

for the protecting sheets of basalt in Antrim, probably no fragment of Lias or Oolite would now have been left in the island. Prof. Hull submerges his country a little more in the Cretaceous period, but still keeps the high grounds as islands. Can he produce any evidence that they were so? Has he sounded the Cretaceous Ocean about which he is so precise? The denudation of Ireland has been unquestionably enormous, but had the country been above water as long as the Director of its Geological Survey imagines, we fear that every geological formation would have been worn off its surface down to the very platform of its fundamental or Laurentian gneiss. In fact the continued survival of the country above water could only have been maintained by repeated uplifts that in some measure at least compensated for its superficial degradation.

The chapters accompanying the maps furnish the reader with some of the information he requires to be able to estimate the extent of the data on which the restorations have been constructed. But they do not give him nearly enough of it. Some of their statements moreover will provoke criticism not less than the maps themselves. The author asserts, for instance, as if it were an established fact, that what he regards as the "essentially oceanic" conditions under which the Chalk was formed prevail from Ireland to the shores of the Caspian, and from Belgium to North Africa. We can hardly suppose him to be ignorant of the fact that the Chalk is but a local development of calcareous matter confined to the western part of the European area. Yet the author not only spreads the Chalk across most of Europe and into Africa and Asia, but proceeds to infer from this asserted extension that "according to all the laws of terrestrial mechanics" the site of much of the North Atlantic must have been then dry land. In other words, he first infers a wide deep ocean, and then creates a continent to keep it company.

One of the chapters, with the sounding title of "The Genesis of the North Atlantic Ocean," will be read with amazement by those who have watched the progress of recent research on this question. The author begins it by the following oracular announcement: "I date the genesis of the North Atlantic Ocean, properly so called, from the close of the Carboniferous period; and, consequently, from the same period, that of the British Isles and Western Europe." One is disposed at once to ask what may be his "exquisite reason" for this extraordinary statement, and he frankly volunteers it. It appears to be somewhat as follows:—The Carboniferous rocks of Western Europe were much disturbed at the close of the Carboniferous period, being thrown into east-and-west ridges. Similar movements took place over the eastern States of North America, the direction of the ridges being there more nearly north and south. It may be concluded, therefore, that the formation of the basin of the Atlantic Ocean formed part of these terrestrial movements!

In his Preface the author tells us how he had long entertained the idea of preparing such a series of maps as he has now published, and how he was deterred by the cost of publication. At last, in what we venture to think was an evil hour for his reputation, the Royal Dublin Society generously agreed to bear the expense. The maps were therefore prepared and published in the

Society's *Transactions*, and a fresh impression has been printed off from the plates for the volume just issued. Fortune would have been kinder to one whose long services entitled him to gentle treatment at her hands had she induced him still to keep his restorations in the privacy of his own portfolio, at least for some years to come, or, if they must be published, had she insisted on greater accuracy in the statement of what is known and greater precision in the expression of what is conjectured.

OUR BOOK SHELF

Die Verwandlungen der Tiere. Von Dr. Otto Taschenberg, Privat-dozent in Halle. Pp. 268, with 88 Illustrations. Small 8vo. (Leipzig: G. Freytag, 1882.)

THIS forms the seventh volume of the series known as "Das Wissen der Gegenwart," the object of which is to give, in an attractive and popular form an outline of the "science of the day." Metamorphosis and development are always interesting subjects, and we are of opinion that Dr. Taschenberg has contrived to place them before his readers in a specially clear manner by choosing a few types in each class of the animal kingdom upon which to dilate, leaving the blanks to be filled in by more advanced students than those for whose instruction this elementary treatise is intended. The author goes in this manner through the entire animal kingdom, and so far as we can see he is well posted up in most of the latest discoveries and theories bearing upon his subject; we miss, however, any allusion to the disputed position of *Limulus*, although the metamorphoses of that remarkable animal are not entirely overlooked. A work such as this is naturally to a large extent a compilation, and in all such works the good or bad influence exercised depends upon the acumen of the author in his choice of subjects and authorities. In the present instance our author seems usually to have consulted the best and most modern authorities. The numerous illustrations are mostly very good; some of them are superlatively so. In these, as in the text, various works have been laid under contribution; and probably to no work is the author under greater obligation than to the text-book on embryology by the lamented F. M. Balfour, but due acknowledgment is always made.

The concluding chapter is devoted to a sketch of the "evolution of species," in which, in a few pages, the author has contrived to give succinct historical information, winding up with a definition of "protoplasm," in connection with which a German translation from well-known English lines is given, and perhaps the definition was so modelled as to fit the lines. We reproduce them, just to show what latitude may be allowable in translation:—

"Der grosse Cäsar tot und Lehm geworden
Verstopft ein Loch wohl vor dem rauhen Norden.
O dass die Erde, der die Welt gebebt,
Vor Wind und Wetter eine Wand verklebt."

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.]

Natural Selection and Natural Theology

I AM very glad to find from Prof. Asa Gray's last communication (*NATURE*, vol. xxviii. p. 78) that the result of our "amicable discussion" has been that of coming to an agreement on all