

P. Webster; two Badgers (*Meles taxus*) from Russia, presented by Mr. C. R. Meltzer; a Cinereous Sea Eagle (*Haliaeetus albicilla*), European, presented by the Hon. M. Finch Hatton; two Common Barn Owls (*Strix flammea*), British, presented by Master Golden; a Mountain Ka-Ka (*Nestor notabilis*) from New Zealand, deposited; two Snow Buntings (*Plectrophanes nivalis*), two Mountain Linnets (*Linota flavivrostris*), a Cirl Bunting (*Emberiza cirius*), British, purchased.

OUR ASTRONOMICAL COLUMN

THE OBSERVATORY OF MELBOURNE.—The sixteenth annual report to the Board of Visitors of this Observatory has been issued by the Director Mr. Ellery. The staff now consists of the Government Astronomer, the Chief Assistant, Mr. White, and three junior assistants. Mr. White takes charge of the meridional work, and on Mr. Turner devolves the observation, drawing, and photography in connection with the great telescope, and obtaining daily sun-pictures with the photo-heliograph. The large telescope almost monopolises the services of a workman. The actual work with this instrument during the year ending June 30, 1881, to which the Report refers, was performed on sixty-eight nights, twenty-four of which were devoted to lunar photography, unfavourable weather, or bright moonlight is stated to have interfered on 125 nights, while eighty-two nights were occupied with the great influx of visitors to the Observatory, during the continuance of the Melbourne International Exhibition. Twenty-two nebulae of Sir John Herschel's Catalogue were observed and sketched, with a new one, preceding No. 3705 by 1m. 7s., and 4' 30" south. The majority of the nebulae observed agree well with Herschel's description, but Nos. 4502, 4510, and 5012 do not accord with his measures; 3430 is found to be much more suddenly condensed in the centre, and 3734 is much fainter than he describes. The nebula surrounding η Argus was carefully compared on three occasions with drawings of 1875, but no decided change could be detected. During the year, 175 photographs of the sun were obtained showing a marked increase of spots and disturbances of the surface. The magnetical and meteorological work and progress of intercolonial meteorology are also subjects of the report. The Government had approved of the purchase of a new transit-circle more adequate to the requirements of the day than the existing instrument, and the necessary amount had been placed upon the estimates.

THE OBSERVATORY OF CORDOBA.—Dr. B. A. Gould, writing on December 22, mentions that the first volume of the Cordoba astronomical observations was finished, and he expected to forward it to Europe during the ensuing week. A meteorological volume would follow immediately.

THE GREAT COMET OF 1881.—The following places depend upon the last ellipse calculated by MM. Dunér and Engström of Lund:—

	At 12h. Berlin M.T.			Decl.
	R.A.	h. m. s.		
Feb. 11	0 10 15	...	...	+ 55 2'8
13	0 14 24	...	...	54 57'6
15	0 18 30	...	...	54 52'9
17	0 22 34	...	...	54 48'5
19	0 26 36	...	...	54 44'6
21	0 30 37	...	...	54 41'0
23	0 34 35	...	...	54 37'8
25	0 38 32	...	...	54 35'1
27	0 42 27	...	...	54 32'7
March 1	0 46 20	...	...	54 30'6

On the first date, the comet's distance from the earth will be 3'76, and on the last date 4'14, the earth's mean distance from the sun being taken as unity.

PROBLEMATIC SUN-SPOTS.—As a somewhat similar case to that recorded by Sir William Thomson in last week's NATURE, we may recall an observation by Lichtenberg on November 19, 1762, described in a letter from his brother in Zach's *Allgemeine geographische Ephemeriden*, 1798, p. 260; the observation had been mentioned in Götting's *Taschenbuche* for 1787, p. 121. In Lichtenberg's diary he had entered the particulars as follows: On November 19, 1762, as, in company with a friend, v. Pöllnitz of Reinheim, he was journeying from Würzburg towards Erlangen early in the morning, one of great cold and thick vapours, their attention was directed at sunrise, by the con-

