The eight skulls of *Malays* (six of men and two of women) afford the highest mean of any of the Oceanic Races, viz. 47·07 oz., or 1334 grms. For such a bold and enterprising race, who have pushed their migrations, chiefly for commercial purposes, over almost the whole Ocean, such a rich cerebral endowment might have been in some measure expected.

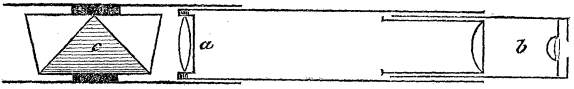
The collection which has afforded the materials for this Memoir is rich in crania from the Dutch dominions in the East-Indian Archipelago. These are distinguished for a tolerably high average of brain-weight. And this is not much diminished when we reach the aboriginal inhabitants of the Polynesian Islands and Western Pacific.

In conclusion, it is believed that this investigation has contributed much more than any former one to define and to discriminate the brain-weights of different human races. Hence it is hoped that it will be accepted as a valid contribution to a most important subject.

II. "Description of a Hand Spectrum-Telescope." By William Huggins, F.R.S. Received December 19, 1867.

The instrument described in this paper was contrived in the summer of 1866, for the purpose of observing the spectra of meteors and their trains. The special suitability of this apparatus, as *a hand-spectroscope*, for the examination of the spectra of the lights which may be seen about the sun during the total solar eclipse of next year, induces me to offer a description of it to the Royal Society.

The apparatus consists essentially of a direct-vision prism placed in front of a small achromatic telescope.



The achromatic object-glass marked *a* is 1·2 inch in diameter, and has a focal length of about 10 inches. The eyepiece (*b*) consists of two plano-convex lenses. As a large field of view is of great importance, especially for its use as a meteor-spectroscope, the field-lens is made of nearly the same diameter as the object-glass. The imperfect definition at the margin of the field is not of much practical importance, as the spectra can be brought for examination into the centre of the field. The field-lens is fixed in a sliding tube, which permits the distance between the two lenses of the eyepiece to be altered; in this way the magnifying-power of the instrument may be varied within certain limits at pleasure. Before the object-glass is fixed a direct-vision prism (*c*), consisting of one prism of dense flint glass, and two prisms of crown glass.

The field of view of my apparatus embraces an area of sky of about 7° in diameter. The spectrum of a bright star has an apparent length of nearly 3°. The spectrum of the Great Nebula in Orion appears as two

bright lines, one of them broad, crossed by a faint continuous spectrum. The magnifying-power of the telescope is insufficient to show the three distinct lines of which the spectrum of the nebula consists. The continuous spectrum is due to the stars of the trapezium, and the other fainter stars scattered over the nebula.

For the purpose of testing the efficiency of this instrument as a meteor-spectroscope, I observed the spectra of fireworks seen from a distance of about three miles. The bright lines of the metals contained in the fireworks were seen with great distinctness. I was able to recognize sodium, magnesium, strontium, copper, and some other metals.

Unfortunately I was prevented from making the use of the instrument which I had intended at the display of meteors in November 1866. I have, however, great confidence in the suitability of the apparatus for the prismatic observation of meteors and their trains.

As the instrument is not provided with a slit, it is applicable only to bright objects of small size, or to objects so distant as to subtend but a very small angle. It is obvious that if the object has a diameter smaller in one direction than in any other, as would usually be the case with the trains of meteors, the instrument should be rotated to take advantage of the form of the object. The most favourable position will be when the smallest diameter of the object is perpendicular to the height of the prisms. In this way I have seen the lines of Fraunhofer in the spectrum of the moon when a very narrow crescent.

In the case of objects which appear as points, a small breadth may be given to the spectrum by a cylindrical lens fitted in a little cap which slips over the eye-lens, and is placed next to the eye.

As some of the advantages which this instrument possesses over an ordinary spectroscope, or over a prism held before the eye, may be stated the comparatively large amount of light which the object-glass collects, the great facility for instantly pointing the instrument to the object desired, which the large field of view affords, and in some cases the magnifying-power of the instrument.

It may perhaps be mentioned that secret signals might be conveyed at night by means of the temporary introduction of certain suitable substances, as preparations of lithium, copper, strontium, &c., into the flame of a lamp giving a continuous spectrum; the presence of the bright lines due to these substances would not be perceived except by an observer provided with a spectrum-telescope, to whom they might convey information in accordance with a previous arrangement.

This little instrument, held in the hand and directed to the place of the sun during its eclipse in 1868, might enable an observer, who was not provided with larger apparatus, to give an answer to the important question whether the bright prominences are self-luminous or reflect solar light. At least it would be possible for him to determine the general character of the spectrum of a bright prominence so far as to learn whether

it is continuous or consists of bright lines. On account of the low magnifying-power of the instrument, the red prominence would appear sufficiently small to permit of bright lines being distinguished on its spectrum, if such should exist.

The instrument should be previously focused by the observer on the moon, or some distant object.

Should a portion of the sun's limb be visible, the instrument must be rotated until the spectrum of the little projecting prominence appears in a direction parallel to that of the spectrum of the sun's limb, and is not overlapped by it. Perhaps a diaphragm across the field of view and cutting off about one-third of it would be an advantage, as the spectrum of the sun's limb might be concealed behind it. The eye, relieved in this way from the bright solar spectrum, would be in a more favourable state to examine the fainter spectrum of the red prominence.

Four of these instruments, made by Mr. Browning, have been sent out by the Royal Society to India, to be placed in the hands of observers stationed at different places along the central line of the eclipse. This instrument would be specially suitable for use at sea.

Postscript.—Mr. Browning has recently suggested a method of diminishing the apparent velocity of meteors by the use of a concave cylindrical lens placed with its axis perpendicular to the direction of their motion. This mode of observing may be applied to the spectrum-telescope by substituting, when required, a plano-convex cylindrical lens for the eye-lens of the eyepiece. If this lens be placed with its axis parallel to the height of the compound prism before the object-glass, and if the telescope be held in a position such that the direction in which the light of the meteor is dispersed is perpendicular to that of its motion, the spectrum of the meteor will be magnified, as when the ordinary eye-lens is employed, but the apparent velocity of the meteor will be less by an amount equal to the magnifying-power of the eye-lens.

January 30, 1868.

Lieut.-General SABINE, President, in the Chair.

The following communications were read:—

I. "Remarks upon *Archæopteryx lithographica*." By Prof. T. H. Huxley, LL.D., F.R.S. Received January 1, 1868.

The unique specimen of *Archæopteryx lithographica* (von Meyer) which at present adorns the collection of fossils in the British Museum, is undoubtedly one of the most interesting relics of the extinct fauna of long-past ages; and the correct interpretation of the fossil is of proportional importance. Hence I do not hesitate to trouble the Royal Society with