Is the American Slipper-Limpet (*Crepidula fornicata*) an Oyster Pest?

THE shortage of oysters (*O. edulis*) on the European oyster beds has led to the introduction in many places of American oysters, on which the American slipper-limpet (*Crepidula fornicata*) frequently occurs. Oyster-cultivators in various parts of Europe are therefore becoming interested in the possible effects of introducing the slipper-limpet on their beds, so that it has become a matter of economic interest to know the results to date of the introduction of this animal on English oyster-beds since its arrival about 1880 (see Orton, *Proc. Roy. Soc.* B. 91, 1909).

The American slipper-limpet (*Crepidula fornicata*) is undoubtedly regarded as a great pest on the oyster beds in the Thames Estuary at the present time for the following reasons:

(1) It has spread so rapidly and thrived so well in that locality that it is possible to dredge 20 tons a day on some grounds, actually occupied by oysters. In a pit adjacent to—but not actually a part of—the oyster beds the writer took in July 1923 in a few minutes' haul of the dredge 2226 limpets weighing approximately 26 lb. On all grounds it has increased the labour in dredging, while adding only slightly or not at all to the income of the oyster-producer.

(2) The limpets attach themselves in piles or chains on the oysters, which have therefore to be cleaned of limpets as well as barnacles, etc., before sending them away from the beds.

(3) It is impossible to remove Crepidula entirely from the beds, once it is established on the ground, as it has a free-swimming larva—like the oyster—and in addition changes its sex from male to female so that every individual may breed as a female (*loc. cit.*). Moreover, spawning occurs in England from about March to November, and females may spawn more than once in a season.

In favour of Crepidula, it may be said:

(1) That it is not an enemy of the oyster but a competitor for space and food, like sea-squirts, various bivalves, and other plankton-feeding animals.

(2) That where Crepidula occurs in abundance it can be dredged in the normal routine of work, and the shells easily accumulated in great piles and cleaned and bleached to serve as cultch for catching oyster spat. On some beds Crepidula is beginning in this way to pay some of its debts to the oyster-producer.

There can be no doubt, however, that unless Crepidula can be utilised as food—in a small way its shell is utilised in England when crushed with oyster shells as chicken food—it is a great nuisance to the oyster-cultivator. No serious attempt has been made in England to use the slipper-limpet as food, but it is probable that if Crepidula occurred in quantity in France it would be so utilised, and acclaimed as an undoubted benefit.

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Photo-electric Polarimetry.

As the use of selenium cells and photo-electric devices is engaging the attention of several workers, a brief account of an application to the polarimeter due to one of our research students—Miss Winifred E. Dickes—may be of interest.

A long series of experiments has led to a simplified arrangement as follows. The apparatus in essentials consists of a spectrometer, for the collimator of which is substituted a polarimeter without eyepiece or half-shadow device, but having a slit over the polariser diaphragm and an electrical photometer behind a slit in the eyepiece of the telescope. An additional eyepiece is placed at right angles to the axis of the telescope for observing the line of the spectrum employed. Half of the field of this eyepiece is fluorescent, for convenience in setting when making determinations in the ultra-violet regions.

The photometer used is a selenium or alkali metal cell, and valve amplification is being tried.

The peculiar novelty of the method is the way in which the observations are taken. A quantitative measure of the light intensity is obtained. Two positions are found, about 90° apart, which give the same current. The mean of the two readings so found gives an accurate value for a minimum or maximum, according to choice, although the minimum as a rule is slightly to be preferred.

The readings 90° apart are taken repeatedly and are averaged in the same way as pointer readings are used in weighing. With a selenium cell, these observations are made at fixed time intervals to allow for the characteristic small secular variation in the current.

Since there is no half-shadow device, the whole of the light can be utilised by the photometer. A magnified image of the polarimeter slit is used for the photometer, in order that a larger (that is, more sensitive) selenium cell may be used.

At the end of 1924, with a rough arrangement, an accuracy had been obtained of 0·01° in the red end of the spectrum and 0·1° in the violet. The work was then interrupted by illness. It is now being resumed, and there is reason to hope that a considerably greater accuracy may be obtained, when a paper will be published.

It is proposed also to investigate two possible extensions, namely, the direct use of the apparatus for absorption measurements, and its adaptation to an automatic or recording polarimeter.

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February 2.

Wordsworth's Interpretation of Nature.

THE introductory lines which appear in the complete collection of Wordsworth's poems crystallise, with such singular fitness, the point of view so ably expressed in the supplement to NATURE of January 16 that I think it is important to direct attention to them:

> If thou indeed derive thy light from Heaven,
> Then, to the measure of that heaven-born light,
> Shine, Poet! in thy place, and be content:
> The stars pre-eminent in magnitude,
> And they that from the zenith dart their beams,
> (Visible though they be to half the earth,
> Though half a sphere be conscious of their brightness)
> Are yet of no diviner origin,
> No purer essence, than the one that burns,
> Like an untended watch-fire, on the ridge
> Of some dark mountain; or than those which seem
> Humbly to hang, like twinkling winter lamps,
> Among the branches of the leafless trees;
> All are the undying offspring of one Sire:
> Then, to the measure of the light vouchsafed,
> Shine, Poet! in thy place, and be content.

The lines in parenthesis surely indicate once more the possibility that Wordsworth might easily have become a man of science, whilst the following lines display, as effectively as anything in the body of his works, that intense spirituality of the poet's vision, the *particular* quality of which is unique among the great English poets. Can there be any lover of Nature but has felt the influence of that star which scintillates

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