increasing radioactivity, measured according to the β- and γ-rays method, showed itself. The tube, hermetically sealed, was also laid on a photographic plate enclosed in an aluminium box. After six hours a very perceptible blackening appeared on the part of the photographic plate corresponding to the quartz tube. The contents of the tube were dissolved in nitric acid. From the solution the artificially produced radioactive material was separated by all the known methods by which uranium X can be separated from uranium. Observation of the decrease of the radioactivity showed the half-period time to be that of uranium X. The identity of the radioactive material generated with uranium X was thereby proved. The β and γ ray activity of the uranium oxide freed from the mercury varied between 1·4 and 20 times the radioactivity of an equally large amount of uranium oxide in equilibrium with its decay products, and increased proportionally to the energy applied and to the time.

One obtains even a greater production of uranium X if one makes, in analogy to the experiments of Nagaoka, as described in NATURE of July 18, the electric discharges pass within a thick-sided quartz or porcelain vessel between a tungsten point and mercury covered with a thin coating of vaseline and uranium oxide. This coating possesses such a high electric resistance that, even when applying the highest tensions which can be obtained, one is obliged to diminish greatly the sparking distance in order to obtain a discharge. This proceeding offers the advantage that the energy is concentrated into a very small space. Consequently one can show, after half an hour's work, the production of relatively large quantities of uranium X. It should be stated, of course, that before the tests all parts of the apparatus were examined as to radioactivity and found not to be radioactive.

The production of uranium X considerably in excess of that produced by spontaneous decay is to be explained only by the fact that, under the influence of the electric force, an acceleration of the radioactive transmutation of uranium takes place.

A. GASCHLER.

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Berlin, W.30.

Some Simple Characteristic Relationships among the Ferromagnetics.

THERE are some simple relations existing among the ferromagnetic bodies which no doubt have a fundamental significance. If we calculate the ratio of the critical temperature on the absolute scale (θ) to the maximum intensity of magnetisation (I_0) for each of the ferromagnetics, we obtain the following values for θ/I_0.

Iron	$1058/1817 = 0{\cdot}58 = 2 \times \frac{8}{27}$
Cobalt	$1348/1422 = 0{\cdot}95 = 3 \times \frac{8}{27}$
Nickel	$661/552 = 1{\cdot}19 = 4 \times \frac{8}{27}$
Magnetite	$808/431 = 1{\cdot}83 = 6 \times \frac{8}{27}$

Thus θ/I_0 is proportional to the simple numbers 2, 3, 4, and 6. The fraction $\frac{8}{27}$ is the numerical constant in the equation to the critical temperature, namely,

$$\frac{\theta}{I_0} = \frac{8a'}{27R'},$$

where a is the constant of the intrinsic field and R′ is the reciprocal of Curie's constant.

We may ask if a new ferromagnetic material were to be discovered would it fit into this scheme; in short, are these simple whole numbers necessary to ferromagnetism?

In Heusler's alloy we have such a new ferromagnetic material, and an examination of its properties provides one answer to this question. Recently Prof. Thompson kindly supplied me with a sample of this alloy, prepared in the metallurgical laboratory of the University of Manchester, and experiments with it show that its critical temperature is 355° C. or 628° on the absolute scale, and the maximum intensity of magnetisation is approximately 420. Hence the ratio of θ/I_0 is $628/420 = 1{\cdot}50$, and this is very nearly $5 \times 8/27$. Thus Heusler's alloy conforms to the whole number rule, and, moreover, it fills the vacant space between nickel and magnetite, so that the consecutive numbers from 2 to 6 are now complete. These numbers are exactly whole numbers within the accuracy with which θ and I_0 are known.

When it is remembered that three of these ferromagnetics are metallic elements, one is a definite chemical compound and another is an alloy of three non-magnetic metals, these results are all the more remarkable.

There are one or two other simple relations closely connected with the foregoing: for example, the ratio of the maximum intensity of iron to that of nickel is 3·3, and the ratio of the intensity of cobalt to that of magnetite is likewise 3·3. Similarly the ratio of the critical temperatures of iron and nickel is 1·60, and of cobalt and magnetite 1·67; so that these ferromagnetics fall into two closely related groups.

J. R. ASHWORTH.

55 King Street, South,
Rochdale, August 20.

Planetary Densities and Gravitational Pressure.

WITH reference to Mr. Mallock's letter in NATURE of July 4, I beg to point out that the gravitational forces in his supposed envelopes will increase their density to a value comparable with that of a solid unless the planets are very hot indeed. The stability of the belts and spots on Jupiter and Saturn is a serious objection to the existence of such thick envelopes.

As to the compressibility of solids, the electrostatic theory of molecular structure is inconsistent with great increases of solid density. Surely Mr. Mallock's chalk experiment indicates that in the lower chalk the conditions are nearly crystalline and not that simple compression can produce important changes in density.

HERBERT CHATLEY.

Whangpoo Conservancy Board,
Shanghai, August 4.

The Word "Australopithecus" and Others.

IN answer to Dr. Lucas's letter (NATURE, Aug. 29, p. 315) it may be said that although scientific names need not be literature, and therefore need not follow any philological rules, yet where they pretend to be derived from Greek, or Latin, or any other particular language, good taste demands that they should conform to the structural system of that language.

We "scientists" are contemptuous when the unscientific misuse our terms: if we wish to avoid the contempt of literary folk, we should be careful how we use theirs.

F. J. ALLEN.

8 Halifax Road,
Cambridge,
August 30