

to expect a popular treatise on all orders of insects, an idea at once dissipated by the title-page. There are other books covering the same ground that would answer the young student's purpose as well as this. Judging it in comparison with the multitudinous other compilations from the same pen, we have no very particular fault to find. It is sketchy, but in some respects it compares favourably, especially in some of the explanations concerning the *Coleoptera*. Some of the illustrations are good, others wretchedly bad, and unrecognisable without the explanations. When comparing the "nervures" in the wings of a butterfly with the "rays" in the fins of a fish (p. 178), the writer should have explained the minute structure of both.

The real point at issue in connection with books of this nature is their effect. They are eminently rudimentary, and not elevating. Let us take instances from the book now under review. At p. 14, after an explanation of the terminology of the external skeleton of a beetle, we read:—"At first some of these terms may appear to be harsh, repulsive, and difficult to master. In reality they are not so, and a knowledge of them is absolutely necessary to any one who wishes to understand the description of an insect." This is a very sensible remark. Yet throughout the book the utmost favour is bestowed upon absurd meaningless "English" names. The culminating point of absurdity is reached at p. 276. Amongst the small moths the author "figures" one (under a misspelt generic name), and because it (out of several hundred other fortunate little moths) has received no "popular" name, he terms it the "*Brown Dolly*"!

Anthropo-Geographie oder Grundzüge der Anwendung der Erdkunde auf die Geschichte. Von Dr. Friedrich Ratzel. (Stuttgart: Englehorn, 1882.)

WE have had occasion to speak of the wide extension which geographical science has taken in Germany, and of the broad and intricate field which it covers. The work before us is a good example of this. It is the first of a series of geographical handbooks, which is to include "General Geology," by Prof. von Fritsch; "Oceanography," by Dr. von Boguslawski; "Geographical Distribution of Animals," by Prof. L. von Graff; "Climatology," by Dr. Hann; "Glaciers," by Prof. Heim; "Volcanoes and Earthquakes," by Prof. von Fritsch; and "Botanical Geography," by Dr. Oskar Drude. Dr. Ratzel's volume must not be mistaken for a treatise on Anthropology. That subject it only incidentally includes, its main purpose being to point out in detail the light which geography sheds upon history and the development of social and political economy. The author discusses the various conceptions of geography, its place among the sciences, the human element in geography, and the relations between geography and history. After a brief introduction on these points, the author proceeds to consider, in the second part, natural conditions, and their influence on mankind. Under the head of position and aspect of the dwelling-places of man, pointing out the parts which continents, islands, and peninsulas have played in the distribution of the human species and in history, he devotes a chapter to states and the various conditions which determine their boundaries, and in another discusses the distribution of centres of population. In a chapter on conditions of space he discusses the subject of great and small states, and the connection between the extent and power of states, and has some specially interesting remarks on what he calls the continental type of history. In a section on surface-forms, the author treats of such subjects as the inequalities of the earth's surface and of the contrast, ethnologically and historically, between mountainous and flat countries—of plains, steppes, and deserts. To the important subject of coast-lines, and the dependence of a country's development on their form, a

chapter is devoted, and two to the historical importance of water, in its various forms of sea, lakes, rivers, and marshes. Considerable space is, of course, given to climate and to the animal and plant world. One of the most interesting chapters is that on "Natur und Geist," in which Dr. Ratzel attempts to show the great influence of a people's surroundings on their mental and moral development. In two concluding chapters the author gathers up the lines of discussion, referring especially to the subject of human migration, its influence on history, and its effect on the mixture of races; and finally points out the practical bearings of his subject. Thus it will be seen that, whether the subject comes legitimately under the conception of geography or not, Dr. Ratzel has written a work of great interest and of much utility to the historian who wishes to treat history in a scientific spirit. It is both instructive and attractive reading.

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 ensure the appearance even of communications containing interesting and novel facts.]

Mimicry in Moths

I OBSERVED here, a few days ago, a case of mimicry which interested me much, and may deserve mention. The weather has been such as is usual on this part of the Riviera at this season. There has been a very hot sun, with sometimes a very cold "mistral" wind. Insect life is abundant, and not a few of our summer *Sylvia*æ seem to secure a very good living. Flies are a plague. Mosquitos are not wanting. Bees are busy, and large dragonflies hunt continually. But there is one order of insects "conspicuous by its absence," and that is the *Lepidoptera*. Neither the diurnal nor the nocturnal species have been visible.

I was much surprised, therefore, one day last week to see a large insect of this order come from above the olive trees overhead, with the wild dashing flight of the larger moths. Attracted apparently by the sheltered and sunny recess in which I was sitting and by the scarlet geraniums and bignonias which were in full flower in it, the moth darted downwards, and after a little hovering, settled suddenly on the bare ground underneath a geranium plant. I then saw that it was a very handsome species, with an elaborate pattern of light and dark chocolate browns. But the margins of the wings, which were deeply waved or dented, had a lustrous yellow colour, like a brilliant gleam of light. In this position the moth was a conspicuous object. After resting for a few seconds apparently enjoying the sun, it seemed to notice some movement which gave it alarm. It then turned slightly round, gave a violent jerk to its wings, and instantly became invisible. If it had subsided into a hole in the ground, it could not have more completely disappeared. As, however, my eyes were fixed upon the spot, I soon came to observe that all the interstices among the little clods around it were full of withered and crumpled leaves of a deep blackish brown. I then further noticed that the spot where the moth had sat was apparently occupied by one of these, and it flashed upon me in a moment that I had before me one of the great wonders, and one of the great mysteries of nature. There are some forms of mimicry which are wholly independent of the animals themselves. They are made of the colour and of the shape which are like those of the surrounding objects of their habitat. They have nothing to do except to sit still, or perhaps to crouch. But there are some other forms of mimicry in which the completeness of the deception depends on some co-operation of the animal's own will. This was one of these. The splendid margins of the fore-wings, with the peculiar shape and their shining colour had to be concealed; and so, by an effort which evidently required the exertion of special muscles, these margins were folded down—covered up—and hidden out of sight. The remainder of the wings were so crumpled up that they imitated exactly the dried and withered leaves around.