tusks, two large limb bones, several vertebrae and ribs, and one lower mandible with molar in place. Two of the tusks were evidently those of *Mastodon americanus*; one, larger and more curved, was probably derived from *Elephas primigenius*. The writer measured one of the highly curved—*Elephas*—tusks when about half excavated in the gravel bed at 56 inches. The recovered mandible, identified by the incased tooth, was that of the *Mastodon*. Other "big bones" recovered here in whole or as fragments may simply be loosely defined at present as proboscidian. Of the three tusks found, two were so soft and decayed that they fell into fragments during hand excavation. One, probably that of a young male *Mastodon*, was removed in two parts and presents a fine tip, which is frequently not well preserved. This tusk exhibits a small amount of planation, perhaps by running spring water a few inches from the tip. Toward the close of the day Cut No. 5, 18 feet N. 55° W. of the curbing of the old salt spring, was opened like the others but was unproductive.

In the course of the operation throughout the day each of the five cuts opened was refilled and the surface brought back nearly to normal as soon as the hand exploration was finished.

Altogether, 20 laboratory storage trays of the Museum of the University of Kentucky at Lexington are now filled with the vertebrate fossil material recovered during the one-day exploration of 15 September 1946. The individual bones and fragments of bones, as yet uncounted, probably number 200 or more. Besides these relics, which in time will be cleaned and prepared for museum, exhibition, and educational purposes, a considerable number of bones and some teeth of lesser consequence and value were picked up and removed by various individuals—mostly curiosity hunters—during the course of the exploration. As far as is now known no American Pleistocene species heretofore unknown to this area were found, nor were any undoubted Paleolithic artifacts discovered in the black, hard gravels.

It was estimated that between 600 and 650 people viewed this "fossil hunt."

WILLARD ROUSE JILLSON

Frankfort, Kentucky

The Immunizing Effect in the Action of Trypanocidal Agents

The results recently reported by Mayer and Brousseau (*Proc. Soc. exp. Biol. Med.*, 1946, 62, 238) afford a confirmation of the viewpoint advanced by Reiner and Leonard (*Arch. int. Pharm.*, 1933, 44, 434) that, in the treatment of trypanosomiasis with certain trypanocidal drugs, a response of the host defense mechanism, an immunizing effect, contributes as a factor in the sterilization of the host. Reiner and Chao (*Amer. J. trop. Med.*, 1933, 13, 525) reported the immunization of rats to *T. equiperdum* by the use of vaccines of p-benzoquinone-killed and also of neoarsphenamine-treated trypanosomes. Strong trypano-agglutinins and lysins appeared demonstrable *in vitro* by their action on motile, virulent parasites. The immunity was shown to be strain specific. Immunized rats reinoculated with trypanosomes always survived longer than normal rats, but it was difficult to sterilize infected rats with the vaccines alone. A smaller than normal dose of an arsenical given in addition to the vaccine could, however, wipe out the infection. The serum of rats with progressed trypanosomiasis which were treated with arsenicals also showed the agglutinating and lytic effects, not shown by normal rat serum.

Mayer and Brousseau, working with mice, have apparently rediscovered this action of neoarsphenamine and have also found a similar immunizing action of an antimonial, melaminylphenylstibonic acid (Compound 122). The trypanocidal activity of this Sb compound has been reported by Friedheim and Berman (*Proc. Soc. exp. Biol. Med.*, 1946, 62, 131). Mayer and Brousseau, as in our earlier work, found only a temporary immunity conferred by their drug plus trypanosome injections, with a reappearance of trypanosomes in the blood after three days or later, and subsequent death of most of the infected animals. These workers have demonstrated a new point, namely, the transfer of passive immunity by injecting the serum of mice immunized by treatment of a progressed trypanosome infection into untreated, uninfected mice, followed by attempts to inoculate the latter.

Reiner and Leonard (*Arch. int. Pharm.*, 1932, 43, 10) demonstrated that *in vitro* treatment of *T. equiperdum* suspensions, in the presence of serum globulin, with arsenicals at drug concentrations failing to immobilize the parasites altered the virulence of the strain, so that rats inoculated with the treated trypanosomes were found to survive longer than controls inoculated with untreated trypanosomes.

The present writer has long held the view that trypanocidal drugs, even at concentrations failing to kill trypanosomes, can so alter the metabolism of the parasites as to make them more easily phagocytized, followed by an immunizing response of the host. That the immunization is only temporary may be due to a change in the character of the surviving parasites. Indeed, Friedheim and Berman note that the trypanosomes reappearing in mice after treatment with their Sb compound, followed by multiple reinfections, are atypical for mouse trypanosomiasis, the disease no longer showing the typical continuous, progressive blood-stream increase of parasites to death of the host, but rather an alteration to the chronic type infection seen in rabbits.

Finally, may we point out that no similar experiments seem to have been done to test whether such immune serum is obtainable after drug treatment of experimental treponeme infections. In view of the nature of the disease in rabbits (chiefly a tissue, rather than a blood-stream infection), this may be more difficult to demonstrate. But it would seem as if this could be tested *in vitro* by the action of rabbit sera on suspensions of treponemes from rabbit chancres. Such experiments might throw light on whether or not the Swift-Ellis subdural neurosyphilis therapy involves immunity factors, long a disputed point.

CLIFFORD S. LEONARD

Burlington, Vermont