

was testing. The effects varied from no deviation or slight, to cases where the needle swung completely round while still a foot or two away. Among the strongest noted were some crags north of Kynance Cove, and some on a headland about a quarter of a mile south of Coverack, both consisting of serpentine. Any one whose holidays take him to a rocky neighbourhood, may find interest in carrying out similar observations.

Cockfield, July 28.

E. HILL.

The Aurora Australis.

THE following report of a brilliant Aurora, seen in the Indian Ocean, will be interesting to many of your readers:—

THE AURORA AUSTRALIS.—When sailing along the Indian Ocean from the Cape of Good Hope to Australia, and in about the vicinity of St. Paul's Island, longitude $76^{\circ} 17'$ east, latitude $4 1^{\circ} 22'$ south, an Aurora Australis of remarkable grandeur was seen by those on board the ship *Isle of Arran*. Describing it yesterday, Captain Carse said his chief officer and he had a beautiful view of the phenomenon on two nights (April 28 and 29). It was a very fine sight, the streams of light in spraylike form shooting upward for fully thirty degrees, lighting up with wonderful brightness the whole southern part of the heavens. Some very bad weather was experienced by the ship in the locality of St. Paul's. High confused seas prevailed with a strange continuance of easterly winds.—*Herald*, May 23.

No report was received that this was seen in any part of Australia, and I have seen no report that the brilliant Aurora seen in the northern hemisphere on March 30 was seen in this part of the world.

H. C. RUSSELL.

P.S.—I got position and date from Captain Carse.

Absence of Butterflies.

THE most common butterflies—as, for instance, *Pieris Brassica*, *Coleas Rhamni*, *Vanessa Urtica*—were very rare hereabouts this spring too (*cf.* NATURE, vol. 1, p. 225), and the same has been observed at Frankfort-on-Maine. As for *Pieris*, this scarcity might have been predicted with certainty last autumn, as, here and at Frankfort, the cabbage-plants in fields and gardens were almost exempt from their usual ravagers, the caterpillars of the said species. If the extraordinary dryness of last year's summer should be connected with these facts, it cannot have acted through the damage done to the food-plants, but must have operated more directly upon the insects themselves.

D. WETTERHAN.

Freiburg, July 28.

A STRANGE LIGHT ON MARS.

SINCE the arrangements for circulating telegraphic information on astronomical subjects was inaugurated, Dr. Krueger, who is in charge of the Central Bureau at Kiel, certainly has not favoured his correspondents with a stranger telegram than the one which he flashed over the world on Monday afternoon:—

“Projection lumineuse dans région australe du terminateur de Mars observée par Javelle 28 Juillet 16 heures Perrotin.”

This relates to an observation made at the famous Nice Observatory, of which M. Perrotin is the Director, by M. Javelle, who is already well known for his careful work. The news therefore must be accepted seriously, and, as it may be imagined, details are anxiously awaited; on Monday and Tuesday nights, unfortunately, the weather in London was not favourable for observation, so whether the light continues or not is not known.

It would appear that the luminous projection is not a light outside the disc of Mars, but in the region of the planet not lighted up by the sun at the time of observation. The gibbosity of the planet is pretty considerable at the present time. Had there been evidence that the light was outside the disc, the strange appearance might be due to a comet in the same line of sight as the planet. If we assume the light to be on the planet itself, then it must either have a physical or human origin; so

it is to be expected that the old idea that the Martians are signalling to us will be revived. Of physical origins we can only think of Aurora (which is not improbable, only bearing in mind the precise locality named, but distinctly improbable unless we assume that in Mars the phenomenon is much more intense than with us), a long range of high snow-capped hills, and forest fires burning over a large area.

Without favouring the signalling idea before we know more of the observation, it may be stated that a better time for signalling could scarcely be chosen, for Mars being now a morning star, means that the opposition, when no part of its dark surface will be visible, is some time off.

The Martians, of course, find it much easier to see the dark side of the earth than we do to see the dark side of Mars, and whatever may be the explanation of the appearances which three astronomers of reputation have thought proper to telegraph over the world, it is worth while pointing out that forest fires over large areas may be the first distinctive thing observed on either planet from the other besides the fixed surface markings.

