

I would particularly call attention to the third and fourth measurements, as also to the last two, and venture to think that no one could entertain the trustworthiness of data that involve such great changes in cranial capacity in such short spaces of time. To what, then, are these differences due? Partly, of course, to unavoidable errors of observation. This, however, I think is only a small portion of the differences. The main difference is, I believe, due to other causes. Anyone who has seen the instruments will recognize that they are far too rough and imperfect to measure small differences with any degree of accuracy, and yet it is on differences as small as one-tenth of an inch that Mr. Galton's calculations are based.

I admit it is quite possible that, even after elimination of the errors due to experimental causes and to the imperfection of the instrument, the figures would still be somewhat variable. These variations may, however, be readily explained, without the assumption of any improbable head-growth. The amount of hair on the head must considerably influence the measurements, and, according as it is long or short at the time of measurement, so will the figures show an increase or a decrease. I have tested this, and proved it to be the case. On August 30 (my hair not being very long, having been cut two and a half weeks previously) my head was measured, the figures being as follows:—

$$5\cdot8, 7\cdot4, 5\cdot6 = 240\cdot35.$$

I then had my hair cut fairly short, and was measured again; the figures then read—

$$5\cdot7, 7\cdot4, 5\cdot5 = 231\cdot99.$$

Again, the scalp being, as is well known, very vascular, any change in the fulness of its vessels must materially affect the thickness of the scalp, and so influence the measurements, and so any cause producing either increased blood-flow or hindering the return of blood from the scalp, will have some effect on the measurements.

Several other similar explanations of supposed head-growth might be given, but I think the measurements I have given will suffice to show the uselessness of the measurements for calculating head-growth, and, further, that such differences as actually do exist can be readily explained without having recourse to any such improbable assumption as the further growth of the head after nineteen years of age, and without involving the unintelligible statement that the head of a "poll" man grows more than the head of an honour man. This would necessitate the supposition that a "poll" man, by his three years' study (?) at Cambridge, profits more than an honour man! Such an hypothesis would need more scientific proof than has been given.

Trinity College, Cambridge, September 3. H. J. P.

#### Glories.

COLOURED rings are often seen surrounding the shadow of the spectator's head when the sun is shining on a fog of water particles. They are known by various names, such as glories, arthelia, Ulloa's rings, &c. Can any of your readers inform me if they can also be seen when the fog is frozen? I should also be glad of accurate accounts of their colour and angular dimensions. I have read those given by Scoresby (Kaemtz, "Meteorology," translated by Walker); Flammarion (Glaisher's "Travels in the Air"); Abercromby (*Phil. Mag.*, January 1887); and Mohr (*NATURE*, February 1888).

JAMES C. MCCONNELL.

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#### Fine Slow-moving Meteor.

ON September 25, at 8h. 5m., I saw a bright first-magnitude meteor amongst the stars of Aquarius. It moved very slowly to the east, and, after a duration of about 13 seconds, disappeared at the point R.A.  $11^{\circ}$ , Decl.  $+8^{\circ}$ . Its place of first appearance was near R.A.  $332^{\circ}$ , Decl.  $-7\frac{1}{2}^{\circ}$ , so that the length of its observed path was about  $42^{\circ}$ . The nucleus was followed by a thick train of sparks, and at the end it divided into two parts. This meteor was observed at Oxford by Mr. W. H. Robinson, of the Radcliffe Observatory. He writes:—"This evening a fine meteor was seen slowly moving between the constellations Aquarius and Pegasus, at 8h. 5½m. G.M.T. It was first seen at R.A.  $330^{\circ}$ , N.P.D.  $88^{\circ}$ , disappearing near R.A.  $352^{\circ}$ , N.P.D.  $82^{\circ}$ ; duration, 3 or 4 seconds." A comparison of these observations shows that the radiant point was probably in R.A.  $244^{\circ}$ ,

Decl.  $-22^{\circ}$ , and that the meteor, when first seen, was at a height of 46 miles over a point in the English Channel 20 miles south of the Isle of Wight. It disappeared near Staplehurst, in Kent, at the same height. Length of path, 100 miles. At Oxford, the early part of the meteor's flight was not seen. The Bristol observer watched the meteor through 91 miles of its course, and the duration of 13 seconds would give a velocity of 7 miles per second. At Oxford, 35 miles of the terminal section of the flight was seen in 3 or 4 seconds, which gives a velocity of 10 miles per second.

Further observations of this body would be valuable to corroborate these results. The meteor was an exceptional one, both as regards its slow speed and the position of its radiant point. No meteor-shower has hitherto been recognized at this epoch in the region of Scorpio. Isolated slow-moving meteors of this description are of great value as giving us indications of feeble systems not otherwise discoverable, and as allowing good determinations to be made of their heights and velocities.

Bristol, October 4.

W. F. DENNING.

#### A Brilliant Meteor.

AT 7h. 6m. ± p.m. G.M.T., on October 10, a brilliant meteor was observed here, about  $10^{\circ}$  south-west of  $\alpha$  Pegasi, and travelling from thence to near Jupiter, being apparently three times the size and brilliancy of that planet. Its colour was of a bluish-white, and it possessed a fine train, disappearing after six seconds, having burst into a number of pieces.

W. HUGO.  
Kew Observatory, Richmond.

#### The Shining Night-Clouds—An Appeal for Observations.

THE following is the substance of an appeal for observations made by Herr O. Jesse in the spring. The time of year in which the clouds appear in these latitudes has now elapsed; I have seen no sign of them this summer, either in this country or while travelling in the Alps. But as Mr. D. J. Rowan saw them (see *NATURE*, June 13, p. 151) it is very desirable that they should be looked for in all parts of the world. I see Mr. Le Conte assumes (October 3, p. 544) that Mr. Rowan is correct in calling these clouds self-luminous—which conclusion I agree with Herr Jesse in considering highly improbable.

Sunderland, October 12.

T. W. BACKHOUSE.

The time of year has again arrived when the lustrous silvery clouds, which have appeared annually in June and July from 1885 to 1888, may be expected to again become visible to observers throughout Europe.

These clouds are not only of high meteorological interest, but may be of an almost greater astronomical one, for, from their so decidedly pronounced periodicity, joined to their extraordinary height, it may perhaps be inferred that they are of extra-terrestrial origin.

As there is entire lack of previous record of these clouds, and they may disappear soon for an indefinite period, I would earnestly ask for such early observations as may be likely to determine their origin, nature, and periodic motion. Spectroscopic examination of their light would be valuable. Prof. Galle and others have considered that the clouds in question are phosphorescent, but this is very improbable, and I hold they are scarcely, if at all, visible unless the sun shines directly upon their substance. On this assumption, their height in 1885 was found to be from 49 to 54 kilometres; but, by photographic observations in 1888, it came out as great as 75 kilometres.

Prof. Kohlrausch advances the opinion that these clouds have in some way been formed by the eruption of Krakatão, although they were not generally seen until nearly two years after that event. From this hypothesis I suggest that they may be caused by the condensation of gases from that volcano, and that the process of condensation occupied the intervening time. One observer, however, states that he saw them in 1884.

#### NOTES.

WE deeply regret to have to record the death of James Prescott Joule, one of the greatest men of the age. He died on Friday last at his residence at Sale, near Manchester.