Feeding Habits of the Angler-fish, *Lophius piscatorius.*

In a recent publication ("The Seas", by F. S. Russell and C. M. Yonge) a statement is made with regard to the feeding habits of the angler-fish which does not accord with my own repeated observations, and it has been suggested that I should describe the feeding habits of this interesting fish as seen by myself on many occasions in the tanks of the Marine Biological Station at Port Erin.

In the publication referred to, the angler-fish is stated to lie perfectly still with its huge mouth wide open and to appear to use the tentacle borne on the top of its head as a lure. There is no doubt, as is shown below, that the tentacle is so used, but, though the fish was always kept in a dimly lighted tank, I have never seen the tentacle luminescent. However, I have never observed the fish during the night. It was our practice on many occasions to put into the tank containing the angler a few living young specimens of the coal-fish, *Gadus virens*. These would soon be noticed by the angler, which, while remaining stationary with closed mouth, raised the lure from its horizontal position along the back and jerked it to and fro. Suddenly, as the unsuspecting coal-fish hovered over the head of the angler and sampled the living and actively moving bait—I cannot say that I ever saw it touch the bait with its snout—the angler's mouth would open and as suddenly close upon its prey; the head of the coal-fish always disappearing first, while the tail projected from the tightly closed mouth. A few seconds later the tail would be drawn by a sort of suction into the still closed mouth and the angler would be ready for another meal.

I never saw the angler attempt to pursue its prey. It was its invariable habit to lie perfectly still on the bottom of the tank, the lure being actively jerked to and fro when the coal-fish were introduced. When no prey was in view, the lure always lay horizontally along the top of the angler's head.

H. C. Chadwick.

Marine Biological Station,
Port Erin, July 17.

Crystal Structure of Solid Nitrogen.

In a previous communication, dated June 28 (Nature, Aug. 17), I gave results regarding the crystal structure of the form of solid nitrogen, which is stable below 35·5° K. It was stated that the X-ray powder diagrams can be interpreted with respect to the positions of the lines by means of a cubic unit cell the length of the side of which is 5·65 A., and containing 8 atoms.

Since then, the work has been continued, and after a long and laborious discussion of the various possibilities, we have now succeeded in finding the atomic arrangement which satisfies the intensity distribution of the X-ray spectrum. Our results, which will be more fully described in a subsequent paper, may be shortly stated as follows:

Solid nitrogen of the form considered has a pronounced molecular structure belonging to the space group T^4, and similar to that of the sodium chlorate type. The molecules—each consisting of two atoms—are placed on the four non-intersecting trigonal axes typical for this space group. The structure has two parameters, by a proper choice of which we obtained a remarkably good agreement between calculated and observed intensities. The parameter values thus found led to a distance of 1·06 A. between the two atoms of a molecule. If we could consider the molecules as spheres, the structure might approximately be regarded as a cubical close packing of molecules, with a minimum distance of about 4·0 A. between their centres.

Sodium chlorate, in the cubical form, turns the plane of polarisation and shows anomalous behaviour in producing double refraction. The similarity with regard to crystal structure would indicate that solid nitrogen should possess similar optical properties. In fact, D. Vorländer and W. H. Keesom (*Comm. Phys. Lab. Leyden*, No. 182 *c*; 1926) have found that solid nitrogen shows double refraction, and we intend to undertake experiments at this Institute with the object of discovering whether solid nitrogen gives any rotation of the plane of polarisation. L. Vegard.

Physical Institute, University,
Oslo, Aug. 1.

Optical Excitation of Phosphorus Vapour.

On illuminating the vapour of phosphorus by the light of various sparks, we obtained a fluorescent emission in the region 3500-1900 A. The vapour was contained in an evacuated and sealed quartz tube into which a quantity of carefully dried white phosphorus distilled *in vacuo* was previously introduced. The temperature and pressure of the vapour could be varied independently by an oven and a water bath. In order to obtain the fluorescence, heating of the vapour up to 600°-700° C. was found to be necessary, the vapour pressure being kept low (*c.* 0·1 mm.). The phosphorus molecules, which consist normally of four atoms (P_4), dissociate under these conditions into diatomic molecules (P_2) to an appreciable amount.

The spectrum of the fluorescence consists of resonance series excited by the spark lines 2195 and 2144 of cadmium, 2100 and 2062 of zinc, 1990 and 1935 of aluminium. The analysis of these series enabled us to estimate the first vibration quantum of the normal P_2-molecule as 775 cm.$^{-1}$ and its dissociation energy as 6 volts. Of various emission spectra of phosphorus in an electric discharge studied by Geuter (*Zeitsch. wiss. Phot.*, **7**, 1; 1907) only one, designated by him as *C*, is ascribed to the P_2-molecule. It shows the same sequence of vibration quanta as our resonance series in the near ultra-violet. From the combination of these data an energy diagram of the P_2-molecule (similar to the N_2-molecule) was constructed in which the convergence of 'upper' vibration quanta ($\omega' = 450$ cm.$^{-1}$) seems to correspond to a dissociation of P_2 into P + P′, where P′ designates the atom of phosphorus in its first excited metastable state ^2D, 1·4 volt above the normal state ^4S (cf. McLennan and McLay, *Trans. Roy. Soc. Canada*, **31**, 63; 1927). The results of a complete analysis of the emission and absorption spectra will be published elsewhere.

A. Jakovlev.
A. Terenin.

Physical Institute,
University of Leningrad.

Iceberg Detection.

(By Cable.)

One of the interesting results of the Van Horne expedition just returned from iceberg study on the Atlantic was obtained with our submarine microphone detector. Very loud deep noises were heard three miles from an iceberg and became faint at six miles.

These noises are apparently due to the cracking under water of the iceberg, and they could readily be heard above the usual ship's noises. The succession of cracks was irregular, running from 11 to 68 a minute. The effect is so characteristic that we propose to extend the investigation in the hope of finding a method of iceberg detection.

Howard T. Barnes.

McGill University, Montreal.