experiment was not more decisive than the other. Not only did luminous appearances accompany the setting-in of a current towards the earth from the network of insulated wires spread over the summit of Mount Oratunturi, but the light evoked was distinctively *auroral*. Examined with the spectroscope, it yielded the still enigmatical "citron-line" discovered by Ångström in 1867. This is the invariable and chief constituent of auroral radiations. Besides one fitfully present, detected by Zöllner in the red, it is the only vivid line its spectrum includes. Ten others, more or less dubiously enumerated, are faint, hazy, indeterminate. M. Lemström holds that there is a fair agreement between some of them and lines in the laboratory-spectrum of rarefied air. But this is perhaps a too sanguine opinion. These seeming coincidences are very loose, and have not been drawn closer by careful inquiry. Vogel's conclusion that the spectrum of the aurora is modified from that of atmospheric air is indeed highly probable, but its probability is derived far more from external than from internal evidence.

A. M. CLERKE

THE BUTTERFLIES OF INDIA

The Butterflies of India, Burmah, and Ceylon. A Descriptive Hand-book of all the Known Species of Rhopaloceros Lepidoptera inhabiting that Region, with Notices of Allied Species occurring in the Neighbouring Countries along the Border. With Numerous Illustrations. By Lionel de Nicéville, F.E.S. Vol. II. Royal 8vo. (Calcutta. London: Bernard Quaritch, 1886.)

MORE than four years have elapsed since the first part of this book was published, and one of the authors has been obliged to resign his share in the work. The second volume, which has been written by Mr. de Nicéville alone, is in no way inferior to the first. When we remember that in the trying climate of Calcutta, and only in the leisure hours which can be spared from official work, Mr. de Nicéville has with but very trifling assistance from the Government of India completed a volume of nearly 300 pages, containing over 300 species of butterflies, we must allow that he deserves great praise; and though a volume produced under such difficulties must of necessity contain faults, yet it is in every respect very superior to Mr. Moore's work on the Lepidoptera of Ceylon, which was largely subsidised by Government. There is no doubt that the impetus given to the study of the butterflies of India by the publication of this work will have the best results, and we have every reason to hope and believe that it may be completed in three or four years more at latest. The present volume is devoted almost entirely to the family of Nymphalinee, and brings up the number of Indian butterflies already described to over 600, all of which are treated in a thoroughly scientific, careful, and painstaking manner.

Though the author has gathered to his assistance a growing band of field workers in various parts of India, among whom Messrs. Möller, Knyvett, Graham-Young, Colonel Swinhoe, and others are conspicuous, and is rapidly accumulating a large quantity of specimens from all parts of the country, he still labours under the diffi-

culty of being unable to see the types of many of the so-called species described by Messrs. Butler and Moore in Europe. Evidence is constantly being brought forward to confirm the opinion of most entomologists, that a large proportion of the names given by these authors represent no fixed or constant varieties, and that the characters described by them cannot be recognised in the insects themselves; but it is impossible to ignore them until this can be proved by comparison of these types with large series of specimens. Under these circumstances, Mr. de Nicéville has acted wisely in printing the descriptions of all these doubtful species, so that the attention of collectors may be called to them, and their existence proved or disproved. His remarks on them have the advantage of being intelligible, which is not always the case with the original descriptions of the authors in question, who have had for some years almost a monopoly in the description of Indian butterflies.

The kind of difficulty which occurs in many instances may be illustrated by the author's final remarks on the numerous varieties of the genus *Abisara*, described as species by Mr. Moore.

"A *prunosa* is typically the darkest coloured, and in the male most brilliantly purple-shot, of this group of the genus, specimens from Travancore being particularly large and dark. Even among Ceylon specimens, however, I find considerable variation; in some males the inner discal band on the fore-wing is evenly convex, and in others distinctly angled in the middle, and the purple suffusion is also variable; the size and number of the black spots on both sides of the hind-wing is extremely inconstant. In one very abnormal specimen there are two sub-apical spots, only the anal ones being entirely wanting. From an island one would expect to find some distinguishing characters in a species supposed to be peculiar to it, but I have quite failed to discover any. I can only repeat that, in my opinion, the name *echerius* should apply to all the species of this group of the genus *Abisara*, except perhaps to the Andaman local race, which has been named *bifasciata*; that as, in this case, the geographical range of numerous slight local races is not segregated, and each local race must interbreed with the next on the boundary-line which is supposed to separate them, it can serve no good scientific purpose to pick out a few apparently different specimens from each local race and to describe them, at the same time ignoring the intergrade specimens which exist."

If this opinion had been more generally held, the study of the butterflies of India would have been much simplified, and it is to be hoped that a new edition of "The Butterflies of India," which will certainly be called for almost before the first is complete, will show a large reduction in the number of names. A fixed nomenclature is the first desideratum in this as in other branches of science, and tends more than anything to attract good workers, who are often disgusted by a long list of synonyms and by changes in well-known old names.

The keys to the genera and species have been worked out very carefully, and will be useful to beginners. The literature, geographical distribution, and variation of each species are also well and carefully done. The volume will be indispensable to lepidopterists generally, and ought to interest many in India, who have hitherto looked on the collection of butterflies as rather a pastime than a science.

H. J. ELWES