

et quelquefois de la moitié du corps hors de l'eau. Elle était ronde et épaisse et paraissoit plus massive que nos plus grandes vaches. . . . Un de nos matelots nous assura que ces animaux avoient les pieds, comme vous pouvez voir dans la figure que voici."

This figure, however, except for the toes, which resemble fins or webbed feet, is unmistakably the hippopotamus! (See "Voyage et Aventures de François Leguat," vol. i. p. 35; Londres, 1708.) Leguat did not apparently consider it a manatee, for on p. 93 he gives a full description, with plate, of the lamentin or manati, which "se trouve en grande abondance dans les mers de cette Isle" (Rodriguez). The skin is "noirâtre."

Père Tachard plainly calls the hippopotamus the *vache marine*—he is speaking of the Cape: "on voit dans les grandes Rivières un animal monstrueux, qu'on appelle Vache Marine, et qui égale le Rhinocéros en grandeur" ("Voyage de Siam," vol. i. p. 78; Amsterdam, 1688). The plate accompanying is the hippopotamus, and we know that the Dutch colonists have always called this pachyderm the "zee-koe."

Kolbe ("Caput bonae spei hodiernum," p. 167, Nürnberg, 1719) speaks of the "zee kuh," the "meer kuh," the "zee pferd," and the "kuh fisch," all of which he appears to consider different names for the hippopotamus, notwithstanding that "in dem Tartarisch meere grosse Küh-Fische schwemmern, die grosser als unsere Kühe in Europa waren, aber weder Schuppen noch Hörner hatten." This must be the dugong, surely.

Bogaerts ("Asia," p. 105; Amsterdam, 1711) distinguishes between "zee-paarden" and "zee-koiën."

Dampier's mention of the manatee is probably well known:—"While we lay here (Blewfield River, between the Nicaragua and Veragua Rivers) our Moskito men went in their canoa and struck us some manatee or sea cow. Besides this Blewfield River I have seen of the manatee in the Bay of Campeachy, on the coast of Bocca del Drago and Bocca del Toro, in the River of Darien, and among the South Keys or little Islands of Cuba. . . . I have seen them also at Mindanae, one of the Philippine Islands, and on the coast of New Holland." Then follows a full description (see Dampier's "Voyage Round the World," vol. i. p. 33 *et seq.*, also pp. 2, 9, 41, 381, 463, and 547; London, 1729). Dampier also points out that the so-called manatee of St. Helena is really a "sea-lion."

Cape Town, August 4

W. HAMMOND TOOKE

Time Reform in Japan

THE following communication may perhaps interest your readers.

On my return home from America and Europe, I presented a report on the resolutions of the International Meridian and Time Congress, held at Washington last year, to which I was sent as a delegate. A Committee was appointed to discuss the matter contained in my report, and reported favourably. The following decree was issued on July 12, 1886, under the Imperial seal:—

(1) The meridian passing through the centre of the transit instrument at the Observatory of Greenwich shall be the initial meridian for longitude.

(2) Longitude shall be counted from this initial meridian in two directions up to 180°, east longitude being + and west longitude -.

(3) On and after the first day of the first month of the twenty-first year of Meiji (January 1, 1888), the time of the meridian of 135° E. shall be used as the standard time throughout the empire.

D. KIKUCHI

Science College, Imperial University, Tokio, Japan

Tremblement de Terre du 5 Septembre

L'ÉBRANLEMENT des couches terrestres, qui peut être considéré comme la suite du tremblement du 27 août, a eu son centre dans le Piémont, dans les environs de Suze, au pied du Mont-Cenis. Le phénomène a été composé des secousses suivantes, qui ont toutes été très-faibles dans la Suisse.

Secousses préparatoires. 4 septembre, 11h. 35m. soir (heure de Berne) Colombier (Neuchâtel); 5 septembre, 8h. 16m. soir, Briançon (Hautes-Alpes, France).

Grande secousse. 5 septembre, 8h. 55m. soir. Nous en avons des observations de Bienne, Berne, Lausanne, Morges, Genève, Vevey, Aigle, Villars-sur-Ollon, Bex, Mouthey, Troistorrens, Sion, Savièse.

Secousses consécutives. 5 septembre, 11h. 55m. soir, Genève; 6 septembre, 4h. 10m. matin, Mouthey (Valais); 7 septembre, 4h. 43m. matin, Genève. F.-A. FOREL
Morges, 12 septembre

Lunar Rainbow

A BEAUTIFUL lunar rainbow was plainly visible here for a few moments last evening. The eastern sky being clear, the moon looked fully out from behind dark clouds in the west at a moment when rain was falling lightly. Turning quickly away from her light, in the hope of seeing a bow, I was not disappointed. A semicircle of pale, whitish light, was projected against the eastern sky, much smaller in diameter, apparently, than a sun-bow, and without any traces of colour.

