(6), who have reported on 14 patients treated in the Cameroons, are most impressed with the action of the drug in advanced patients and state that to their knowledge no other drug is endowed with such a power of meningeal penetration or has such a beneficial effect upon the clinical symptoms of advanced patients.

In New York City two Americans in the advanced stages of sleeping sickness have been successfully treated with tryparsamide. One patient, whose history has recently been reported by Morgan (7), had relapsed 2 months after treatment with Bayer 205 with the typical symptoms of an advanced infection including lethargy; her condition was extremely grave. Tryparsamide was administered intravenously in three courses over a period of 13 months and she has been given a total amount of 63.0 grams. Clinical improvement was observed after the initial dose of the drug and by the end of the first course of ten doses both the physical and mental condition appeared normal. Since this time she has resumed her household and social duties which have only been interrupted by the additional treatment administered. Physical examinations have continued to be negative, the last one being 6 months after the cessation of treatment. The condition of the second American was fortunately not so critical. Two courses of tryparsamide amounting to 53.0 grams were administered by Dr. K. M. Lewis (8) with prompt clinical response and a rapid restoration of the normal state of the cerebrospinal fluid. The patient's condition was reported to be satisfactory 10 months later.

From various reports, both published and unpublished, dealing with the therapeutic results obtained with tryparsamide in African sleeping sickness, the system of treatment at present recommended is the administration of 24.0 to 30.0 grams in early cases and from 50.0 to 70.0 grams in advanced cases. The treatment for advanced patients should be given in two or three courses separated by intervals of 2 or more months, and each course should consist of eight to ten weekly doses. The size of the individual dose most frequently used is 3.0 grams and the intravenous route of administration has so far been followed almost exclusively.

Tryparsamide is now being widely used in the Belgian Congo at the request of the Colonial Government, and it has recently been supplied to the British and French colonies in tropical Africa. The results of its use under various conditions of field administration and in different parts of Africa will be published from time to time. The chronic nature of African sleeping sickness and its tendency to relapse are formidable obstacles in obtaining authentic cures and it is the realization of these facts that has led us to emphasize the necessity of continued observation of treated patients for long periods of time. However, if future reports are as encouraging as those briefly summarized above and if the treatment of the native population in infected districts can be carried out on a large scale, it is probable that the control of African sleeping sickness may eventually be accomplished.

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THE PANCREATIC RESPONSE TO CARBOHYDRATE INGESTION

IN the course of studies on the relation of blood sugar concentration to food ingestion, we have been impressed with the variety of responses by the body mechanism for glucose storage. The subjects were healthy students working in the chemical laboratory. The morning meal was taken immediately after the first blood sample was drawn. Analyses were made by the Folin-Wu method.

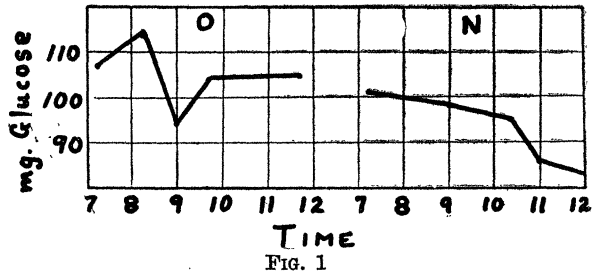

FIG. 1

In Fig. 1 the curve of subject O presents what seems the commonest type of reaction. During the period of relatively low blood sugar concentration there was a definite sense of hunger. This we correlate with the observations reported by Bulatao and Carlson.[1] The curve of subject N is of a different

[1] Bulatao, E., and Carlson, A. J., *Am. J. Physiol.*, 1924, lxix, 107.

