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Influence of Modified Fowler's Solution of Arsenic on Rats Receiving Vitamin A-Free Diet with Iron Iodide Added.

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About a year ago we conceived the idea that certain minerals, particularly iodine and iron, might be used as substitutes for Vitamin A. Rather extensive experiments with these minerals have been performed and the results with 57 rats are to appear soon in *Science*.

Having established the optimum dosage of iron iodide for rats on the Sherman A-free diet, it was deemed advisable to test the action of potassium arsenite, administered in the form of a Fowler's solution of arsenic. The formula used did not include the oil of lavender ordinarily incorporated as it was feared that contamination with vitamin A might result.

The animals used were agouti and pink-eyed yellow rats, both extremely resistant stocks, described elsewhere. As in other experiments performed in our laboratory, the young rats, approximately 30 days of age, were placed in individual round cages of the Sherman type and furnished a plentiful supply of distilled water. Individual records were kept of the foods consumed and weights were recorded twice each week. Autopsies were performed as soon as possible after death.

Twenty-eight animals were used in the experiment. The control animals used in the experiment were 23 in number, 15 negative and 8 positive. The positive controls received 1 drop of cod liver oil daily, whereas the negative controls were fed only Sherman A-free diet No. 380. Five animals placed on the standard Sherman A-free diet No. 380, received in addition, 3 drops daily of a solution of iron iodide which was added to their food. Each animal received 0.01 mgm. of irradiated ergosterol which was fed daily mixed with 1 gm. of the deficiency diet No. 380. Fowler's solution of arsenic was administered in the drinking water in such strength that each cubic centimeter contained 0.379 mgm. of arsenic.

At no time in the experiment did the average weights of the experimental animals reach that of the negative controls. Starting with an average weight of 40 gm., they reached a maximum of 169

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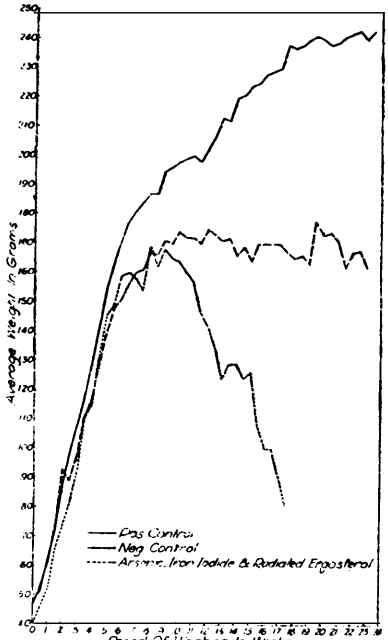

THE INFLUENCE OF ARSENIC ON RATS FURNISHED A VITAMIN A FREE DIET WITH IRON IODIDE ADDED

gm. at the end of 8½ weeks. After fluctuating around 160 gm. for 2 weeks the weights declined rapidly until death, which ensued at the end of 18 weeks. Declination in weight was much more rapid than in the negative controls.

Autopsies showed that 4 of the animals had either liver or gall bladder infection, 2 had badly infected thyroids, one had an infection in the right ear, while one had a remarkably hypertrophied right adrenal.

The literature is already burdened with presumably authoritative papers that include separate graphs of each of the 3 animals in a series. And the experiments have been stopped at the end of 3 or 4 weeks. Physicians are familiar with the temporary improvement induced by arsenic in anemia. While we realize that our results were obtained with too few animals, we should like to point out that the experiment ran for 18 weeks.

Digestive disturbances are common when arsenic is given to people in the presence of iron. It is therefore not surprising that our preliminary dosage was unsatisfactory in the case of experimental animals weakened by deficiency in "Vitamin A". Our success in furnishing iron and iodine as catalytic agents of importance in avitaminosis may induce us to try further experiments with smaller doses of arsenic as iron cacodylate.