

should get a sort of key to the strange cypher band called the spectrum, which might prove of inestimable value, not only in the future, but in a proper understanding of all the telescopic observations of the past. We should, in fact, be thus able to translate the language of the spectro-scope. Again, by observing the spectrum of the same prominence both before and during, or during and after the eclipse, the effect of the glare on the visibility of the lines could be determined—but I confess I should not like to be the observer charged with such a task.

What, then, is the evidence furnished by the American observers on the nature of the corona? It is *bizarre* and puzzling to the last degree! The most definite statement on the subject is, that it is nothing more nor less than a *permanent solar aurora!* the announcement being founded on the fact, that three bright lines remained visible after the image of a prominence had been moved away from the slit, and that one (if not all) of these lines is coincident with a line (or lines) noticed in the spectrum of the aurora borealis by Professor Winloch.

Now it so happens that among the lines which I have observed up to the present time—some forty in number—this line is among those which I have most frequently recorded: it is, in fact, the first iron line which makes its appearance in the part of the spectrum I generally study when the iron vapour is thrown into the chromosphere. Hence I think that I should always see it if the corona were a permanent solar aurora, and gave out this as its brightest line; and on this ground alone I should hesitate to regard the question as settled, were the new hypothesis less startling than it is. The position of the line is approximately shown in the woodcut (Fig. 1) near E, together with the other lines more frequently seen.

It is only fair, however, to Professor Young, to whom is due this important observation, to add that Professor Harkness also declares for one bright line in the spectrum of the corona, but at the same time he, Professor Pickering, and indeed others, state its spectrum to be also continuous, a remark hard to understand unless we suppose the slit to have been wide, and the light faint, in either of which cases final conclusions can hardly be drawn either way.

So much, then, for the spectroscopic evidence with which we are at present acquainted on the most important point. The results of the other attacks on the same point are equally curious and perplexing. Formerly, a favourite argument has been that because the light of the corona is polarised; therefore it is solar. The American observers state that the light is *not* polarised—a conclusion, as M. Faye has well put it, “very embarrassing for Science.” Further,—stranger still if possible,—it is stated that another line of inquiry goes to show that, after all, Halley may be right, and that the corona may really be due to a lunar atmosphere.

I think I have said enough to show that the question of the corona is by no means settled, and that the new method has by no means superseded the necessity of carefully studying eclipses; in fact, their observation has become of much greater importance than before; and I earnestly hope that all future eclipses in the civilised area in the old world will be observed with as great earnestness as the last one was in the new. Certainly, never before was an eclipsed sun so thoroughly tortured with all the instruments of Science. Several hundred photographs

were taken, with a perfection of finish which may be gathered from the accompanying reproduction of one of them.

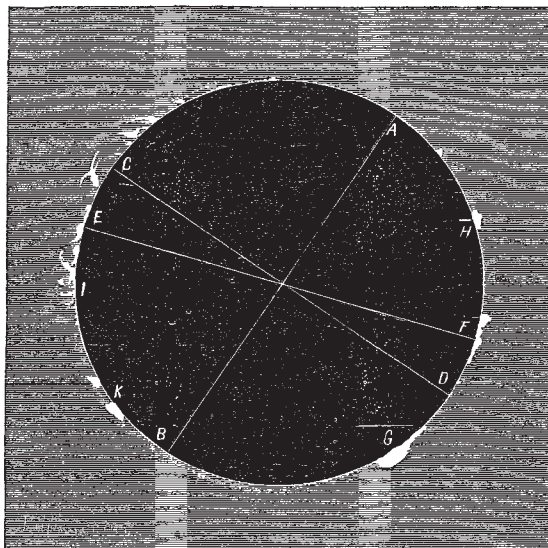


FIG. 2.—Copy of a photograph of the Eclipse of August 7, obtained by Professor Mortor's party

The Government, the Railway and other companies, and private persons threw themselves into the work with marvellous earnestness and skill; and the result was that the line of totality was almost one continuous observatory, from the Pacific to the Atlantic. We read in *Silliman's Journal*, “There seems to have been scarcely a town of any considerable magnitude along the entire line, which was not garrisoned by observers, having some special astronomical problem in view.” This was as it should have been, and the American Government and men of science must be congratulated on the noble example they have shown to us, and the food for future thought and work they have accumulated.

J. NORMAN LOCKYER

Since writing the above, I find the following independent testimony in favour of Dr. Frankland's and my own notion of the corona in the *Astronomische Nachrichten*, from the pen of Dr. Gould. He says:—“Its form varied continually, and I obtained drawings for three epochs at intervals of one minute. It was very irregular in form, and in no apparent relation with the protuberances on the sun, or the position of the moon. Indeed, there were many phenomena which would almost lead to the belief that it was an atmospheric rather than a cosmical phenomenon. One of the beams was at least 30' long.”

MADSEN'S DANISH ANTIQUITIES

Antiquités préhistoriques du Danemark. By M. Madsen. Folio, pp. 19, with 45 engraved plates, some coloured. Price 36s. (London: Williams and Norgate.)

