir of Plague?

Black rats (*Rattus rattus*) are well known as propagators of plague, and Roberts (1950) believes they are the only rodents concerned in outbreaks in Kenya. However, recent work (Heisch, 1952) indicates that wild rodents are the permanent reservoir in Kenya, and that rats are infected secondarily and are incapable of harbouring plague for long periods. Many workers think that rats are never permanent reservoirs of plague; this may be true, but it has not yet been proved.

One of the main features of wild-rodent plague is a tendency for the infection to persist indefinitely in areas once invaded. Rodents often show a marked resistance to the infection, and harbour *Pasteurella pestis* in their tissues and fleas without showing signs of disease. Such invisible or inapparent plague is usually demonstrated by pooling the tissues and/or the fleas of groups of rodents and inoculating guinea-pigs. Such techniques, known as "pooling tests," are of great value in revealing foci of sylvatic plague which might otherwise remain undetected. If *P. pestis* can be isolated from apparently healthy rodents and/or their fleas during silent or interepizootic periods, it strongly suggests that the rodents concerned are permanent reservoirs of plague.

In Kenya, rats (*R. rattus*) are unlikely to be permanent reservoirs. Not only are they highly susceptible, but the infection soon dies out, and *P. pestis* has never been isolated from their tissues or fleas during interepizootic periods. Though far fewer rats than wild rodents have been subjected to pooling tests in Kenya, it seems significant that 827 *R. rattus* and 1,564 *Xenopsylla brasiliensis*, from the old silent focus of Keruguya on the slopes of Mount Kenya, were negative for *P. pestis* (Heisch *et al.*, 1953). Different results have been obtained in other endemic areas. Thus, in India, rats often show a marked resistance and even develop inapparent infections. At the Calcutta Conference of Medical Research Workers in 1934, it was reported that 13 out of 141 tissue pools, derived from 2,107 apparently healthy rats, were positive when inoculated into guinea-pigs. Inapparent infections in commensal rodents have also been demonstrated by Peryassú (1934) in Brazil and Devignat (1940, 1949) in the Belgian Congo; but according to Pollitzer (1954) it was never claimed that such animals played a part in the perpetuation of plague. It seems strange that inapparent infections in wild rodents are considered important while similar infections in commensal rats are disregarded.

It is not clear whether the inapparent infections in commensal rats were found during interepizootic periods or during epizootics when rats may have been incubating plague or recovering from it. It is the interval between epizootics which is the critical period, and determined attempts should be made to isolate *P. pestis* from rats and their fleas at such times. Though pooling techniques have proved invaluable in sylvatic plague studies, they appear not to have been so widely used for detecting *P. pestis* in commensal rodents. This may partly explain why it is still uncertain whether

rats are a permanent reservoir in India, Madagascar, Egypt, Senegal, Peru, Brazil, and elsewhere. The brilliant work of Baltazard (in press) has shown that the gerbil—*Tatera indica*—is an important though perhaps rather unstable reservoir in India, but the possibility that rats may also maintain the infection does not yet seem to have been excluded.

Meyer (1957) has stated that "it is becoming increasingly apparent that the highly susceptible rodents, such as the marmot, the squirrel, and the rat, are not the permanent reservoir of the plague bacillus." This overlooks the fact that a highly susceptible species like *R. rattus* may sometimes develop a marked resistance to the plague bacillus. The terms "susceptible" and "resistant" as applied to rodent species have a relative rather than absolute connotation. The persistence of plague in focal areas is a complex matter, and apparently depends on the presence of susceptible as well as resistant rodent species. It can of course be argued that fleas and not rodents are the chief reservoir of plague. Wild rodents and their fleas are of primary importance in the perpetuation of plague, but it seems doubtful whether the commensal aspect of the reservoir problem is quite in perspective.

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Familial Incidence of the Henoch-Schönlein Syndrome

The Henoch-Schönlein syndrome is now regarded as an allergic or hypersensitivity reaction related to conditions such as erythema nodosum (Wintrobe, 1956) or polyarteritis nodosa (Lecutier, 1952). Visceral forms were first described by Henoch (1874) and the joint symptoms by Schönlein (1837), but these two manifestations are now considered to form part of one syndrome produced by capillary fragility without thrombocytopenia (Ackroyd, 1953). Osler (1904) described a relationship between the skin manifestations of the syndrome and erythema multiforme. The syndrome often occurs after the consumption of certain foods and after upper respiratory infections, frequently due to haemolytic streptococci (Gairdner, 1948). It is not usually regarded as a familial complaint (Davis, 1948), although a family history of allergy is frequently obtained (Alexander and Eyermann, 1929). Wedgwood and Klaus (1955) recorded a series of cases in which no familial incidence of the disease was found. Reports of cases occurring in siblings are uncommon, and the histories of the two children reported here are thought interesting enough to be recorded. The second child, aged 14 months, is much younger than the usual patient with the syndrome; it is believed to be rare under the