publication,[6] 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,[7] Barnes[8] 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.

BENJAMIN HARROW
THE CITY COLLEGE, COLLEGE OF THE CITY OF NEW YORK

THE USE OF SOLANUM INDICUM IN DIABETES[1]

IN 1927 Dr. Hugh M. Smith reported[2] 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[3] and orally to a very few patients.[4]

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,[5] 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 practises 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.

ISRAEL S. KLEINER
NEW YORK HOMEOPATHIC MEDICAL COLLEGE AND FLOWER HOSPITAL

EXERGIC AND ENDERGIC REACTIONS

SINCE my publication[1] of a note on "Exergic and Endergic Reactions," my attention has been called to the prior use of the words exergic and endergic by Bergen Davis[2] in connection with nuclear transformations. Although he apparently employed these terms

[6] *Proc. Soc. Exp. Biol. and Med.*, 31: 315, 1933.
[7] *Endocrinology*, 15: 511, 1931.
[8] *Endocrinology*, 17: 522, 1933.
[1] Aided by a grant from the Lucius N. Littauer Foundation, Inc.
[2] SCIENCE, 66: 619, 1927.
[3] M. L. Long and F. Bischoff, *J. Pharmacol.*, 38: 313, 1930.
[4] H. A. Bulger, *Proc. Soc. Exp. Biol. and Med.*, 27: 920, 1930.
[5] H. Tauber and I. S. Kleiner, Proceedings of the American Society of Biological Chemists. (In press.)
[1] SCIENCE, 79: 84, 1934.
[2] SCIENCE, 76: 615, 1932.

to refer to the total energy involved in nuclear changes, and I employed them to refer to the free energy of chemical reactions, no confusion is likely to arise from these analogous and consistent applications of these words.

W. BLUM

U. S. BUREAU OF STANDARDS

THE EFFECTS OF CIGARETTE SMOKING UPON THE BLOOD SUGAR

OUR attention has been called to the fact that observations similar to those published by us in SCIENCE, February 16, 1934, under the title "The Effects of Cigarette Smoking upon the Blood Sugar" have been reported previously by E. T. and S. Lundberg in one section of their general study of the internal secretions (Beitrag zur Kenntniss des Innersekretorischen Gleichgewichtsmechanismus, *Acta medica scand.* Suppl. 38, 1931).

Our observations were made in 1932. We regret our oversight.

HOWARD W. HAGGARD
LEON A. GREENBERG

SCIENTIFIC BOOKS

THE LOWER EOCENE FLORA OF SOUTHERN ENGLAND[1]

THE pyritized fruits and seeds found at Sheppey in the Thames estuary have been objects of interest for over two centuries. It was their apparently mature condition which led James Parsons in 1757 to controvert the ideas of John Woodward that Noah's Flood had occurred in the spring of the year and to insist that this important event had taken place in the fall, since the fossil fruits are mature, which they could scarcely have been in the spring.

Gideon Mantell also writes about Sheppey in his "Medals of Creation" and quaintly describes the outcrop and how to reach it conveniently from London. In 1840 James Scott Bowerbank published a work, "On the Fossil Fruits of the London Clay," the copper plates for which were engraved by Sowerby, and this, which is practically the only previous scientific work on these objects, is a model of careful description and illustration, such shortcomings as it has—and these are fairly numerous—being due to the lack of recent material for the purposes of comparison and correct botanical identification of the fossils.

The authors of the present work have had long experience in this field of research and have spent seven years on the present undertaking. They have conceived their problem in a comprehensive way and discuss not merely botanical questions and methods of study, but the geology, distribution, origin, climatic inferences and other considerations to be derived from their study.

It will be conceded, I think, that no previous work of a carpological nature has been as extensive or has been as well done, and the work is a mine of information not only on the fruits and seeds of the London clay, but is similarly informative on the carpological nature of any flora, fossil or recent, which contains considerable Indo-Malayan elements—information not to be found in works on systematic botany, nor to be obtained in any of the larger American herbaria, where little attention has been given to fruits and seeds and in which the collections are pitifully inadequate.

It is perhaps wise that the authors limit their interest almost exclusively to the field in which they excel, but this results, to cite but a single instance, in only one American flora—that of the Brandon, Vermont, lignite, receiving consideration, whereas the exceedingly rich and varied Wilcox flora, which is in part at least the same age as the London clay (Ypresian) but is largely based upon foliar remains, is barely referred to, and is not taken into consideration in their generalizations.

One of the most interesting results of this work is the very considerable number of extinct genera disclosed. This has been suspected for a long while, but is something which it is not possible to demonstrate in fossil floras which are almost wholly foliar in character.

Of the 234 named and satisfactorily identified species in the London clay flora, it is possible to refer almost all with a considerable degree of certainty to living families. However, many of the fossils show an emphasis or lack of emphasis of certain characters or have the family characters in different combinations than are exhibited in the still living genera, so that the authors quite rightly consider these to represent extinct genera. The families in which these extinct genera belong and their number are well worth enumerating.

There are one each in the families Juglandaceae, Urticaceae, Nymphaeaceae, Saxifragaceae, Hamamelidaceae, Linaceae, Meliaceae, Vitaceae, Tiliaceae, Sterculiaceae, Flacourtiaceae, Haloragaceae, Onograceae, Myrtaceae, Boraginaceae and Solanaceae; two each in the Palmae, Burseraceae, Euphorbiaceae, Celastraceae, Nyssaceae and Sapotaceae; three each in the Lauraceae, Sapindaceae and Apocynaceae;

[1] "The London Clay Flora." By Eleanor Mary Reid and Marjorie Elizabeth Jane Chandler. 4to, viii + 561 pp., 17tf., 33 pls. British Museum (Nat. Hist.) London, 1933.