

his journey in the Atlas and the Northern part of the Algerian Sahara; the Rev. Thos. Wakefield's fourth journey to the Southern Galla country; and Capt. Paiva de Andrada's Zambesi Expedition, 1881. We learn that the Search Expedition for Mr. Leigh Smith is now organised, and will be commanded by Sir Allen Young. The expedition will leave this month.

FROM a letter of Consul H. E. O'Neill in the June number of the Geographical Society's *Proceedings*, it would seem that the "snow-clad Irati" spoken of by Messrs. Maples and Goldfinch as reported to exist in the country south-east of Lake Nyassa, is probably a delusion. Mr. O'Neill was close to the mountain, which he estimates at not more than between 5000 to 6000 feet above the sea.

MISS ELLEN M. TAYLOR has compiled a very useful guide-book to Madeira, under the title of "Madeira: its Scenery, and How to See It" (Stanford). She gives the very kind of information intending visitors are likely to want, and the possession of which will save them much trouble. While Miss Taylor draws largely on existing authorities, she also gives the results of her own experience. Her list of trees, flowers, ferns, and seaweeds will be useful to the amateur naturalist.

THE first paper in the June number of *Petermann's Mittheilungen* is on M. Charnay's expedition to the ruins in Central America, by Herr Fred. Kofler. Dr. Hermann J. Klein has an article of much interest on "Some Volcanic Formations in the Moon," in which he suggests that the lunar surface ought to be carefully examined by geologists, in order to discover the exact condition of things as compared with terrestrial geology. There is a short account of Oschanin's exploration of Karategin in 1878, and a very useful paper by Herr B. Hassenstein, on the geographical and cartographical literature of the Indo-Chinese border-lands, with a map of the Tibetan and Indo-Chinese border-region.

THE last number of the *Izvestia* of the Russian Geographical Society (vol. xviii. fasc 2), contains a good many valuable papers. We notice among them the preliminary report on the geological exploration of the former beds of the Amu-daria, by A. E. Hedroitz; a paper by M. Mousketteff on his geological exploration of the Caucasus; a description of an excursion to Seraks, by P. M. Lessar, with a map of the route between Askabad and Seraks; a notice by A. Regel of his journey to the Karategin and Darvaz, dated Ka'a-i-Khumb, with a map; on the sands of Ferghana, by M. W. Malakhoff, and a variety of small notices. We are glad to learn that the *Izvestia* will have a special department, "Polar News," devoted to all that concerns the exploration of Polar regions; it will be under the direction of Baron Wrangel.

WE learn from the *Izvestia* of the Russian Geographical Society that Dr. A. E. Regel has returned from his journey to Karategin and Darvaz to Samarkand, and is preparing for a new journey to the Pamir.

PROF. NORDENSKJÖLD has telegraphed to the Mayors of Tromsø, Hammerfest, and Vardö, on behalf of Herr Oscar Dickson, of Gothenburg, asking them to acquaint skippers leaving for the Arctic Sea, with the rewards offered by Herr Dickson for the Discovery of the *Eira*, viz. 22*5*l. to be paid to the one who may first relieve Mr. Leigh Smith or any of his companions; 140*l.* to the one who may first discover and give information in writing of the crew of the *Eira*, of a later date than November 1 last, 50*l.* for the first information, by telegraph, addressed to Herr Oscar Dickson, that any one of the crew of the *Eira* has been found, or a letter from either of a later date than that of November 1 last.

THE German Antarctic expedition, consisting of Dr. Schrader and six companions, have sailed by the Hamburg mail steamer for Monte Video, thence by Imperial corvette to the island of South Georgia, to establish a scientific station for meteorological observations. They will remain twelve months.

AT the last meeting (May 30) of the Russian Geographical Society, the Secretary said that a telegram received from Irkutsk announces the possibility of establishing seven new meteorological stations in the far north, namely, at Verkhoyansk, Orlensk, Witimsk, Olekminsk, Kirensk, Nokhtuisk, and Preobrajensk, besides the station already established at the mouth of the Lena. The necessary instruments will be forwarded immediately by the Central Meteorological Observatory. At the same meeting, M.

Rykatcheff made a communication on tides in the atmosphere. He proved the correctness of the theory of Laplace with regard to atmospherical tides by the discussion of a very great number of anemometrical observations.

PROF. LENSTROM, Secretary of the Meteorological Commission of the Society of Science in Finland, anxious that Finland may participate in the Circumpolar observations, has offered to erect a station at Sodankylä (67° 20' N., 26° 40' E.), which proposition has been accepted by the President of the International Congress, Dr. H. Wild, of St. Petersburg.

THE ROYAL OBSERVATORY

THE annual visitation of the Royal Observatory took place on Saturday, when the Astronomer-Royal, Mr. W. H. M. Christie, presented his report.

"The Report," Mr. Christie states, "here presented, refers to the period of twelve months, ending May 20, 1882, a fixed date being taken, conveniently near to the visitation day. Sir G. B. Airy resigned his office on August 15, 1880, and a portion of the observations here referred to were made under his superintendence. There seems to be no occasion to separate these from the remainder, as the course of observation which Sir G. B. Airy has carried out for so many years has been continued without essential alteration in its main features."