THE INTERNATIONAL GEOLOGICAL CONGRESS.

THE sixth meeting of this Congress will be held at Zurich, commencing on August 29. The Congress was founded at Philadelphia in 1876, the first meeting being held at Paris in 1878; subsequent meetings have been—Bologna, 1881; Berlin, 1885; London, 1888; Washington, 1891. As one result of discussions at the Paris meeting, committees were appointed in different countries to draw up reports on classification, nomenclature, &c. At Bologna these reports were received and discussed, the greater part of the time being thus spent. An additional committee was then appointed to prepare a geological map of Europe; this work is still in progress, but the committees on nomenclature, &c., have practically lapsed, and but little attention has been paid to such subjects at the more recent meetings. At the Washington Congress a committee was appointed to report on the Bibliography of Geology. Lists of bibliographies for each country were to be prepared, and printed in the report of the Washington meeting; but the volume has recently appeared without such lists. It is hoped that the committee will submit a report on this important subject at Zurich.

Prof. E. Renevier, of Lausanne, is nominated President of the Zurich meeting. He has been an active member of the Congress from the commencement, and the excellent arrangements for the forthcoming meeting are no doubt largely due to his powers of organisation. Prof. A. Heim, of Zurich, is Vice-President; Prof. H. Golliez, of Lausanne, is Secretary; M. C. Escher-Hess, of Zurich, is Treasurer. This apparently exhausts the list of officers of the organising committee, democratic Switzerland dispensing with “president of honour,” “honorary members of committee,” &c., which have largely figured in the lists of previous Congresses, even in that of Washington. Not having such honorary lists upon which to draw for funds, the subscription for membership is double that previously charged, but is even now only 25 francs.

The arrangements made for the Zurich meeting differ somewhat from those of previous sessions. There will be no formal discussion on nomenclature, classification, &c.; but, after transacting general business, the Congress will divide into three sections, meeting simultaneously. The subjects for discussion will be: (1) General and Tectonic Geology; (2) Stratigraphy and Palæontology; (3) Mineralogy and Petrography. Amongst the papers

promised are: K. von Zittel, Palæontology; M. de Bertrand, Structure of the Western Alps; A. Heim, Geology of the Environs of Zurich; A. Michel-Lévy, the Unification of Petrographical Nomenclature; E. Suess, Tectonic Geology. There will also be papers on glacial geology; and Captain Marshall Hall will submit a proposal for an international survey and record of glaciers.

At the Zurich meeting, however, papers and discussions will form but a comparatively small part of the work. Excursions have always played a prominent part in the arrangements for the various meetings; but hitherto they have been mainly made after the close of the Congress. At Zurich the Congress will practically divide into five excursion sections, starting on September 3, traversing the Alps in different directions, and all converging on Lugano, where the closing meeting will be held on September 14. These excursions would alone make the Zurich meeting memorable; they have been planned to include the most interesting districts of the Swiss Alps, and to facilitate the study of many intricate problems concerning the structure of the mountains and the petrographical nature of the rocks. After investigation of the northern flanking ranges of folded secondary rocks, the central crystalline zone will be crossed, and in some cases glacial phenomena can be well studied. Prof. Heim will conduct a party over the country which he has so well described, starting from St. Gall and crossing the Alps of Glarus, the Vorder Rhein, and the eastern Lepontine Alps; Prof. Schmidt will conduct the party from Schwyz over the St. Gotthard; Prof. Baltzer, starting at Lucerne, will take a line some miles further west; Prof. Schardt, starting at Bulle, will traverse the western end of the Bernese Alps and part of the Pennine Alps, and will reach Lugano by the Simplon. These four excursions are for pedestrians only, and those only are invited who are accustomed to long walks and climbing, hard beds, and frugal living. A more elaborate circular tour in the Alps will be conducted by MM. Ruffieux and Ruchonnet, of Lausanne; this will traverse a wider district, and the work will be done with less fatigue. Profs. Renevier and Golliez will be the scientific directors of this tour.

Supplementary excursions will start from Lugano after September 14, one of which, conducted by Profs. Brückner, Du Pasquier, and Penck, will study the glacial phenomena of the Italian Lakes, thence by the Tyrol to Munich, and finally to the Lake of Constance.

