The Occurrence of the American Oyster Pest *Urosalpinx cinerea* (Say) on English Oyster Beds.

IN NATURE of Nov. 5, 1927, one of us (J. H. O.) described experiments on the rate at which that rough whelk-tingle, which is abundant on the oyster beds in the River Blackwater, devoured young oysters. In continuing these experiments, it was suddenly realised that the whelk-tingle from this locality is undoubtedly not, as stated (loc. cit.), *Ocinebra erinacea* (= *Murex erinaceus*, L.), although it is a closely related form. It was, moreover, found impossible to identify it with any form described in literature on, or present in a representative collection of, British shells. When it was established with certainty that this common Blackwater shell is not a British form, Winckworth was soon able to identify it from radula and shell-characters as *Urosalpinx cinerea* (Say), the American oyster pest.

Therefore in the note in NATURE referred to above, the name *Urosalpinx cinerea* (Say) must be substituted everywhere for *Ocinebra erinacea* and Urosalpinx for Murex, except for the designation of the right-hand shell in Fig. 1, p. 654. *Urosalpinx cinerea* is a close ally of *Ocinebra erinacea* and lays egg-capsules very similar to those of the latter; moreover, the egg-capsules of both species turn purple when the embryos they contain are damaged. In the near future it is hoped to review all the forms which cause destruction of oysters on different English oyster beds. It has, however, been proved that *Ocinebra erinacea* from the Fal Estuary destroys oysters, but that it is probably not so voracious as *Urosalpinx cinerea*, and more readily feeds on barnacles in the absence of oysters.

There can be no doubt that Urosalpinx has been introduced into English waters from America on American oysters in the same way, and probably about the same time, as *Crepidula fornicata* (see Orton, *Proc Roy. Soc.*, vol. 91, B, 1909). This species of Crepidula is extremely abundant in the same locality (that is, in the Blackwater River) as that in which the Urosalpinx now occurs also abundantly. It would seem that both Crepidula and Urosalpinx (and possibly other organisms) at once found congenial conditions of food and climate on introduction into the rich Essex oyster beds and rapidly established themselves. The embryos or adults of Urosalpinx will certainly have been carried already to the Whitstable and other beds in the Thames Estuary either on American or native relaid oysters, and may have spread even to more distant beds. As Urosalpinx is a much more dangerous enemy to the oyster-producer than is Crepidula, additional precautions will be necessary to prevent the introduction of foreign pests from the Thames Estuary oyster beds to other parts of the country.

It is now possible to review the economic conditions on the Essex oyster beds in a new light. In the note to NATURE (*loc. cit.*) it was recorded that in 1924 50 per cent. of an experimental spatfall was destroyed by what we now know is Urosalpinx, and that a similar amount of destruction occurred over the whole of the neighbouring beds at the same time. During the last twenty or thirty years, or possibly less, Urosalpinx has become an effective addition to the enemies of the oyster-cultivator, and must have increased the difficulties in rearing brood oysters, compared, say, with the conditions which existed thirty or forty years ago. It is hoped that local inquiries may reveal more information regarding the time of arrival and spread of Urosalpinx and its effects on oyster-culture.

J. H. ORTON.
R. WINCKWORTH.

Plymouth and London,
July 31.

The Afterglow in Mixtures of Nitrogen and Oxygen.

IN a paper published by J. Kaplan in the *Proc. Nat. Acad. of Science* (**14**, 258; 1928) there are described some experiments on the afterglow accompanying the passage of an electric discharge through air at about 5 mm. pressure. A point of interest is the observation of a blue glow when a condensed discharge with spark gap was employed, but a yellowish-green glow when the spark gap was not in operation. In this connexion I wish to mention a phenomenon which I observed some time ago, in the course of some experiments dealing with the afterglow in mixtures of nitrogen and oxygen.

The electrodeless discharge was used with a spark gap, and the limits of pressure were about 1·8 to 0·01 mm. In a given mixture, for example, air, there is a sharp minimum in the duration and intensity of the afterglow at about 0·53 mm. pressure, which separates the yellowish-green oxygen afterglow (at higher pressures) from the orange-yellow nitrogen afterglow (at lower pressures). See also a note to NATURE (**121**, 938; 1928). In a certain pressure region in the neighbourhood of this minimum, a long discharge ($\frac{1}{2}$ second or longer) gives rise to a blue afterglow. At a suitable pressure the nitrogen-bands also appear faintly along with the blue glow and can be observed with a spectroscope. However, with a very short discharge (not measurable) only the yellowish-green afterglow is visible (continuous spectrum). Thus, different types of afterglows may be excited in the same gas mixture at the same pressure merely by altering the period of discharging. The same phenomenon can be observed in mixtures containing other proportions of nitrogen and oxygen but at different total pressures.

At a pressure where the transition from the yellowish-green to the blue afterglow commences (using $\frac{1}{2}$ second discharge), the former glow is displaced as a wave along the tubing leading from the discharge vessel while the latter glow occupies the vessel. The blue glow falls off in intensity, but is soon brightened up again by the return of the yellowish-green wave. (Compare Majewska and Bernhardt, *Zeit. für Physik.*, **48**, 137; 1928, for observations on the progression of afterglow waves in air.)

BERNARD LEWIS
(National Research Fellow).
University of Minnesota,
Minneapolis, U.S.A.

Analysis of the First Spark Spectrum of Sulphur (S^+).

A VERY thorough study of the spark spectrum of sulphur was made by Eder and Valenta in 1904 in the region λ3301 to λ5819. In 1907, Sir Norman Lockyer showed that some of the stronger lines of S^+ occur in the spectrum of Rigel (class B8), but not in the spectrum of α-Cygni (Giant Ao), or Sirius (Dwarf Ao).

The clue to the analysis was obtained in the following way. Taking the structure diagram of S^+ the possible transitions are:

$$3M_2 \begin{array}{l} \nearrow 2M_2M_3 \\ \searrow 2M_2N_1 \end{array} \longrightarrow 2M_2N_2 \begin{array}{l} \nearrow 2M_2N_3 \\ \searrow 2M_2O_1. \end{array}$$

The fundamental lines $3M_2 \longleftarrow \begin{array}{c} 2M_2M_3 \\ 2M_2N_1 \end{array}$ lie in the ultra Schumann region, and Millikan and Bowen's data in this region are rather incomplete. The next groups, $\begin{array}{c} 2M_2M_3 \\ 2M_2N_1 \end{array} \longleftarrow 2M_2N_2$, lie in the visible region.