SODIUM TETRATHIONATE AND METHYLENE BLUE IN CYANIDE AND CARBON MONOXIDE POISONING

HYDROCYANIC acid or compounds capable of liberating hydrocyanic acid are, in the light of our present knowledge, the sole toxic principles of the poisonous plant arrow grass (*Triglochin maritima*). In this laboratory various agents have been tried in some preliminary work relative to the procuring of a satisfactory antidote for cyanides. According to published bibliographies the effective treatment of cyanide poisoning by methylene blue in laboratory animals has been known for some time. In 1932 a human case of cyanide poisoning was successfully treated at the University of California. Recently Foresti[1] has reported that sodium tetrathionate is an effective antidote for cyanide poisoning.

Of the various antidotes advocated to treat cyanide poisoning two, according to results in this laboratory, are quite effective. A dose of three to four milligrams of a hydrocyanic acid solution per kilogram of body weight is fatal for the rabbit when administered orally. The intravenous injection of two to three milliliters of a 2 per cent. solution of sodium tetrathionate per kilogram of body weight is effective in saving rabbits having received orally three times the minimal lethal dose of hydrocyanic acid (10 milligrams per kilogram of body weight). The sodium tetrathionate solution is administered with the onset of the first symptoms of cyanide poisoning. Rabbits tolerate three times the above therapeutic quantity of tetrathionate without exhibiting any toxic effects.

Methylene blue administered intravenously in the form of a 1 per cent. aqueous solution does not afford quite as much protection. Rabbits receiving more than two times the minimal lethal dose (more than six or seven milligrams of hydrocyanic acid per kilogram of body weight) could not be saved. The intravenous injection of quantities in excess of 2.5 cc of a 1 per cent. solution of methylene blue was injurious to the rabbit.

The results obtained with the use of sodium tetrathionate in cyanide poisoning suggested a trial of the effectiveness of this salt in other types of poisoning, particularly that due to carbon monoxide. Rabbits were placed in a special gas chamber arranged so that the supply of air (that is, the oxygen source) and the concentration of carbon monoxide could be regulated. The animals were gassed to a point from which recovery was impossible without treatment. Sodium tetrathionate is more effective than methylene blue in reviving the animals poisoned with this gas. Animals can be revived from definitely more severe stages of carbon monoxide poisoning with tetrathionate than with the methylene blue.

Carbon monoxide will always be more or less of a serious source of poisoning so long as the automobile, the illuminating gas and the coal-burning appliances are used by man.

This laboratory confines its work to the study and treatment of plant poisoning in live stock. These observations on the effectiveness of sodium tetrathionate in treating carbon monoxide poisoning are produced here in the hope that it may be given due study and trial by those who are called upon to treat human cases of carbon monoxide poisoning. There are no greater achievements of man than the saving of human life.

Mr. C. S. Gilbert has kindly prepared very pure sodium tetrathionate and has helped in the construction and manipulation of the gas chamber.

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[1] B. Foresti, *L'Ateneo parmense*, Vol. 3, No. 6 (1931), through *Chem. Abst.*, Vol. 26, p. 5662.

THE OCCURRENCE OF IXODES AURITULUS NEUM. IN NORTH AMERICA (OREGON)

THE type locality for *Ixodes auritulus* is recorded as the Straits of Magellan, South America. Neumann's four type specimens were taken from an unidentified bird, and two additional females in the British Museum came from the South American blackbird, *Trupialis militaris*. It is of interest, therefore, to record the recovery of a single, fully engorged female tick of this species from an English sparrow (*Passer domesticus*) near Hebo, Oregon, on August 25, 1932. The specimen was forwarded through the kindness of Mr. H. E. Staples.

Comparison with the description of this species as given by Nuttall and Warburton[1] in their Monograph of the genus shows an almost precise agreement with the characters as listed. The anterior projection of article one of the palpae is very distinct. Measurements agree almost exactly, except that the scutum is not quite one and one half millimeters in length; the shape of the latter agrees with the remarks of the above authors in being "more angular" on the sides than in Neumann's figure of the type. This specimen also lacks the yellow suffusion between the cervical grooves, although there is a faint indication of it anteriorly. The characters of the hypostome are obscured by adherent tissues, but it is otherwise in a well-preserved condition.

[1] G. H. F. Nuttall and C. Warburton, "Ticks—A Monograph of the Ixodoidea," Part II. Cambridge University Press, 1911.