obtained if the substrate only was incubated, or if both were allowed to react immediately). The experiment was repeated in more concentrated heavy water (1 : 213 diplogen ratio) and a new effect appeared. The *Planaria* in heavy water of this concentration were rapidly parasitised by moulds and succumbed within three weeks (Fig. 1). In some cases the living animal becomes invested with slime mould, and in others is covered with tufts of mycelium. The reduced metabolism and movement are possible factors in addition to the specific effect of this concentration of diplogen on mould growth.

A similar increase in the growth of moulds was seen in tests of *Aquilegia* seeds kindly supplied by the Cambridge Seed Testing Station, through the courtesy of Mr. Hugh Richardson of Wheelbirks, Northumberland. In the 0·47 per cent diplogen cultures, masses of white mould mycelium appeared (Fig. 1), but these were chiefly saprophytic, since they occurred mostly on the unsprouted seeds.

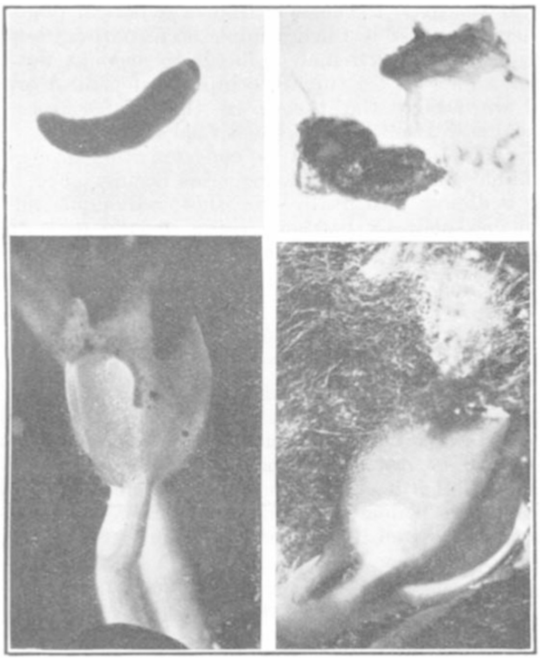

FIG. 1. Upper left: a control planarian in ordinary water. Upper right: two representative planarians killed by mould in 0·47 per cent heavy water. Lower left: sprouting *Aquilegia* seeds in ordinary water. Lower right: seedling in 0·47 per cent heavy water surrounded by white mould.

It would appear from the work of Meyer on *Aspergillus* and the experiments reported in this note, that diplogen in 1 : 200 concentrations has a specific effect in stimulating the growth of moulds and possibly bacteria. This property should afford many interesting problems in parasitology, and might be of considerable importance in the possible therapeutic use of dilute heavy water.

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May 8.

[1] T. C. Barnes, *J. Amer. Chem. Soc.*, **55**, 4332; 1933.
[2] T. C. Barnes, *Science*, **79**, 370; 1934.
[3] S. L. Meyer, *Science*, **79**, 210; 1934.
[4] T. C. Barnes and E. J. Larson, *J. Amer. Chem. Soc.*, **55**, 5059; 1933.

## Physiology of Deep Diving in the Whale

PROF. KROGH in discussing the liability of whales to caisson disease[1] writes: "Supposing the whale to stay 5 minutes at 100 m., the 1,000 litres of blood passing per minute would take up an extra amount of 100 litres . . .", and apparently calculates that diffusion would take place as readily at 100 m. depth as at the surface of the sea. I venture to think that he has overlooked an important consideration.

Prof. Krogh assumes, and I think everyone who has considered the matter will agree with him, that the air in the whale's lungs must stand at the same pressure as the water outside the thorax. At 100 m. the total pressure is about 11 atmospheres absolute, so, at that depth, the whale's lung is compressed until an average alveolus has only one eleventh of the volume it had when the whale left the surface and began to dive. This shrinking of the alveoli must greatly decrease the surface available for diffusion and, in addition, the epithelium of the alveolus must become thicker, still further hindering diffusion. The effect of these changes is to obstruct the entrance of excess nitrogen into the blood when the whale is at a considerable depth and to favour its discharge when the animal is breathing at the surface.

G. C. C. DAMANT.

[1] NATURE, **133**, 636, April 28, 1934.

THE point raised by Capt. Damant is certainly important. I have not found it possible to conjure up a mental picture of the whale's thorax and lungs compressed to one tenth or less, and it becomes especially difficult when the air passages are taken into account, since these must take up an increasing proportion of the total quantity of air available. If the compression fails to interfere with the circulation, I do not think that the diffusion of nitrogen or oxygen will be *very* seriously impaired. M. Krogh found[1] that the diffusion in human lungs became independent of the volume when this was diminished below a certain point and explained this by the folding of the alveolar walls. Such folding must take place to a very large extent in the lungs of the diving whale.

AUGUST KROGH.
Copenhagen.

[1] *J. Physiol.*, **49**; 1915.

## The Giorgi System of Units

I REGRET to say my recent article on the Giorgi system[1] contained a mistake, inexcusable I fear in the case of a pupil of Maxwell. In the evaluation of $K_0$ I used electromagnetic instead of electrostatic units. The value I gave needs dividing by $v^2$, the square of the velocity of wave propagation. If we take $3 \times 10^{10}$ cm. per sec. as the value of $v$, then $K_0$ becomes

$$\frac{1}{4\pi}\,\frac{10^{11}}{9 \times 10^{20}} \text{ or } \frac{1}{36\pi}\,10^{-9}$$

and this is the value used by Prof. Giorgi.

I have to thank more than one correspondent for the correction.

R. T. GLAZEBROOK.

[1] NATURE, **133**, 597, April 21, 1934.