south and east coast from Hampshire (especially the Isle of Wight) to Norfolk. Whether conditions other than climate are suitable in these areas is beside our point.

Temperatures during June do not adequately explain variations in the prevalence of *M. persicæ* from year to year. These variations are closely linked with conditions during winter[7,10]. Thus, in Cornwall and Devon the very hard winter of 1939–40 greatly reduced the numbers of *M. persicæ*, and the potato crop which followed was lightly infested[8], even though the summer of 1940 was unusually hot and dry. But very cold winters are not characteristic of *maritime* seed areas. The contrary is demonstrably the case. To take as examples places in North Wales which have already been cited, minimum temperatures during January are higher at Holyhead than at Aber, and at Aber than at Sealand; while, to illustrate on a larger scale, the general run of winter minima is appreciably higher in the good seed areas of Ireland, North Wales and south-western England than in the English Midlands, and at least as high in the Scottish seed areas as in the Midlands[5]

Because they carry the taint of interference by irrelevant winter temperatures, aphid surveys in maritime climates must often be continued tediously for many years if they are to be sound. But speed is not the only advantage of the June temperature test. It is unaffected by the often remediable proximity of Brassicæ or other winter hosts. Further, being a test of the climatic conditions which govern the flight of *M. persicæ*, it measures the tendency towards migration; and the number of winged migrants to potato fields is, Whitehead[7] believes, a finer test of the aptness of an area for seed than the crude total of aphids, mostly wingless, which eventually multiply in the fields and are ordinarily the subject of a survey.

Wind has not been discussed, because its independence as a separate factor is questioned. It is true that Davies[2] showed in the laboratory that wind (above 3·75 m.p.h.) stopped the voluntary flight of aphids, but this does not imply that all wind is beneficial. In the maritime type of seed area a hot dry wind would be out of place and counter to the need for a cool temperature and a high relative humidity. All we can consider as unquestionably beneficial are cool, moist winds which, in the type of area under discussion, we can for all practical purposes take to be sea-winds. Their prevalence needs no elaborate system of wind roses for its measurement; it can be recognized simply by the intensity of the maritime influence on the climate, as determined, among other methods, by the June temperature test. In support of this view is the recognized fact that mere bleakness and high altitude are no adequate substitute for exposure to the sea.

The test applies only to a cool, maritime climate, and it would save confusion to point out that such a climate is only one of at least three in which infestation of potatoes by *M. persicæ* can be controlled naturally. The bulk of the world's seed potatoes is grown in areas with a cold, continental winter. These include most of the seed areas of continental Europe, of continental North America and (because the weather there moves from west to east) even most of the Atlantic seaboard of the United States and Canada. In these areas the requirements for good seed are very different. Finally, *M. persicæ* is scarce on potatoes in a very hot, dry climate, a fact systematically exploited in South Africa[11]. Here the desirable features are the opposite of those in a cool maritime climate: a mean maximum temperature during the summer months of about 90° F., a daily range of 28°–35° F. or more, and strong, hot, dry land-winds.


[1] Davies, W. M., *Ann. Appl. Biol.*, **22**, 106 (1935).
[2] Davies, W. M., *Ann. Appl. Biol.*, **23**, 401 (1936).
[3] Davies, W. M., *Ann. Appl. Biol.*, **26**, 116 (1939).
[4] Davidson, W. D., *J. Dept. Agric. Eire*, **35**, 20 (1935).
[5] Averages of temperatures for the British Isles for periods ending 1935. Met. Office (Great Brit.) H.M. Stationery Office.
[6] Davies, W. M., *Ann. Appl. Biol.*, **21**, 283 (1934).
[7] Whitehead, T., *Ann. Appl. Biol.*, **30**, 85 (1943).
[8] Staniland, L. N., *Ann. Appl. Biol.*, **30**, 33 (1943).
[9] Samuel, G., *Ann. Appl. Biol.*, **30**, 80 (1943).
[10] Thomas, I., and Jacob, F. H., *Ann. Appl. Biol.*, **30**, 97 (1943).
[11] *Nature*, **153**, 589 (1944).


# ONTARIO RESEARCH FOUNDATION

ACCORDING to the report of the Ontario Research Foundation for the year 1943, that year saw a peak in the activities of the Foundation; for the first time since 1928 the problem of allotting laboratory space became acute. Some decision as to whether increased or permanent extensions are justified will be required in the near future. A second limiting factor has been the supply of trained research workers; until the demands from military departments and the war industries diminish, it will be impossible to devote adequate and sustained attention to post-war problems. The transition period might be shortened if research relating to post-war problems were given a higher rating in the system of controls and restrictions. It was not until shortly before the present War that any considerable use was made of the Foundation's facilities other than for routine services and short-term investigations, and at present the Foundation cannot establish enough fellowships to take care of the demand for research. This change is largely due to the gradual development and diffusion of a correct understanding of the relation between industrial scientific research and economic stability. It would add greatly to the stability and continuity of scientific research if the Governments concerned would encourage and not disallow the establishment of reserves for research.