Of the Transit of Venus instruments the Report states, two transits, three altazimuths, five 6-inch equatorials, two photoheliograph mountings, nine clocks, and one Transit of Venus model have been sent to Mr. Stone at Oxford for use in the forthcoming Transit of Venus, and three transits, an altazimuth, a photoheliograph, and two clocks are at the Cape of Good Hope, where they will be available for the Transit of Venus.

A series of pendulum observations was made in the record room last autumn by Major Herschel, R.E.

After giving details as to the usual astronomical observations, the altazimuth, and other matters, Mr. Christie goes on to speak of the spectroscopic and photographic observations:—

"During the twelve months ending May 20, 1882, the sun's chromosphere has been examined with the half-prism spectro-scope on 36 days, and on every occasion prominences were seen. On one day a detailed examination of the whole spectrum of the chromosphere was made at 24 points on the sun's limb. Several prominences have shown great changes in the course of two or three minutes, and large displacements or contortions of the bright lines, indicating very rapid motions of approach or recession have been noted. In particular, a prominence examined on May 13, 1882, was observed to rise through a space of about 30' in less than two minutes, being at the rate of about 110 miles a second, whilst the C line showed a displacement towards the red gradually increasing from $\frac{1}{4}$ to $11\frac{1}{4}$ tenth metres, corresponding to a motion of recession increasing in two minutes from 36 to 330 miles a second. Thirteen sun-spots have been examined on 20 days with reference to the broadening of the lines in their spectra. The strong black lines or bands in the part of the spectrum between b and F , first noticed in the spectrum of a spot on November 27, 1880, have been generally observed to be present in the spectra of spots during the last twelve months, besides several fine lines in the same region of the spectrum to which there is nothing corresponding in the solar spectrum. For the determination of motions of stars in the line of sight, 177 measures have been made of the displacement of the F line in the spectra of 41 stars, 68 of the b_1 line in 19 stars, and 9 of the b_2 line in 5 stars. Of the 61 stars observed, 15 had not previously been examined, and the total number of stars of which the motions have been spectroscopically determined, is now 106. In the case of three of the stars observed in the last year, a dispersive power equivalent to that given by sixteen prisms of 60° has been used. A comparison of the successive determinations of the motion of Sirius indicates a progressive diminution from about 22 miles a second in 1877 and 1878, to about 7 miles a second or less this year, and as other stars do not show anything similar, it appears likely that the change is due to the orbital motion of Sirius. Further observations will, however, be required to settle the point. The spectrum of Comet b 1881, was examined on six nights, that of Comet c 1881, on three nights, and that of Comet a 1882, on three nights. The spectra of the first two objects showed the usual cometary bands corresponding to those of the first spectrum of carbon, and a continuous spectrum from the nucleus and brighter portions of the head. Comet

a 1882, has hitherto shown only a continuous spectrum with two irregular ill-defined maxima of light. The observations of this comet are being continued."

In the year ending May 20, 1882, photographs of the sun have been taken on 200 days, and of these 352 have been selected for preservation. Since the end of last August photographs have been taken on Sundays as well as on week days. There were only 2 days out of 200 on which the sun's disk was observed to be free from spots. There has been a large increase in the number and size of spots and faculæ, the mean of the daily areas for each in 1881 being nearly double of the corresponding quantities for 1880, and the increase is still continuing, though with well-marked fluctuations. A very remarkable outbreak of spots occurred in April last.

With regard to magnetical observations the report states that no important change has been made in the three magnetometers with which the changes in the magnetic declination, horizontal force, and vertical force are continuously recorded by photography.

"The large temperature correction for the vertical force magnet has made it impracticable to discuss satisfactorily the diurnal inequality of vertical force and its dependence on solar activity, notwithstanding the great care taken to keep the magnetic basement at as nearly uniform a temperature as possible. After giving details as to rearrangements of the earth-current apparatus, the report states that "on four days during the year, viz., September 12 and 13 and April 16 and 19, magnetic storms have occurred. Those of April were of more marked character than any that have taken place since the great storms of the year 1872, and it is a significant fact that exceptionally large spots made their appearance on the sun shortly before, viz., on April 11 and 17. Smaller magnetic movements are now also much more frequent, the traces exhibiting a marked contrast to their general appearance some two or three years ago. In regard to the long period variation of about 11 years, we are able now to say definitely that the minimum as regards diurnal range of declination occurred at the commencement of 1879, whilst as regards diurnal range of horizontal force, it occurred unmistakably earlier, about August, 1878. Since the epochs mentioned, each element has, with small fluctuations, continued regularly to increase again in magnitude, the daily range of declination having increased from 6'59 at the beginning of 1879 to 9'15 in 1881, and that of horizontal force from '00110 (in parts of the whole H.F.) in 1878 to '00181 in 1881. We have frequent applications from mining surveyors for the values of the magnetic elements, and recently the wish has been expressed that information as to the diurnal inequality and particulars of magnetic storms observed here should be communicated from time to time to the *Colliery Guardian* newspaper, in order that mining surveys may be carried out with due allowance for the diurnal and other motions of the magnetic needle."

