

Himalayas, a Temminck's Tragopan (*Cerionis temmincki*) from China, a Spotted Turtle Dove (*Turtur walatensis*) from India, presented by H.R.II. the Prince of Wales, K.G.; two Black Lemurs (*Lemur macaco*) from Madagascar, presented by the Rev. G. P. Badger, D.C.L., F.Z.S.; a Sykes's Monkey (*Cercopithecus albigularis*) from East Africa, presented by Miss Mabel Beale; a Sambur Deer (*Cervus aristotelis*) from Malacca, presented by Mr. W. H. Stevenson; a Stanley Crane (*Tetrapteryx paradisea*) from South Africa, presented by Capt. Edward Jones, R.M.SS. *Conway Castle*; a Wood Owl (*Syrnium aluco*), European, presented by Mr. W. Addison; a Kittiwake Gull (*Rissa tetradactyla*), European, presented by Mr. H. R. Bower; a Hairy-nosed Wombat (*Phascolomys latifrons*) from South Australia, deposited.

OUR ASTRONOMICAL COLUMN

THE HARVARD COLLEGE OBSERVATORY.—We have received the Thirty-fourth Annual Report of the Director of this Observatory, presented to the Visiting Committee on December 5. Prof. Pickering notifies that the subscription of 5,000 dollars a year for five years, suggested in his previous Report, for relieving the immediate needs of the Observatory, more especially with regard to the publication of accumulated work, has been completed through the liberality of some seventy ladies and gentlemen, who have thus shown their interest in the establishment, an example of scientific zeal, we may say, by no means unique in the United States, nor indeed in the history of the Harvard Observatory; it may be remembered that the beautiful plates illustrating Mr. G. P. Bond's great work upon Donati's comet (Harvard *Annals*, vol. iii) were contributed by a few citizens of Boston and vicinity. The success attending the subscription has enabled both the equatorial and the meridian circle to be actively used during the year, the former frequently through the night. Photometry is still made the prominent feature in the work; vol. xi. of the *Annals* will contain the results of over 25,000 photometric observations, principally made with the large equatorial; amongst them are measurements of the outer satellite of Saturn, *Japetus*, on 101 nights in the autumn and winter of 1878-79, which, with similar observations on twenty-eight nights in the previous year, will furnish a determination of the law followed by this satellite in its changes of brightness. Another work of some extent, in the same direction, was commenced in 1879, viz., a determination of the light of all stars visible in the latitude of Harvard College; a preliminary catalogue has been formed containing all the stars in the Uranometries of Argelander and Heis, and in Behrmann's Atlas, with the stars of the *Durchmusterung* to the sixth magnitude inclusive. Most of the stars being inconspicuous objects, Prof. Pickering remarks, there would be much loss of time in identifying them in the field of a photometer mounted on an ordinary stand. This he avoids by observing them in the meridian as with a transit-instrument. "The photometer consists of a horizontal telescope pointing to the west, and having two objectives. By means of two prisms mounted in front of the telescope the pole-star is reflected into one object-glass, and the star to be measured into the other. The cones of light are made to coincide by a double-image prism, the extra images being cut off by an eye-stop. The star to be measured is thus seen in the same field with the pole star, with the same aperture and magnifying power." Errors to be apprehended in the use of the Zöllner photometer and other instruments, when the comparison is made with an artificial star are by this means eliminated. Of the work with the meridian circle, the observation of eight thousand stars in the zone +50° to +55° undertaken by the Observatory, and which has occupied Prof. Rogers during the greater part of eight years, was completed on January 26, 1879, and is mentioned as one of the largest astronomical undertakings which have been carried to completion in the United States; some years, it is added, will still be required to finish the reductions and publication of this work. The General Catalogue, 1874-75 (in vol. xii.) will be issued shortly, over two hundred pages being in type. Vol. xi., to which we have alluded, will be distributed in the course of the present year.

