

publication,<sup>6</sup> Katzman and Doisy, using their method for getting the gonadotropic factor of pregnancy urine, and applying it to the urine of men, find that hyperglycemia is produced by these extracts. They make one change in their method of preparing the extract, which is not without significance when compared to the method used by Funk: instead of extracting the final residue with water they use dilute alkali (pH 8-9).

The conclusion is pretty well forced upon one that Funk, on the one hand, and Katzman and Doisy, on the other, are dealing with one and the same substance. Funk has confined himself to acetone production and Katzman and Doisy to sugar excretion. That the pituitary is involved in carbohydrate metabolism is indicated by the work of Houssay,<sup>7</sup> Barnes<sup>8</sup> and others. Preliminary work, in which we prepared an extract according to Funk's method, shows quite clearly that a marked hyperglycemia, comparable to that resulting from Doisy's extracts, and a very definite increase in acetone in the blood, can be produced.

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#### THE USE OF SOLANUM INDICUM IN DIABETES<sup>1</sup>

IN 1927 Dr. Hugh M. Smith reported<sup>2</sup> that the fruit of a certain solanaceous plant growing wild in Siam, when taken orally by diabetics, had a marked influence on the sugar content of the urine. No blood sugar tests were made, and Dr. Smith suggested that the matter be more thoroughly investigated. Through the good offices of Dr. Smith, as well as Dr. A. G. Ellis, of the Rockefeller Foundation, the Siamese Ministry of Agriculture and others, supplies of the fruit were obtained from Siam from time to time and tested clinically.

During the course of these studies two reports appeared, giving negative results following the administration of these fruits parenterally to animals<sup>3</sup> and orally to a very few patients.<sup>4</sup>

Our first experiments were rather favorable. The blood sugar was lowered for a few days, after which the medicament had little or no effect. The question arose whether the potency had been reduced as a result of the drying and aging of the fruit incidental

to the long journey from Siam. Moreover, the fruit comprised two forms, one of which bears thorns, while the other does not. The latter, *Solanum Sanitwongsei*, was the form used by Long and Bischoff, and by Bulger, while the first shipment sent us by Dr. Smith consisted almost entirely of the thorned form. The inconstancy of our results, therefore, might have been due to a varying mixture of the two forms. It was accordingly thought advisable to attempt to grow the thorned form and have it "pure" and fresh. Dr. Lela V. Barton, of the Boyce Thompson Institute for Plant Research, succeeded in growing several plants, which were identified as *Solanum indicum* by Dr. E. D. Merrill, of the New York Botanical Garden, where it was successfully grown but fruited so late that frost destroyed most of the fruit. Finally, Dr. T. B. McClelland, of the Puerto Rico Agricultural Experiment Station, Mayaguez, P. R., was successful in growing the plant and in shipping to New York at frequent intervals sufficient fruit for more extensive clinical tests.

The material was dried, ground and encapsulated. It was given to patients under a variety of conditions and in different dosages, with and without insulin. Since the results were negative, or at best inconstant, there is no need to report details. In a few instances the material seemed to replace a small amount of insulin, but in no case was such an effect permanent. The patients usually "felt better" during the treatment, but whether this was due to a psychic effect or to the influence of a glucoside of the digitalis series, which is present,<sup>5</sup> we do not know.

In this study I have had the cooperation of a number of clinicians who have tested the material on patients in their own practices and in the clinics of several hospitals. Among them are Drs. Reginald Fitz of Boston, Benjamin Eis and Lionel Rosenberg of Brooklyn, Sydney Gubin of Mt. Vernon, and P. J. R. Schmahl, Saul Ritter, A. S. Blumgarten, Harry D. Leinoff and the late S. Franklin Adams of New York. I am also grateful to Mr. A. Rosenthal, Miss R. Halpern and Drs. Merrill, McClelland and Barton.

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#### EXERGIC AND ENDERGIC REACTIONS

SINCE my publication<sup>1</sup> of a note on "Exergie and Endergie Reactions," my attention has been called to the prior use of the words exergie and endergie by Bergen Davis<sup>2</sup> in connection with nuclear transformations. Although he apparently employed these terms

<sup>5</sup> H. Tauber and I. S. Kleiner, Proceedings of the American Society of Biological Chemists. (In press.)

<sup>1</sup> SCIENCE, 79: 84, 1934.

<sup>2</sup> SCIENCE, 76: 615, 1932.

<sup>6</sup> *Proc. Soc. Exp. Biol. and Med.*, 31: 315, 1933.

<sup>7</sup> *Endocrinology*, 15: 511, 1931.

<sup>8</sup> *Endocrinology*, 17: 522, 1933.

<sup>1</sup> Aided by a grant from the Lucius N. Littauer Foundation, Inc.

<sup>2</sup> SCIENCE, 66: 619, 1927.

<sup>3</sup> M. L. Long and F. Bischoff, *J. Pharmacol.*, 38: 313, 1930.

<sup>4</sup> H. A. Bulger, *Proc. Soc. Exp. Biol. and Med.*, 27: 920, 1930.