MODERN ARGENTINA.[1]

FEW countries outside the British Dominions are more interesting to the inhabitants of Great Britain than the Argentine Republic. Enormous amounts of British capital are invested there—some 170,000,000*l.* in the railways alone, indeed Great Britain has financed most of the developments—about a quarter of our imported foodstuffs come from there, and a number of young Englishmen go out to find employment on the great estancias. At present the bulk of the population centres round Buenos Aires, the enormous hinterland being only thinly populated, and in many regions not thoroughly explored. And yet the country is not new; it has a history of three centuries, two of which, however, were under the old Spanish *régime*, when only Spanish emigration was permitted, and the few adventurers and officials who went out preferred the life of the town to that of the country.

The administration in 1907 very wisely determined to take stock of the present agricultural position, and a scheme for a census, or, more strictly, a great inventory, was drawn up It was, however, necessary to proceed cautiously, and for some time an advertising campaign was conducted informing the people exactly what information was wanted, and why. The census was taken in 1908, and the results are now published; there are two volumes of figures, and one volume devoted to monographs dealing with the physical conditions, the agriculture, and the people.

From these volumes we learn that the Argentine is now growing at a good, but not very rapid, rate. Of its 4,500,000 inhabitants in 1900, about a million were foreigners, nearly half being Italians, followed by Spaniards and Americans; under 22,000 are English. The exports are wheat, maize, linseed (Argentine being the chief producer of this) and other cereals, meat, both chilled and tinned, hay, quebracho (used for tanning), and similar commodities, the total value being in 1909 79,000,000*l.* Formerly it was mainly a grazing country, but of late years crops have been grown extensively.

The wheat supply from the Argentine has an interesting history. As in other newly settled countries—*e.g.* Canada—wheat is one of the earliest crops the newcomer grows, because it requires but little capital and trouble, and is always saleable. But wheat does not necessarily remain the staple crop; in the more closely settled parts of Canada mixed farming comes into greater prominence, and in the Argentine wheat gives place to lucerne, which yields valuable hay, and is also excellent for cattle food In improving land, the usual method is to plough it up and sow maize, then linseed, then wheat, and finally lucerne, which is left for hay and the cattle, the colonist moving on to break up more ground. There is this difference between the Argentine and other new countries, that in the Argentine much of the land is already owned by absentee landlords, who put in a manager—commonly an Englishman, who does well as a rule—but do not themselves take any part in the development. The system is admittedly bad, but it is a legacy from the old days, and is not easily displaced. The agriculture is, however, sound; lucerne enriches the soil in nitrogenous organic matter, and leaves it in a fertile condition for any subsequent arable crop that may be taken.

Geologically, the surface of the country is mainly derived from Tertiary and later formations; the Archæan occurs only in small and isolated patches; the Silurian occurs extensively in a few districts the Devonian runs from north to south, and contains a certain amount of coal; the lower Triassic has not yet been found, but the Jurassic has, and agrees well with the formation as found elsewhere. It is, however, not prominent in the Argentine, and has not been found east of the Pampean ranges and on the plains. The Cretaceous system is well marked, running north to south, but does not cover a wide tract of country. The great plains and the Pampas are formed of loess, a fine-grained sand varying from light to dark grey in colour, and containing calcareous nodules; the origin of this deposit is not settled, but the current idea seems to be that sea water, fresh water, and wind have all played an important part in its formation. One general feature is that the soil is so rich in salts that it not infrequently deposits a white efflorescence containing sodium chloride and sulphate with other salts. Nine different groups of flora are distinguished: the Antarctic forest in the south, consisting mainly of beech with some cypress; the Patagonian, in a dryer region, comprising herbaceous plants, shrubs, and trees; the Pampean, in a moister region, absolutely without trees, consisting of Gramineæ, Compositæ, and Leguminosae; then further north, in another dry region, the Chañar, or bush flora, especially mimosas; and further north again the subtropical region, the garden of the Argentine. Of the other four regions, one in the north-west is desert and one in between the rivers is bush. Why the Pampas should be without trees when trees occur in the surrounding dryer regions is not clear.

Turning again to the agriculture, cattle are of great importance, but sheep, as in other countries, are diminishing in number. The stock is being steadily improved; some of our best pedigree bulls and rams are imported, and the Argentine buyer never hesitates to secure what he considers suitable animals, whatever the price may be. The decrease in the number of sheep is considerable, and is attributed to two causes: certain "worms" have proved very fatal, and the sheep have been found to injure lucerne, and therefore have lost favour with the estancieros. This result can only be regretted; sheep are as much wanted as ever, and they are a very valuable support for the agriculture of a country. To cut them out is to narrow the basis on which the system of agriculture is built.

It is clear that the Argentine has some serious problems to face, but the rapid increase in its volume of trade and in its area of land under cultivation justifies the hope that continued progress will be made, and that the country will still retain its high rank among the food-producing countries of the world.

[1] Journal of the Royal Society of Arts, December, 1910.
Argentine Republic—Agricultural and Pastoral Census of the Nation. Stock-breeding and Agriculture in 1908. Vol. i., Stockbreeding, pp xviii+435; vol. ii., Agriculture, pp. x+441; vol. iii., Monographs, pp. xcv+705+xliv plates.
Live Stock and Agricultural Census of the Argentine Republic, May, 1908. 5 maps. (Buenos Aires: Argentine Meteorological Office, 1909.)

METABOLISM IN DIABETES MELLITUS.[1]

THE depth of the tragedy into which the most recent investigators of the disease "diabetes mellitus," whose observations are described in the memoir referred to below, have inquired, is sufficiently indicated by the fact that seven of their ten "severe cases" have died since coming under observation in the early part of 1908. Diabetes is considered as being primarily a disturbance of nutrition tending to develop a condition of starvation, and yet it will be noted that in six of these cases the fatal result is attributed to "diabetic coma." Diabetic coma is in no sense due to any deprivation of nutriment experienced by the central nervous system, but rather to a very real poisoning assignable to an appearance in the blood of unusual chemical compounds or to an appearance of compounds in an unusual quantity which are normally present only in minute traces. Nutrition, in short, is not only deficient, leading to a great emaciation of the patient, but is also disordered, leading to death by internally developed poisons. Medical treatment of this disease, its causation having been fully developed prior to the arrival of the doctor, is therefore directed to maintain nutrition in very adverse circumstances by expert adjustments in the diet, and to secure the elimination, or at least neutralise, the effects due to the presence of these poisons. As a valuable contribution to our knowledge of the principles underlying such treatment, this account of the extremely precise and varied observations of Benedict and Joslin will meet with a wide welcome.

Everyone, taught by numerous and by no means reticent guides to the true ritual of diet, is aware that diets necessarily contain certain nitrogenous materials, "proteins" and certain non-nitrogenous materials, "fats and carbohydrates." Almost as many know that the diabetic patient is incapable of dealing with more than a minimal quantity of carbohydrate material. In his alimentary

[1] "Metabolism in Diabetes Mellitus." By F. G. Benedict and E. P. Joslin. Pp. vi+234. (Washington, U.S.A. Carnegie Institution, 1910.)

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).