It will be seen from this summary of the contents of Prof. Pickering's Report that the Harvard College Observatory is fully maintaining the high reputation it acquired under the management of his predecessors, and the discrimination with which the

subjects to which attention is directed are chosen, so as to avoid unnecessary or useless duplication of work, is not the least important point to be remarked. If this should hardly appear to apply to the proposed determination of the light of naked-eye stars, it must be remembered that the previous determinations of Argelander, Heis, &c., were made from eye-estimation, not by photometric instruments.

THE MINOR PLANETS IN 1880.—The specialty of the *Berliner astronomisches Jahrbuch* is well known to be the ephemerides of the small planets, which at the expense of a great amount of labour Prof. Tietjen has for many years kept up so nearly to our knowledge of these bodies. In anticipation of the appearance of the volume for 1882, these ephemerides applying to the year 1880 have just been circulated amongst observers. In addition to fifty-nine accurately computed ephemerides about the times of opposition of as many planets, there are approximate places for every twentieth day of the first one hundred and ninety-nine of this numerous group, excepting only *Dike* and *Scylla*, for which adequate material for calculation does not exist. Only two out of the number approach the earth during the year, within the distance 1°0, viz., *Ariadne*, in the middle of May, distance 0°923, and *Progne*, in the middle of August, distance 0°996.

That *Dike*, No. 99, should be still adrift, notwithstanding it was discovered as far back as May, 1868, is not perhaps a matter for surprise, considering that M. Borrelly, when he detected it, did not estimate its magnitude over 13'14, though it was within ten degrees from the perihelion. *Scylla* was observed for a fortnight in November, 1875, and may have been in opposition during the last autumn, though not found: from the elements in the *Annuaire* for 1879, it would not appear to be identical with No. 206, discovered by Prof. Peters at Clinton, N.Y., on October 13, 1879, and only observed for three or four days.

A GREAT COMET.—Dr. Gould, in charge of the Argentine National Observatory at Cordoba, telegraphs thus from Buenos Ayres to Prof. Peters, the editor of the *Astronomische Nachrichten*:—"Great comet passing sun northwards;" the telegram was received at Kiel on the 5th inst. The ocean cables may in future prevent such a surprise as was experienced in these latitudes on the sudden appearance of the huge comet of June, 1861, which, rising rapidly in declination and passing the sun, as Dr. Gould describes the new one, was observed simultaneously or nearly so, throughout Europe, with a tail upwards of 100° in length. The astronomical phenomena of the present year which admit of prediction, do not offer any feature of special interest, and a large comet will therefore come the more opportunely.

PHYSICAL NOTES

Two researches on singing condensers, such as that employed in Varley's telephone, have lately been published. M. R. Chavannes, in the first of these, maintains that undulatory currents produce no sounds in such condensers; that intermittent currents are absolutely necessary. M. Tréve has shown, in the second, that a pressure exerted upon the leaves of the condenser sufficient to drive out the air from between them will destroy the production of the tones; and that if the condenser is placed in an exhausted chamber it ceases to emit sounds.

It will be remembered that in 1876 Prof. Rowland discovered the magnetic effects of electric convection. M. Lippmann has discussed, in a recent number of the *Comptes Rendus*, the converse case of the ponderomotive force exercised upon material bodies charged with electricity by the relative motion of a magnet.

CAST-IRON MAGNETS are now being made of a superior quality by M. Carré, who publishes in the *Revue Industrielle* an account of his process. A soft and very slightly carburetted metal is melted in earthen crucibles. Just previous to running into the moulds 10 to 15 per cent. of steel filings are added. In order to produce a metal which will stand tempering at a cherry-heat, there is added either 1 to 1.5 per cent. of nickel, with 0.25 per cent. of copper, or 2.0 per cent. of tin and 0.5 per cent. of copper.

AN "acoustico-electrical kaleidoscope," the invention of M. Michelangiolo Monti, is mentioned in *Les Mondes*. It consists of a microphone used in conjunction with an induction-coil and a Geissler tube, and is, like Edmunds's phonoscope, which it