the sodium nitrite reducers, was lost. So far it has not been possible to return to the problem; but the preliminary results then obtained showed that: (1) the organism at pH 7·0 actively reduced sodium nitrite to free nitrogen, only traces of ammonia being formed at the same time; as no attempt was made to set up a nitrogen balance, it was impossible to say whether all the sodium nitrite was reduced to free nitrogen or had been partly assimilated or converted into other nitrogenous compounds such as hydroxylamine, amino-acids, etc.; (2) the reduction, with well-washed cells, appeared to be practically unaffected by the addition of glucose, succinate and lactate as hydrogen donators; (3) the enzyme system appeared to be sensitive both to toluene and potassium cyanide; (4) the organism reduced sodium nitrate to nitrite, but at a much lower rate than that of the reduction of sodium nitrite to nitrogen.

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Availability of the Magnesium of Grass to the Ruminant

IN a previous communication under the above title[1], it was shown that the greater part of the magnesium of grass is liberated during the processes of ruminal and abomasal digestion. The ability of the animal to absorb this magnesium has been further studied.

It was unfortunately not found possible to carry out accurate determinations of magnesium balances, and experiments were confined to the determination of the percentage utilization of the dietary magnesium. In view of Nicolaysen's results[2], which indicate that the magnesium of fæces is unabsorbed food magnesium with a small amount derived from intestinal secretions, it was considered that, despite the limitations of the method, some information of value might be acquired.

At the time this work was commenced, the only suitable small laboratory animal available was the guinea pig. It has been shown that ruminal organisms play only a small part in the liberation of magnesium of plant materials[1], and it was assumed that results obtained using a non-ruminant herbivore such as the guinea pig would not differ widely from those obtained with the ruminant. This has since been shown to be the case by applying a lignin-ratio technique and using cattle.

Grass samples were collected during the dry season of 1948–49 (October–February) and during the wet season of 1949 (June–August). No attempt was made to separate species of grasses, and all samples were cut at random from pastures normally grazed by cattle, with the exception of one sample of wet-season grass which came from an area on which cattle had not been pastured. This sample, and the dry-season samples, consisted largely of spear grass (*Imperata cylindrica*). A list of the other principal grasses found at this Laboratory has been published elsewhere[3]. All the hay had been made from grass cut in August and September 1948.

A stock of grass sufficient for the whole experimental period was cut at one time and stored under conditions designed to keep it as fresh and moist as possible. Random samples were taken from this stock for the estimation of magnesium, calcium, phosphorus, lignin and crude fibre. At first an attempt was made to estimate lignin by a method based on the separation technique described by Bondi and Meyer[4]; but inconsistent results were obtained and the method of Ellis, Matrone and Maynard[5] was therefore used. In the latest series the method of Armitage, Ashworth and Ferguson[6] has been employed.

It was found that, in this series of experiments, 65–86 per cent of the magnesium of fresh grass is retained by the guinea pig and 63–74 per cent by cattle. Rather less (35–58 per cent) of the magnesium of hay is retained by the guinea pig.

The amount of magnesium retained is apparently not dependent upon the magnesium content, the calcium–phosphorus ratio or the crude fibre content of the food.

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Effect of Temperature on the Consolidation of Soils

IN civil engineering practice it is sometimes necessary to estimate the probable rate of settlement of structures founded on clay and other compressible soils. The settlement arises from a process in soil known as consolidation, in which the application of a load to the surface of the soil causes water to be expelled from its pores. *A priori*, it would be expected that the rate of consolidation of the soil would be a function of the kinematic viscosity of the water, and since the latter depends upon the temperature, it follows that the rate of consolidation should also be a function of temperature.

In order to check this hypothesis an experimental study has been made of the effect of temperature on the rate of consolidation of saturated samples of London clay. Samples of soil 3 in. in diameter and 1 in. thick restrained laterally were compressed between two porous disks, and the compression after various periods of time up to twenty-four hours was noted. The tests were made at a number of temperatures between 15° C. and 45° C. The results confirmed that, within the limits of experimental error, the coefficient of consolidation (a function of the rate of the process) was inversely proportional to the kinematic viscosity of water.