insect (4th instar) into an older one (5th instar), which then develops into a nymph instead of an adult, it has since been proved that the absence of metamorphosis in the young stages is certainly dependent on the secretion of this gland; though it is still uncertain whether there are really two hormones or only a single one in different concentrations. Further, both moulting and inhibitory effects are non-specific: both can be produced in *Rhodnius* by appropriate secretions from bugs of the allied genus *Triatoma*.

The corpus allatum remains active in the adult *Rhodnius*; this suggests that in this stage it is concerned in the regulation of reproduction. This has been proved to be the case. Adult females deprived of the brain and corpus allatum do not develop eggs; but if the brain is removed without the corpus allatum, eggs are developed normally; and the blood from females *with* a corpus allatum will induce egg development in females *without*. This effect, also, is non-specific.

The moulting hormone will not induce egg-formation; nor will the egg-forming hormone induce moulting. This little gland therefore secretes at least two and possibly three hormones regulating growth. It has already been suggested that diapause in insects may be due to a temporary failure of its secretion[1]; perhaps the so-called 'gonotrophic dissociation' (the failure to develop eggs after feeding), which occurs in the females of certain mosquitoes during hibernation, is due to the same cause. This question is being investigated.

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Aug. 3.

[1] V. B. Wigglesworth, *Quart. J. Micr. Sci.*, **77**, 191; 1934.

Plankton Production and the Nitrate Nitrogen and Phosphate Cycles in the Pacific Ocean off New South Wales

RECENT quantitative research into the production of plankton and more especially into the seasonal cycle of plankton production has been accompanied by a keen appreciation of more accurate chemical analyses of sea-water. Whilst the complexity of the interrelationships between the biological and the physico-chemical conditions in the sea are being thoroughly realised, some rather definite and interesting correlations have been already demonstrated, and the investigation of the different seas in different latitudes promises further light on this subject.

One of the most interesting of these correlations is the marked cycle in the amount of nitrate nitrogen and phosphate in European seas, which seems closely bound up with the cycle of plankton production. Thus Harvey and Atkins working at Plymouth have shown how the nitrate nitrogen and phosphate are reduced almost to zero in the surface waters of the English Channel during the summer months, the fall beginning after the attainment of a maximum in the growth of diatoms during the spring.

During the past four years, a continuous series of plankton and physico-chemical determinations have been made by us in the Pacific Ocean off the New South Wales coast on the open continental shelf. The results indicate that whilst there is not such a marked cycle as in the English Channel (our sea temperatures are much higher, ranging from approximately 16° C. to 22·5° C.) there are definite occasions in the year when the nitrate nitrogen in particular and the phosphate to a slightly lesser extent are reduced to a mere trace in the surface waters, or even to zero. These occasions always occur after the attainment of a spring maximum in diatom production. The summer is a period with a low concentration of nitrate nitrogen, but the phosphate concentration typical of these seas is quickly regenerated. The winter concentration of phosphate in our surface waters ranges from 20 mgm. to 30 mgm. P_2O_5 per cubic metre, whilst the nitrate nitrogen ranges from 20 mgm. to 35 mgm. per cubic metre.

These are probably the first records from the southern hemisphere of a cycle resembling that of European seas, the only other seasonal records being those from the Antarctic with their own peculiarities.

Full details have been drawn up for publication in the *Journal of the Linnean Society of New South Wales*.

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July 24.

Ventilation and Domestic Heating

THE "Writer of the Note" on this subject[1] refers to experiments carried out by the Department of Scientific and Industrial Research and the Medical Research Council, and adds that "No evidence was obtained that any difference on 'nose opening' is due to the temperature of the source, either bright or dull". These experiments were carried out by Messrs. Dufton and Bedford, who received grants from the above bodies, which as customary allowed their grantees to publish their researches on their responsibility and not on that of the Department or Council.

I myself have received a grant from the Medical Research Council to aid me in research which negatives the conclusions of Dufton and Bedford.

The correctness of my conclusions about 'nose opening' rays has been confirmed not only by myself, but also by Dr. W. A. R. Thomson, who carried out observations on 100 sailors at H.M.S. *Excellent*, and by Dr. Dishoeck of the Rhinological Department, Groningen University. The latter has used an exact method of experiment, and has pointed out the cause of the failure of Dufton and Bedford to confirm my work.

Dr. Dishoeck's paper was published in the June number of the *Journal of Industrial Hygiene*. In the *Lancet*, July 13, 1935, I published the latest of my papers on the subject, and described therein a method of measuring the air-way of the nose, which should prove of general use to rhinologists. There is no doubt of the susceptibility of certain people—not all, but about 50 per cent—to 'nose opening' rays or of the importance to comfort of the quality of the rays imparted by sources of heat.

LEONARD HILL.

[1] NATURE, **136**, 225, Aug. 10, 1935.

I HAVE read with interest Sir Leonard Hill's letter and his paper on "A Method of Measuring the Air-way of the Nose" which appeared in the *Lancet* of