canal carbohydrates are dealt with as efficiently as ever, and the sugar into which they are there converted is absorbed into the body-fluids in normal fashion. There is, however, reason to believe that, once in the body-fluids, this sugar has almost completely lost its normal significance. Instead of being the most readily available of the fuels that are oxidised, and together form the only source of energy for all the mechanical work performed by the body, and within the constituent parts of the body, this sugar is now an almost useless commodity, and is further a harmful adulterant tending to accumulate within boundaries through which it is swept at none too great a pace by mechanisms primarily adapted for the excretion of a different class of material.

In addition, too, there is the sugar which is formed within the tissue-cells by chemical change in the proteins that form another of the absorbed fuels of the body. This further quantity of sugar has the same character and meets with much the same alteration in significance, and so it follows that the proteins absorbed from the diet and the proteins formed within the body cease on this account to possess their original value to the economy. Nor is this all, since there is some reason to believe that the remaining class of fuel, the fats, is—this probably as a secondary consequence—not so well dealt with as normally. Incomplete oxidation of the fats is by some, at least, considered as in part responsible for that rancidity of the blood which finally determines the onset of diabetic coma.

The picture of trouble due to these manifold disturbances in the utilisation of fuel must be limned even still more gloomily if the conclusions of Benedict and Joslin are to meet with acceptance. They find that the diabetic patient is the site of more extensive processes of oxidation than the normal person in similar circumstances. Nothing that they say prevents us from continuing their statement into the necessary corollary, that the "efficiency" of the internal mechanisms of the diabetic patient is lowered. Within these patients a greater usage of oxygen and waste of heat accompanies such performances of mechanical work, such internal displacements of matter, as coincide with the periods of rest during which these observations were made. The diabetic patient, already handicapped by his incapacity to utilise fuel, is still further handicapped by the necessity for utilising a greater quantity of fuel.

Now, in the present writer's opinion, there is nothing in their experimental results to support such a conclusion further than the point where the same fact is seen as true for the normal person with the same relation between body-surface and body-weight. Benedict and Joslin do indeed themselves discuss the possibility that the peculiarity which they discover in the diabetic patient is no more than a peculiarity of the emaciated person, but they dismiss this possibility as incapable of explaining differences of the magnitude they observe. It is a pity, however, that they have not brought their opinion to the test of a quantitative calculation, since the point is of great importance to our knowledge of the normal person as to our knowledge of the diabetic patient. If it is true that in this respect the diabetic patient is no more and no less than an exaggerated normal person, then physiology is obviously in their debt for an extension of physiological inquiry to limits not readily attainable in the ordinary way.

This very definite statement of opinion is, it is held, based soundly upon the fact that their experimental results may be referred to several criteria other than the particular one used by the authors, which not only bring the diabetic patient on to the same level of value as the normal person, but also serve to make the results obtained from their normal persons far more congruous than the authors have made them appear. Indeed, their suspicions might well have been excited by the fact that their method of arranging the experimental results (per kilogram of body-weight) leads to greater discrepancies when dealing even with normal persons than are found when the results are left in the form they were actually obtained (per individual person).

The interested reader of these most valuable experimental data, and the authors themselves, will gain rather than lose respect for the exact outcome of prolonged, highly skilful, and enterprising labour when they observe the manner in which the results can be marshalled into line by the adoption of a new artifice. This will be found to be the case when the quantities of physical and chemical change observed per unit of time are divided, not by W (the weight) and expressed per kilogram, but by $H\sqrt[3]{W}$ (the height multiplied by the cube root of the weight). Whatever the meaning of this new divisor and form of expression, it is a fact that it places the diabetic patient upon the self-same level as the normal person so far as his dissipation of heat and oxygen requirements are concerned. A very probable meaning is that the results are thus referred to the extent of the body-surface, and that per square metre of surface the loss of heat is the same. Accepting for the time being this probability as a fact, then the surface of the body in the emaciated as in the normal person is equal to $2{\cdot}9\ H\sqrt[3]{W}$. Making use of this formula, we can express the results of these experiments as is found below:—

Examined in the "Chair Calorimeter."

	Heat (kalories) dissipated per kilogram and per hour	Heat (kalories) dissipated per square metre of surface per hour.
Severe cases of diabetes	1·40	40·21
Mild cases	1·21	38·83
All cases	1·33	39·76
All normal persons	1·21	39·96

J. S. MACDONALD.

THE ICE AGE IN CORSICA.[1]

DR. LUCERNA has made an elaborate study of the physiography of the mountains which occupy so large a part of Corsica, and culminate about 2700 m. above sea-level. Brought up, evidently, at the feet of Prof. Brückner, he has no difficulty in recognising the pre-glacial valley floors and the successive deepenings due to the advancing glaciers of the Günz, Mindel, Riss, and Würm times. The existing moraines, of course, chiefly belong to the last of these, and he is able to identify, as has been done in the Alps, the Bühl, Gschnitz and Daun stages of retreat. The height of the snow-line appears to have varied with the locality, but was generally rather lower than in the southern parts of the Maritime Alps; in more than one place it was about 1650 m., which would signify a sea-level temperature nearly 17° F. lower than that of Ajaccio at the present day. In the valleys, terminal moraines occur, these, of course, being at various levels; for example, in one case at 1350 m., in another as low as 750 m.

As the deepening of the valleys, according to Dr. Lucerna, was a feature hardly less notable than in the Alps—in one valley it amounted, during the Mindel and Riss episodes only, to as much as 85 m.—the advances of the ice gave rise to great masses of gravel, forming terraces in the lower districts, each of which the author assigns to its proper date. Nothing could be more complete. But perhaps some sceptics will suggest that though a cliff terrace on a valley flank indicates, not only a deepening, but also some change in the conditions of erosion, it does not prove a glacier to have been the agent, and that in Corsica, as in the Alps, very much that is set down to the work of ice may quite as well have been pre-glacial.

The second part of Dr. Lucerna's memoir discusses the sea-level in Corsica. During the Glacial epoch the island was gradually rising, and a raised beach or terrace corresponds with each of its episodes. The Günz terrace, near Ajaccio, is about 70 m. above sea-level, the Mindel nearly 40 m., the Riss about 27 m., and the Würm perhaps 13 m. Even the Bühl level can be detected still nearer the sea. The coincidences are curious, but space does not permit an enumeration of the facts from which the conclusions are drawn. If they do not always convince the reader, they will, at any rate, prove that Dr. Lucerna's memoir is a most laborious study of Corsican physiography.

[1] Dr. Roman Lucerna: "Die Eiszeit auf Korsika und das Verhalten der exogenen Naturkräfte seit dem Ende der Diluvialzeit" (Abhandlungen der k.k. Geographischen Gesellschaft in Wien. ix. Band, 1910, No. 1). Pp. vi+144+xiii plates. (Wien: R. Lechner, 1910).