

instructive as it is interesting to all who take the opportunity of glancing at it. There is a routine about educational works which is rarely diverged from to any considerable extent. Beyond the information they contain there is always a mass of oral tradition, glimpses into which only occasionally appear in print. This becomes, in many cases, the basis of the higher work of the succeeding generation, and to the student it is an invaluable adjunct to his more formal reading. In the small book before us, Prof. Newton has touched upon some of these less familiar points, bringing to the foreground several questions, the importance of which in the general economy of nature is scarcely sufficiently appreciated. He commences by a most instructive analogy, comparing the different members of the animal kingdom to a mixed collection of coins in a bag, whose history is to be determined mostly from what is to be found on their surfaces. Some, like fossil forms, are no longer current; in other words, they are extinct. Others, in their stamping give indications of the histories of the nations by which they were struck, as do organised forms by their external shape and internal structure; and so on. Upon this basis the principles of classification are, on an evolutionary foundation, established in a most lucid manner. An anecdote, particularly to the point, shows the fallacious reasoning into which students are likely to fall when they lay too little stress on the accuracy of the most minute facts, the mistake of a distinguished French naturalist with regard to the habits of the swallows found at Rouen being the instance given. The section on Geographical Distribution, when read in connection with the small map which is introduced, is as definite and precise as can be desired; at the same time that the observations on the effects of peculiarities in the physical conditions of life on the organisation of species have a bearing the full significance of which Prof. Newton has done so much to indicate. The remarks on nomenclature will also be fully assented to by all working naturalists. One of the chapters is devoted to a rapid sketch of the different classes of the animal kingdom; and this, when taken in connection with those on the subjects above mentioned, makes the little volume as complete an introduction as can be desired to the science of which it treats.

LETTERS TO THE EDITOR

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Marine Boulder Clay, and other Deposits

It seems from the concluding paragraphs of the report of the *Challenger* Observations in *NATURE*, vol. xi. p. 116, that the dredge has at length settled the question of the mode of deposition of marine boulder clay, and shown that in the Southern Ocean it is now being formed over areas perhaps as great as those now covered with similar deposits in the northern hemisphere. The facts stated show (1) The deposition of a bed of mud and sand with fragments of stones from floating ice; (2) That this deposit is so rapid as completely to mask or supersede the ordinary deposition of organic slime; and (3) That in certain areas of deep water there is a possibility that an excess of carbonic acid may remove all trace of calcareous organisms. It is further to be observed that, owing to the small amount of land, the conditions are probably much less favourable than those which existed in the north at the time of the great Post-pliocene subsidence.

These facts appear to me to confirm the conclusion which I have so often stated with reference to the boulder clay or "till" of North America, and which I have endeavoured to establish by the nature of the deposits now taking place in the areas of ice-drift on the coast of North America, by the distribution and chemical characters of the boulder-clay itself, and by the occurrence of marine fossils in it. It is to be hoped that in future we shall not have so confident assertion as heretofore, that these

remarkable clays are due to the action of land ice, and that they will cease to be regarded as affording evidence of a "continental ice-cap" in temperate latitudes.

The details given in the same communication with reference to the formation of a "red clay" from the decomposition of organic ooze, in connection with the remarks of Prof. Williamson in *NATURE*, vol. xi. p. 148, are also very suggestive. They help to account not merely for certain red clays and slates and beds of silicious organisms, but also for the association of glauconite and other hydrous silicates with organic marine beds of all ages; an association which I have long held to be not accidental, though its precise chemical conditions may be obscure. The time may not be distant when geologists may learn to regard many deposits of this kind, from the Serpentine, Loganite, and similar minerals of the Laurentian up to the Modern Greensands, as products connected with the animal life of the sea, or dependent on it for their accumulation. Some chemical suggestions bearing on this will be found in Dr. Sterry Hunt's recent volume of "Chemical and Geological Essays," which I would commend to the study of all your younger geologists.

McGill College, Jan. 20

J. W. DAWSON

The Transit of Venus

AMONG the brief telegraphic accounts given in *NATURE*, vol. xi. p. 122, of the work done by the several Transit expeditions, is one from Janssen, in which it is stated that Venus was seen over the sun's corona before contact (which contact, external or internal, is unfortunately not mentioned).

The idea of the rim of light round the planet being due to the corona does not seem to have struck other observers; and there are one or two points, gathered from my own observations, for and against the conclusion, that I may perhaps be pardoned for bringing forward.

For the coronal view, then. I looked for, but failed to see, the retreating edge of the planet after last external contact. The air, however, was less steady than in the morning, and my eye was very weary with straining at the last tiny indentation made by Venus on the sun's limb.

Against the theory there are the facts that the line of light was apparently of equal thickness throughout, and at half immersion was visible up to the sun's limb without perceptible loss of light; that at first internal contact, or rather when the cusps had almost united and the solar light was but little cut off (*vide* A in diagram), the last portion of the ring was undiminished in brightness. Finally, in the pencil notes taken at the time, I find, referring to the ring of light, these words: "A brighter spot on lower limb, entering sun about $\frac{3}{4}$ immersion" (*vide* B). This spot I then imagined to be due to a portion of the planetary atmosphere, freer from cloud, and therefore refracting more light than the rest.

Taking Janssen's view, it may be accounted for by presuming the planet to have travelled over a bright streak of corona, or possibly an elongated prominence.

It will be interesting to know whether coronal structure was seen by any of the observers.

E. W. PRINGLE

Manantoddi, Wynaad, Jan. 15

Ants and Bees

IN his recent paper on "Ants and Bees," Sir John Lubbock is reported to have said—alluding to the bees which had tasted the honey he had set for them:—

"If bees had the means of communicating knowledge, no doubt these bees would have told the others in the hive where

