

Academy of Sciences will be found of interest as bearing on this question. Writing from Rome on the 27th of August, he says (*Comptes Rendus*, p. 613):—"On the 15th of this month we had an Aurora Borealis by day, at ten o'clock in the morning up to midday. The magnetometers were greatly disturbed, and in the heavens at half-past ten appeared an arch of light cirrus clouds, stretching from N.N.W. to N.E., and crowned along the whole of its contour by numerous and fantastic rays (*jets filamenteux*). The forms of these rays so perfectly resembled those of the solar protuberances that some of the drawings of them might easily be mistaken for drawings of solar protuberances even by people well accustomed to these observations."

Merton College, Oxford

J. P. EARWAKER

Meteor

LAST night, Oct. 9-10, about midnight, G.M.T. a meteor was seen by my wife in the S., considered by her to rival the brightness of Venus, and describing a path which was so carefully sketched by her immediately afterwards as to form a possible basis of comparison; and which therefore may be thought worthy of insertion in NATURE. It seems to have become visible near ζ Ceti, probably rather *near* that star (which, however, was not noticed by her through a dewed window-pane), and to have passed with a slow motion and a yellowish light, in a path somewhat convex towards the zenith, in the direction of β Ceti, before reaching which it vanished. For about three-fifths of its course it preserved the same aspect, as of a ball of light with sparklings round it, and some appearance of a train; but in its further progress it seemed to waste away to extinction.

T. W. WEBB

Hardwick Vicarage, Herefordshire; according to Ordnance Map, long. W. 3h. 4m. 23s., lat. N. $52^{\circ} 5' 20''$.

Fossil Oyster

I HAVE recently noticed a fossil oyster, in what Sir C. Lyell calls the Lower Miocene, or Hampstead beds. Can you, or any of your readers inform me if it has been noticed before. I can find no mention of it, in any work within my reach. I have been a subscriber, from your first number; and have observed the kind notice you have extended to other inquirers, and have thus been emboldened to trouble you.

INQUIRER

N.B.—I have no pretensions to science, or any scientific acquaintance, being merely a solitary observer.

AN ELECTRICAL BAROGRAPH

I HAVE recently designed a barograph, a brief account of which may be interesting to your readers. The advantages claimed are:—

That the record may be seen as it is going on.

That it is quite as, if not more sensitive than, the photographic barograph, and the scale is larger.

That no time is lost preparing the paper, printed forms answering the purpose.

That the first cost and cost of working are both much less than in the photo-barograph.

A photograph has been taken which shows the instrument in working order, with part of a day's record shown on the cylinder.*

The cylinder is ten inches long, and eight inches in diameter, allowing for one inch per hour of paper.

The clock, or governor, is connected by a bar to a movable inclined plane, this is again connected by a bar to the long wire parallelogram which carries the pen, and the clock, by means of an eccentric, causes the inclined plane, and with it of course the pen frame, to move backwards and forwards once every minute. The wire frame is guided by four brass friction wheels, attached to a brass frame having motion up and down only; under it are the coils of an electromagnet, the armature of which is attached to the brass frame. So long as no electricity passes through the coils the brass frame is thrown up by a small spring high enough to lift the pen off the paper.

* A photograph and section were obligingly forwarded by the author with his description.

The barometer tube is an ordinary glass one 0.58 in diameter, and is fixed firmly to the case. Its cistern is a small glass one, one inch in diameter, and cemented to a brass arm hinged to the left side of the case, and which allows it perfectly free motion up and down, but not sideways. From this cistern projects a very light arm, also hinged, and bent at the end so as to extend over the inclined plane. One wire of the battery is attached to the cistern arm, and the other, after passing round the magnet, to the inclined plane. As soon, then, as these two parts touch, the electro-magnet brings down the brass frame, and with it the pen, on to the papers which at once begins to mark, and continues to do so until the motion of the clock draws the inclined plane from the cistern arm, and so breaks the contact; the pen remains off the paper until, by the motion of the clock, the inclined plane is brought to touch the projecting cistern arm, when the pen at once begins to write. As the barometer, when the pressure increases, must draw the mercury for its increased height from the floating cistern, the cistern becomes lighter, and rises with it, and the smallest motion may be made sensible by altering the inclination of the moving inclined plane. The accuracy of the motion of this plane is secured by making it work on two fine steel points—the same motion, in fact, as that given to the cutter of a dividing engine. The cistern floats in a reservoir of mercury.