ductor of the vehicle, to something upon the sun's disk; he had not wholly risen in an unimpeded view, was of a blood-red colour, and, as usual, seemed magnified. Under these circumstances Lichtenberg says he saw with the naked eye, to his no small surprise, a dark, well-defined spot, the diameter of which he estimated at more than a twelfth of the apparent diameter of the sun: "etwas unter dem Mittelpunkte gegen den nördlichen Rand." It is added "Die vollkommen runde Gestalt und der völlig reine Ausschnitt liessen auch beim ersten Anblick schon etwas Anderes als ein gemeinen Sonnenfleck von seltener Grösse vermuthen. Er dauerte auch nicht lange, so sah ich deutlich, dass ich mich in meiner Meinung nicht geirrt hatte, denn der Körper hatte seine Stelle merklich verändert." The journey to Erlangen was hastened in the hope of arriving there before the egress of the spot, and on reaching the town Lichtenberg says he hurried to Prof. Arnold to secure confirmation of his observation, but although immediate steps with that object were taken, the body was found to have passed off the sun, which appeared round and spotless.

The brother who communicated these details to Zach, considered that in conjunction with a diagram, it followed that the object had described a chord of nearly 70° on the solar disk in about three hours; the direction being from the north limb towards the south.

GEOGRAPHICAL NOTES

THE French African traveller, M. de Sanderval, has returned to Paris from his expedition to Timbo. His principal object was to find the route which European travellers have searched for for more than a century, and which is destined eventually to become the main route by which civilisation will progress from the coast to the Upper Niger and the Soudan. During his first journey in 1879 M. de Sanderval obtained permission to construct a railway from the Iman of Timbo and grant of a district of 12,000 square kilometres. The maps and notes of the traveller will be presented to the Academy by M. de Lesseps.

At the meeting of the Geographical Society on Monday last, Mr. Cuthbert E. Peek read a paper on the journey across Iceland which he made last summer in company with Mr. E. Delmar Morgan and Mr. J. Coles. Mr. Delmar Morgan afterwards gave an account of an excursion which he made by himself to Askja, the only Englishmen who have visited it before having been Messrs. Watts and Lock. The interest in Mr. Peek's expedition centres almost entirely in the fact that he had been entirely trained to the use of instruments, &c., at the Geographical Society under Mr. Coles, the instructor, and the result shows that the system adopted is useful and effective.

In the Geographical Society's *Proceedings* this month, the only papers are those read at the meeting of January 16, and alluded to in our issue of January 26. The map on which the routes of Mr. Thomson and the Rev. C. Maples are laid down, is a useful contribution to the geography of East Africa. A note on Mr. O'Neill's journey in the interior of Mozambique dissipates all hopes which may have been formed that he had visited the snow-clad mountains there. Mr. O'Neill appears to have reached a point within sight of the lofty peak Namuli, said by natives to be capped with snow, but owing to clouds he could not verify this statement. Much useful information will be found collected together under the head of Pere Duparquet's journeys in Ovampo-land. The remainder of this issue is largely devoted to foreign societies, among the reports of which will be found authoritative accounts of Dr. Stecker's work in Abyssinia, and Mr. Poliakof's in the Island of Saghalien.

It is stated that Col. Prjevalsky intends shortly to start on another expedition to Tibet, and we hope that this time he may at length succeed in reaching Lhasa.

