

*tinuum*, the *regula* may be regarded as the *discretum*; but it were a false conception, that of the continuum as made up of an infinite number of *discreta* (*regulæ*) infinitely small. Such continuum is but the *exemplification*, *proxumbration*, *externalisation* of the *regula*," &c. (p. 116.)  
W. S. J.

### OUR BOOK SHELF

*Junior Course of Practical Chemistry.* By H. E. Roscoe, B.A., F.R.S., &c., and Francis Jones. (London: Macmillan and Co.)

THE work now before us represents the course of practical chemistry carried out by students entering the Owens College Laboratory. It commences with the preparation of the ordinary gases, which are, if anything, too shortly described; and then proceeds to the subject of blowpipe analysis and the preliminary examination of simple substances, and afterwards to the reactions of metals, &c., and qualitative analysis itself. The book does not deal in any way with theoretical chemistry, but the student is referred to Prof. Roscoe's "Lessons in Elementary Chemistry" for any explanation of this kind. This, of course, necessitates a considerable amount of extra reading, more particularly in the earlier portions of the book. The course of qualitative analysis, and so forth, through which the student has to pass, seems to be very similar to that which is now in use in most of our laboratories.

The various experiments, reactions, &c., are as a rule clearly described, but we notice one or two which would undoubtedly be better for some slight alteration and addition; thus, on p. 59, we find the following given as a method of testing for Baric sulphate:—"Barium sulphate fused with  $\text{Na}_2\text{CO}_3$  and HCl added, yields  $\text{BaCl}_2$  (flame coloration green), precipitated by  $\text{SrSO}_4$  solution." Now we think that there is a strong probability that a student proceeding as directed in the book would again form the original Baric sulphate, and he would certainly not obtain any precipitate with Strontic sulphate solution, and probably would not obtain the green colouration. The same method is also given for the detection of Strontic sulphate. Another instance in which we think that clearness has perhaps been sacrificed to brevity is in Table A, but with a teacher at hand there need be little fear but that the student will easily overcome such minor difficulties. In fact the book is written with the desire to aid the teacher in his work, and not to dispense with his services altogether; in the former we think the book is very successful, but we do not believe that a student could well work through the book without such aid.

A number of well-selected questions is appended at the end of the book. They seem well adapted to test the student's knowledge of his work, and will in this way considerably lighten the teacher's labours.

We must also not forget to mention in terms of high praise the three short rules for the guidance of students, which are appended by Prof. Roscoe at the end of the preface, and we hope that every student who works by this volume will lay them to heart, and practise them with all sincerity.

The title of this book, "Junior Course," &c. scarcely conveyed to our minds exactly what we have found the book to be. It is more advanced than we anticipated, and yet, perhaps, it is not a thoroughly complete manual of qualitative analysis, although nearly so; but we must still thank the authors for a clear and succinct little manual, which will no doubt prove very useful to both teachers and students.

*The Philosophy of Evolution.* An Actonian Prize Essay. By B. T. Lowne. (Van Voorst.)

THE author of this short sketch of the theory of evolution is already favourably known by his treatise on the

anatomy of the Blow-fly, a strictly anatomical work, abounding in detail, and not going beyond the region of fact. We can scarcely congratulate him, however, on the success of his theoretical attempts, as many of them are but weakly based, and others lead to very unreasonable deductions.

In the discussion of the variations which, according to the Darwinian hypothesis, give rise to the development of new forms, Mr. Lowne terms the greater tendency possessed, as he states, by some animals, to vary, plasticity, and the less tendency among others, rigidity; and he considers that these characters, plasticity and rigidity, are capable of being transmitted from generation to generation like other hereditary characters. At first sight this may appear highly probable, but to any one who considers the subject, it will be evident that it is based on an erroneous conception of the nature of that so frequently employed, but still ill-understood expression, variation. For the assumption of the existence of a struggle, together with the concomitant "Survival of the Fittest," means that the possible variation in a particular advantageous direction is tending to a limit, or in other words, that the continuation of the struggle is, correlated with a tendency to the reduction to a minimum of the power to vary, for directly any advantageous tendency is developed, it is immediately run upon and exhausted.

The chapter on nutrition contains more than one proposition open to criticism; the function is incorrectly defined, and the ultimate destination of foods which is said to be in three directions, namely of nutrition, energy, and excretion, is very misleading. But it is in the explanation of the formation of the antlers of the Deer that a theory is given, which is not exceeded in rashness and lack of foundation by any lately put before the scientific world; the following is a sketch of the argument:—Herbivorous animals, specially ruminants, take into their system a superabundance of salines, the excess of which the kidney is not sufficiently developed to eliminate; consequently, on an axiom laid down by Sir J. Paget (who would be one of the first to object to this abuse of his words) that every part of the body may be looked upon as an excretion to every other part in highly complex organisms, this excess is got rid of by the development of the antlers, which contain a large amount of calcium salt, and are shed every year: the females have no horns, because in them the excess of salts is employed in the formation of the bones of their progeny. Such being the case, we do not know how Mr. Lowne explains the elimination of the salts in the Cavicorn ruminants, and their non-development in the males of all other herbivorous animals.

We cannot agree with our author in his attempt to derive all the higher forms of animal life from aquatic ancestors. Upon this supposition he attempts to prove that the Penguins and Auks belong to the early type of birds, and that they show marked reptilian affinities, but as they do nothing of the kind, his endeavour is worse than feeble. We are quite unable to see how the view "that the aquatic penguins belong to an early type of birds has been materially strengthened of late by Professor Marsh's remarkable discovery of an Ichthyornid type of birds in the Cretaceous shales of Kansas."

The elaborate markings of the flint shields of the Radiolaria and Diatomaceæ being somewhat like the curves which are produced on the surface of a vibrating metal plate, on which sand has been scattered, we are told that "nothing appears more probable than that similar points of vibration and rest exist upon the surface of these shield-forming organisms, and that the excreted silica which forms their shields comes to rest at the nodal points." This explanation is bold, to say the least, considering the very different circumstances under which the results are produced. Mr. Lowne should try to produce the curves or the vibrating metal plate under water.