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The effect of high protein diets on the kidneys of rats.

By HENRY JACKSON, JR. (Introduced by Francis W. Peabody).

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As a part of a series of experiments designed to study the etiology of chronic nephritis, a number of rats were placed on diets made up of pure food materials, pure salts and vitamins. Diet A contained 20 per cent casein by weight, and was used as the standard or base diet. Diet B contained 76 per cent casein. Diet C contained 76 per cent casein plus the calculated amount of sodium bicarbonate necessary to neutralize the phosphorus and the sulphur derived from the casein. Diet D contained by weight, 20 per cent casein and 56 per cent purified egg albumen.

The rats, all of which came from the same stock, were, at the beginning of the experiment, from 50 to 300 grams in weight. They were kept on the various diets for 8 to 14 months.

Those on standard diet consumed 0.97 grams protein per 100 grams rat body weight per day. Those on Diets B and C ate 3.65 grams protein per 100 grams rat per day; those on high egg albumen Diet D, 3.60 grams. Figured in calories, the standard series ate 21.4 calories per 100 grams body weight per day; the high protein series, 21.2 calories; and the high egg albumen, 20.8 calories.

All the rats grew normally. The growth curves on the various diets were similar and agreed with the standard curves of other observers. Young rats grew rapidly and maintained their growth well on all diets.

At various intervals the urine was tested for albumen, the sediment was examined, and quantitative nitrogen determinations were made. Traces of albumen were found in the urine of all our rats, in this and in other series as well. In but one instance did the albumen increase during the progress of the experiment, and that was in a rat which died of a chronic lung disease. Casts were not found in any case except in the same individual. No qualitative or quantitative abnormalities which might be attributed to the high protein were found in the nitrogen metabolism. The non-protein nitrogen of the blood of the standard diet rats

at the time of death varied from 30 to 40 mg. per 100 cc. whole blood. The non-protein nitrogen of the rats on high protein and high albumen diets varied from 40 to 62 mg. per 100 cc. No clinical signs of nephritis were found.

The rats were autopsied, and the organs were studied grossly and microscopically. With the exception of a pseudo-tuberculous lesion in the lungs of some rats, no pathology was found.

The kidneys of the rats on high protein diets were considerably hypertrophied. Microscopically there were no lesions in the glomeruli, tubules or interstitial tissue. Occasional casts were found in the kidneys of rats on alkali diet.

We have been unable to produce nephritis of any sort in rats by high protein diets over a long period of time.

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Extractives of liver possessing blood pressure reducing properties. Report of clinical tests.

By W. J. MACDONALD. (Introduced by John R. Williams).

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In January, 1923, I became interested in the effect of certain extracts of the liver on the metabolism of uric acid in dogs. While this investigation did not yield information of significance, it was observed that the intravenous injection of these products possessed depressor principles which caused a sharp and fairly persistent fall in both systolic and diastolic blood pressures.

It is quite generally known that various fragments of protein cleavage, notably histamine and the guanidine salts, possess depressor and pressor properties; and that various proteins, when injected into the circulation, induce shock and accompanying fall in blood pressure.

The theory underlying the experiments here reported is that the liver structure may contain an active principle which will regulate blood pressure.