So firmly did he stand on the ancient ways that he has been often heard to say—and he may have even expressed the sentiment in as many words in some of his writings—that he could not look into one of his insect-drawers without disgust did he not believe in the direct and independent creation of each individual species. At any rate he never lost an opportunity of avowing his hatred of Darwinism, though his opposition to it made no difference in his feelings towards those of his friends who were Darwinians.

It is understood that before his death he had arranged for the ultimate transfer of his magnificent collection of Butterflies to the British Museum, where, according to the terms of the compact, its present condition is to remain undisturbed for twenty years. Mr. Hewitson, who was buried at Walton-on-Thames, had been a widower for many years and left no children. A portion of his very considerable fortune he is said to have devoted to charitable purposes, but a large portion of the remainder to his old and tried friend, Mr. John Hancock, while his copyrights go to his publisher, Mr. Van Voorst. It is believed also that Mr. Kirby is to make a catalogue of the collection of *Lepidoptera* before it is removed to the British Museum. A. N.

ANDREAS VON ETTINGSHAUSEN

WE regret to record the death in Vienna, on May 25, of Baron von Ettingshausen, one of the oldest of European physicists. He was born in Heidelberg, November 25, 1796. After the completion of his academic studies, he entered the philosophical faculty of the Vienna University as privat-docent for physics and mathematics in 1817. Two years later he accepted the professorship of physics in Innsbruck, but was called back in 1821 to Vienna, to the chair of mathematics, which position he exchanged in 1834 for the professorship of physics. In 1852 he accepted the direction of the newly-grounded Physical Institute, completed its organisation, and raised it to its prominent position as a centre of physical investigation. Some years since he was compelled by increasing age to retire from the duties of his professorship, after a half-century of unwearied activity.

As an investigator Ettingshausen was first known by his mathematical contributions. In 1834 he was one of the first to apply Faraday's discovery of electric induction; and the magneto-electric machine devised by him at this time, and bearing his name, marks an important step in the progress of this branch of physics. Of his later researches we would mention those on the movements in homogeneous systems of molecules, on the parallelogram of forces, on the law of isochronism in the vibrations of the pendulum, and on the formulæ for the intensities of reflected and refracted light, in all of which the mathematical element was predominant.

Ettingshausen's literary work was confined chiefly to his "Vorlesungen über höhere Mathematik," which appeared in 1827; his "Lehrbuch der Physik," published in 1844, and to the editorship of the "Zeitschrift für Physick und Mathematik," from 1826-1832.

As a lecturer Ettingshausen was one of the leading celebrities of the Austrian capital. His auditorium was thronged not only by the students but by the educated classes of Vienna, who were attracted by his rare combination of oratorical power and experimental elegance.

In the Physical Institute he rendered services of the greatest value. For a number of years Vienna was unexcelled in the opportunities it offered to young physicists, and the present activity in physical research existing throughout the Austrian universities is undoubtedly due in a great measure to the healthful impulse given by Ettingshausen a score of years since. It is probably to the same source that we can trace the marked mathematical character of the modern school of Austrian physicists, nearly all of whom have been trained under his eye.

Ettingshausen's varied services made him the recipient of numerous decorations, and some years since he was raised by the Emperor into the nobility. He was a leading member of the Vienna Academy of Sciences, which he assisted to found, and for a long series of years its general secretary. His researches appeared chiefly in its *Sitzungsberichte*. He leaves behind him a son, Baron Constantine v. Ettingshausen, the well-known authority on palæontology.

A NEW CRATER ON THE LUNAR SURFACE

WHEN examining the surface of the moon on May 27, 1877, Dr. Hermann J. Klein, of Köln, observed, with his 5½-inch dialyte by Plössl, a great black crater on the Mare Vaporum, and a little to the north-west of the well-known crater Hyginus. He describes the crater as being nearly as large as Hyginus, or about three miles in diameter, and, being deep and full of shadow, and as forming a conspicuous object on the dark grey Mare Vaporum. Having frequently observed this region during the last twelve years, Dr. Klein felt certain that no such crater existed in this region at the time of his previous observations. Dr. Klein communicated his observations to Dr. Schmidt, of Athens, the veteran selenographer, who assured him that this crater was absent from all his numerous drawings of this part of the lunar surface; neither is it shown by Schroter, Lohrmann, nor Mädler, who carefully drew this region with the fine refractor at Dorpat. On one or two subsequent occasions Dr. Klein obtained further observations of this new crater. He found it to be either without a wall or with a very low one, but to be a deep conical depression in the surface. Shortly after sunrise the crater takes the appearance of a dark grey spot, with an ill-defined edge.

