species is not well known; but it is cited from the Pliocene. I am dealing with its supposed occurrence at the Cape in a forthcoming paper.

The presence of the essentially Austral forms, *Magellania lenticularis* and *Magadina cumingi*, in the Tertiary rocks of Japan, opens up a very wide question as to the former geographical distribution of these genera. With regard to the first species, I might point out that the figures accompanying the memoir do not suggest the New Zealand form; figure 17 especially being very unlike.

As to *Magadina cumingi*, the figures certainly present a general resemblance to the species occurring off the coasts of S.E. Australia and to certain New Zealand Miocene forms. But identity in outward appearance is not a safe criterion. It is found by experience that it is necessary to investigate the interiors before a species can be definitely referred to its proper genus. Forms having the same shape externally may possess quite different loop-stages. This feature is nowhere better displayed than in the forms possessing Bouchardiform beak characters, like the species in question.

In conclusion I should like to point out that Dall's generic name for *T. grayi* Reeve, namely, *Pereudesia*, 1920, is antedated by my *Coptothyris*, 1918 (replacing my *Thomsonia*, 1916, preoccupied). This fact has been pointed out in other papers. By the recognition of this form as a distinct genus there are now three finished types of northern genera in the Dalliniæ.

J. WILFRID JACKSON.

Manchester Museum,
May 21.

The Ionising Potentials of Nitrogen and Hydrogen.

In a paper published last autumn (Proc. Roy. Soc. A, 102, pp. 283-293, 1922) I suggested a new mode of attack on some ionisation problems and described its application in experiments on mercury vapour. The object of the method is to give a direct means of studying the types of ion produced in a gas or vapour by the impact of electrons of known speed. The experimental principle involved is the combination of an ordinary ionising potential arrangement with a simple positive-ray analysis apparatus. The extension of the method to gases and some of the results obtained may be of interest.

For the production of ions the common arrangement of a tungsten filament, a grid and a plate is used. Electrons from the filament are accelerated to the grid by a field V_1 and then retarded by an opposing field V_2 which also serves to draw positive ions toward the plate. A narrow slit in this lets through a beam of positive ions which are then further accelerated by a large electric field, V_3 . These ions are then bent in a semicircle by a magnetic field and detected electrically. Different values of V_3 bring ions of different m/e on to the detecting slit. By using two Langmuir pumps a sufficiently high vacuum is maintained in the positive ray box to prevent scattering, and very sharp peaks are obtained corresponding to different types of ion.

In nitrogen it was found that for values of V_1 slightly above the ionising potential of 16.9 volts, only molecular ions of $m/e = 28$ were present. As V_1 was increased small numbers of N^{++} ions began to appear at 24.1 ± 1.0 volts, while N^+ ions were not present in appreciable numbers until V_1 passed 27.7 ± 1.0 . These three critical potentials are interpreted as corresponding to the transitions $N_2 \rightarrow N_2^+ + e^-$, $N_2 \rightarrow N^{++} + N + 2e^-$ and $N_2 \rightarrow 2N^+ + 2e^-$. If this interpretation is correct, the first ionising potential of atomic nitrogen is about 11 volts and the second

about 18 volts, assuming the heat of dissociation of nitrogen to be of the order of 140,000 calories, equivalent to six volts.

At a value of V_1 corresponding to the K-limit for nitrogen (375 volts) the proportion of atomic ions increased very sharply.

Preliminary results on hydrogen indicate that the ionisation of molecular hydrogen in the neighbourhood of 16.5 volts is not usually accompanied by dissociation as has been generally supposed. Whether there may be a small number of atomic ions produced at this point is not yet certain. Experiments are being continued.

H. D. SMYTH.

Cavendish Laboratory,

May 25.

Chromosome Numbers in Aegilops.

I HAVE recently been investigating the cytology of species of *Aegilops*, and find the chromosome numbers as follows:—

	Haploid Number.
<i>Aegilops cylindrica</i>	= 7
<i>A. ovata</i>	= 14
<i>A. ventricosa</i>	= 14

On morphological and other grounds I expressed the view in my monograph on "The Wheat Plant" that one or both of the former species appear to be involved in the ancestry of the *vulgare* group of wheats. Later I hope to discuss the significance of these chromosome numbers in relation to this hypothesis.

JOHN PERCIVAL.

University College, Reading,
May 26.

Effect of Insulin upon Blood Sugar Concentration.

THE injection of insulin into rabbits causes the blood sugar concentration to be lowered, as determined by micro methods. When a certain concentration is reached, 0.05 per cent. by Bang's method, the animal goes into convulsions. If the animal is then killed and the sugar extracted from a large quantity of blood, it is found that it is without copper-reducing value as determined by the Wood-Ost method. This method is not liable to estimate substances in blood other than reducing sugars.

There is, however, a considerable quantity of carbohydrate present, as indicated by the α -naphthol test. The substance is dextro-rotatory. We have not succeeded by acid hydrolysis in obtaining copper-reducing substances from it, though these can apparently be formed under certain conditions as a result of enzyme action *in vitro*.

Dudley and Marrian (Proc. Physiol. Soc., May 19, 1923) have shown that the glycogen content of the liver and muscles of animals is greatly diminished after insulin. We have obtained from the liver and muscles of rabbits after insulin a substance similar to that present in blood under this condition. Owing to its resistance to acid hydrolysis it would not be estimated by ordinary methods. The chemical nature of this sugar is being studied.

We noticed in the case of some solid preparations that the α -naphthol reaction gradually disappeared on drying. Mr. H. F. Holden suggested that this might be due to polymerisation, and that on hydrolysis with acid the α -naphthol reaction would reappear. We find that this happens. It seems possible that the carbohydrate content of the animal body may be not appreciably diminished after large doses of insulin. The above facts would suggest that the sugar stored in the body as glycogen is converted