THE EFFECTS OF DDT AND OF SODIUM MONOFLUORACETATE UPON PHYSARELLA OBLONGA MORGAN

THE efficacy of DDT as an insecticide has naturally aroused interest as to its possible use as a fungicide. Yet, so far as I am aware, the only published account of experiments dealing with this problem is that of D. O. Morris.[1] Since, for some time, I have been keeping cultures of the slime mold, *Physarella oblonga*, it occurred to me that it would be of interest to test the effect of DDT upon that organism.

About forty tests were made, most of them involving the use of DDT in acetone. DDT is practically insoluble in water, but is soluble in acetone to the extent of 52.5 ± 2.5 gms/1. A saturated solution of acetone was added to the warm agar culture so as to give an emulsion of known concentration. It was found necessary to evaporate the bulk of the acetone, since experiments demonstrated that it is highly toxic to Physarella. The experiment was also tried of growing Physarella upon plates dusted with dry DDT to the extent of about 40 mgs per sq. cm. of surface. The measure of growth was the time required for a 1 sq. cm. plasmodial transplant to cover the entire plate of 63.58 sq. cms.

Results are given in Table 1. These results indicate that: (1) Physarella grows as rapidly upon treated agar as upon that which is untreated, and (2) there is no correlation between rate of growth and the concentration of DDT. There was some indication that dry DDT delays growth, probably for mechanical reasons, but, on the other hand, it was interesting to note that subsequently the growing plasmodium completely covered the layer of dry powder. Likewise, subsequent growth upon the cultures composed of DDT emulsion was as vigorous as upon untreated cultures. Evidently DDT has no very pronounced effect upon *Physarella oblonga*.

TABLE 1

EFFECT OF DDT ON PHYSARELLA

No. of tests	Quantity DDT Treatment mgs/ml		Average rate of Growth 1 sq. cm. to 63.58 sq. cms.
4	In acetone	105.0	30 hours
4	" "	52.5	32 "
4	" "	26.2	32 "
4	" "	13.1	29 "
4	" "	6.5	27 "
4	" "	3.2	27 "
4	" "	1.6	32 "
4	Dry DDT on surface	40.0	50 "
3	Untreated controls		32 "

For purposes of comparison the effects of sodium monofluoracetate were considered. This substance is readily soluble in water and probably, like the salts of iodo-acetic acid, acts as an enzyme inhibitor. In any case its effect upon Physarella is pronounced. On cultures containing respectively 12.0, 10.5, 9.0, 7.5 and 6.0 mgs/ml, plasmodia developed and survived at least a week. On cultures containing only 0.75 mgs/ml of monofluoracetate, Physarella did fairly well. In no case, however, did the plasmodium spread characteristically over the plate. Instead it wandered about, the "posterior" portion dying out as the opposite margin advanced. The results, in this case, suggest antagonistic effects between the nutrients and toxic substance.

CYRIL E. ABBOTT

WASHINGTON, D. C.

[1] Jour. Counc. Sci. Indust. Res. Australia, 17, (4): 289–290, 1944.

RELATIONSHIP BETWEEN PATHOGENICITY AND pH TOLERANCE OF MICROORGANISMS

ACCORDING to hypotheses of Leise and James,[1] pathogenicity of bacteria and fungi seems to be related to tolerance for different degrees of pH; it may be possible to differentiate pathogenic from nonpathogenic microorganisms by growth in alkaline broth, and it may be possible to change a virulent microorganism into an avirulent one by an antitryptic agent. While these possibilities may apply to certain bacteria which the authors studied, they do not apply to all. For example, the pathogenic variant form of *Micrococcus tetragenus*[2] grew better in acid medium. The tolerance of other variant forms of the same strain varied in regard to pH, temperature, atmosphere and other circumstances. Changing a favorable environment for one variant of *M. tetragenus* to one unfavorable to it did not necessarily direct variation toward the form best suited to the changed conditions. Variants seemed to appear by chance, and if a variant appeared which found the new environment favorable, life of the strain was continued.

HOBART A. REIMANN

JEFFERSON HOSPITAL,
PHILADELPHIA

[1] J. M. Leise and L. H. James, SCIENCE, 101: 437–438, 1945.

[2] H. A. Reimann, *Jour. Bact.*, 33: 513–523, 1937.