In April, 1878, Dr. Klein communicated his observations to the editor of the *Selenographical Journal*, who at once took the proper steps to have this object observed by the members of the Selenographical Society. The day for observing this region was unfortunately cloudy, and no observations could be made in England, but Mr. J. Ward, of Belfast, caught a glimpse of the moon through a temporary break in the clouds. He at once saw the crater in the position assigned to it by Dr. Klein, and described it as being a black crater with a soft edge. The next opportunity for observing this crater was May 9, but the occasion was not favourable, the sun being then high above the horizon of this part of the moon. The day turned out cloudy. Messrs. Backhouse and Neison observed through thin clouds, and saw in the position of the new crater a dark elliptical spot. On May 11 Messrs. Knott, Neison, and Sadler observed in this place a dark ovoid mark or shading. So far, then, the English observations have been perfectly in accord with those of Dr. Klein, although bad weather has rendered it impossible to see the new crater as a crater.

Mr. Neison repeatedly examined and drew this portion of the lunar surface during the years 1871-1875, and discovered a number of minute details in the region where Dr. Klein has seen the new crater. Quite close to this object are a number of much smaller craters, several under a mile in diameter. Several of these are shown by Schroter, Lohrmann, Mädler, and Schmidt. It may be regarded, therefore, as absolutely certain, that previous to 1876 there did not exist on this portion of the lunar surface a deep black crater of three miles in diameter, and it is thus Dr. Klein describes the new object seen by him. Mr. Neison has expressed the opinion that it is most improbable that he could have missed seeing so conspicuous an object as the present dark marking which it is certain exists now in this region. If, therefore, the existence of

Dr. Klein's new crater be confirmed, it will form the strongest possible evidence of a real change on the surface of the moon, a change, moreover, of a volcanic nature.

The Mare Vaporum in which the new crater is situated lies close to the centre of the visible surface of the moon, so that objects in this region are very slightly affected by the lunar librations. Fortunately it is a portion of the surface which has been most carefully studied by Lohrmann, Mädler, Schmidt, and Neison; for had this new crater of Dr. Klein appeared in a less well-known region, much doubt would have been felt as to whether it had previously existed or not.

DEEP-SEA DREDGING OFF THE GULF OF MEXICO

THE last number of the *Bulletin* of the Museum of Comparative Zoology at Harvard College, Cambridge, Mass., contains a letter from Alex. Agassiz to the superintendent of the United States Coast Survey, detailing the results of some recent dredging operations in the United States schooner *Blake*. A series of deep-sea dredgings were made in the first place across the Florida Channel from Havana to Sand Key, out to the Tortugas reefs, then across the Gulf to the Yucatan Bank, to Vera Cruz, about the Alacran reef and then across the Yucatan Channel, and in the trough of the Gulf Stream to Sand Key, Florida—in all about 1,100 miles of lines taking the shortest distance from point to point. The results of the cruise are full of interest; we can only allude to a few of them. The great Alacran reef is an atol—an atol existing not as Darwin suggests to be the case with atols in general, in an area of depression, but in one of elevation, like those in which the Florida and Bahamas reefs are found. The formation of the Alacran reef is in full activity, the eastern slope is nearly perpendicular, rising to a height of twenty fathoms from the surface in a comparatively short distance. It is exposed to the full force of the north-east trades and the surf breaks heavily against the great masses of *Madrepora palmata*, which build up the narrow line of coral barely flush with the level of the sea. The western slope is much more gentle, and here the reef consists of a number of half-made narrow islands. These are mere strips of sand formed by the breaking-up of the exposed masses of coral, which are gradually cemented together by the accumulation of the loose material held in suspension by the water. Here, in the shallower parts, grow huge masses of Astræa, of Gorgoniæ, of Mæandrina, which now and then rise to the surface.

