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TICK FEVER* IN THE TRANSBAIKAL

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Preliminary Report

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In 1943 we undertook the study of cases of a disease which occurred in April and May of this year in the town of Ukurei, Chitinskaya Oblast' [Chita Region], and in Chita. At first, these cases were diagnosed by the attending physicians as "atypical typhus", though a careful epidemiological investigation gave no basis on which to conclude that an infection from lice was possible.

On arrival of the patients at the clinic, gorged ticks were removed from them in two cases. This circumstance gave us the idea that we had here a disease connected with tick-bites. And indeed further clinical observation showed that the disease (which was later reported at Irkutsk, at Ulan-Ude, at Siding No.77 of the Trans Siberian Railway and other places) took the same course as the typical tick fever of Western or Central Siberia and of the Far Eastern Province. (SHMATIKOV and VELIK, 1939; N.V.SERGEYEV, 1940, S.R.ROTEBURG, 1941.)

The disease appeared four or five days after the tick-bite. At the location of the bite (most frequently on the neck or the pectoral region) a small area of necrosis developed. Sometimes there was an increase in the size of the lymphatic glands of the region. The patient complained of weakness, chill and violent headache. As early as the third day, the temperature was up to 40°C. Subsequently the temperature gradually declined, and by the eighth or tenth day was back to normal. On the fourth to sixth day there appeared, all over the body and including the face and palms of the hands, a profuse roseolar, papular rash, which persisted for six to eight days. After the disappearance of the rash, which took place by the time the temperature was normal, there remained spots of light pigmentation on the skin.

No increase in liver or spleen size was noted. Blood tests during the first few days of the illness showed leucocytosis (9000-12000 per mm³) and a moderate lymphopenia.

The Weil-Felix reaction remained negative during almost the whole of the fever period (first eight to ten days). On the eleventh to fourteenth

* Literally, "tick-borne typhus". (Tr.)

day after the commencement of the illness, when the body temperature was already back to normal, the Weil-Felix reaction (with Proteus OX19) was positive in titers of 1:200 to 1:400.

On the tenth and sixteenth day after the beginning of recuperation, the agglutinin titer went to 1:3200 ~ 1:6400; on the forty-second day, to 1:800.

Guinea-pigs were intraperitoneally infected with the blood of one of the patients, taken on the eighth day of the illness. From the fourth to the ninth day after infection, the guinea-pigs' temperature was observed to rise to 39.8°, which in the males was accompanied by edema of the scrotum and inflammatory symptoms in the tunica vaginalis testis. Before infection, the agglutination reaction with Proteus OX19 was negative in these guinea-pigs; eighteen days after infection it was positive in three out of five of them, in titers of 1:40, 1:80. In smears prepared from the punctate of the testicle (Macchiavello's stain) a large quantity of rickettsia was found. An emulsion from the testicle of a sick guinea pig, when injected into another guinea pig, produced a similar syndrome.

Histological autopsies (A.A.FLORENISOV) revealed the presence, in the organs of the test-animals, of demarcated infiltration in and around the vascular walls, of the "typhus cuff" type.

We also made virus-determination tests on the gorged ticks taken from the patients. Guinea pigs were infected with an emulsion of the washed salivary glands and with the cavity-fluid of these ticks, (V.I.MOROZ). In all cases the result was a fever, accompanied by the scrotal phenomena in some of them and by the appearance of agglutinins (Proteus OX19) in titers of 1:400 to 1:800. Subsequently the virus thus obtained was passaged three times through male guinea pigs.

The ticks taken from the patients were found to be Dermacentor nuttali Olenov (as determined by V.B.DUBININ). This type of tick was described by N.OLENEV in 1921, from collections made in the nineties of the last century by the G.N.POTAPIN Expedition in North-western Mongolia (Kobdo District).

According to the literature, this tick does not exist in the European part of the USSR nor in Central Asia (OVCHINNIKOV, 1938). It has been found in Western and Central Siberia (Academician Ye.N.PAVLOVSKI and associates, 1938-1939) and in the Eastern part of the Mongolian People's Republic (M.N.BAIDIN, 1943).

Study of tick collections sent to us shows that Dermacentor nuttali is found in the Baikal country (Irkutsk and District) and in the Transbaikal, in Buryat Mongolia (Kiakhta, Ulan-Ude, Tarbagatai) and in Chita Region. Dermacentor nuttali is fundamentally a representative of the range-land type of tick, and is spread over a number of districts

(Ukurei, Oloviannaya, Çugulovski Daçan, Aga, Borzia, Maçiyevskaya, Chita).

In April-July 1944, we conducted tests to determine the degree of spontaneously occurring tick-fever virus infection in Dermacentor nuttali ticks collected from cattle (adult ticks) and rodents (larvae and nymphs) in Çugulovski Daçan Settlement, where this type of tick is very numerous. In addition, ticks collected in the Irkutsk area (16 specimens) were investigated. These tests showed that over 20% of all the ticks collected in Çugulovski Daçan (4 empty and 3 gorged females out of thirty tested) produced the characteristic illness in guinea pigs.

A test for the presence of the virus in the larvae and nymphs taken from voles (Microtus spec.) gave a positive result only in two cases out of seven. In ticks collected in Irkutsk and district (16 specimens) the presence of the virus was established only in one case.

The above observations point to the existence of natural foci of tick-fever* in the steppe-land areas of the Transbaikal.

The Transbaikal Focus is certainly closely connected on the one hand with the foci of typhus in the eastern part of the Mongolian People's Republic (M.N.SIDIN, 1943) and in the Far Eastern Province (MILL', 1936; ANTONOV and NEUSTADT, 1936; FEDUKOVICH, 1938; KRONTOVSKAYA and associates, 1939), and on the other hand with foci of this disease in Western and Central Siberia (Ye.N.PAVLOVSKI and associates, 1941).

Thus the whole of Siberia, the Baikal and Transbaikal, plus a considerable part of the Mongolian People's Republic and the Soviet Far Eastern Province constitute a single natural focus of a new disease, still little studied, which we may very properly call "Eastern Typhus".

* Other ticks may be vectors of the virus. Thus for instance in Khabarovsk Territory (E.P.SAVIÇKAYA, V.I.SHKORBATOV, 1944) the vectors of tick-fever are Dermacentor silvarum and Haemaphysalis concinna, which also seem to be found in the Transbaikal.