case lies in the fact that the antipodal point corresponding, being S. lat. 19° 21′ and E. long. 115° 38′, lies about 100 miles north by east of Barrow Island, off the west coast of Australia. It is further interesting to note that the line which joins this point with the southern point of Barrow Island fairly represents the direction of the coast-line at this point, and leads to the presumption of the existence of main lines of faulting there having that direction. To this relation of antipodean points in connection with earthquakes I have already had occasion to call attention.

J. P. O'REILLY

Royal College of Science, Dublin, December 22

Barnard's Comet

THIS comet has been observed here with the 7½-inch refractor, with power 50, than which no higher power could be used with advantage.

On December 19, at 18h., it appeared as bright as a 2nd magnitude star similarly situated; the nebulous head was about 10′ in diameter, with central condensation of perhaps half a minute. The "position" of the principal tail was estimated to be 0°: it remains of a parallel breadth throughout, and does not increase in breadth as it recedes from the head of the comet; this constant breadth is equal to the diameter of the nebulous head, that is to say, 10′. By sweeping, this tail may be traced to a distance of some 10° from the head.

The secondary tail is inclined at an angle of between 30° and 40° to the principal one, and fades away rapidly at a distance of perhaps 1° from the head; it is well defined on the preceding side, but on the following side it melts away into a nebulous mass connecting it with the principal tail for some distance from the head.

On the 27th, at 19h., the comet was decidedly less bright than on the 19th, but the same general description applies.

The "positions" of the two tails were measured, and were: the principal tail, 15°·5; the secondary, 338°; the included angle, 37°·5 ± 0°·5. The secondary tail did not appear as well defined, on the following side, as on the 19th.

Finlay's comet presents no visible feature of interest.

WENTWORTH ERCK

Shankill, co. Dublin, December 28

Electricity and Clocks

IN the absence of any details, apparently Mr. Wilson's simplest plan would be to insulate the hammer and bell of his "small striking clock," and arrange that a galvanic current should pass through both, when they come in contact by the act of striking: this current of course to be directed to a large electro-magnet, to raise the hammer for striking on his bigger bell. Should the striking of Mr. Wilson's smaller clock be on a gong with a leather-beaked hammer, a separate attachment must be made for contact.

HENRY DENT GARDNER

Lee, S.E., December 26

P.S.—If a longer contact be desired, the hammer whilst at rest should repose upon a weak spring, and be kept away from a banking; when the hammer rises, contact will ensue between the spring and banking, and last until the hammer falls again.—H. D. G.

Seismometry

THERE are one or two points in Prof. Ewing's letter on the above subject in the last number of NATURE which seem to call for a few words of reply.

(1) As to the alleged inconsistency between what I wrote in 1881 and what I wrote in my last letter. The remark quoted referred to a light pivoted frame carrying at its centre of percussion, relatively to the axis through its pivot, a pivoted mass. There was no "if need be" about this mass: it was an essential part of the system. I believe the remark I then made was perfectly correct and in no way inconsistent with my remarks in 1886.

(2) As to the vertical-motion instrument, the lever with spring joint used at Comrie in 1842 does not at all resemble the rigid lever working on knife edges and supported by springs as introduced by me and used by Prof. Ewing. On the question of compensating the lever by the addition of negative stability, I have nothing to add to what I stated in my last letter.

(3) As to the publication referred to by Prof. Ewing, the memoir printed by the Tokio University is probably, from the circumstances of its publication, hardly known to anybody. The "Encyclopædia Britannica" article is not, in my opinion, a fair account of what has been done in seismometry.

THOMAS GRAY

7, Broomhill Avenue, Partick, December 27

The Recent Weather

AT Cardross, half-way between Dumbarton and Helensburgh on the Clyde, at about 25 feet above sea-level, in an outer lobby with a temperature of say 45° to 50° F. at 9 a.m. on Wednesday, the 8th inst., the mercurial barometer stood at 27·51 inches, which, with reduction of say 0·02 added for elevation, and say 0·03 subtracted for temperature, would make it 27·50 inches. On January 26, 1884, it stood at 27·39 inches, which with like reductions would give 27·38 inches. These are nearly as low as those you refer to in your number for last week.

Cardross, Dumbarton, December 23 R. B. W.

OBSERVATIONS OF NEBULÆ AT ARCETRI[1]

M. TEMPEL observes under difficulties. The Arcetri Observatory possesses, it is true, two fine refractors by Amici, one of 11, the other of 9⅓ inches aperture; but neither is, properly speaking, available for astronomical use. The smaller is rudely set up on an open and uneven terrace, exposed to every gust of wind, and, at the most, serves to display the wonders of the heavens to curious visitors. Amici I. is duly ensconced in a revolving dome, but clockwork motion is wanting; the circles, both of declination and right ascension, are (strange as it may seem) *undivided;* and when the necessarily somewhat unwieldy instrument is, with infinite pains and without so much as the aid of a handle, pointed towards the object sought, there is actually no means of clamping it in the position so laboriously arrived at! That M. Tempel, under circumstances so discouraging to him and disgraceful to the responsible authorities, should have executed a number of valuable drawings of nebulæ, should have re-observed many such objects neglected, or even believed to have disappeared, since the elder Herschel's time, besides discovering a good proportion of new ones, gives astonishing proof of his keenness, zeal, and accuracy. All the more, nevertheless, there is reason to regret that qualities so rare should be employed at such cruel disadvantage for want of the judicious expenditure of a couple of thousand francs.

The paper before us is accompanied by reproductions of two admirable drawings by the author, one of the Orion, the other of the "Crab" nebula (Messier I.). The latter is of especial interest, as disclosing a feature unnoticed by any previous observer. This is a dark cleft right through the central condensation, dividing it along the major axis into two spindle-shaped nebulæ. Incipient fission would seem to be indicated. On the same plate with his own, M. Tempel has engraved five earlier drawings of the object, by J. Herschel, D'Arrest, Lassell, Secchi, and Lord Rosse. The comparison is instructive, if somewhat disheartening; for, assuredly, no two of the six confronted delineations could be supposed, on an unprejudiced inspection, to have been inspired by one original. Yet the nature of that original sufficiently explains the discrepancies. The apparent form of nebulæ depends upon almost evanescent gradations of diffused faint light, and differs, for each individual eye, with its sensitiveness to them. And since personal equation, as regards such gradations, is shown by many proofs to be enormously large, a vast amount of detailed variation in the representation of the objects exhibiting them becomes intelligible. It is, then, a circumstance of pecu-

[1] "Ueber Nebelflecken. Nach Beobachtungen angestellt in den Jahren 1876-79 auf der Königl. Sternwarte zu Arcetri bei Florenz." Von Wilhelm Tempel. Abhandlungen der Königl. Böhm. Gesellschaft der Wissenschaften. VII. Folge, 1 Band. (Prag, 1885.)