Elements of the central nervous system parasited by Trypanosoma Cruzi (*)

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(With plates XXXIII—XXXIV).

The classical cell of neuroglia (astrocyte, macroglia), up to now, has been considered the element of the central nervous system which is parasited by the Trypanosoma Cruzi. Gaspar Vianna was the first who showed that the cell of the neuroglia is invaded by the parasite, and he did so ever since his first histopathologic studies on Chagas' disease. Both in experimental infection and in human disease nevroglic cells are to be seen filled, more or less, by parasites of Leishmania form, at different stages of evolution.

Gaspar Vianna's statement was confirmed by several authors, and it was also corroborated by a specific method of staining (Alzheimer's method IV) in a collaborative work of one of us together with Dr. Magarinos Torres. Now we are able to confirm it again by means of Horteja's silver impregnation method (Figs. 1, 2, 3, 8, 10 & 11).

Still if the macroglia is, in fact, one of the parasited elements of the central nervous system, yet it is not the only one. The very nervous cell and the microglia can also be invaded by the parasite.

The nervous cell, the neuronal cell had seemed not to be subject to parasitism by Trypanosoma Cruzi.

Up to now, trypanosomes had not yet been found in the neuronal cell, in spite of pertinentaceous research.

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In a young dog inoculated with *T. Cruzi* from a *Tatusia novemcinctum* with an intense natural infection, one of us (Eud. Villela) verified in sections stained by Giemsa's and also in those impregnated by Hortega's (impregnation with ammonio-silver carbonate) that the neuronal cell can also be invaded by *T. Cruzi*. Figs. 4 and 5 plainly exhibit pyramidal cells of the dog's cortex cerebri full of parasites of Leishmania form. Fig. 4 is stained by Giemsa's and fig. 5 is impregnated by Hortega's.

After Hortega's discovery of the element of the interstitial tissue of the central nervous system which he termed «microglia» and after his studies on same, it was to be presumed that this cell, considered as being of mesodermic origin and also as being endowed with phagocytic activity, should not escape from parasitism either active or passive.

And really it is so. Our preparations show that not seldom cells of microglia are found full of trypanosomes of a Leishmania form, habitually met with in the tissues (Figs. 6, 7 and 9). At least, in the cases of strong experimental infection of dogs with *T. Cruzi* from the *Tatusia* strain, not only the cells of interstitial tissue — classical neuroglia (astrocyte, macroglia) and microglia (Hortega's cell) — but also the neuronal cell is invaded by *T. Cruzi*. It, of course, does not imply that the enumeration of the cells in which the parasite is localized is thus exhausted. It must not be forgotten that the vascular cells do not escape from the parasitic invasion as those of the vessels of the other viscera. Among the elements which are proper to the central nervous system, the oligodendroglia is the only one which we cannot affirm to be parasited. Besides, we did not put into practice any special technique for researches thereon.

This parasitic localization in the neuronal cell which thus suffers the direct activity of the parasite is of great interest. It is also an argument in favour of the neurotropism ascribed to the *T. Cruzi* from the *Tatusia* strain.

Ever since the first researches made by one of us in collaboration with Dr. Magarinos Torres, in which we studied the lesions induced by the *T. Cruzi*, in the central nervous system, we noticed the rarity of meeting with the parasite in the hearts of the cases which served for those studies.

The heart nevertheless is, as a rule, the most habitual localization of the parasite.

At our request, Dr. Penna de Azevedo returned again to researches upon the heart of the same dogs. The results confirmed the aforesaid: The parasite abounding in the central nervous system was rare or absent in the corresponding hearts. The real preference of this parasitic strain for the nervous system is thus confirmed.
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