treatment. It appears in betting, and it is the basis of all games. The degree of capriciousness which can be tolerated varies for each individual, but it never vanishes.

R. WEATHERALL.

Eton College, Windsor,
March 7.

Physiological Specialisation of *Hemileia vastatrix* B. and Br.

IN the course of some recent work on the behaviour of a number of hybrids and selections of *Coffea arabica* Linn., collected at the Mysore Government Coffee Experiment Station, towards infection by *Hemileia vastatrix* B. and Br., indications of the existence of physiological specialisation in this rust fungus have been obtained.

It had previously been found possible to carry out inoculation experiments on detached leaves in the laboratory, and to keep such leaves healthy for at least six weeks. The method was applied to testing a number of resistant and partly resistant selections. Among these, one selection, *S. 5/30*, was found to be completely resistant to spore collections made from the Coorg variety of *Coffea arabica*, though it showed

Identical results have been obtained in a number of similar experiments. There are indications of very minute chlorotic flecks in the case of Coorg spore infections on *S. 5/30* leaves, and the histology of these flecks is shortly to be investigated. The infections caused by the two spore collections on the Coorg leaves and the *S. 5/30* spore collection on the *S. 5/30* leaves are morphologically indistinguishable.

Up to date, only one plant exhibiting this difference in behaviour to different spore collections has been found. Work is in progress involving the study of plants of the same origin as *S. 5/30* and other plants showing variations in behaviour to *Hemileia vastatrix*. A full account will be published when results are available.

I am indebted to Mr. M. J. Narasimhan, mycologist, Department of Agriculture, Mysore State, for the photographs of infected leaves.

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Jan. 20.

FIG. 1.

itself to be somewhat susceptible to the rust in the field.

Tests were then made with collections of spores from the Coorg variety and from the selection itself. Four leaves from a susceptible Coorg tree and four from the selection *S. 5/30* were inoculated on the right-hand side of the midrib with a Coorg spore collection and on the left-hand side with an *S. 5/30* spore collection. Six areas on each half-leaf were infected by dusting the spores on the surface of drops of sterile distilled water. The results were as follows:

Coorg Leaves (Fig. 1, A).

Right-hand side: Coorg spore collection, 21/24 successful inoculations.

Left-hand side: *S. 5/30* spore collection, 17/24 successful inoculations.

S. 5/30 Leaves (Fig. 1, B).

Right-hand side: Coorg spore collection, 0/24 successful inoculations.

Left-hand side: *S. 5/30* spore collection, 23/24 successful inoculations.

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Microscopic Measurements

IN elementary biological classes the measurement of microscopic objects is useful for training in accurate observation and for the intelligent use of the various parts of the microscope. In this connexion it may be pointed out that the estimation of the vertical distance between objects in microscopic preparations helps greatly in the realisation of solid forms and of the information which may be obtained from superimposed optical sections. The estimation can be made very simply by the use of a microslip carrying on one side a short line of transparent red, and on the other a similar line of green, glass ink. The lines cross each other and form an 'X' when one looks vertically through the slip. From the thickness of the slide at X, ascertained with a coverglass-micrometer, and the number of revolutions of the milled head of the fine adjustment of the microscope, which are required to pass from the level of the focus of the red to that of the green line, the pitch of the screw and the value of the movements of the fine adjustment are obtained.

Despite errors due to accommodation and refraction the use of the fine adjustment calibrated in this way is very advantageous, and, when combined with micrometric observations in a horizontal plane, conveys a sense of solidity which can scarcely be obtained so simply by any other method. By way of example, the vertical diameter of a filament of *Spirogyra porticalis* was estimated by this method as 0.021 mm., while its horizontal diameter, found by the 'ghost micrometer', was 0.0198 mm.

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Catalysis in an Inert Solvent

As Dr. Traill is now in Australia, I may direct attention to the fact that calculations of a similar character to those given by Dr. Moelwyn-Hughes in *NATURE* of Feb. 27, p. 316, had already been made by him. These were published in the February number of the *Philosophical Magazine* under the title "Kinetics of a Catalysed Isomeric Change in Solution", whilst Dr. Moelwyn-Hughes's letter was in the press.

T. M. LOWRY.

Laboratory of Physical Chemistry;
Cambridge, Feb. 27.