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A Critical Evaluation of
The Present Plague Situation and The Method of Plague Control
in the Soviet Union

Report V

by

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A. Plague incidence1. Incidence of human plague

The question of the validity of the claim officially made by Pastukhov (1960) that for about 30 years human plague has been absent from the Soviet Union has been dealt with already in the first part of these plague studies. Attention has been drawn there to the statements of several authors who pointed to the dangers of a continued contact of the people with infected wild rodents and their fleas in the plague areas not brought under control, particularly in those of Central Asia. Specially noteworthy among these statements appears that of Zhdanov (1956) who expressly admitted the possibility of an occurrence of sporadic human infections contracted immediately in the epizootic foci.

The conclusion reached by the present reviewer was therefore that the official claims as to the absence of human plague in the Soviet Union can be considered as valid in so far only as the absence of epidemic manifestations of the disease are concerned. That, however, sporadic instances of plague or even attacks in small groups of people exposed to the infection in the wild rodent foci not brought under control continue to occur, seems most probable, if not certain.

2. Incidence in wild rodents and their ectoparasites

The information on the incidence of plague in wild rodents and their ectoparasites furnished in the first and partly also in the fourth parts of these studies may thus be summarized and evaluated:

<u>Locality</u>	<u>Year of Last Recorded Manifestation</u>	<u>Comment</u>
North-west Caspian Plague Areas	Stalingrad Oblast-1934; Stavropol Krai - 1936; Rostov Ob- last - 1938; 'Black lands' - 1954; Dages- tan - 1956	The claim that plague has been eradicated in the Stalingrad and in the Stavropol Krai seems justified. Though doubts have been expressed in regard to Dagestan, the foci there have been quiescent in 1957, 1958 and the first half of 1959. The situation in the 'Black lands' of the Kalmyk steppes remains potentially dangerous.

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Volga-Ural Inter-fluvial Area	1951-1952	Plague ceased to be manifest in those parts of the area where wholesale campaigns have been conducted against the susliks or gerbils. It is still uncertain, however, whether the plans to deal in the same manner with the considerable hitherto untreated stretches of the area have been implemented.
Trans-Ural Focus	1958	As proved by the appearance of an epizootic in <u>Mus musculus</u> in 1958, plague has remained active among the rodents in this focus up to that year at least.
Trans-Caucasus Plague Focus	1958	Attention has been drawn to the fact that as late as 1957-1958 numerous plague strains have been isolated from wild rodents and their ectoparasites in this focus. That plague has disappeared since, is unlikely, especially in view of the danger of its re-importation from the foci in Turkey and Iran.
Central Asian Plague Foci	1958	Inasmuch as (a) the isolation of numerous plague strains from wild rodents and their ectoparasites has been recorded in these areas as late as 1957-58; (b) only emergency work could be done in the foci situated in the plains and (c) control in the mountainous part of the area could be undertaken only on an incomplete scale, there can be no doubt that the infection persists in these areas.
Transbaikalia	1946	As has been stated in the first of these studies, large scale examinations of wild rodents and their ectoparasites proved practically negative during 1947-1954 and entirely negative in 1955-56. These findings support the claim of the Soviet workers that plague

has been eradicated in Transbaikalia. However, as pointed out by some observers, specially Feniuk (1959) the continued existence of plague in adjacent parts of Mongolia renders the situation in Transbaikalia still potentially dangerous. Whether the creation and maintenance of an only 10km wide rodent-free belt along the Soviet-Mongolian border will obviate this danger, remains to be seen.

As will be gathered from this survey, control of the plague situation on an area-wide scale has been achieved only in the Caspian foci and, in a precarious manner, in Transbaikalia.

B. Methods of plague control

1. General anti-plague program

As can be gathered from the general statements by Fedorov and co-authors (1955) and Pastukhov (1959) as well as from the data furnished for Transbaikalia by Donskoi (1959), it is a widely adopted practice in the Soviet Union to supplement the operations conducted against the wild rodents by the implementation of a general anti-plague program in the settlements, comprising, besides vaccination and public health education, rat eradication and disinfestation. It is noteworthy in this connection that Feniuk, while admitting the necessity for work of the latter kind in the sections of the foci where epizootics were present or threatening, militated with much reason against the yearly repeated implementation of deratization and disinfestation throughout the foci even in settlements where no real indication for such work existed. Here, as in anti-plague work in general, it is certainly easiest to continue with the use of a once adopted routine but to do so serves no really useful purpose and involves much effort and expenditure which could be utilized to better advantage for really necessary operations. The necessity of constantly re-adjusting the anti-plague program to changes in the plague situation seems to be not rarely disregarded in the Soviet Union.

It is curious to note that Feniuk, dealing with the peculiar conditions in the Central Asian plains, advocated that the plague workers should pay prime attention to general preventive measures, resorting to anti-rodent operations even of an emergency type only in the presence of intense epizootics in localities where the implementation of the general preventive program met with difficulties. To

accept this unusual advice is difficult. However, one must agree with Feniuk that one should be hesitant to adopt an elaborate program of long-term prophylaxis in sparsely populated areas of little economic importance.

