

of nitrogen, half of which was given as urea, throughout a uranium nephritis without any retention.) This would seem to indicate that the increase in non-protein nitrogen of the blood in such animals is due in part to an abnormal chemical combination which can not pass the kidney and is not necessarily due to impaired kidney function.

Before ascribing an increase in the non-protein nitrogen of the blood in any form of nephritis to kidney insufficiency, the influence of all the above factors should be taken into account.

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The influence of induced diabetes on malignant tumors (including a report of a case of human phlorhizin glycosuria).

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Experiments have been reported by Beebe and Van Alstyne showing that withdrawal of carbohydrates from the diet of white rats markedly inhibits the "taking" and rate of growth of transplantable malignant tumors in these animals. Cremer and Lockhead have recently shown that carbohydrate is utilized in the growth of tumor tissue in experimental tumor rats. As a development of the idea that utilization of glucose plays an important rôle in the synthesis of new protoplasm, we have carried out experiments upon rats planted with the "Buffalo sarcoma" in which the animals were placed upon a carbohydrate-free diet, and at the same time rendered diabetic through the injection of 0.2 gram doses of phlorhizin in olive oil once in two or three days.

As a brief summary of our results in this connection it may be stated that we have worked with about forty rats in all, so far, and that the results are so striking and constant as to warrant a positive statement that the production of the complete diabetes in experimental sarcoma rats is followed by retrogression and ultimate cure of the growth in every case where the growth at the

time of beginning of the treatment does not exceed 20 by 25 millimeters, and the animal will survive the treatment for a period of at least ten days. In every case where the animal lives for three days a marked effect upon the growth is to be noted. Small growths show no local reaction, but begin to retrogress at once, while in very large growths there is rapid development of local inflammation and softening. Small growths go on to complete cure, while with large growths the death of the animal most frequently occurs before much of the growth has been absorbed.

The following protocol of a single experiment is given as illustrative. On May 10, 1912, the growth measured 12×10 mm., on May 11, 14×11 mm., on May 13, 16.5×13 mm., on the 14th, 19×14 mm. The treatment was begun on May 14, and continued for twelve days. On May 16 the growth measured 16×12 mm., on the 18th 14×11 mm., on the 21st, 10×8 mm., on the 25th, 4×3 mm. On June 10 no trace of the growth could be felt on or under the skin. Early in July the animal was chloroformed. Autopsy showed no detectable growth anywhere. This experiment is one of a number of practically similar ones. Controls have always been employed, and many experiments have been carried out upon animals where the growth was unquestionably past the stage where spontaneous retrogression would occur. The largest growth which we have succeeded in curing by the above indicated treatment measured 45×47 mm. We believe that this is by far the largest experimental malignant growth which has so far been successfully treated.

Upon the basis of the above summarized results, we were led to apply a similar method of treatment to some human cases of cancer at the General Memorial Hospital, under the supervision of Dr. James Ewing and Dr. Richard Weil. In some cases the results were slightly encouraging, but the results obtained with rats were far from duplicated. We have so far applied the method in only a very few desperate cases of human cancer, and we believe that the treatment may still be worked out so as to be of value as a therapeutic measure.

We have studied the glycosuria following injection of phlorhizin and withdrawal of carbohydrate from the diet in one case in detail and may summarize our findings by stating that the urine picture

exactly duplicates in all essential features the urinary findings in the later stages of severe types of diabetes mellitus. The dextrose to nitrogen ratio is approximately 3.6 upon a carbohydrate free diet. Glucose given at this time was quantitatively recovered. In spite of doses of sodium bicarbonate ranging from 20 to 30 grams per day the ammonia output rose to over four grams per day, representing 27 per cent. of the total nitrogen at its highest level. Oxy-butyric acid, diacetic acid, and acetone were eliminated in large amounts. When large quantities of glucose were given the urine picture returned to normal almost at once, and the diabetes completely ceased when phlorhizin administration was stopped, the patient rapidly returning to normal condition. Considering the severity of the treatment the patients stand it surprisingly well. They lose weight, but the general condition does not at all duplicate the later stages of diabetes mellitus.

The findings in this case will be reported in detail elsewhere.

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A study of further generations of mammals from ancestors treated with alcohol.

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Experiments now in progress for almost four years have demonstrated the fact that the germ cells of male guinea-pigs can be so injured by allowing the animals to inhale the fumes of alcohol that they give rise to defective offspring although mated with vigorous untreated females.¹

In the present communication I wish to emphasize the fact that the effect of this injury of the germ cells is not only shown by the immediate offspring of alcoholized animals but is conveyed through their descendants for at least three generations.

The offspring from the treated guinea-pigs which reach ma-

¹ *Archiv f. Entw.-Mech.*, XXXV, 1912; *Archives of Int. Med.*, X, 1912; *American Nat.*, XLVII, 1913.