Before the Congress there will be excursions in the Jura—five for pedestrians—as follows: French Jura, M. Schardt; Vaudois Jura, M. Jaccard; Bernese Jura, M. Rollier; Bâle and the Argovian Jura, M. C. Schmidt; Argovian Jura and Soleure, &c., M. Murlberg. There will also be a long circular tour in the Jura by MM. Ruffieux and Ruchonnet, with MM. Renevier and Gollitz as scientific directors; the latter part of this will be much devoted to glacial questions, and will therefore be preparatory to the special glacial excursion starting from Lugano.

Arrangements have been made for inclusive charges for all these excursions. For the pedestrian tours, they are 50 or 60 francs for the Jura excursion of five or six days each, and 300 francs for the circular Jura tour of fourteen days.

For the longer excursions in the Alps, after the Congress, the prices are from 150 to 250 francs for the pedestrian tours of eight to thirteen days, and 400 francs for the circular tour of thirteen days.

A guide-book to the various excursions is in preparation. This will contain about 300 pages of text, and will be amply illustrated by plates and sections; it will form a most useful handbook to the geology of Switzerland. A new geological map will also be published, on the scale of 1 : 500,000; this will be a reduction of the official maps of the Swiss Geological Survey, which is now completed.

Special guide-books to the important geological collections at Lausanne and Zurich are in preparation. As usual at such meetings, geological maps and other publications, photographs, specimens, &c., will be exhibited.

W. TOPLEY.

THE DISCS OF JUPITER'S SATELLITES.

THE discussion which is now taking place between two well-known observers—namely, Profs. Pickering and Barnard—as to the forms which the satellites of the planet Jupiter assume at various times, is one not only of absorbing interest, but, moreover, of a nature somewhat delicate, for the bodies in question are so minute as to baffle any but the very best and trustworthy observers. Such observations, then, to be of any value at all, must be either made in the clearest of atmospheres with a moderately large aperture, or in a moderately clear atmosphere with a very large aperture. Considering these two conditions, one would doubtless think that the larger the instrument the more chance there would be of finding out the shape of a body, and with a very clear atmosphere in addition these chances would be very greatly increased. On the other hand, however, we have the facts still in our mind of Schiaparelli's wonderful observing powers, which enabled him to notice the doubling of the canals of Mars with his small aperture long before they were declared "double" by other observers. In this case one would have thought that such an observation would have been more easily observed with large apertures than with the small telescope which was at his disposal.

Let us, however, turn to the facts at hand with regard to the satellites that are now under discussion; but first a few words with regard to the instrumental equipment employed and the observing stations.

Prof. Pickering's observations have been made at the Observatory that is situated near Arequipa, in Peru, at an altitude of more than eight thousand feet, where the sky during a large part of the year is nearly cloudless. The telescope employed has shown that there is a remarkable degree of steadiness in the atmosphere, and night after night atmospheric conditions prevail, which, as he says, "occur only at rare intervals, *if ever*, in Cambridge." Several of the diffraction rings surrounding the brighter stars are visible, close doubles in which the components are much less than a second apart are readily separated, and powers can be constantly employed which are so high as to be *almost useless* in Cambridge. In fact, he says that in many researches the gain is as great as if the aperture were doubled. The aperture of the refractor employed is 13 inches.

Prof. Barnard has made his observations, on the other hand, with the now well-known 36-inch refractor of the Mount Hamilton Observatory, a description of which here would be unnecessary; suffice it to be mentioned that Prof. Burnham has increased the number of double stars by about 200 during his brief use of this instrument, most of which are beyond the reach of the majority of telescopes.

Turning now to the observations of the satellites themselves, we find the first account of Prof. Pickering's observations in the March number of *Astronomy and Astro-Physics* for the year 1892.

On October 8, a series of measurements was made of the diameters of the satellites. On the next evening it was noticed that the disc of the first was not circular but very elliptical. Early observations on the tenth confirmed the measurements made on the eighth, but after an examination of the other satellites the first was again measured, when, as Prof. Pickering says, "to my astonishment, instead of showing an elliptical disc, it showed one that was perfectly circular, precisely like the