The following Donations to the Library were announced :—

- Observations made at the Magnetical and Meteorological Observatory at St Helena. Vol. I. 1840–43. 4to.—*By H. M. Government.*
- Fusinieri (A.) sulle Ipotesi del Signor Melloni circa il Calore Raggiante. 4to.—*By the Author.*
- Astronomical Observations made at the Royal Observatory, Edinburgh. By the late Thomas Henderson. Reduced and Edited by C. P. Smyth. Vol. VII. for 1841. 4to.—*By the Royal Observatory.*
- Fellenberg (L. R. de), Fragmens de Recherches comparées sur la Nature constitutive de différentes sortes de Fibrine du Cheval dans l'état Normal et Pathologique. 8vo.
- Analyse de l'Eau Minérale de Weissenburg. 8vo.
- Ueber die bei der Consolidation des Faserstoffes stattfindenden Veränderungen der elementar - analytischen Bestandtheile desselben. 8vo.—*By the Author.*
- Bulletin des Séances de la Société Vaudoise des Sciences Naturelles. No 13. 8vo.—*By the Society.*
- Journal of the Royal Geographical Society of London. Vol. XVII., Part 2. 1847. 8vo.—*By the Society.*
- The London University Calendar for 1848. 12mo.—*By the University.*
- Acta Academiæ Cæsareæ Leopoldino-Carolinæ Naturæ Curiosorum. Vol. XXI., Pars 2. 4to.—*By the Academy.*

Monday, 21st February 1848.

RIGHT REV. BISHOP TERROT, V.P., in the Chair.

The following Communications were read :—

1. Practical Illustration of the Adjustments of the Equatorial Instrument. By Professor C. Piazzzi Smyth.

The object of this paper was partly to introduce to the notice of travellers and residents in tropical countries, a small equatorial instrument, specially contrived for observing the Zodiacal light; and partly to bring forward before amateur astronomers, prominently,

the advantage of equatorial mountings in general; as well as to exemplify the best and easiest methods of adjusting and rectifying the instruments, and placing the telescopes in every respect in the most favourable circumstances for yielding good results. After describing how, in the history of astronomy, equatorial or parallactic stands were twice taken up and abandoned again, from the erroneous estimate formed of the purposes to which they were adapted, the author mentioned the impracticable nature of the altitude and azimuth mountings which followed; and dated the present era of the perfection and the rational employment of equatorials to have commenced in 1820, when Sir J. Herschel, in conjunction with Sir J. South, erected one of these instruments, to give, by its A. R. and Declination circles, absolute places roughly; and, by means of a micrometer applied to the focus of the telescope, small differences very exactly: the old error having been, to attempt to determine absolute places with the utmost precision.

After particularising the various merits and imperfections of the two grand divisions of equatorials, viz., the English and the German, and mentioning a new construction in progress for the Edinburgh Observatory, combining with the single-pier and short polar axis of the German form, the advantage which the English possesses, of large circles, and a position for the telescope *between* the two bearing ends of the polar axis, together with an exceeding degree of firmness and stiffness,—the author proceeded to describe the six errors of adjustment to which all equatorials are subject, and to shew, by means of a model placed within a representation of the celestial sphere, contrived for the purpose, how all the rectifications might be made by means of observations of stars.

The application of clock motion to equatorials, for the purpose of keeping a celestial object stationary in the field, was next entered into; and the plan explained by which the hitherto ungovernable fits of “knocking” of the revolving balls in the later form of English clocks, has been remedied in the case of the Edinburgh Equatorial;—viz., by having *three* pendulum-balls 120° apart, attached to the vertical spindle of the governor, instead of only *two* at 180° .

As a proper micrometer to be used for very faint objects, in place of the ring micrometer,—which the author unhesitatingly condemned, as never having furnished accurate results either in A. R. or Decl., but more especially in the latter, in any person’s hands, though so

strongly recommended, and extensively used, on account of the beauty and truth of one of the theoretical principles involved in it,—he recommended a bar-micrometer, wherein right ascensions were measured by transits across three parallel bars, marking both the immersions and emersions, so as to get rid of error of focus and irradiation of light; and declinations were measured by a bar at right angles to the former, the objects being bisected alternately with either edge of the bar. Observers already provided with position-micrometers might easily have some of these bars inserted, which in one position might be used for A. R., and in another for Decl. Such a micrometer has been found to require no illumination on the darkest nights, even in telescopes of small aperture, and to produce results, with the amorphous masses of faint comets, almost equal in accuracy to those obtained from stars observed with fine wires in an illuminated field.

The paper concluded with a short special description of the Zod. Light-equatorial, which, for economy, lightness, and general effectiveness, seemed well fitted for scientific travellers.

2. On the Vertebral Column, and some Characters that have been overlooked in the Descriptions both of the Anatomist and Zoologist. By Dr Macdonald.

After noticing that the vertebral skeleton has usually been compared to a column, of which the basis (in man) is formed by the sacrum and coccyx, the shaft or columnar part being the bodies of the true vertebræ, as they are usually styled, and surmounted by the splendid composite capital the cranium, the author proposed restricting the observations to the columnar portion, usually divided into 7 cervical, 12 dorsal, and 5 lumbar vertebræ. This division was denounced, and beginning at the summit, he shewed that the upper or cervical region consisted only of 6 vertebræ, as the 7th, in its normal position in the mammal class, had a rib partly articulated to its body, and therefore acquired the character of a dorsal vertebra.

Restricting the cervical to six, the arrangement of the atlas and axis indicates the tendency to a combination into pairs in the course of the vertebral axis. The body of the atlas is almost entirely replaced by the intrusion of the odontoid process of the axis; and thus,