

before the tartrate was given, the dose survived was 3.0 grams per kilo. One rabbit only developed albuminuria when this dose was given. In one series of four rabbits three survived such a dose. In another series with 3.5 grams per kilo, one survived and three died, two in 12 and 36 hours and one in 6 days. The resistance was likewise very marked when carrot leaves were fed 4 to 11 days before injecting tartrate, but was less than in the case of young carrots, the minimum fatal dose being about 2.5 grams per kilo. The duration of life in this case was 2 to 5 days, the rabbit dying, however, without developing albuminuria. The toxicity when mature or winter carrots were fed was on the contrary considerably greater, the fatal dose being 1.25 to 1.5 grams per kilo.

Exactly the same results were obtained with sweet potatoes as with carrot leaves, as 2.5 grams per kilo likewise proved to be fatal, while a dose of 2.0 per kilo failed to produce any nervous symptoms or renal irritation. Sodium tartrate proved to be most toxic when the diet consisted of oats and cane sugar, glucose, or levulose. When 0.5 gram per kilo was injected subcutaneously on this diet, seven out of 8 rabbits died after 2 to 13 days. Symptoms of renal irritation and nervous disturbances were noticed in these experiments. The toxicity on hay, cabbage or oats was about the same in each case and was approximately twice that on oats and sugar, or about one fourth that on young carrots. The resistance to sodium tartrate on a diet of sugar beets was about half that on young carrots. Experiments with tartrate on cats that received different diets failed to show any marked difference, but when starved for eight days the toxicity was increased about 40 per cent.

63 (1241)

A note on the parenteral administration of starch.

By C. E. KING.

[From the Laboratory of Physiology, University of North Dakota.]

Very little work has been done on the question of the production of a protective amylase after the parenteral administration of starch. Most observers agree that the blood normally contains

a starch-splitting enzyme. There is also abundant evidence that the term amylase is applied to a variety of starch-splitting enzymes characterized chiefly by the extent of the hydrolysis, such as the production of soluble starch, dextrans, and reducing sugars. We have found that the blood of a given animal may vary considerably from day to day, sometimes producing dextrans slowly and reducing sugars rapidly, or dextrans rapidly and reducing sugars slowly. It is evident that the study of the formation of a protective amylase after parenteral introduction of starch calls for a quantitative study of at least three phases of starch hydrolysis.

We have at hand data on seven dogs. These animals have received both single and repeated intravenous injections of soluble starch. No constant or significant increase in the amylolytic activity of the blood has been found. There is, however, a great increase in the amylolytic power of the urine on the day following the injection of the starch, the increase being shown by a more rapid production of both dextrans and of reducing sugars.

In the interpretation of these results it appears possible that there is an increased production of amylase after the injection of starch, but the kidneys eliminate it so rapidly that there never is present in the blood enough of the excess over the normal to be detected by any of our present methods. On the other hand the amylase may be present in the blood in an inactive state, perhaps in combination with some colloid, and on the introduction of a suitable substrate this combination is broken up, and at least a part of the enzyme eliminated by the kidneys before it can recombine.

Experiments are now in progress for the purpose of determining whether there is an actual increased production, and if so, where it takes place, and also to throw more light on the second hypothesis mentioned above.