2. Campaigns against mice and allied species of small rodents

When dealing with the control of mice and allied species of small rodents in the fourth part of these studies, due emphasis has been laid upon the value of campaigns conducted each year in early spring in the optimal sites which these animals were then apt to inhabit exclusively in much restricted numbers. There can be no doubt that this "prophylactic" method of control, first recommended by Feniuk and elaborated by Naumov is far simpler and more promising than campaigns against the animals during later seasons when they have become widespread and numerous. As will be discussed later, similar rational methods have been recommended also for the purpose of controlling wild rodent plague.

3. Campaigns against wild rodents

As has been discussed in the fourth part of these studies, the system of "complete" plague eradication officially adopted in the Soviet Union is based upon the conduct of long-term anti-rodent campaigns throughout, or in large parts of, the wild rodent foci, in the course of which the sections of the foci initially dealt with are subjected to perennially repeated treatment for period of at least 5-6 years.

While, as shown by the results obtained in the Caspian plague areas and also in parts of some of the other foci work of this type gave good results, it has become increasingly doubtful whether such long-lasting and cumbersome campaigns were really indispensable for the eradication of plague. That this was not the case was indeed demonstrated already through the success of the initial campaigns conducted against the susliks in the Caspian plague foci during the period of 1933-1941: As shown in a table inserted in the fourth part of these studies plague had become absent during that time not only in the Stavropol Krai where suslik eradication had been undertaken at an average of 6.3 times but also in the Rostov and Stalingrad oblasts where such operations had been conducted only about 4.7, respectively 4.3 times. Nevertheless, even though the subsequent appearance of plague in hitherto untreated areas of the Caspian plague foci did not lead to a spread of the infection to the Stavropol Krai and the Rostov and Stalingrad oblasts, large-scale rodent extermination campaigns were continued in these three sections for more than 10

years. It is understandable that the workers responsible for the control of plague in these parts were anxious to do all in their power to prevent a reappearance of plague in these areas, which were situated nearest to the central parts of the Soviet Union. Still, as far as an outsider can judge, there seems to have been no real need for these extraordinary precautions.

That the perennial repetition of the campaigns against the gerbils conducted for long periods in the Volga-Ural interfluvial area was unnecessary, has been asserted by Karpuzidi (1959), Naiden (1959) and Osolinker (1960). As maintained by the last mentioned observer, it was sufficient to conduct wholesale eradication campaigns in the wild rodent plague foci for three successive years, provided that a careful search for evidence of the infection in the rodents and their ectoparasites was continued for a long time. Karpuzidi pointed out with great reason that the "passion" for many times repeated eradication campaigns actually retarded the rapid liquidation of the foci, because the great efforts and considerable funds necessary for such campaigns could be used to far better advantage for more rational work.

As has been alluded to above, a radically modified system for the eradication of wild rodent plague has been proposed by Naumov (1954, 1957). Finding that during the inter-epizootic periods plague remained active and capable of spreading only in a limited number of "elementary" foci, Naumov considered it unnecessary to continue anti-rodent campaigns on an areawide scale for prolonged periods. In his opinion it was possible to obtain equally good and at the same time much speedier results if after one or two large-scale initial eradication campaigns attention was concentrated upon anti-rodent work in the "elementary" foci, where alone the infection persisted. There can be no doubt that, if based on large-scale careful surveys, work of this kind is bound to prove far more rapidly successful than the hitherto adopted system of long-term perennially repeated rodent eradication campaigns.

As recommended by Aizen and his associates (1959), advantage might also be taken of Naumov's system for dealing with the often comparatively distant microfoci in which marmot plague persists in the Tian-Shan mountains, possibly even without first resorting to initial wholesale rodent eradication campaigns. It is regrettable that apparently thus far no large-scale practical advantage seems to have been taken of this and Naumov's original scheme. For work of this kind might prove not only of great value for the Soviet Union, but might open the road for the implementation of similar operations in other parts of the world where the infection persists among the wild rodents in an enzootic form.

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In curious contrast to the often redundantly great efforts made in the Soviet Union to cope with the situation in the plague foci through anti-rodent campaigns, so far only rather limited use has been made of supplementary efforts directed against the rodent ectoparasites. As generally held by the Soviet workers (see e.g. Feniuk, 1960), a combination of flea eradication with the anti-rodent campaigns is indispensable only when implementing the method of emergency prophylaxis during epizootics. On the contrary, in the opinion of Feniuk and most other Soviet workers it was not necessary to resort to combined rodent and flea eradication in campaigns aiming at the liquidation of the plague foci, because in the course of these owing to the maintenance of a low level of the rodent populations for a number of years a gradual reduction of the flea populations is automatically achieved. However, while the success of the campaigns perennially conducted for prolonged periods against the wild rodents alone supports this contention, there can be no doubt that a combination of such work with flea eradication is bound to yield much more rapid results. To judge from a study of recent publications, increasing attention is now being paid to the advantages of the latter system. Even Pastukhov, the official spokesman, admitted that combined rodent and flea eradication "gives prospects of a more rapid sanitation of the natural foci and the final eradication of the plague epizootics in them." In his opinion, however, the hitherto available methods for such combined work were still not expedient. Nevertheless, one must note that, as has been described in the fourth part of these studies, promising results have been obtained in the fight against wild rodent fleas with DDT and benzene hexachloride for simultaneous campaigns against susliks or other wild rodents and their fleas. The difficulties of finding a workable system for such combined operations are therefore certainly not unsurmountable.