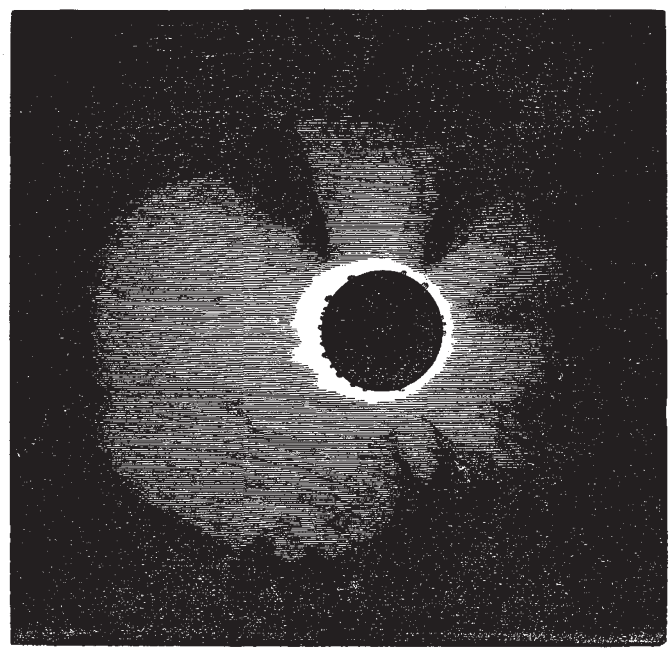
prominences; some parts of the first light shade can be seen, but the outer rays are altogether invisible. When, however, the plate is viewed by reflected light, the whole of the detail is distinctly seen. The negative was the last one taken; four others were exposed for the corona, but owing to the presence of cloud very little detail is visible.

It will be noticed that there is more of the corona shown on the west side of the moon than on the east, north, or south. This feature is shown on all the plates, so that there can be no question that there was more coronal light on the west side of the moon than at the other points. In explanation of the great display of the outer rays (I use the term *rays* for want of a better—perhaps *outer light* would be more correct, for there is no indication of lines or rays on any of the plates), I had supposed that the east side might have been partially covered with cloud; but in conversation with Prof. Eastman I found that he was observing for the reappearance of the sun, and he is quite certain that there was no cloud at the time the photograph was taken—that is, at about thirteen seconds from the end of totality. Mr. Fryer also is equally certain that there was no cloud. The plate was exposed eight seconds. It will be noticed also that the prominences are more numerous on the side where the corona is brightest.

Various opinions have been expressed as to the quality of the light of the corona. The effect we saw was that of moonlight, but not of the *full* moon, excepting the brilliant light close to the moon's limb, which is equal to the brightest moonlight, and I think its action on the sensitive plate confirms this opinion.

A point of much interest to be noticed is, that the light of the corona had been considered to be much less active than it really is; eight seconds were sufficient to produce on the plate an effect of light extending beyond the moon's limb, at least one and a half millions of miles.

I leave it to others to account for the cause of the great gaps or rifts in the corona; also their identity in position with those shown in the photograph taken by the American photographers at Cadiz. The identity of one of the rifts



THE LATE ECLIPSE, AS PHOTOGRAPHED AT SYRACUSE

is absolutely fixed by the two prominences between which it appears in the photographs, and this one gives the relative places of the others.

When the two photographs are compared, there is an apparent difference in the places of the rifts with respect to their angular position on the moon's circumference. How this difference arises I am not prepared to say, as I have no information as to how the American picture was taken, and there is no mark on the transparency which has been lent to me by Prof. Young, to indicate the north point. In the engraving from my photograph the top is the north.

It is perhaps necessary to say that it is quite impossible to represent in an engraving on wood the delicate detail of the corona. The cut fairly gives the main features, but it is *hard* when compared with the original; the contrast should not be so great; the ground should not be perfectly black; and the effect should not be produced by *lines*. No woodcut has ever yet accurately represented the phenomena of the eclipsed sun.

When the photograph No. 5 is combined in the stereoscope with the one taken about one minute earlier, stereoscopic relief is produced—the corona is distinctly seen beyond the moon. It may be thought that this is merely the effect of contrast, but I believe it is really due to the change in the position of the moon. No such relief is seen when two copies of the same photograph are combined stereoscopically.

In order to see the woodcut with the best effect, it should be placed at a few feet distance from the observer, so as to lose all trace of the lines of the engraving; the effect is then very accurately given of the corona as seen by the unaided eye.

A. BROTHERS

THE LATE EAST INDIA COMPANY'S MUSEUM—A ZOOLOGIST'S GRIEVANCE

THE late East India Company in their former palace in Leadenhall Street were in possession of a valuable Zoological Museum. It contained specimens in all departments of science, received from the Company's Oriental dominions. These had been contributed by

public servants, attached as naturalists to various missions, or had been given by gentlemen of the civil and military services to the Court of Directors. Amongst the contributors to the East India Museum, it will be sufficient to mention the names of Dr. F. Buchanan Hamilton, Dr. Horsfield, Sir T. Stamford Raffles, Col. Sykes, Dr. Wallich, Mr. M'Clelland, Dr. Falconer, Mr. Griffith, and Mr. Hodgson, to prove that the collection was one of no ordinary merit. The Zoological importance of the East India Company's Museum was further augmented by the preparation and publication by, or under the superintendence of, the late Dr. Horsfield, of several catalogues. Of these may be particularly mentioned that of the Mammalia, published in 1851, and that of the Birds in 1854 and 1858, the second part of which bears likewise the name of Mr. Frederick Moore, then assistant-keeper of the Company's Museum, as joint author, on its title-page.

