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A preliminary note on the experimental production of edema as related to "war dropsy".

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Denton and Kohman[1] report the occurrence of dropsy in a large per cent. of rats fed on a carrot diet with a low percentage of nitrogen. This dropsy is produced by a diet very similar to that of man in certain war zones where "war dropsy" has been reported.

It was of interest to determine whether the case of the edema was a lack of protein, rather than a deficiency of either of the vitamines, fat-soluble A, or water-soluble B, or a deficiency of salts in the diet.

The diets with which dropsy was produced in rats were made up of carrots, corn starch, fat (butter or lard), salts and an alcoholic extract of wheat germ. The percentage of all the ingredients, except carrots (the only source of protein) was varied, but in every case some of the rats developed marked edema, which manifested itself in various ways, sometimes with fluid in the pleural and peritoneal cavities, and sometimes with fluid collected subcutaneously, especially on the chest and about the fore legs. Weakness always occurred and usually loss of weight, except for a final gain due to the accumulation of fluid in the tissues.

In one experiment two out of three rats developed edema on a diet adequate in every way except for its protein content. In both cases the edema was subcutaneous about the neck and chest. One of the animals died. The other was fed a diet the same as the above described diet in every way, except that 18 per cent. of pure casein was added in place of 18 per cent. of corn starch. Marked improvement occurred in twenty-four hours and complete recovery in two days. After eating this diet for two weeks the animal was again given the original low protein diet but with double portions of salts. In two months the animal had again developed edema which was cured in the same way as above

[1] *J. of Biol. Chem.*, Vol. XXXVI, p. 249.

by substituting casein for corn starch, and in ten days had gained ten grams.

Another animal which had developed edema on the original low protein diet with the double salt mixture was cured with a diet the same in every respect except for the increased protein content.

That the low protein diet is adequate except for its protein content is shown by the fact that rats kept on this diet with 18 per cent. casein substituted for 18 per cent. corn starch grow normally, are active and in general good condition.

From the above observations and other experiments that are being conducted at the present time, it appears that "war dropsy" is not due to a vitamine deficiency as has been suggested by some, but is due to insufficient protein.

ADDENDA.

In dispensing the tincture of chinosol according to the formula here given, a heavy precipitate will form when the ingredients are first mixed with the alcohol, which on standing for 24 to 36 hours with occasional shakings of the mixture, will almost entirely dissolve. The precipitate consisting mostly of oxyquinolin, should be allowed to dissolve and should not be filtered off. When, in making up the tincture of chinosol, the chinosol and sodium chloride were first dissolved in the requisite amount of water needed to dilute the 95 per cent. alcohol down to 80 per cent., and the alcohol then added to this solution, the final residue after two or three days, was insignificant, which technic of making up this tincture seems to be the best. It requires 9.5 c.c. of water to be added to 45.5 c.c. of 95 per cent alcohol to make an 80 per cent. alcohol (U. S. Pharmacopeia), or 84 minims of water to 396 minims of 95 per cent. alcohol.