SLEEVE STOPPERS IN CLOSED SYSTEMS

WE would like to attest the value of a serum bottle stopper and hypodermic syringe for the addition and

removal of solutions or gases in a closed system, as described in a recent issue of SCIENCE.[1] The device was incorporated in a simple gasometric pipette for the analysis of respiratory gases which has been in use in our laboratory for the past two years and has proved highly satisfactory. This adaptation of a serum bottle stopper was first suggested to me by Lieutenant Colonel F. G. Hall, while working at the Aero-Medical Laboratory at Wright Field. The pipette assembly was described in the *Journal of the Elisha Mitchell Scientific Society*.[2]

F. H. MCCUTCHEON
NORTH CAROLINA STATE COLLEGE,
RALEIGH, N. C.

SOCIETIES AND MEETINGS

ANNUAL MEETING OF THE ROYAL SOCIETY OF CANADA

THE meeting of the Royal Society of Canada for 1945 was held at Queen's University, Kingston, from May 20 to May 23, under the chairmanship of the president, J. K. Robertson, professor of physics at Queen's University. In the scientific sections, one hundred and four fellows and half as many guests were in attendance.

New fellows were presented at the first general meeting, including the following in the scientific sections:

Section III (Chemical, Mathematical and Physical Sciences): R. Brauer, E. W. Hewson, O. J. Walker.

Section IV (Geological Sciences): V. J. Okulitch, J. E. Thomson, H. V. Warren.

Section V (Biological Sciences): E. W. Crampton, J. Labarre, W. Leach, C. A. Mitchell, A. W. H. Needler, D. Y. Solandt.

Besides sectional and business meetings, there were two largely attended evening meetings. On the evening of May 21, the society's medals were presented. Professor R. B. Thomson, of the University of Toronto, received the Flavelle Medal as a tribute to his work on the comparative anatomy and physiology of plants. The Henry Marshal Tory Medal was presented to Professor Otto Maass, of McGill University, who was hailed as a man possessed of experimental skill and scientific imagination, with a fondness for hazardous experiment. Professor Maass is assistant to the president of the National Research Council, director of chemical warfare and smoke for the Department of National Defence, and has played a leading rôle in planning chemical research in Canada since the outbreak of the war. The Willet G. Miller Medal was given to Dr. M. E. Wilson, who, conspicuous among Precambrian geologists of the world, has done much in Canada in guiding, prospecting and encouraging mining. The Lorne Pierce Medal was awarded to L'Abbé Felix Antoine Savard, of Laval University, and the Tyrell Medal to Professor F. Landon, of the University of Western Ontario.

After the presentation of medals, Professor J. K. Robertson delivered his presidential address on the subject, "Continuity and Discontinuity." The paper was divided into two parts, a discussion of the progress of philosophical opinion down to the eighteenth century, followed by an assessment of the emergence of the two conceptions and their development by physicists up to the present day. Recognizing that "present-day physics continues to demonstrate the interplay of continuity and discontinuity," he concludes that "the modern physicist no longer accepts a materialistic philosophy and no longer assumes that, as time goes on, he will learn more and more about the ultimate details of a real objective world. His advances have shown him that measurements and observations can not give him exact knowledge beyond a certain stage, and hence, for him, what is beyond has no meaning. His aim now is the more modest one of describing facts and observations in terms of correlating laws, which in the last analysis can be expressed accurately only by mathematical symbols."

On the evening of May 22, following a complimentary dinner given by the mayor and City Council of Kingston, a popular lecture, "Biological Control of Insect and Plant Pests," was given by Dr. W. R. Thompson, F.R.S., Imperial Parasite Service, Belleville, Ontario. This paper so impressed the fellows that a resolution was passed at a general meeting next day, expressing to the Imperial Institute of Entomology its appreciation of the work done in Canada during the war, and asking that arrangements be made for its continuation.

In Section I, twenty-one papers were presented on subjects of historical or literary interest in French Canada.

In Section II, the presidential address by Professor W. H. Alexander was a provocative discussion of some obvious incompatibilities of temperament as between the ideals of a genuine education and the spirit of the ultrademocratic state as suggested by Plato's Apology to Socrates. Papers were read in the fields of literature, philosophy, history and the social sciences. Anthropology and archeology were represented by papers on "The Distribution of Rubbed Slate Instruments in Eastern Canada" by Dr. Douglas Leechman, and by the myth of "Bear Mother" by Dr.

[1] F. B. Senn, SCIENCE, 101: 392, 1945.

[2] 59: 201–204, 1943.