THIS work contains forty-five carefully executed plates of Danish Antiquities belonging to the Stone age. The first represents the Shellmound of Fannerup; a difficult subject, very faithfully rendered, as the present writer can testify. The three following plates give the common and characteristic objects of the Shellmounds. Then follow ten plates devoted to tumuli and dolmens. These are admirably executed, those of the great chambered tumulus at Uby being particularly successful. Plates xv. to xx. give

certain remarkable "finds." These are very interesting, 50 objects discovered together being more instructive than 500 found separately. On the remaining plates are represented the most characteristic Danish forms, as well as many unique specimens. The work is devoted to the Stone age (the Bronze age portion, though commenced, not being yet completed), but it must not be supposed that all the specimens of stone implements here figured necessarily belong to the Stone age, although the great majority no doubt do so. It cannot, however, be too often repeated that many stone implements were in use during the Bronze age.

Everyone looking even cursorily at these plates must be struck by the excellence of the Danish flint, and the wonderful mastery which had been acquired over it. The daggers, for instance, represented in Pl. xxxv. are extraordinary instances of skill in flint chipping, and it must be confessed that such masterpieces could hardly be found in any country but Denmark.

It will be observed also that all the specimens figured belong, or may have belonged, to the Neolithic or second Stone period; there is not in the whole series, nor I believe is there in any of the great Danish museums, a single specimen of the characteristic Paleolithic forms. The rarity of the reindeer and of the mammoth renders this still more significant. We suppose that no one could look through these plates and yet retain any doubts as to the important part played by stone, and especially flint implements, in ancient times; though we must confess that we once showed our collection to a lady, who remained incredulous almost to the last, until we came to a drawer containing a roe deer's horn, which she at once said was evidently of human workmanship, and showed much skill.

The letterpress attached to the plates is confined to twenty pages, of which nine contain an introduction, the rest giving descriptions of the plates. It would, we admit, have been scarcely worth while to describe each specimen figured, but we regret that, excepting as regards the first few plates, no information is given as to the localities in, and the circumstances under, which they were discovered.

The introduction represents very fairly the general opinion of Danish archæologists, and with it we in the main concur. M. Madsen points out that the large, chambered, tumuli never contain metal, and, like Steenstrup, he doubts whether during that period the inhabitants of Denmark had any other domestic animal than the dog. No doubt some modern races, for instance the Polynesians, present this condition; but then their islands contained no cattle or sheep. It is, we think, very improbable that a people capable of such considerable constructions as the chambered tumuli, would not have tamed the wild cattle of the country.

Neither can we agree with M. Madsen and the Danish antiquaries in fixing the commencement of the Danish Iron age so late as the third century. We know that in southern Europe the use of iron commenced several hundred years earlier, and the great similarity of the bronze weapons all over Europe indicates clearly, we think, that they belonged to one and the same period. We cannot but think that the use of iron, when once discovered, would have spread rapidly over Europe, though it would, no doubt, have remained scarce in a comparatively poor country, as Denmark then was.

Lest our readers should suppose that a book containing more than forty beautifully executed plates must necessarily be very expensive, we may mention that the price is only 1*l.* 16*s.* We heartily thank M. Madsen for this valuable addition to our Archæological Libraries.—JOHN LUBBOCK

NEWMAN'S BRITISH MOTHS

An Illustrated Natural History of British Moths. By Edward Newman, F.L.S. F.Z.S. &c. Large 8vo. pp. 486. (London: W. Tweedie.)

A HUNDRED years ago, or perhaps even less, a man who displayed a fondness for collecting insects was commonly regarded as a weak-minded individual, whose power of managing his own affairs, although it might in charity be conceded by his neighbours, was at least somewhat doubtful. To use the old Scotch phrase, he was supposed to have "a Bee in his bonnet," because he liked to have a Butterfly under his eyes.

In the present day, although many people may be found who cannot see the use of such pursuits, one runs no risk of a commission *de lunatico*, on account of a predilection for moths or beetles; and if we may judge from the articles provided for the delectation of the multitude in our popular journals, natural history subjects, including entomology, form a not unattractive portion of their bill of fare.

The fact is, that the *cacœthes colligendi* is one of the commonest affections of humanity, and there are few forms of the disease more harmless than the entomological one. Pictures and statues, books, prints and old china, call for a very considerable expenditure of hard cash, if it is desired to form ever so small a collection of any of them; but the insect-collector generally brings his treasures together by the labour of his own hands, and his boxes and pins do not cost much. Moreover, the collector of insects can hardly avoid learning something of the structure and habits of the objects of his pursuit—a knowledge which must have a favourable effect upon his own mind, and may frequently enable him to be serviceable to his neighbours.

Mr. Newman's "History of British Moths," which is now completed so far as the larger forms are concerned, is admirably adapted to favour these desirable objects; it not only furnishes good descriptions of the British species of moths, but gives an account of their habits in all stages of their existence. This book, which forms a handsome octavo volume, will be welcomed with enthusiasm by numbers of young entomologists in all parts of the country, as it gives them, in a convenient and intelligible form, pretty nearly all that can be told about the great group of insects of which it treats. It has another claim upon their attention also in the admirably executed woodcuts with which it is illustrated. Mr. Newman has given figures of every species, in many cases of both sexes of the species, and sometimes of their most prominent varieties, and these figures, although from their nature they are only in black and white, have been so carefully drawn, and so admirably cut, that the want of colour is hardly felt.

We reproduce here two of the cuts, which will show how effective the illustrations are. To the country entomologist working at a distance from any library, whence he can obtain the expensive illustrated works in which