Reflecting on the circumstance that repeated efforts have never, previously, enabled me to see a lunar bow, although the conditions necessary for its formation are common enough, I am tempted to think that the phenomenon can only be seen when the atmosphere is unusually clear. The light issuing from the bow is so faint that the slightest mistiness of the air intervening between itself and the spectator is probably sufficient to, practically, extinguish it. Last night the air here and over the Channel was extraordinarily pellucid, lights on the French coast which are hardly ever seen being plainly visible, while others, nearer neighbours, flashed with most unusual brilliancy.

D. PIDGEBON

Arthur Villa, Hythe, Kent, September 6

Aurora

THE aurora seen in Ireland on July 27, and described in NATURE, August 5, p. 312, was visible in this vicinity. It was the finest observed thus far this year, with the exception of that of May 8. Other dates on which the aurora has been seen in this locality recently are as follows: June 29, June 4, and April 14. It has been noted that these appearances of the aurora have been coincident with the return of the disturbed area on one side of the sun (see NATURE, July 22, p. 278), and likewise with widespread and violent storms.

Lyons, New York, August 25

M. A. VEEDER

THE SOLAR ECLIPSE OF AUGUST 29

THE following communication, dated Grenada, September 5, is published by the *Times* from its correspondent with the Eclipse Expedition. It should be compared with the communication made by Prof. MacAlister to Section A at the Birmingham meeting of the British Association (NATURE, September 9, p. 441), and with the article in the same number (p. 437), describing the arrangements for observation.

"The observations of the corona during the last two eclipses, including that observed in Egypt, have been confirmed by the present. Capt. Darwin's observations with the coronagraph seem disappointing, the glare of irradiation from the body of the sun, and not the true corona, being visible on his plates. The bright lines seen in the spectra of the prominences are displaced in such a direction as to prove that there is in them a downrush of gas towards the sun.

"The curious prolongation of the corona observed on several previous occasions to occupy the sun's equatorial plane, does not appear in any of the photographs taken, though it was visible at all the stations except Mr. Lockyer's."

PHOTOGRAPHY OF THE SOLAR CORONA

UNDER the above title we have received the following communication with reference to the results of the recent eclipse observations:—

Accounts have appeared in your journal of my attempts to photograph the corona of the sun without an eclipse. Many of the plates obtained presented appearances which seemed not to myself only, but to several scientific men who must certainly be con-

sidered to be amongst those who are exceptionally competent to give an opinion on this point, to be most probably due to the corona. Plates taken in England about the time of the eclipse of May 6, 1883, and drawn by Mr. Wesley before any information reached this country of the observations of the eclipse, presented not only a general resemblance to those taken during the eclipse, but showed the remarkably-formed rift on the east of the sun's north pole which is the main feature of the corona, as photographed at Caroline Island. It is true that since the summer of 1883 I have not been able to obtain in England photographs which show satisfactory indications of the corona; but the abnormally large amount of air-glare from finely-divided matter of some sort, which has been present in the higher regions of the air since the autumn of 1883, might well be considered a sufficient cause of the want of success. This well-known state of the sky rendered the plates taken by Mr. Ray Woods in Switzerland in the summer of 1884 inconclusive as to the success of the method. During the past year photographs of the sun have been taken at the Cape of Good Hope, and are under discussion by Dr. Gill.

Such was the state of things before the eclipse of August 29. The partial phases of this eclipse furnished conditions which would put the success of the method beyond doubt if the plates showed the corona cut off partially by the moon during its approach to and passage over the sun. As the telegrams received from Grenada and a telegram I have this day received from Dr. Gill at the Cape of Good Hope state that this partial cutting off of the corona by the moon is not shown upon the plates, I wish to be the first to make known this untoward result. I regret greatly that a method which seemed to promise so much new knowledge of the corona, which under ordinary circumstances of observation shows itself only during total eclipses, would seem to have failed. At the same time, I am not able to offer any sufficient explanation of the early favourable results to which I have referred briefly in the opening sentences of this letter.

