A Junior Course of Practical Zoology. By the late Prof. A. Milnes Marshall and the late Dr. C. Herbert Hurst. Ninth edition, revised by Prof. F. W. Gamble. Pp. xxxvi+517. (London: John Murray, 1920.) Price 12*s.* net.

THE principal change in the new edition of this admirable and well-established text-book is the substitution of *Dipylidium caninum* for Tænia as an example of a tapeworm. This change has no doubt been determined largely by the common occurrence of Dipylidium and the consequent facility in obtaining sufficient material—especially scolices—for class purposes. The account is illustrated by a page of good figures, but there is an error in the magnification given for Fig. 3. From the point of view of the organs of the segment, Dipylidium—with two sets of reproductive organs in each segment, and the uterus subdivided into capsules in the mature segment—is not so good as Tænia as a type for study by junior students, and for the convenience of those teachers who prefer the latter type a brief description of the organs of the segment of Tænia might be added at the end of the account, together with Figs. 4 and 6 on p. 47 of the previous edition.

In spite of the care with which the book has been edited, a few slips have escaped attention—*e.g.* on p. 12 "Monocystis belongs to . . . the Sporozoa or Gregarines," as if these two terms—one relating to a class, and the other to an order in the class—were synonymous; there is the loose statement on p. 33 that in Obelia some of the buds "have no mouth and become medusæ"; and the amount of acid given in the formula for acid alcohol is incorrect owing to the omission of a decimal point.

Letters to the Editor.

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The Separation of the Isotopes of Chlorine.

MR. CHAPMAN'S conclusion (NATURE, June 17, p. 487) that the isotopes of chlorine should on certain assumptions be capable of separation by chemical means, is clearly wrong, unless there is something not stated in the reasoning to prevent it being applied to the case of a "pure" element, such as, for example, according to the results of Aston, fluorine actually is. Denoting an entirely imaginary difference between two kinds of fluorine atoms by F and F′, the reasoning seems to lead in this case to the obviously absurd result that these two kinds of identical atoms with a purely imaginary difference must be capable of separation by chemical means.

The error appears to be in the equilibrium equation (i)

$$[Cl_2][Cl'_2]=[Cl.Cl']^2.$$

Mr. Chapman does not show how he deduces this, and it is of interest to know whether the error is due to a slip in the application of the theory of chemical equilibria to the case or to a fundamental flaw in that theory. In the present case, if the isotopes are assumed to be chemically identical and the distribution of the two kinds of atoms in the molecules due to pure chance, then if n is the fraction of Cl atoms and $(1-n)$ that of the Cl′ atoms, the fraction of Cl_2 molecules is n^2, of the Cl'_2 molecules $(1-n)^2$, and of the Cl.Cl′ molecules $2n(1-n)$. This gives

$$[Cl_2][Cl'_2]=\tfrac{1}{4}[Cl.Cl']^2,$$

which is in accord with the ratio 9 to 1 to 6, stated by Merton and Hartley for the case $n=0{\cdot}75$ (NATURE, March 25, p. 104), and with Mr. Chapman's own equation (iv) deduced from the assumption that the isotopes are non-separable. FREDERICK SODDY.

A Possible Cause for the Diamagnetism of Bohr's Paramagnetic Hydrogen Atom.

ONE of the difficulties which confronts Bohr's structure of the hydrogen atom is the fact that hydrogen, on his hypothesis, should be paramagnetic, whereas it is, like the majority of the simple gases, diamagnetic. Experiments on the magnetism of gases have, however, always been made above absolute zero, and the atoms must therefore be in motion; and if this motion involves vibrations and rotations of the atom as well as translatory movements, then it is possible for the atom to appear diamagnetic, although it may be inherently paramagnetic. In a paper on "The Mean Magnetic Moment and Mean Energy of a Vibrating Magnet" (Mems. Manchester Lit. and Phil. Soc., vol. lvii., 1913, No. 4) I considered in a simple case how such an effect might arise if a magnet were in a uniform field and free from the influence of neighbouring magnets. In these circumstances, when the vibrations exceed 130° on either side of the position of rest, or if the vibrations pass into rotations, then the magnet will appear to be diamagnetic, because the average time during which the positive and negative poles are in the diamagnetic position is longer than the average time during which they are in the paramagnetic position.

Honda (Phys. Rev., Ser. 2, xiii., 1919) has recently examined at length the effect of all the possible rotational movements of a magnet in his kinetic theory of magnetism, and, with certain assumptions as to the shape of the atom, comes to the same conclusion.

Applying this result to a paramagnetic atom, it is possible that such an atom, in virtue of its motion, may appear to be diamagnetic, and the fact that hydrogen is diamagnetic may be quite consistent with Bohr's paramagnetic model of the atom.

The kind of diamagnetism here considered, which may be called pseudo-diamagnetism, differs from that due to induced electric currents in the atom, which may be regarded as true diamagnetism. Pseudo-diamagnetism will be subject to variation with changes of temperature and with the state of aggregation of the atoms, while true diamagnetism is probably independent of these.

If the diamagnetism of hydrogen should be found to change at a very low temperature and in a very strong field, it would show that the diamagnetism of this gas was probably an effect of the motion of its atoms, and such a result would indirectly help to confirm Bohr's view of the structure of the atom by removing a difficulty. J. R. ASHWORTH.

Rochdale, June 8.

A Stalked Parapineal Vesicle *in* the Ostrich.

THE ostrich chick on hatching displays an oval, dark-coloured, bare patch towards the hind part of the head. Later, it tends to be hidden by the thick growth of hair-like feathers which cover the head