positive results have recently been obtained by infecting the flowers of rye with spores of the blind seed fungus. The only point of difference is that macroconidia have not been described in Endoconidium.

Then while Muskett and Calvert[1] report apothecia of the blind seed fungus only on dead rye-grass seed, we have found as many as three of these apothecia on a caryopsis which has given rise to a perfectly normal seedling, as shown in the accompanying figure. This suggests that the fungus does not always behave as a pathogen. Several systemic fungi have already been reported on *Lolium perenne*; McLennan[4,5] has described one endophyte and one mycorrhizal fungus, Sampson[6] a second endophyte which produces microconidia, and Neill[7] has described an endophyte which may be identical with that described by McLennan; this last was found in the course of an investigation into a suspected herbage toxin. The results of our cultural experiments suggest that these systemic fungi may not be entirely dissociated from one another or from the blind seed fungus.

With regard to the Pullularia occurring along with the blind seed fungus, our experiments have had similar results to those reported by Muskett and Calvert; it appears that Gemmell[8] described the blind seed fungus under the name *Pullularia pullulans*.

A consideration of the foregoing statements indicates that neither the cause of the low germination of rye-grass nor the identity of the associated fungi has yet been adequately investigated. A fuller account of work on these points will be published in due course.

In view of the recent letter from Glasscock[9] on this subject we should like to emphasize that infection with the "blind seed fungus" is not necessarily correlated with low germination in rye-grass. In a recent test, of 19 seeds bearing conidia of the fungus 13 germinated and have given rise to normal plants.

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Non-parallelism of Lattice Planes in Tin Coatings on Steel

X-RAY and optical examination of the crystals of the tin layer of tinplate has shown that a continuous change of orientation takes place along such crystals in their direction of growth.

Back-reflection X-ray photographs taken at a series of points along such a crystal are characterized by a movement of the reflection spots from one photograph to the next. Photographs taken with the specimen moved uniformly during the exposure consist of continuous lines instead of spots. It follows that a change of orientation takes place along the crystal, and that this change is continuous.

Visual inspection of an etched surface of such a crystal, or inspection by the optical method previously used for the determination of the orientation of tin crystals[1] confirms the existence of the effect. It is observed in exceptional cases that the crystals undergo several complete rotations, as evidenced by the periodic appearance of bright patches on the etched surface. The extent of the rotation is variable, but in the few cases where it has been measured it has had values up to 40° per cm.

The proposed explanation is that the conditions of formation of the layer cause a greater concentration of iron in the tin near the tin-iron interface than at the free surface, and that this causes a gradual contraction of the lattice as the interface is approached. Calculation shows that a contraction of the lattice of 0·04 per cent at the tin-iron interface would introduce a departure from parallelism in the lattice planes sufficient to account for the observed rotation.

It is also suggested that this explanation may apply to the striated structure sometimes observed in the tin layer on copper tinned by hot-dipping[2].

It is to be expected that this type of 'non-parallel crystal lattice' would be present wherever a concentration gradient exists as, for example, in cored crystals, under such conditions that the lattice spacing depends on the concentration.

It is hoped that a full investigation of this effect will be undertaken in due course, but the present abnormal conditions may cause considerable delay in full publication.

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Submarine Canyons

PROF. W. H. BUCHER, as reported in NATURE[1], argues that the marvellous submarine canyons of the continental slope are due to tsunamic (or tunamic) waves. I am delighted to find this view advanced by so competent an authority, for though I gave evidence for its adoption in 1938[2], my voice has been as of one crying in the wilderness. In fact, Prof. Douglas Johnson, in an approximately complete recent survey of the subject[3], has overlooked the seismic possibility altogether, except for very limited applications put forward by Prof. F. P. Shepard[4] from 1931 onwards.

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