Under the heading of Meteorology, the Report states that "the mean temperature of the year 1881 was 48°·7, being 0°·6 lower than the average of the preceding 40 years. The highest air temperature was 97°·1 on July 15, and the lowest 12°·7 on January 17. The mean temperature was below the average, 6°·7 in January and 4°·8 in October, and above the average, 5°·9 in November. In other months the temperature in general differed little from the average. On four days in July the temperature rose above 90°. The mean daily motion of the air in 1881 was 291 miles, being 12 miles greater than the average. In January and September the mean daily motion was 70 miles and 72 miles below the average respectively. In April, August, and November it was 70 miles, 60 miles, and 71 miles above the average respectively. The greatest daily motion was 999 miles on October 14, the day of the great storm, and the least, 59 miles on May 25. A velocity of 61 miles an hour was recorded on October 14, and one of 58 miles an hour on April 29, these being both greater than any recorded in previous years. The greatest pressure was 53 lbs. on the square foot on October 14; pressures of 46, 47, and 48 lbs. were also registered during the same gale. On April 29 a pressure of 49½ lbs. was recorded at a time when the hourly velocity was 50 miles; the pressures corresponding to the maximum velocity of 58 miles an hour were not registered, the cord of the pressure pencil having slipped off the pulley."

"The volume of Greenwich Observations for 1879 was printed and distributed last autumn, and the volume for 1880 was passed for press in the middle of April. The copies are now in the binder's hands. As regards the volume for 1881, the transits are

printed to May 19, meridian zenith distances to April 27, azimuths with the altazimuth to March 31, and zenith distances to June 2."

"The number of chronometers now being tested at the Observatory is 214, 168 of which (120 box-chronometers, 23 pocket-chronometers, and 25 deck-watches) belong to the Government, and are being rated after repair previous to being issued to the navy. The remaining 46 are placed here for the annual competitive trial, and of these 18 are fitted with Airy's supplementary compensation. In addition to the above, 6 chronometers have been placed on trial for the Mauritius Observatory, and 5 chronometers have been tested for the Japanese Government.

"There has been only one case of accidental failure in the automatic drop of the Greenwich time-ball. On four days the ball was not raised, on account of the violence of the wind. The Deal ball has been dropped automatically at 1h. on every day throughout the year, with the exception of 15 days, on which there was either failure in the telegraphic connection, or interruption from telegraph signals continuing up to 1h., and of one day when the current was too weak to release the trigger without the attendant's assistance. On 3 days, high winds made it imprudent to raise the ball. The Westminster clock has continued to perform well, its errors having been under 1s. on 49 per cent of the days of observation, between 1s. and 2s. on 44 per cent., between 2s. and 3s. on 14 per cent., and between 3s. and 4s. on 2 per cent. Time-signals, originating in the Observatory, are distributed at 10 a.m. and 1 p.m. to all parts of the country by the Post Office telegraphs."

Mr. Christie concludes his Report by referring to some new arrangements for calculations and observations, which will greatly economise the time and labour of the staff. The staff, indeed, seems inadequate to the constantly increasing work. With reference to spectroscopic observation, for example, Mr. Christie says:—"With only one assistant available for observations, we can barely do half of the work which we have undertaken in deference to a widely-expressed wish, and we are continually forced to make a choice between observations with conflicting claims on our attention. As regards solar photography, the value of our results would be very greatly increased if the gaps in the Greenwich series were filled up by the help of the photographs taken in India and elsewhere under the auspices of the Solar Physics Committee, so that the areas and positions of sun-spots and faculæ should be given for every day. I am in communication with the Committee on this matter, and am in hopes that the saving of labour recently effected in our photographic reductions will enable us to undertake the work with our existing staff."

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

OXFORD.—The honorary degree of D.C.L. will be conferred at the approaching Encenia upon the following among other distinguished persons:—Baron Nordenskjöld, Dr. Allen Thomson, and M. Pasteur.

CAMBRIDGE.—The election of a Professor of Animal Morphology took place on May 31, when Mr. Francis Maitland Balfour, M.A., F.R.S., Fellow of Trinity College, was by an unanimous vote of the members of the electoral roll selected to fill the newly-established chair. The professorship was established by a grace of the Senate passed on May 11 by virtue of the provisions of the University Statute for the establishment of additional professors. The stipend attached to the chair is 300l. per annum, and it is provided the professorship shall terminate with the tenure of office of the professor first elected unless the University shall decide that the professorship shall be continued. The Council of the Senate in their report recommending the foundation of the professorship laid stress on the fact that the teaching of biology in Cambridge had lately been most successful and had rapidly developed. The classes are now so large that the accommodation provided a few years ago had already become insufficient. It was well known that one branch of this teaching—viz. that of animal morphology, had been created in Cambridge by the efforts of Mr. F. M. Balfour, and that it had grown to its present importance through his ability as a teacher and his scientific reputation. The service to the interests of Natural Science thus rendered by Mr. Balfour having been so far generously given without any adequate academical recognition, the benefit of its continuance was en-