The pen is a syphon pen, supplied with *thin* ordinary writing ink.

H. C. RUSSELL

Sydney Observatory, Aug. 10

BEAUFORT'S WIND SCALE AND THE BOARD OF TRADE*

THE Board of Trade have recently issued instructions to Receivers of Wreck and Officers of Coastguard, with reference to Beaufort's Wind Scale, so that one uniform construction should, as far as possible, be placed upon the wind scale by them. In the Circular the following passage occurs:—

"The Board of Trade are led to think that different constructions are placed by different persons upon the scale known as Beaufort's scale. In illustration, it may be remarked that the higher forces, 11 and 12, are, as the Board learn from the Meteorological Committee, scarcely, if ever, reached in the British Isles. Force 12, which is intended to represent a West India hurricane, the velocity of which is 80 miles per hour and upwards, has been reached only twice in four years on the coasts of the United Kingdom; notwithstanding high winds prevailing at the time of a wreck are frequently described by the ships' officers as storms or hurricanes."

It is here taken for granted that the positions of the anemometers of the Meteorological Committee are such as to record observations of wind fairly comparable with those felt at sea; and also that the anemometers are constructed to record those velocities of the wind which are applicable to the case in hand.

It is not stated how the two instances of velocity of 80 per hour and upwards were ascertained. Since, however, the space traversed or recorded by the anemometers at the observatories of the Meteorological Committee can scarcely be measured for a shorter period of time than 15 minutes, it may be assumed that on two occasions, and only on two occasions during four years, have the anemometers been noted to record a velocity of 20 miles or upwards in 15 minutes—that is, a velocity at the rate of 80 miles an hour or upwards. If the tracings of the Hemispherical Cup Anemometer could be read off for so short a period as five minutes, many instances of 80 miles an hour, and even several velocities of 100 miles an hour and upwards, could be taken from the records of these four

* See Circular, No. 558.

years in the Meteorological Office. Indeed, a careful inspection of the lines of wind velocity published in the Committee's Quarterly Reports renders this supposition extremely probable.

During high winds it is well known that the wind does not blow with a uniformly high velocity, but that there occur frequent gusts of comparatively brief duration, many of the heaviest being, indeed, all but instantaneous. Thus the anemometer may indicate a velocity at the rate of no more than 60 or 70 miles an hour, but during the time there may have occurred 20 or 30 sudden gusts quite equal to the Force 12 of Beaufort's scale. Now, it is these repeated heavy gusts which cup-anemometers do not record that sailors have to provide against in the management of their ships. Hence it happens that while at observatories on land, provided only with cup-anemometers, no greater velocities than 60 or 70 miles an hour can be noted, in ships at sea, what the seaman has actually to deal with are velocities of 80 or 100 miles an hour. He accordingly enters these high pressures in his log.

It is evident that the Board of Trade are not in a position to give the assistance to sailors which they are seeking to give, till pressure-anemometers have been established at their observatories.

The Circular contains this very judicious remark:—"The Board desire to impress upon Receivers and Officers employed in reporting casualties, that the direction and force of the wind at the time of a casualty should be ascertained as accurately as possible, and that therefore these particulars should not be inserted without every precaution being taken to insure that they are in accordance with fact." It only remains that the Board of Trade furnish each Receiver and Officer with a simple pressure-anemometer, having a scale, 0 to 12, agreeing as nearly as possible with Beaufort's scale, and so constructed as to show the pressure at the time of observation, and to register maximum pressures, so that the officials may be put in a position to carry out the instructions of the Board.

SCIENCE AT OXFORD AND CAMBRIDGE

THE following courses of lectures are arranged for the ensuing term at the University of Oxford:—

Mr. R. B. Clifton, Professor of Experimental Philosophy, on "Optical Instruments and Physical Optics;" beginning Saturday, the 19th of October. The Physical Laboratory of the University will be open daily for instruction in practical physics from 10 to 4 o'clock on and after Thursday, the 17th of October.

Mr. J. O. Westwood, Hope Professor of Zoology, proposes to form a class for the study of the structure and classification of articulated animals.