type. It is probable that more frequent observations would have shown a brief rise in the curve at first as in O. The steady decrease in the blood sugar for the last three hours is striking. During this period there was marked hunger, relieved for only a few minutes by water-drinking. The most obvious explanation for these observations seems to be the following. The hyperglycemia during food absorption acts as a physiological stimulus to insulin production by the pancreas. The immediate result is glycogen storage and glucose utilization. The insulin thus produced outlasts the need for it. Its presence in greater amount than previous to breakfast leads to the typical hypoglycemia when artificially administered. The hunger is a consequence of the hypoglycemia. The hypoglycemia acts as a physiological stimulus to the glycogenolytic mechanism and the blood sugar returns to the normal "fasting level."[2] This latter level is an optimum operating level for the body in the post-absorptive equilibrium. In some individuals the glycogenolysis may occur at such a slight hypoglycemia that the curve shows it only when frequent observations are made. In others, such as subject O, a definite diphasic curve is found. In still others, such as subject N, the glycogenolysis is a poor response, and hunger gets worse until another meal is taken. N stated that he was not hungry during the morning when he ate no breakfast, but always hungry when he did eat. The reports of Harris[3] seem to be of such individuals.

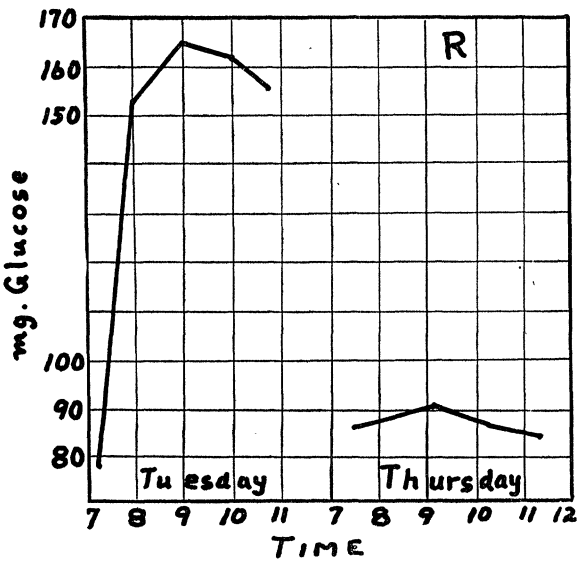

FIG. 2

[2] Cannon, W. B., McIver, M. A., and Bliss, S. W., *Am. J. Physiol.*, 1924, lxix, 46.

[3] Harris, S., *J. Am. Med. Assn.*, 1924, lxxxiii, 729.

In Fig. 2 are shown the results of a somewhat different type of study. R was one of the three students who went on a voluntary three day fast. Blood sugar determinations were made twice on the first and third days. There was a gradual decline in the sugar concentration from 92 mg the first morning to 77 mg the fourth morning. This was not associated with marked hunger. The fast was broken on the fourth morning by a breakfast rich in carbohydrates, including fruit. The blood sugar curve marked "Tuesday" was obtained during this morning. There was a notable lack of satisfaction from the meal until after about two hours afterward. This is to be correlated with the unusually high curve and the marked delay in the return to a normal level. The urine of the last fasting day showed ketosis. Two days later, after meals had been taken as usual, the Tuesday breakfast was repeated exactly, and the blood again analyzed. The curve marked "Thursday" shows a marked contrast to that of the morning after the fast. The Thursday breakfast gave satisfaction subjectively. The two other students studied reacted in this same fashion throughout, except for no evidence of ketonuria. We propose as rapidly as possible to extend these observations and to verify the extent of ketosis. It may be that there is contained here some hint of the nature of the apparently vicious cycle of vomiting and starvation which occurs in pregnancy and after surgical procedures. Insulin has repeatedly been found efficacious in breaking this cycle and restoring normal oxidation without ketosis, when glucose alone failed. These observations may help to explain why in the presence of ketosis it is necessary to use such large doses of insulin to render the diabetic free from glycosuria.

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THE EFFECT OF FLUORINE AS SODIUM FLUORIDE ON THE GROWTH AND REPRODUCTION OF ALBINO RATS

IT has long been known that fluorine is present in the bones and teeth of mammals, and fluorine was used by Osborne and Mendel[1] in one of their salt mixtures for rats more than a decade ago. It is quite generally considered as being one of the inorganic elements essential in nutrition, which is necessary in small amounts only, although there is no evidence of its necessity except its occurrence in the animal body.

[1] Osborne and Mendel, *Journal of Biological Chemistry*, Vol. 15, 317, 1913.