COL. VENIUKOF has furnished the French Geographical Society with some notes of Dr. Regel's new journey in Central Asia, principally in Karategin and Darwaz. His explorations commenced on the banks of the Macha, near the Zarafshan Glacier, whence he went first to Garm, the capital of Karategin, traversing the mountains by the Pakshif defile, and descending into the valley of the Kizil-su by the little river Sor-bokh. From Garm he went to Kela-Khumb, traversing on the way the valley of the River Wakish or Wakhia, and the Kamchirak, Sagridesht, and Khubu-rabat passes, the first of which is 9500 feet above the sea. Further on he followed the valley of the Oxus as far as the confluence of the Warij, which the natives

consider one of the two principal sources of the Amu-daria, the other being the Pianj. According to their statements the Aksu, which waters the Pamir, is an affluent of the Wanj, and does not fall into the Pianj near Kala Wamar, the affluent of the Pianj being called the Chun'uk-daria, which flows out of the Yashil-kul. In order to assure himself of the truth of these statements Dr. Regel followed the Wanj as far as Tesh-i-Senghi, and he found that the river contained abundance of water. He intended to spend the winter at Darwaz, in order to resume his explorations in the spring, and it may be hoped that he will succeed in solving the last remaining mysteries of the Pamir.

MR. S. E. PEAL'S account of his expedition in 1879 to the Nongyang Lake and to the pass over the Patkoi Range will be found, with map and panoramic sketches, in Part 2, No. 1, of the Bengal Asiatic Society's *Journal* for 1881.

THE following despatch has been received at the London office of the *New York Herald*:—"Irkutsk, February 1, 1882, 2.45 p.m. Our three boats left Semenovskiy Island on the morning of September 12, bound for Barkin, ninety five miles distant. We got clear of ice at noon. Heavy gale from north-east, and boats dispersed during night; captain's boat, loaded deep, lost mast and sails. We made land on the evening of the 17th, shoal water. Boat abandoned two miles from beach; party waded and reached deserted village, Saga-tor; 'cachéd' log books; proceeded south on the 19th. Delong's last record found reads as follows:—"Saturday, October 1st.—Fourteen of the officers and men of the *Jeannette* reached this hut on Wednesday, September 28, and having been forced to wait for the river to freeze over, are proceeding to cross to the west side this morning on their journey to reach some settlement on the Lena River. We have only two days' provisions, but having been fortunate enough thus far to get game in our pressing needs we have no fears for the future. Our party all well, except Ericksen, whose toes have been amputated in consequence of frost-bites. Other records will be found in several huts on the east side of the river, along which we have come from the north.—(Signed) GEORGE W. DELONG." Three subsequent records had been found. Ericksen died October 7; party in great distress for food. Noros and Nindemann sent ahead for relief, October 9. They marched south fifteen days, and were found in a starving condition, October 24, by three natives, who took them to a settlement. They could not make themselves understood. News of them reached us October 29. Immediate search commenced, and party traced to a wilderness on left bank of Lena. Natives refused further work, and return to Bulong; was necessary to get Russian assistance.—November 28.—A large party is now searching, having to dig out everything deeply covered with snow. The wilderness devoid of game. Very prompt and efficient action by Russians. Every effort is being made. Jack Cole's tranquil to-day; violent only at times; softening of brain. My left eye ruined, and right one badly impaired. Other men well. Jackson has telegraphed me from Orenburg.—JOHN DANENHAUER." Semenovskiy Island is probably a small island marked Semenov in the map in the "Voyage of the Vega," on the north-west of Stobovoi Island in the New Siberia group. Barkin is on the north-east point of the Lena delta, where there is a winter tent. Sagastyr, where they landed, is at the mouth of the most northern branch of the Lena delta. The engineer Melville has made arrangements for a thorough search for the missing party, at once.

THE PRIZES OF THE PARIS ACADEMY OF SCIENCES

THE annual distribution of prizes at the Academy of Sciences took place on Monday February 6. M. Wurtz, president for the year 1881, was in the chair. The list of laureates was read by M. Dumas.

The prize of 240*l.* for any improvement in the French naval forces was awarded to M. Sébert for his apparatus for measuring the velocity of projectiles, and to M. Brault for his study of naval meteorology.

The Lalande Prize was awarded to Prof. Swift of Rochester, (U.S.) for the discovery of seven comets in the brief interval of four years. Another astronomical prize was awarded to Mr. D. Gill, director of the Cape Observatory, for his determination of the solar parallax by observations of Mars.

