

material used in the present work, nor are the type and printing, especially in the later volumes, the best ever produced in India. Misprints are numerous. One is amusing: the Tibetan antelope is credited with no less than ten horns. It is to be hoped that commentators on the Apocalypse will not be led to believe that a ten-horned beast really inhabits Tibet.

On the whole, whilst in case a second edition is required, careful revision is desirable, which might in some cases take the form of abridgement and the omission of irrelevant matter, the principal feature of the work is the large amount of energy that has been expended in its preparation, and the great effort that has been made to bring together information from all quarters. To write a complete account of the products of India, and to give a full scientific and economic description, both of the products themselves and of the sources from which they are derived, are tasks far beyond the powers of any single individual, and that could only be thoroughly carried out by a committee of specialists.

W. T. B.

#### CHINESE AND JAPANESE BUTTERFLIES.

*Butterflies from China, Japan, and Corea.* By John Henry Leech, B.A., F.L.S., F.Z.S., F.E.S., &c. 4to. With forty-three coloured plates. (London: R. H. Porter, 1892-1894.)

UNTIL within the last few years, almost nothing was known of the Palæarctic fauna, except that of Europe and the Mediterranean sub-region, and though butterflies are the most attractive and the easiest collected of all insects, those with which we were acquainted from Siberia, the greater part of China, and Japan, might almost have been counted on the fingers.

Since then, however, great progress has been made. In the first place, Russian exploration and consolidation have opened up vast regions of previously almost unknown parts of Asia to science, and the work begun on the Amur and in Turkestan by Schrenck and Fedchenko, has been worthily continued by the Grand Duke Nicholas Mikhailovitch and his coadjutors, among whom the brothers Groum-Grshimaïlo deserve the place of honour. When shall we see one of our own Royal Princes bringing out a work on the insects of one of our own colonies to compare with Romanoff's "*Mémoires sur les Lépidoptères*?" In Western Europe, such work is left to private enterprise.

The French Jesuit missionaries, especially the Abbé David, have penetrated to such out-of-the-way parts of China, as Mou-pin, and have brought back large collections of different kinds, including many very remarkable butterflies, which have been illustrated by Oberthür in his "*Études d'Entomologie*."

Since the time when China and Japan were thrown open to Europeans, English entomologists have not been behindhand in the work of collection and description. The fine collections formed in Japan by Lewis, Pryer, and Maries have been worked out so well by Dr. Butler and others, that the Lepidopteræ of Japan are now more thoroughly known than those of any other part of Asia except British India. The late Mr. W. B. Pryer published a work on the butterflies of Japan, in the country itself,

in English and Japanese, with coloured plates of all the species known to him; but as this book is scarce, and the letterpress very meagre, we are glad that Mr. Leech has included Japan in the important work which forms the subject of the present article.

Mr. Leech commenced his entomological career by the publication of a useful little volume on British *Pyralidæ*, and by collecting excursions to the Canary Islands, Brazil, &c. Subsequently he became interested in the fauna of Eastern Asia, and devoted eight years to its study, and to the accumulation of materials for the present work, not only by employing experienced collectors like Pratt and Kricheldorf to explore the interior of China, but by personally visiting and forming large collections in the Himalayas, Corea, and Japan; in Japan, indeed, he succeeded in capturing almost every species of butterfly known to inhabit the country. By this means, he gradually accumulated the fine collections on which he has based his great work, in which he has been able fully to describe 650 species, a large proportion of which are figured in the forty-three excellent coloured plates which accompany it. We have also a map, and five plates of scenery (four of Western China and one of Japan), the second of which exhibits a side-view of the tremendous and almost perpendicular face of the mountain of Omei-Shan, in the neighbourhood of which Mr. Pratt obtained many of the most beautiful and interesting butterflies which he discovered.

The usefulness of the work is increased by an interesting introduction, dealing with the literature of the subject, the countries visited by the author and his collectors, and a table of geographical distribution, divided into the following columns: Japan, China, Corea, Amurland, Himalayas, Thibet, Europe, and "other countries and regions."

The author remarks in his preface: "It is a matter of regret that, owing to an almost complete absence of information respecting habits and life-histories of the majority of the species, the work is unfortunately less complete than the author could have wished." All honour to him for saying so. It is the duty of every entomologist to seek for and record everything of the kind which he can obtain; but entomologists are sometimes too much disposed to care only for the specimens they receive, and it would not occur to them to encourage their collectors, as they easily might do, to record anything more than dates and localities. Mr. Leech, however, seems both to have sought for and utilised such information, so far as it was accessible or obtainable.

On examining Mr. Leech's 650 species of butterflies, which are distributed among rather more than 150 genera, it becomes apparent that they are to a large extent mainly an amplification of the European fauna. About 300 species are found in Europe proper, divided into about 50 genera, of which only about 9 genera, each including but one, or at most two or three, species of very limited range, are not represented in Mr. Leech's work. These are *Triphysa*, *Nemeobius*, *Aurotis*, *Thestor*, *Zegris*, *Doritis*, *Spilothyrsus*, *Thymelicus*, and *Cyclopides*; and there is no reason why some, even of these, should not extend to Western China. In China the European and Indian faunas meet and mingle; thus in the *Satyrinæ*, the Mountain Brown butterflies of the genus

*Erebia* are far more sparingly represented in China than in Europe; but *Lethe* is far better represented in China than in India, and *Ypthima* at least as well. The tropical subfamilies *Morphinae* and *Acraeinae* are also represented in China, the first by four species, one of which, *Stichophthalma howqua*, is as large and handsome as a South American *Morpho*, and the other by one of the two Indian species, *Pareba vesta*, which extends its range to several parts of South-Western China. In Japan and the extreme east of China, we find one or two species belonging to peculiarly Nearctic forms, such as *Anthocharis scolymus*, for example.