Mr. W. Odling, Professor of Chemistry, on "The Succession of Chemical Ideas;" beginning Thursday, October 17. There will also be an explanatory and catechetical lecture on Tuesdays at 11 o'clock, to commence on Tuesday, October 22. The laboratory of the University will be open daily for instruction in practical chemistry from 9 A.M. to 3 P.M. on and after Monday, October 14. In addition to this two courses of instruction will be given in the laboratory—a course on the methods of quantitative analysis, and a course of elementary practical instruction in chemical manipulation, intended for those commencing the study of chemistry.

Mr. G. Rolleston, Linacre Professor of Anatomy and Physiology, on "Human Anatomy and Physiology, with special reference to Ethnology;" beginning Friday, the 18th of October. The work-rooms in the Anatomical Department are open daily from 9 A.M. to 5 P.M. for practical instruction, under the superintendence of Mr. Charles Robertson, the Demonstrator of Anatomy, and Mr. S. J. Sharkey, of Jesus College. A special class will be formed

for instruction in Practical Microscopy. Mr. E. Ray Lankester, of Exeter College, will, as Deputy of the Linacre Professor, give a course of lectures on "The General Classification of the Animal Kingdom," beginning on the 19th of October.

Mr. J. Phillips, Professor of Geology, on "The Successive Conditions of Land and Sea, taken in the order of Geological Time;" beginning Monday, October 28.

The following are also announced in connection with Trinity, St. John's, and Sidney Sussex Colleges, Cambridge:—

On "Electricity and Magnetism (for the Natural Sciences Tripos), by Mr. Trotter, Trinity, commencing Wednesday, Oct. 16. On Chemistry, by Mr. Main, St. John's, in St. John's College Laboratory, commencing Thursday, Oct. 17. Attendance on these lectures is recognised by the University for the Certificate required by Medical Students previous to admission for the first examination for the degree of M.B. Instruction in Practical Chemistry will also be given. On Palæontology (the Protozoa and Cœlenterata), by Mr. Bonney, St. John's, commencing Thursday, Oct. 17. On Geology, (for the Natural Sciences Tripos. Preliminary matter and Petrology), by Mr. Bonney, St. John's, commencing Wednesday, Oct. 16. A course on Physical Geology will be given in the Lent Term, and on Stratigraphical Geology in the Easter Term. On Botany (for the Natural Sciences Tripos), by Mr. Hicks, Sidney, beginning on Thursday, Oct. 17. The Lectures during this term will be on the Morphology of Phanerogamia. Mr. Hicks will also give examination papers in Botany to candidates for the next Natural Sciences Tripos, beginning Oct. 21. On the Physiology of the Organs of Sense, by Dr. M. Foster, F.R.S.; and a Course of Practical Physiology. The days, hours, and dates of commencement of these two courses will be announced shortly.

AMERICAN PREPARATIONS FOR THE FORTHCOMING TRANSIT OF VENUS

AMID the violent political agitation and the inevitable social commotion of the United States, one would imagine, judging from our own case, that neither the American Government nor the American people had any time or funds to devote to scientific objects of apparently remote utilitarian interest. That this is not the case every regular reader of this periodical must be aware, for seldom does a week pass but we have occasion to notice some scientific expedition fitted out by Government funds, or the meeting of some well-organised and efficient scientific association, or the report of work done at one of the numerous scientific schools with which the country abounds, or the results of an expensive scientific inquiry or scientific experiment; in short, the Americans seem to think it their interest and duty, as it is their inclination, to give substantial encouragement to scientific research and the spread of scientific culture and knowledge. Verily they know how to do these things better in America than in England; but, indeed, of what foreign country can this not be said? This cannot be better seen than in the action taken by the U.S. Government in reference to the forthcoming Transit of Venus.

In March 1871 Congress, instead of appointing one irresponsible official to organise all the preparations necessary for the observation of one of the rarest and most important astronomical phenomena, authorised the appointment of a Commission "to expend such appropriations as might be made by Congress for the observations of the coming Transit of Venus." This Commission is composed of Rear-Admiral B. F. Sands, Superintendent U.S. Naval Observatory; Prof. Joseph Henry, LL.D., President National Academy of Sciences; Prof. Benjamin Peirce, LL.D., Superintendent U.S. Coast Survey; and two Professors of Mathematics of the Naval Observatory,