Along the Cuban coast the dredge brought up immense numbers of siliceous sponges, a species of Favosites, which we are tantalisingly told is perhaps the most interesting coral ever dredged. We presume it was found living, and we all know that this genus was founded by Lamarck for some fossil corals, only found in the very oldest strata (Silurian and Devonian), a young Holopus in excellent condition (probably the fourth or fifth specimen ever found). The dredge worked well to a depth of upwards of 2,000 fathoms. One haul in 860 fathoms brought up an unusually large number of two and one valved molluscs, including many of exquisite beauty. Some most gorgeously coloured crustacea were brought up from a depth of 1,920 fathoms, and what are we to say to an isopod allied to Aega, and upwards of eleven inches in length and three in width? Amongst the strange fish, we read of one like a huge tadpole with a gigantic round cartilaginous head, and without eyes; of another with a drawn-out flat head, very little eyes, but possessed of gigantic filaments, as long as the whole body, and extending from the tips of the pectoral and lower caudal fins. Some of the Holothurians were striped with bands of a deep crimson colour.

Certainly the wonders of the deep-sea are not yet exhausted, and though the treasures found by our own *Challenger* expedition were great, it could reap the produce of but a very narrow belt out of the great expanse of the ocean world.

A steel wire rope was used by Capt. Sigsbee. The time required to reel in was always below one minute per 100 fathoms, sometimes not more than twenty seconds, while the time required to strike bottom averaged thirty-five to forty-five seconds per 100 fathoms in the deepest soundings of 2,000 fathoms. The wire rope was of galvanised steel with a hemp coil; it measured $1\frac{1}{8}$ inch in circumference, and weighed 1 lb. to the fathom, and had a breaking strain of over 8,600 lbs., and its own weight made the use of heavy weights to sink it unnecessary.

The *Blake* is now on a cruise to explore the inner portions of the Gulf of Mexico, commencing with a run from the Tortugas to the mouth of the Mississippi River, in which we wish her crew of all ranks every success.

E. PERCEVAL WRIGHT

METEOROLOGICAL NOTES

MR. ELLIS has made a valuable contribution to the diurnal variation of the barometer in a paper published in the *Journal* of the Meteorological Society of London, which gives the hourly variations from the means of each month as deduced from a discussion of the photographic records taken at the Royal Observatory during the twenty years ending 1873. The forenoon maximum occurs from May to July about 9 A.M., being fully an hour later than at Kew. The morning minimum at the same season becomes less marked than at other times of the year, as happens in situations more or less continental in middle and higher latitudes; and this feature of the diurnal variation is, it may be remarked, decidedly better marked at Kew than at Greenwich. Mr. Ellis gives, for comparison with Greenwich, the curves for Oxford, Washington, Cape of Good Hope, and Ascension, from which he draws the broad conclusion that in high latitudes the forenoon maximum occurs earlier when the sun rises early, it being however omitted to be pointed out that this holds good only in situations more or less continental or removed from the more immediate influence of the sea. Thus the forenoon maximum which occurs at Greenwich at 9 A.M. and at Kew at 8 A.M., is delayed at Falmouth and Valentia to about 11 A.M. or noon; whilst at Helder the time of its occurrence in June is about 2 P.M. The hourly barometric values for the twenty years were arranged with reference to the time of the moon's meridian passage with the result that no certain indication of lunar variation was apparent. We hope that by-and-by the main details of this elaborate discussion will be printed; such details as will embrace, at least, the hourly values of each day and month of the twenty years for the examination of many inquiries referring to both civil and lunar days, which are now rising into questions of the highest importance.

PROF LOOMIS has recently examined all the cases of violent winds of the United States which have been recorded as having occurred from September, 1872, to May, 1874, the number of cases on which the wind rose to or exceeded forty miles an hour being 250. During the six months from November to April, violent winds were more than five times as frequent as during the other six months of the year. The great preponderance of violent winds are from the north; thus from north-east, north, and north-west, the number were 143, whereas from south-east, south, and south-west, there were only 58. Generally speaking, violent winds increase in frequency and intensity over North America with latitude. Local conditions exercise a considerable influence on the force of the wind. Thus violent winds are of most frequent occurrence near the Gulf of St. Lawrence and the Great Lakes, particularly Lakes Michigan and Erie.