(3) Determination of specific requirements.

C. Field interpretation of laboratory results. (In the case of temperature this will probably mean remeasurements unless recording instruments have been used.)

IV. Studies of plants and animals at the edges of their ranges. Determination of the environment at the edge of the ranges of plants and animals should help to give, for the different environmental factors, the limits within which individual species of plants and animals can grow.

V. Ecological differentiation in plants and animals, structural and functional.

(*a*) Ecological differentiation in single species.

(*b*) Growth forms and regional distribution. Frequency of occurrence and abundance, correlated with environmental factors.

VI. Migration of plant and animals.

(1) Wind.
(2) Animals.
(3) Water.
(4) Free movement of organisms.
(5) Landslides and avalanches.
(6) Movement of environment.

VII. Relation of present plant and animal life to past floras and faunas.

(1) In unglaciated regions.
(2) In glaciated regions.
(3) Post-glacial changes.

VIII. Origin and composition of organic soils. Includes forest soils, humus, peat, muck, etc.

IX. Studies of soil organisms. Bacteria, nematodes, fungi and other organisms.

SPECIAL PROBLEMS

X. Relation of osmotic pressure to elongation.

XI. Relation of temperature to root absorption.

XII. Seasonal rhythm in organism, *e. g.:*

(1) Resting period.
(2) Photosynthesis of evergreens in winter.

XIII. Relation of mycorrhiza to root hair development. (Part of general problem of symbiosis.)

XIV. Composition of light under forest canopies. Is this diffused light or light of different composition?

XV. Effect of shade on chlorophyll content.

XVI. Water requirement of forest trees.

XVII. Nutrition of forest trees. Influence of various kinds of soils.

XVIII. Minimum requirement of solar energy for tree seedling growth or leaf development.

XIX. Factors controlling the natural pruning of forest trees.

XX. Factors controlling the non-periodic shedding of the leaves of forest trees.

XXI. Study of seed bed in forests under natural conditions, in relation to germination and establishment; comparison of seed bed in forests with nursery seed beds.

XXII. Sensitiveness of roots of different species to: (*a*) lack of oxygen, (*b*) soil acidity, and (*c*) soil alkalinity.

XXIII. Studies of fungi in forest soils.

(1) With relation to rendering nutrients (chiefly nitrogen) available to plants.
(2) With relation to soil reaction (acidity or alkalinity).
(3) Influence on ventilation.
(4) Effect on plant roots.

XXIV. Selective absorption of roots in soil.

(1) Under different soil moisture conditions.
(2) Under different atmospheric conditions.

XXV. Pull exerted by roots in withdrawing water from soils under different moisture conditions. Influence of atmospheric conditions

Barrington Moore,
Chairman Committee on Cooperation

THE CANADIAN BRANCH OF THE AMERICAN PHYTOPATHOLOGICAL SOCIETY

The first annual meeting of the Canadian Branch of the American Phytopathological Society was held at the Ontario Agricultural College, Guelph, Ontario, December 11 and 12.

Canadian phytopathologists were well represented at this meeting. Among those taking active part in the proceedings were: Dr. A. H. R. Buller, University of Manitoba; Dr. J. H. Faull, Toronto University; Mr. P. A. Murphy, Dominion Laboratory of Plant Pathology, Charlottetown, P. E. I.; Mr. W. H. Rankin, St. Catharines; Mr. W. P. Fraser, Saskatoon, Sask.; R. J. Blair, Forest Products Laboratories, Montreal; Mr. F. L. Drayton, Central Experimental Farm, Ottawa; Professor L. Cæsar, Professor J. E. Howitt and Dr. R. E. Stone, Ontario Agricultural College.

The president, Professor J. E. Howitt, in his address dealt with what should be the aims of this society. These, briefly summarized, are as follows:

First. To provide adequate facilities for the training of research men in plant pathology in Canada.

Second. To make provision for the publication in Canada of the results of scientific investigations in plant pathology not of interest to the general public.

Third. To make available to the general public the practical application of results obtained from scientific research in plant pathology.

Fourth. The unification of recommendations made by the various pathologists regarding the control of the more common diseases.

Fifth. The carrying out of a plant disease survey to secure information concerning the financial losses caused by disease to agriculture and forestry and the distribution of plant diseases throughout Canada.

Sixth. The adoption of a standard of qualifications required of men entering the field of plant pathology in Canada.

Seventh. The apppointment of an advisory board to confer with the federal and provincial authorities regarding plant quarantine and other restrictive legislation.

Eighth. The maintaining of a bibliography of Canadian plant pathology.

Dr. E. C. Stakman, of the University of Minnesota, was a guest of the Canadian Branch and dealt with the cereal rust problems in the United States and Canada.

The papers on the following program were given at this meeting:

President's address, J. E. Howitt.

"Health and disease in plants," F. L. Drayton.

"Decay in timber of pulp and paper mill roofs." (Illustrated with lantern slides.) R. J. Blair.

"Butt rots of the balsam fir in Quebec Province," W. H. Rankin.

"Leaf blight of the white pine," J. H. Faull.

"Pseudorhiza of certain saprophytic and parasitic agaricinae" (illustrated), A. H. R. Buller.

Address of Welcome, President G. C. Creelman.

Address, Dr. E. C. Stakman.

"Education of plant pathologists." Discussion led by Dr. J. H. Faull.

"Witches broom of the Canada Balsam and the alternate hosts of the causal organism," R. E. Stone.

"Some comparative observations upon the shape of *Basidia* and method of spore discharge in the Uredineæ and Hymenomycetes," A. H. R. Buller. (Illustrated with models and lantern slides.)

"Smut of western rye grass," W. P. Fraser.

Address, E. C. Stakman.

"Some observations made in inspecting for leaf roll and mosaic of potatoes," J. E. Howitt.

"New or little-known diseases of potatoes which cause the running out of seed," P. A. Murphy.

"Breeding beans for disease resistance," G. P. McRoster.

"Combination sprays for apple and potato," G. E. Sanders. (By title.)

"Some data on peach yellows and little peach," L. Cæsar.

"Fungi new to Ontario," A. W. McCallum.

"Some fungi and plant diseases comparatively new to Ontario," R. E. Stone and J. E. Howitt.

The following officers were elected for 1920:

President—Dr. A. H. R. Buller.

Vice-president—Dr. J. H. Faull.

Secretary-Treasurer—Dr. R. E. Stone.

Additional Members of the Council—Professor J. E. Howitt and Mr. F. L. Drayton.

THE AMERICAN CHEMICAL SOCIETY. VI

Colloidal reactions fundamental to growth: D. T. MACDOUGAL. (By title.) Living cell masses from the growing parts of plants in which the H-ion of the sap varies from PH, 3.9 to 7 may show an unsatisfied hydration (absorption) capacity which causes a swelling of 6 to 80 per cent. in thickness in distilled water at 18 to 20 C. Dried (dead) sections of the same material in which the salts originally dissolved in the sap have been adsorbed by solids at high concentrations during the progress of desiccation, show (total absorption) hydration capacities which causes enlargements as high as 550 per cent. of the volume of the dried material. The aspect of comparative swellings in acid and basic solutions (tested between 0.5 M and 0.000001 M) in the two cases are different, probably due to changes in the colloids caused by the adsorption of salts, etc. The actual volume reached by such material in swelling includes some osmotic action and is limited by the morphological or mechanical features of the tissues. Artificial mixtures of pentosans, agar, mucilage and gum, and of plant albumins made up to simulate so far as possible the composition of the plasmatic (living) colloids, show comparative hydrations or total swelling similar to cell masses, and of an equiva-