WILLIAM HUGGINS

Upper Tulse Hill, S.W., September 11

In reply to a similar communication which appeared in the *Times*, Mr. A. A. Common writes to that journal as follows:—

"Dr. Huggins, in his letter in to-day's issue, seems to consider that the failure to get a picture of the moon projected on the corona of the sun during the partial phases of the last eclipse is fatal to his method of photographing the corona; but it is quite possible, and, indeed, probable, that this is due entirely to the state of the sky, for against such unfavourable negative as this we have the positive evidence that the moon has been seen so projected in various solar eclipses, and in one case it has been so photographed. This was by Liáis, at Paranagua, in 1858, under conditions that were not, as far as concerns the processes employed, nearly so favourable as those now in use. This single piece of positive evidence, if correct, is of vital importance in showing that the present failure is probably due only to such temporary causes as have prevented Dr. Huggins getting lately such promising plates as those he obtained in 1883.

"Ealing, September 13 "A. A. COMMON"

THE RECENT AMERICAN EARTHQUAKE¹

THE author gave a brief account of the earthquakes in Eastern Europe of August 27, which seem to have travelled eastwards from Malta to the south of Italy.

¹ "Notes on the Recent Earthquake in the United States; including a Telegraphic Despatch from Major Powell, Director of the United States Geological Survey." Read at the British Association by W. Topley, F.G.S., Geological Survey of England, President of the Geologists' Association.

It is a curious coincidence that the first important indications of earthquake disturbance in the United States took place on that date, when the geyser of the Yellowstone spouted forth and when the first moderately severe shock at Charleston occurred. The principal shock was on Tuesday night, August 31. This is the one which has done most damage, and which was felt over a wider area than any previously recorded in North America. It has, however, been succeeded by shocks, fortunately of less intensity, which have been felt over a still wider area. The later shocks of Thursday and Friday were felt in Nevada and California.

The author gave a description of the earthquake, founded upon the newspaper telegrams and upon a telegraphic despatch which Major Powell had kindly forwarded at the author's request. The latter is as follows:—

"The earthquake is the most severe on record in the United States, and affected the greatest area. Origin along line of post-Quaternary dislocation on the eastern flanks of the Appalachian, especially where it crosses central North Carolina. There were slight premonitory shocks in the Carolinas for several days, moderately severe shocks occurring near Charleston on August 27 and 28. The principal shock, causing great destruction in Charleston, originated in central North Carolina on August 31, 7.50 p.m., 75th meridian time. Thence the shocks spread with great rapidity in all directions, with velocity varying from 25 to 65 miles a minute, over an area of 900,000 square miles, or one quarter of the United States—from the Gulf of Mexico to the Great Lakes and Southern New England, and from the Atlantic seaboard to the Central Mississippi Valley. In the Carolinas it was accompanied by landslides, crevasses, and great destruction of property. Half of Charleston is in ruins; about 40 lives were lost. No sea-wave has yet been reported. A second moderately severe shock occurred at Charleston at 8.25 a.m. September 1. Minor shocks followed at increasing intervals. The principal shock was felt over this vast area in intervals of 15 minutes, and recorded at some principal points on a scale of intensity of 5 as follows:—Raleigh, 4, 9.50 p.m.; Charleston, 5, 9.54; Cedar Keys, Florida, 2, 10.05; Knoxville, 3, 9.55; Memphis, 4, 9.55; St. Louis, 1'2, 10.00; Milwaukee, 3, 10.06; Pittsburg, 4, 10.00; Albany, 2, 10.00; Springfield, Mass., 1, 10.00; New York, 2, 9.53."

Prof. Carvill Lewis has studied a previous earthquake in the North-Eastern States. This ranged along the north-eastern flanks of the Appalachian Chain. The author described the structure of Eastern North America, and the lines of old earth-movements therein to which both earthquakes seem to be related.

The local phenomena of the recent earthquake may be summarised as follows:—Fissures were formed, some running north to south, some east to west, out of which mud and sand were ejected. Several telegrams speak of stones falling from the air, which (if true) must previously have been ejected from such fissures. No tidal wave has been recorded, nor has any alteration of level of land or depth of sea occurred, although the earthquake was noticed at sea off Charleston; but some passing disturbance of the water seems to have occurred at Sullivan's Island near Charleston, for the high water spoken of could not be a spring tide, as the tides then were the neap tides. The accounts agree in the earthquake being accompanied by rumbling noises. Accounts differ as to the direction of the vibratory movement, but it was probably from the south or south-south-west to north or north-north-east, both at Charleston and New York. As usual in earthquakes, wells and springs have been affected; some dried up, whilst water has appeared where before there was none. The natural gas wells of Pennsylvania have been affected, and the supply much diminished. Perhaps the most interesting phenomenon is the