When the East India Company became extinct, and the premises in Leadenhall Street were vacated, the Museum was removed to Fife House, Whitehall, but was very imperfectly exhibited there, a large portion of the contents (the more bulky specimens in particular) being kept stowed away in boxes. When naturalists who wanted to consult specimens remonstrated at their inaccessibility, they were told that this was a mere temporary arrangement, and that when the magnificent buildings of the new India Office were completed, special accommodation would be assigned to the Museum, and there would be ample space for everything. At length the time arrived. The new India Office, with its suites of *salons*, assembly rooms, waiting rooms, and apartments of every description, was finished and opened. Fife House was demolished, and everything that it contained was removed to the new establishment. But when space was required for the Museum it was discovered that the only rooms assigned to this purpose were three or four chambers in the uppermost story, which would not contain a tenth part of the collection. Dr. Forbes Watson, the present chief of this department, has thought it right to devote these to the exhibition of a fine series of specimens illustrative of the arts and manufactures of British India, and we are by no means disposed to find fault with his decision on this subject. But it is the duty of the Government, we maintain, either to provide proper space for the Zoological collections also in the New India Office, or to transfer them to some other Institution, where they may be at least accessible to the scientific student. These Zoological collections contain a large number of typical specimens, without reference to which it is impossible in many cases to ascertain the identity of the species. Some of these typical specimens have, we believe, been handed over to the British Museum, but a number of them still remain in the collection, packed away, we are told, in the same cases in which they were originally removed from Leadenhall Street. This is, we maintain, a great and crying scandal, though as only a few working Zoologists are injured thereby, it is difficult to excite popular feeling upon the subject. In taking over the goods and chattels of the former Company, the India Office must certainly be held to have accepted the corresponding liabilities. Amongst these, it cannot be denied, was that of keeping, at least safe from destruction and in a state accessible to the scientific student, the specimens which the servants of the former Company amassed at such an expenditure of time and toil. If, as we are told, the new India Office is already so short of space that it is not possible to find room for them within its precincts, it is very simple to obtain the necessary accommodation elsewhere. We have good reason to know that Naturalists working on various branches of Indian Zoology are frequently brought to a standstill by the impossibility of access to this important collection, and we trust, therefore, that some steps will be taken to remedy the evil P. L. S.

*THE METAMORPHOSES OF INSECTS**

THIS very handsomely got-up volume is illustrated by 40 full-page engravings, many of which are exquisite landscapes as well as representations of insects in their various stages; and by about 200 excellent woodcuts in the text, from which we have selected a few specimens as samples of the rest. The subject of insect transformations presents us with so many curious examples of instinct, and such strange eccentricities of structure and habits, as to be especially adapted to attract the attention of the young, and to lead them to study this most fascinating branch of Natural History. The name of M. Emile Blanchard, and the high scientific reputation of Prof. Duncan, are a sufficient guarantee that the facts are accurately stated. In the introductory portion of the work, the main features of the external structure and internal anatomy of insects are exhibited by such large and clear illustrations as to be easily comprehended, the changes in the nervous system, from the larva to the perfect insect, being particularly well shown. The nature of metamorphosis and its different kinds are then explained, and a series of chapters is devoted to each order of insects, beginning with the Lepidoptera and ending with the Crustacea.

Among the more remarkable forms in the first-named order are the Psychidæ, small moths the females of which are not only without wings, but have neither legs nor antennæ. The female *Psyche* is, in fact, a mere helpless egg-bag, which never quits the case or covering in which it was bred. The males are small delicate moths with bodies covered with long silken hairs, and with dusky semi-transparent wings. The larvæ live in cases made of silk or vegetable tissue, bits of straw, stick, or leaves, and they carry these cases just as snails do their shells.

The ravages of the Tineidæ and the curious cases of *Coleophora* and *Gelechia* are illustrated by figures after Stainton; while the cut on p. 331 represents the beautiful pink or violet net-work cocoons in which some Brazilian species suspend themselves by slender threads.

The parasitic Hymenoptera forming the families Ichneumonidæ, Chalcididæ, and Proctotrupidæ are well described, and a quotation from this chapter will exhibit the style in which the book is written:—

"These parasites are very pretty and elegantly-formed insects when in the adult form, and are gifted with great agility and restlessness; but in their early condition they cannot move, having no locomotive organs, and their structures are so soft that they are destroyed with the greatest ease. The larvæ look like worms or maggots, and do not attain a great perfection of development during their growth. All the parasites seek out a caterpillar, a larva, or an insect which suits their purpose, in order to lay an egg within its body. The larva which is born from this egg is nourished by the blood and fat of the victim, whose vital organs it does not touch or injure in any way; for were it to die, the parasite would come to an end also. It is only when the larva is nearly full grown, and is about to undergo its metamorphosis into a pupa, that it appears to know that the life of the victim is not likely to be of much further use. It then devours the internal organs of the unfortunate insect, and undergoes its transformation. The skin of the victim protects some of the pupæ of its destroyers after all the inside has been eaten. Nearly all, if not quite all, insects are subject to the attacks of parasitic Hymenoptera. Fine, smooth, and brightly coloured caterpillars often have a black spot upon their skin, and this is the healed wound of the ovipositor of one of the parasites. Sooner or later the creature is sure to die, and

* "The Transformations or Metamorphoses of Insects (Insecta, Myriapoda, Arachnida, and Crustacea)." Being an adaptation for English readers of M. Emile Blanchard's "Metamorphoses, Mœurs, et Instincts des Insectes." By P. Martin Duncan, F.R.S., Professor of Geology in King's College, London. (Cassell, Petter, and Galpin)