

confined chiefly to two spots, where it is seen only to the south-east; imagine a round, straight hole bored through a stratum of sand sufficiently adhesive for the sides to remain erect for a time, and after this suppose that the sand begins to fall inwards, creating a partial cone around to the south-east side; this is the sort of progress that these two spots convey. As to magnitude, the spots are scattered over an area of some 6000 millions of square miles; while the collective area of the spots themselves is about 630 millions of square miles, or, say, six times the area presented by the earth to the sun. Remembering that of solar change "a little goes a long way," so far as we are concerned, who shall say that changes of this magnitude are inappreciable on the earth, however ineffectual the instruments we can now command may be able to measure them? But was this sudden change inappreciable? that is now the question. Unhappily the sun remained invisible till July 30, when two negatives were taken, *i.e.* after an interval of just five days; so far as solar rotation could effect, the so-called new group of N_2 should have been visible not far from the sun's western edge; but the entire group had vanished, leaving no trace behind. In the interim of five days two new spots had come out; of one of these I may add that the umbra is about 200 millions of square miles, and the penumbra some 700 millions, presenting in all a single feature of more than 900 millions of square miles, or say nine times the area exhibited by the earth to a distant spectator. This ends the purport of my letter. But I cannot help adding that I believe the bright solar features or faculae will eventually prove to be more effective exponents than the dark features or spots; as a matter of fact, faculae commonly appear in abundance, covering considerable areas and branching out from one another like coral reefs; and it is a mistake to suppose that faculae exist only in the vicinity of spots; the former may abound where the latter are quite absent, not only in a 4-inch negative, but in a very fair 5-inch equatorial. But I suppose the world will be better informed some day. Meanwhile, surely the sun is worthy of more earnest attention, not only from points of attack already so ably occupied, but from others none the less important, though at present greatly neglected: need I name solar radiation and photography? Physicians are alarmed for the safety of our bodies on detection of even a trifling change in temperature; but what do we know of fluctuations in the source of all terrestrial heat, though it be measurable with an actinometer? Again, land surveys are often made on huge scales; but for the solar survey of $1\frac{1}{2}$ million millions of square miles, what is our largest delineation, and at how many spots round the world is the required daily record made? If a survey of London pays, depend on it surveys of the sun will pay all nations infinitely better.

J. B. N. HENNESSEY

India, North-West Provinces, Mussooree, August 5

Proneomenia sluiteri, Hubrecht

IN the report of the Proceedings of the Biological Section of the British Association which appeared in NATURE, vol. xxiv. p. 501, there is a slight mistake in the notice of my friend Dr. Hubrecht's paper on *Proneomenia*. This interesting mollusc is erroneously described as "one of the valuable finds of the Challenger Expedition." So far as I am aware, neither *Proneomenia* nor either of the other two genera of the *Solenogastres* (*Neomenia*, *Chatoderma*) was obtained by the *Challenger*. The only two specimens of *Proneomenia* which are known to science as yet were dredged by the Dutch Arctic Expedition of 1878 (or 1879), at depths of 110 and 160 fathoms in the Barents Sea. It was not obtained by the *Wilhelm Barents* in 1880, but we may hope that the dredgings of this season have been more productive, for Dr. Hubrecht informs me that 1881 has been a very bad ice year, and that the *Wilhelm Barents* has not succeeded in penetrating so far north as she has done in previous years. The summer has therefore been devoted to dredging operations, and valuable results may be expected. The zoological results of the Dutch Arctic Expeditions of 1878 and 1879 are being published as supplemental volumes of the *Niederländische Archiv für Zoologie*; and in the second of these, which is now in course of publication, will be found an elaborate memoir by Dr. Hubrecht entitled "*Proneomenia sluiteri*, gen. et sp.n., with Remarks upon the Anatomy and Histology of the Amphineura."

