liquid the *pressure* must be *above* a certain point," and goes on to describe some experiments with ice, implying that ice is in this respect a typical substance. Now our text-books speak of the behaviour of water in freezing and melting as exceptional. For instance, Prof. Balfour Stewart says ("Heat," p. 89): "If a substance expands in congelation, its melting-point is lowered by pressure, but if a substance contracts in congelation, its melting-point is raised by pressure." And (p. 91): "Bunsen found that the melting-points of paraffin and spermaceti, both of which contract when freezing, were raised by the application of pressure."

Do the new results tend to overthrow the generally received opinions on the subject? or is there some way of reconciling these seeming contradictions?

I have more interest in these matters than knowledge of them, and must apologise if I am asking a question which I ought to have been able to answer. C. A. M.

October 2

Mr. Haddon's Marine-Zoology Class

OWING to misconceptions which have arisen from the notice in NATURE, vol. xxii. p. 517, relative to my marine-zoology class, I should like to state that this class was formed solely for the purpose of the practical study of marine zoology, and without any idea of founding a zoological station. I would also like to take this opportunity of acknowledging my great indebtedness to Prof. Dohrn's magnificent institution at Naples.

Zoological Museum, Cambridge ALFRED C. HADDON

Landslips

I READ with great interest the article on landslips in NATURE, vol. xxii. p. 505. It is no doubt familiar to many that the salt districts of Cheshire, in the neighbourhoods of Northwich and Winsford, are subject to landslips of a peculiar kind. The beds of rock salt occupying the position of the Triassic salt lakes are the centre of an extensive underground drainage. The fresh water on reaching the salt proceeds to dissolve it and becomes brine. This brine is pumped up and manufactured into white salt. As the fresh water keeps constantly dissolving and eating away the solid salt, the superincumbent earths keep sinking, and on the surface deep furrows, like the dried beds of rivers, mark the course of the underground waters. At times enormous masses of earth sink bodily, leaving cavities of a funnel shape. A short time since a mass of at least 60,000 tons of earth suddenly disappeared. When these subsidences are near rivers they become filled with water, and large lakes over 100 acres in extent have been formed. Although houses are not overwhelmed they are very frequently destroyed, and this destruction of property is so serious that the sufferers are now about to appeal to Parliament for assistance.

The district of the salt manufacture presents phenomena both curious and interesting, and is well worth visiting. A fortnight ago the whole of the water in one of these subsidences of over five acres in extent disappeared, leaving a chasm or abyss in many places forty or fifty feet deep. The action of water on soluble rocks can be seen here in great perfection.

Brookfield House, Northwich THOS. WARD

LIQUEFACTION OF OZONE

AT a recent meeting of the French Academy, MM. Hautefeuille and Chappuis announced that they had liquefied ozone. These chemists have been able to ozonise oxygen to a greater extent than has hitherto been done, by passing the silent discharge through the oxygen at a low temperature. The tube containing oxygen was immersed in liquid methylic chloride, which boils at $-23°$. After being submitted to the electric discharge for fifteen minutes at this temperature, the oxygen was conducted into the capillary tube of a Cailletet's apparatus, the temperature of which was maintained at $-23°$.

After a few strokes of the pump the gas in the tube appeared azure blue; as pressure increased the depth of colour likewise increased, until under a pressure of several atmospheres the ozonised oxygen appeared dark indigo blue. The pressure was increased to ninety-five atmospheres, and was then suddenly removed, whereupon a mist, indicating liquefaction, appeared in the capillary tube.

The stability of a mixture of oxygen and ozone rich in ozone appears to be chiefly dependent on the temperature. If such a mixture be rapidly compressed at ordinary temperatures, a considerable amount of heat is evolved and the gas explodes.

Ozone, say MM. Hautefeuille and Chappuis, is therefore to be placed in the category of explosive gases.

Berthelot has shown that the transformation of oxygen into ozone is attended with absorption of heat: the stability of products of endothermic reactions is as a rule increased by decreasing temperature.

Ozone is much more easily liquefied than oxygen; the latter must be compressed under 300 atmospheres at about the temperature of $-29°$ before sudden removal of pressure succeeds in producing liquefaction.

We have thus the existence through a large range of temperature and pressure of two allotropic forms of the same element; each with distinctly marked chemical and physical properties. We know that the molecule of oxygen has a simpler structure than that of ozone; the substance of simpler molecular structure is capable of existing through a much more extended range of temperature and pressure than that of more complex structure. Under special physical conditions it seems possible that new allotropic modifications of various elements might be produced.

The marked differences in colour, and in temperature of liquefaction, between oxygen and ozone, furnish another illustration of the close connection which exists between the "chemical structure" and physical properties of substances; a different "linking," even of similar atoms, being evidently associated with distinctly different physical properties.

MM. Hautefeuille and Chappuis will doubtless soon be able to furnish more details of the properties of this most interesting substance, liquid ozone. M. M. P. M.

THE UNIVERSITY OF NEW ZEALAND

THE University of New Zealand, with which, since 1874, the University of Otago has been affiliated, has, we are glad to find, adopted a quite modern schedule of subjects for its degree of B.A.

The subjects of examination for the B.A. degree are:—1. Greek Language and Literature. 2. Latin Language and Literature. 3. English Language and Literature. 4. Modern Languages and Literature. 5. General History and Political Economy. 6. Jurisprudence and Constitutional History. 7. Mathematics. 8. Physical Science, any two of the following branches: (*a*) Sound and Light, (*b*) Heat and Radiant Heat, (*c*) Electricity and Magnetism, (*d*) Astronomy and Meteorology. 9. Chemistry. 10. Natural Science, any one of the following branches: (*a*) Geology and Mineralogy, (*b*) Zoology, (*c*) Anatomy and Physiology, (*d*) Botany. 11. Mental Science. No candidate shall be approved by the examiners unless he show a competent knowledge of at least five of the above subjects of examination, of which two must be Latin and Mathematics. The examination may be passed in two sections. Either two or three subjects of examination, one of which must be either Latin or mathematics, shall constitute the first section, which may be taken at the end of the second or any subsequent year, and the remaining subjects shall constitute the second section, which may be taken at the end of the third or any subsequent year; or, at the option of the candidate, all the subjects may be taken together at the end of the third or any subsequent year.

In this curriculum the physical and natural sciences