throughout the Lake States, for example, few plantations can survive satisfactorily without fencing or other protection. Horn tells us that direct seeding in the California pine region is hopeless unless the mouse population is held to less than one mouse per 50-trap nights.

These few citations serve to emphasize not only the importance but the widespread extent of the biological factor in silvicultural operations. No doubt other phases of it will come to our attention as time and resources permit the expansion of biological investigations to additional regions and problems.

The study of the animals themselves, their life habits and so on, are of course primarily the task of the forest biologist. Some of the questions which the silviculturist must put to the biologist are:

(1) What are the important forest-inhabiting animals and birds affecting forests and forest practices?

(2) What is their life cycle, their food habits, etc.?

(3) What effect will the destruction of other animals, including predators, have on them?

(4) How are they affected by environmental changes which the silviculturist may make—as through clear cutting, etc.?

The forester must have the answer to these and similar pertinent questions before satisfactory forest-cutting practices can be worked out in silvicultural terms.

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THE FORMALDEHYDE-PROTEIN REACTION

CLARK and Shenk[1] in a study of the action of formaldehyde upon proteins found evidence which they interpreted upon the basis of compound formation. This evidence, observed by x-ray diffraction methods, consisted essentially of two new interplanar spacings corresponding to values of 2.6 and 3.9 A.U.

The presence of these new diffraction rings in the case of fibrous proteins characterized by ready swelling in alkali (feather, hair, tendon) and their absence in proteins relatively inert to alkali (silk) was construed to be indicative of reaction at the amide nitrogen. The mutually perpendicular fibering of these new interferences in the case of fibrous proteins was considered as being in accord with this interpretation.

Subsequent work at this laboratory undertaken at the suggestion of Professor J. H. Highberger and in conjunction and agreement with experimental work on proteins at the United States Regional Soy Bean Industrial Products Laboratory at this university indicated, however, that the new interferences could be accounted for upon the basis of the polymerization of formaldehyde retained in the protein.

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BACTERIA IN DUST-LADEN SNOW

ON March 5, 1938, a snowfall occurred in the Ottawa district which brought down with it a considerable amount of solid matter sufficient to produce a distinct brownish discoloration. According to the Meteorological Division, Department of Transport, such winter dust falls are reported from time to time from certain stations in Northern Ontario and Quebec. The dust is believed to have originated in the Western States, a low pressure area centered over Arizona and Texas on March 3 to 4 having reached Michigan and Ontario on March 5. Carried at high levels the dust current encountered cold air moving west when condensation to snow brought the dust particles down.

Bacteriological analysis of samples, collected in open country previously covered by fresh clean snow, gave a count of 4,370,000 organisms per gram of deposit. Examination of plate colonies showed them to consist almost entirely of spore-forming types, only one non-spore-former, a micrococcus, occurring on the highest dilution plate of twenty-five colonies. *Bacillus megatherium* was the most abundant species. Others noted were *B. vulgatus, B. mesentericus, B. mycoides, B. simplex, B. cereus* and *Bacillus sp.* The predominant organisms encountered were thus types commonly found in soil and which might be expected to withstand well such adverse conditions as desiccation and low temperature.

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SOCIETIES AND MEETINGS

THE NOTRE DAME SYMPOSIUM ON THE PHYSICS OF THE UNIVERSE AND THE NATURE OF PRIMORDIAL PARTICLES

A SYMPOSIUM dealing with the structure of the universe, cosmic rays and the ultimate constituents of matter and attended by more than 100 visiting scientists from 30 other colleges and universities was held at the University of Notre Dame on May 2 and 3, 1938. The symposium, arranged by Dr. Arthur Haas, comprised three public lectures and several technical sessions at which Dr. Arthur H. Compton, of the University of Chicago, Dr. Harlow Shapley, of Harvard University, Dr. Carl D. Anderson, of the Califor-

[1] *Radiology*, 28: 357, 1937.