

of air. Not only is this in agreement with observation, but I find the coefficient of extinction of light due to scattering

$$\frac{8\pi^3 RT\beta}{27 N\lambda^4} (\mu^2 - 1)^2 (\mu^2 + 2)^2$$

closely represents the observed transparency of pure water in the region of the spectrum where there is no selective absorption. Work is now in progress testing the formula in the case of other liquids.

It is clear that an application of the same idea of local fluctuations of optical density and of Debye's theory of the thermal movements in solids would give the theoretical scattering power of transparent crystals for ordinary light. This is also being tested.

C. V. RAMAN.

210 Bowbazaar Street, Calcutta, October 15.

The Tendency of Elongated Bodies to Set in the North and South Direction.

THE letter from Sir Arthur Schuster in NATURE of October 20 last requires amplification and amendment in one particular. The setting tendency of an elongated body depends upon its method of support. If suspended, with the centre of gravity not free to rise and fall, it is at its "lowest" position when lying on the equipotential section of maximum radius of curvature, *i.e.* tends to set east and west. A floating body, on the other hand, where the centre of gravity is free to rise and fall, is at its lowest when lying on the equipotential of minimum radius of curvature, *i.e.* north and south. The whole matter is fully discussed in an article by Mr. W. D. Lambert, of the United States Coast and Geodetic Survey in the *American Journal of Science* for September last.

The tendency of the rod of a torsion balance to set east and west was pointed out by Baron Eötvös in one of his early papers, probably one of those presented to the International Geodetic Conference, but I am not able to lay my hands on the exact reference.

E. H. GROVE-HILLS.

Ophion luteus.

It is a quite common experience to see *Ophion luteus* fly into houses at night attracted by light. I have myself captured at least half a dozen specimens that had in a single hour flown into a room in that way. Not long ago Dr. James Waterston, at my request, dissected a fresh female specimen, and found in it a poison gland, reservoir, and duct similar in character to those recorded as being present in certain other species of Ichneumonidæ.

M. R. du Buysson, in a paper (*Rev. d'Entomologie*, vol. 11, p. 257, 1892) which I have only recently seen, states that he had often been stung by Ichneumonidæ of the Ichneumon, *Pimpla*, and *Ophion* groups; but however much poison may have been injected, the pain and inflammation produced by the sting, he says, lasted only a short time. He dissected a large number of specimens belonging to all the groups of Ichneumonidæ, and always found one or several poison glands present.

The larvæ of *Ophion luteus* appear to be parasitic in the caterpillars of many different species of Lepidoptera; but it would appear to be the case also that the female does not pierce the skin of the caterpillar to lay her eggs inside. She is said to lay them on the skin. That point probably needs confirmation. But however that may be, it seems to me incredible that the female would mistake the arm of a young lady for a caterpillar. In M. du Buysson's case, the insect had always been held in the hand or otherwise irritated before it attempted to sting, and this seems

to be the general experience. He was never puzzled to divine the purpose of the sting, regarding it, no doubt, simply as an act of self-defence; and that is the explanation which I would venture to suggest in reply to Sir Herbert Maxwell's letter in NATURE of November 10.

C. J. GAHAN.

Natural History Museum, S.W.7,
November 14.

IN respect of Sir Herbert Maxwell's letter in NATURE of November 10 on *Ophion luteus*, Linn., may we hope that the insect caught *flagrante delicto* was preserved in order that the species might be placed beyond a doubt, these large red Ophionidæ being almost impossible to differentiate at a glance?

Ophion luteus is apparently a nocturnal insect. I have observed it at night hunting for *Dianthæcia* larvæ. The species is credited with a long list of hosts, chiefly Noctuid moth caterpillars.

Almost all Ichneumonidæ will "sting" or attempt to if handled, the males included (though, of course, morphologically incapable), but that any member should make an attack unprovoked is most unusual. *O. luteus* and allied species are extremely bad-tempered—a fact which hampers work with them in confinement, as they repeatedly "sting" potential hosts to death without attempting to parasitise them. Perhaps this irritability was the cause of the unusual attack.

R. STENTON.

Pathological Laboratory, Ministry of Agriculture, Harpenden, November 19.

Sex-manifestation and Motion in Molluscs.

I DO not wish to prolong the discussion upon sex-differentiation and mode of life, though I venture to think that Dr. Orton's reply in NATURE of November 3 to my letter in the issue of October 13 leaves several questions very much as they were before.

On many points I find myself in agreement with Dr. Orton, though I consider that the incidence of sex-differentiation in the Mollusca does not exhibit that general correlation with an active habit demanded by Dr. Orton's hypothesis. I quite agree, as I said in my previous letter, that many forms originally considered dioecious may be monœcious; but I think it is for Dr. Orton to prove this, and I shall await his demonstration with interest. I would like to point out, however, that it will not be enough to show *sex-change* (a turnover from maleness to femaleness, or *vice versa*). The implications of Dr. Orton's hypothesis entitle me to demand from him something in the nature of *permanent* hermaphroditic forms.

G. C. ROBSON.

Natural History Museum, S.W.7,
November 14.

Sinistral *Limnaea peregra*.

LAST year I started a breeding experiment with two pairs of sinistral *Limnaea peregra* given me by Mr. J. W. Taylor, of Leeds. The first two generations have not come out on any plain plan, and it is necessary to carry them further if the mode of inheritance of this very rare form of one of our commonest freshwater snails is to be worked out. But the young have now quite outgrown the possibilities of my establishment, and if anyone would take over some of them and breed them out (which is quite simple, as they want little attention) they would be doing me a service.

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November 7.