Eton College, September 24 P. HERBERT CARPENTER

Polydonia frondosa

THE Medusa mentioned by Mr. Archer in NATURE, vol. xxiv. p. 307, is undoubtedly *Polydonia frondosa*, Ag., figured

in the Contributions to the Natural History of the United States. This Medusa was already known to Pallas, who described alcoholic specimens sent him from the West Indies by Drury. It is stated by Agassiz to be quite common along the Florida Keys. I have myself observed it in great abundance at the Tortugas, in the moat of Fort Jefferson, and in the mud flats to the north of Key West. They occur there in from three to six feet of water, the disk resting upon the bottom, the tentacles turned upwards; the disk pulsates slowly while they are at rest. Their habits when disturbed are well described by Mr. Archer. The young sometimes swim near the surface, and are far more active than larger specimens. When kept in confinement they also creep slowly over the ground by means of their tentacles, or, raising themselves sometimes edgewise against the sides of the dishes, remain stationary for a considerable time. The resemblance of *Polydonia* when at rest upon the bottom to large *Actiniae* with fringed tentacular lobes, such as *Phyctactis*, is very striking. The peculiar habits of *Polydonia* were noticed by Mertens in a species named by Brandt *P. Mertensii* in 1838; and found at the Carolines. The genus *Polydonia* was established by Brandt, and not by Agassiz, as is stated by Haeckel in his "System der Medusen." ALEXANDER AGASSIZ

Cambridge, Mass., August 27

Constancy of Insects in Visiting Flowers

MR. A. W. BENNETT's paper (NATURE, vol. xxiv. p. 501) on the "Constancy of Insects in Visiting Flowers" recalls a note I made at Cromer during the hot weather of last July. On the cliffs west of that town, where flowers were very abundant and of various colours, I carefully watched the movements of a small tortoiseshell butterfly to ascertain what flowers it visited. It was at first busy with bindweed; then it left this for yellow bedstraw (*Galium verum*), returning presently to bindweed. Then it tried a thistle, which detained it some time, after which it shifted to ragwort, and finally revisited bindweed. It seemed equally busy with all these flowers, though so various in form and colour. My tortoiseshell was therefore less constant than Mr. Bennett's, and its visits were successive, there being no interludes on grass, leaf, tree-trunk, or ground.

Homerton College, E.

J. T. POWELL

[In Mr. Bennett's paper, p. 501, col. 2, line 31 from bottom, for *from* read *more*.]

Brewing in Japan

WILL you permit me to point out an error which has crept into the report of my paper on "Brewing in Japan" in last week's NATURE, p. 468. After mentioning the points in which *Kōji* differs from malt, the report continues:—"Kōji is prepared as follows: a mixture of steamed rice and water is allowed to remain in shallow tubs at a low temperature (6° - 5° C.) until quite liquid; it is then heated," and so on. The following alterations will make the account of the Japanese brewing process correct:—"Saké (rice-beer) is prepared as follows: a mixture of steamed rice, *kōji*, and water is allowed to remain in shallow tubs at a low temperature (6° - 5° C.) until quite liquid; it is then heated . . ." Not using malt as we do in our breweries, the Japanese have discovered for themselves a means of rendering the rice-grains diastatic with allowing the embryo to germinate. This is effected by exposing the softened rice-grains to the action of dry steam, by which treatment the starch is gelatinised; when cold the spores of a mould are caused to grow over the surface of the rice, the mycelium being formed at the expense of the starch, and heat being liberated together with the usual products of combustion. The albuminoid matter of the rice, which previously was for the most part insoluble in water, is, after the growth of the mycelium, found to be almost completely soluble, and the solution possesses diastatic properties resembling those of malt extract. The main point in which it differs from the latter is in its superior hydrating power, for, unlike malt-extract, the solution of *kōji* very quickly converts maltose into dextrose. This material (*kōji*) is then used instead of malt in the mashing process, the sugar formed from the rice-starch under the influence of the dissolved *kōji* being dextrose, which is further fermented by the accidental introduction from the atmosphere of the germs of a species of yeast. The change induced in the character of the albuminoid matter under the influence of the growing mould is remarkable, and, I think, novel, and the interest of the observations I have made lies in