The services of the Department of Engineering and Metallurgy have been almost wholly engaged on research or production associated with the War. The Gauge-Testing Laboratory has operated with approximately the same staff as in recent years. The gauges now being submitted by the inspection board of private manufacturers require steadily increasing skill and accuracy. The important contribution of the Physical Testing Laboratory is indicated by the increase in the number of test reports sent out from 350 in 1940 to 3,200 in 1943. The facilities have been improved by the addition of a 10,000-lb. tensile testing machine. The Heat-Treatment Laboratory handled 70 per cent more work than in the previous year. The general testing and short-term studies of the Textile Department slightly decreased. There exists in Canada a definite need for standards for moisture content of textiles, based on Canadian conditions of climate, and for an independent laboratory equipped to perform this service and issue certificates which will generally be accepted. A suggestion was made during the year that the Foundation should equip such a laboratory for testing wool

tops, but owing to the shortage of trained men response to the idea has not been possible. The process developed for setting the twist in rayon yarns has been in successful operation throughout the year, and a possible extension to the 'Nylon' field after the War is anticipated. Textile oils developed in the Department met all the requirements of the industry in plant trials. There is evidence that the consumer demand for quality-controlled goods is increasing.

The Department of Biochemistry has investigated on a pilot-plant scale some processes for producing glycerol from wheat, and the study of methods for hydrogenating linseed oil to plastic shortening has continued. The Vitamin Laboratory continues to study and evaluate the latest suggestions for determining quantitatively various vitamins in foods, and a study is in progress to determine the minimum amount of protein required to maintain rats in good health when the diet is adequate in all other respects. Research on synthetic rubber has been co-ordinated with that of the Canadian and American Rubber Committees. The possibilities of raising the quality of Buna *S* by addition of small amounts of chemicals to standard butadiene–styrene mixtures have been explored.

The Department of Agriculture has now collected all the material for a detailed map of the physiography of Southern Ontario, and has found that the photographs of the Royal Canadian Air Force offer a rapid method of obtaining accurate boundaries of physical land features. A thorough search has been made of geological literature relating to this and similar areas in preparation for writing a monograph of the physiography. A detailed study of regional agriculture in Old Ontario was continued; and in the Pathology Laboratory research was continued on problems associated with *Ascaris lumbricoides* infection of hogs, using guinea pigs in the experimental work, as well as on the blood parasites of ruffed grouse.

## SOUTH-EASTERN UNION OF SCIENTIFIC SOCIETIES

### ANNUAL CONGRESS

THE South-Eastern Union of Scientific Societies held its forty-ninth annual congress at High Wycombe on October 14—a single day of sessions and excursions attended by sixty representatives and members. It was organized by the Buckinghamshire Archæological and Architectural Society.

A representative assembly to transact the business of the seventy constituent societies was held in the Royal Grammar School, founded by the Knights of St. John and Jerusalem. For the ensuing year, Brigadier F. A. E. Crew was inducted as president of the Union. After many years as professor of animal genetics in the University of Edinburgh, he has recently been appointed to the Bruce and John Usher chair of public health at Edinburgh; and he is now serving at the War Office as director of biological research; his address was appropriately devoted to "The Biology of War". At the Guildford Congress in 1942, Dr. J. Ramsbottom in his address upon a similar theme (*Nature*, **150**, 241; 1942) came to the conclusion that "Competition in modern man is, for the most part, sociological and not biological". Brigadier Crew considers that "most of the causes of war have their origins, not in the biological constitution of man, but in the constitution of the social aggregates which man has formed and fashioned". Industrialized societies produce so full a routine of work which the ordinary man must carry out to earn a living that war may be welcomed for its stimulating excitement and loosening of conventional bonds. In brief, war is a great adventure because social conventions have not made an adventure out of peace. It is doubtful whether modern war is eugenically selective. "The lethality of a missile propelled from a gun or dropped from the skies has no relation whatsoever to the biological qualities of the man who releases it, and the winning of a combat or of a war is no proof of the biological superiority of the victor". There is a school of thought which teaches that war is definitely dysgenic. Possibly the flower of a generation is destroyed by war, but the flower is not so important as the seed and there is no proof that casualties in the War of 1914–18 seriously affected the physique of the present combatants. "Final victory in war rests with that contestant whose population is caused to increase more rapidly as the result of it." The present groups of mankind represent two widely different ideologies and cultures; it may matter very much indeed to humanity generally, for the next few generations at least, which of these shall prevail.

At the sectional sessions the following papers were read: "The Evolution of the Dwelling House", by E. Yates; "Archæological Work in Bucks", by Flight-Lieut. E. Clive Rouse; "Fungi as Food", by Dr. J. Ramsbottom; "Man and the Migration of Phosphorus", by Dr. K. P. Oakley; "A Plan for Local Social Science Workers", by A. Farquharson; and "The Fauna of New Guinea", by Miss L. Evelyn Cheesman.

In the afternoon, E. A. L. Martyn conducted a walk around Chipping Wycombe of interest to archæologists; naturalists visited Hughenden Valley, and others were shown the geological features of the district.

The annual congress is normally held in June, but this year it had to be postponed until the autumn as the original proposal to hold it in July at the Slough Social Centre proved impracticable. T. D.

## CURRENT MEASUREMENT AT VERY HIGH FREQUENCIES

A PAPER by G. F. Gainsborough entitled "Experiments with Thermocouple Milliammeters at Very High Radio Frequencies" (*J. Inst. Elect. Eng.*, **91**, Part III, No. 15; Sept. 1944) describes work conducted at the National Physical Laboratory under the auspices of the Radio Research Board. In order to assess the performance of commercial thermocouple milliammeters at frequencies up to 700 Mc./s., a reference standard air-milliammeter was first developed by the author, following principles first described by J. A. Fleming in 1910. Each of two similar air cells connected by a capillary tube with a liquid index contains a resistive wire which can be heated either by an alternating or direct current. With a capillary tube of 1 mm. bore, and using a low-power microscope to observe the index, the apparatus described in the above paper gave readings of current of the order of 10 mA., which could be reproduced with an accuracy of 1 part in 1,000. The sensitivity