In certain large genera, such as *Zephyrus*, *Thecla*, and *Papilio*, the number of Chinese species far exceeds those known to occur in Europe; but in the case of *Papilio*, at least, this is mainly due to the large number of properly Indian species which extend their range to China.

It is among the *Papilionidae* and *Pieridae* that we find some of the most interesting of the Chinese and Central Asian forms, especially those allied to *Parnassius*, *Aporia*, and *Colias*. There are only about thirteen well-marked genera of *Papilionidae*, except the heterogeneous genus *Papilio* itself; and eight of these are represented in Mr. Leech's district, the other five being *Hypermnestra* (South-West Asia), *Eurycus* (Australia), *Euryades* (South America), *Thais* (South Europe), and *Bhutanitis* (Bootan). The headquarters of *Parnassius*, however, are perhaps in the mountainous districts rather beyond the range of the present work, as Mr. Leech enumerates only eight species, which seems to us to be rather a small number. Many curious genera allied to *Aporia* are also found in the south-western districts of China bordering on Thibet, such as *Mesapia*, *Davidina*, &c., most of which bear a general resemblance to our Green-veined White (*Pieris napi*). Of these, Oberthür's genus *Davidina* is the most curious, as the wing-cells are divided by longitudinal nervures, a characteristic which we do not meet with in any other butterfly. Only four species of *Colias* are enumerated, the headquarters of this genus also being apparently rather beyond Mr. Leech's limits. He has, however, sunk all the Japanese forms described as distinct by various authors, as varieties of *C. hyale*, Fabr.; but this is one of those questions which will never be disposed of to the satisfaction of entomologists without long and careful breeding of the supposed varieties or species. Some authors, however, have certainly gone too far in regarding mere varieties of butterflies as entitled to specific rank; while others have erred more seriously in the opposite direction, by placing together perfectly distinct species as varieties. It frequently happens that species which subsequently prove to possess very important distinctive characters, have a much greater superficial resemblance to others than obtains between seasonal or otherwise dimorphic forms of insects which belong indubitably to the same species. But if a good species is sunk as a synonym or a variety, the next entomologist who considers it to be distinct will very likely overlook the previous notices, and describe it as new. We are constantly discovering that names which stand as synonyms in our books really belong to insects which have since been described as new under other names.

In taking leave of this extremely interesting book, we must congratulate Mr. Leech on having successfully brought to a conclusion a work which will hold a worthy place among the many valuable local butterfly faunas which have been published in England, of recent years, by Godman and Salvin, Moore, Trimen, Distant, and others.

W. F. K.

#### OUR BOOK SHELF.

*Rainmaking and Sunshine.* By John Collinson. (London: Swan Sonnenschein and Co., 1894.)

THE only object there can possibly be in giving a notice of this book is to warn intending purchasers of its contents, lest they be deceived by the title, and hope to find some account, more or less interesting, of the experiments that were made in America, a short time back, with the view of procuring a rainfall. This book has not even that recommendation. One has not much patience with weather prophets, who base their assertions on conjunctions of the planets, or some equally occult and absurd methods; but Mr. Collinson is in advance of all such vendors of nostrums. Not for him the uncertain, or partial, fulfilment of hazily expressed prophecies, not for him the long and careful study of signs and portents; he, himself, is the rainmaker, he is the dispenser of sunshine and cloud, he is gifted with the divine power that storms and floods and drought obey. Here is his own modest statement: "Thus when suitably placed as to residence, the results of his (the author's) action on magnets are certain to produce changes in the weather, and other effects, as interesting and useful, bearing on meteorological science generally. They are simply marvellous. Storms, floods, drought, &c., can be induced, on the one hand, and the prevalence of sunshine and warmth, in opposition to coldness and gloom, on the other. His action in this direction, judging from experience, could bring any district, and, indeed, the country generally, such favourable weather as would recall the glories of the Golden Age." (p. 18.) Another passage that makes one doubt whether the book is to be taken seriously, relates how a prophet (Query Dr. Falbe, says the author) foretold bad weather for March 28, 1893, sudden fall of the barometer, great conflicts of wind and water, and various other disasters. "About the same time Prof. Jenkins foretold that there would be a cyclone with snow on March 25. I took care that these storms did not happen." (p. 186.)

But there is one form of internal evidence which forbids us concluding that the author has perpetrated an elaborate joke. He claims to have given to a whole nation of holiday-makers ten days of enjoyable weather at Easter, but refused to exercise his godlike gift on behalf of suffering humanity at the following Whitsuntide, because "NO" (in very large capitals) "suitable sign of appreciation had then been received from any of those who largely benefited by the results of the fine Easter weather." (p. 214.) One would like to know what is the force of "then" in this sentence. Have the railway companies rewarded this gentleman since? And what would be a suitable sign of appreciation to a man so endowed? But enough of this nonsense; whoever else the book may amuse or edify, it will scarcely find readers among the subscribers to NATURE.

W. E. P.

*The Elements of Graphic Statics: a Text-Book for Students of Engineering.* By L. M. Hoskins, Professor of Pure and Applied Mechanics in the Leland Stanford Junior University; formerly Professor of Mechanics in the University of Wisconsin. (London: Macmillan and Co., 1892.)

ALTHOUGH the fundamental ideas of Graphical Methods in Statics can be traced back to the writings of Stevinus,