The prize in Physics was awarded to M. Planté for his accumulators, and the Commission records the wonderful experiment which was executed by this physicist when he obtained

a tension of 1200 elements with two Bunsens. Amongst the other prizes which may present some special interest are the following:—M. Briot, for his work, "Sur les Fonctions Abeliennes"; M. Etienne Gilbert, "Étude sur les Philtres, Charmes, Poisons." No prize was awarded for the question "to ascertain by direct observations and experiments the influence of exterior objects on the structure of vegetative organs," but a sum of 60*l.* was delivered to M. Mer to encourage him to work again at the same question which remains open for competition in 1882. One of the Monthyon Prizes was awarded to Dr. Favre for his work on Daltonism, and another to Dr. Paul Richer for a treatise on hystero-epilepsy. M. Collin took the interest of the Breaud Prize for his work on "Epidemical Affections." This prize, originally destined for a remedy against cholera, amounts to 4000*l.*, and the interest is distributed every year, to avoid indefinite accumulation. A posthumous prize was awarded to M. Henri St. Claire Deville for his discovery of the law of dissociation. The rules forbid the Academy to give such an honour to any of its living members, and it is the first time on record that it has been given to a departed one.

When the long series of laureates was recited, M. Bertrand, perpetual secretary for the section of Mathematical Sciences, read the *loge* of Leon Foucault, the inventor of the gyro-scope, electric light regulator, siderostat, silvered glass telescopes, determination of velocity of light, &c. M. Leon Foucault was born in Paris in 1819, he died in the same city in 1868, and never travelled abroad. He was self-educated, having passed his honours only when already illustrious. M. Bertrand has written the preface to the collection of his scientific works, published in 1878 by his mother—a large 4to volume of 600 pages. M. Leon Foucault was besides a very active and successful writer, having been the scientific editor of the *Feuilleton* of the *Debats* for years. His successor is now M. de Parville.

INSTITUTION OF MECHANICAL ENGINEERS

THE Annual General Meeting of this Institution was held at the Institution of Civil Engineers, Great George Street, on January 26 and 27.

The Annual Report of the Council drew attention to the subjects of experimental research, of which some account has already been given in NATURE. With regard to riveted joints, it appears that a long and elaborate series of experiments have been carried on for the Committee by Prof. Kennedy, at the Engineering Laboratory, University College. These experiments dealt exclusively with steel plates and rivets, and were directed first to ascertain the constants of resistance to tension, shearing, &c., in mild steel, the knowledge of which is necessary in order to design the strongest form of joint, and secondly to test joints designed on the basis of the values thus discovered, as against other joints, made purposely to have an excess or defect in one or other of the areas through which fracture might take place. The work has been completely successful; the correctly-designed joints giving decidedly the best results; and thus affording a satisfactory verification of the value determined for the constants. The experiments have further brought out strongly the fact that joints in iron and steel must be designed in a very different manner to give the best results in each, the reason being that the shearing resistance of the rivets is about the same in iron and steel, while the tensile resistance is much higher in the latter than the former. Hence the deduction that manufacturers, who have been content simply to transfer to steel the rules they have been in the habit of using for iron, have thereby involved themselves in serious error.

With regard to the other subject, the hardening and tempering of steel, the Institution have just published some very interesting researches made for them by Prof. Abel, C.B., F.R.S., and also by Prof. Chandler Roberts, F.R.S. The former has shown, by the analysis of thin disks of hardened and unhardened steel, the high probability that in unhardened steel the carbon is present as a definite carbide of iron (probable composition Fe_3C_3), eliminated from the iron in a more or less crystalline form; that on heating, this compound is dissolved in, or assimilated by, the metal; and that sudden cooling does not allow time for the elimination to take place, the carbide thus remaining dissolved, more or less completely, and giving a corresponding degree of hardness to the mass. Prof. Chandler Roberts' researches bear on a suggestion which had been made, that the hardening of steel was connected with the occlusion and exclusion of gases by