AN ANATOMICAL EXPLANATION OF THE NORTHWEST CONIFEROUS CLIMAX FORESTS

INASMUCH as the summers of the Pacific Northwest are dry, while the winters are wet and mild, it has been suggested that the evergreen conifers have come to form the climax forests of that region because they grow during the winter months. Dr. D. T. MacDougal,[1] after dendrographic measurements, has said of the Monterey pine in California that "Growth was continuous for one period of three years." Over a considerable period of time the writer has attempted to gather anatomical evidence showing that the conifers of Oregon are active in the winter when the deciduous trees are resting.

This study was begun in 1914 with material collected in western Oregon during the winter months and has been continued at more or less regular intervals up to the present time. Beginning in 1921, material was collected in the summer and sometimes once a month for an entire year. Specimens from Kentucky were occasionally examined for purposes of comparison, since the Kentucky climax forests are dominantly deciduous.

Phloem, cambium and adjacent xylem of the following Oregon trees were examined: *Pseudotsuga taxifolia, Abies grandis, Libocedrus decurrens, Thuja plicata, Pinus ponderosa, Taxus brevifolia, Quercus garryana, Acer macrophyllum, Salix schouleriana.* For comparison similar material was used from the following Kentucky trees: *Pinus rigida, Picea rubra, Juniperus virginiana, Tilia americana, Ulmus americana, Celtis occidentalis, Quercus velutina.* Results were fairly consistent except under conditions of abnormally cold weather.

The Oregon conifers studies from October to February showed in radial view from 3 to 10 sieve tubes free from callus and an undifferentiated cambium region 5 to 14 cells wide. The deciduous trees at this time showed no open sieve tubes, and the cambium was 3 to 5 cells wide.

During July and August in the conifers from 1 to 4 immature sieve tubes were free from callus, and the undifferentiated cambium was 5 to 6 cells wide. At this time, in the deciduous trees there were either no open sieve tubes, or from 2 to 3 immature ones, while the cambium was 6 to 9 cells wide.

In the Kentucky conifers in winter there were no open tubes, though occasionally there was one partially free, and the cambium was from 4 to 5 cells wide. The deciduous trees there showed no open tubes.

Since the absence of callus pads in sieve tubes together with a wide undifferentiated cambium is accepted as evidence of activity, it may be assumed that the Oregon conifers were active during most of the winter season, while the deciduous trees were quiescent. In the late dry summer both types were practically inactive. In Kentucky, on the other hand, both conifers and deciduous trees were inactive in winter.

It was interesting to note that the winter activity of the Oregon conifers seems to be confined to three phases: food manufacture, some phloem development and some apical elongation. As far as was observed, no new xylem cells were formed in the main trunk at this time.

It seems then that the Oregon deciduous trees, having leaves for only two or three months of that part of the year when water is sufficiently abundant to carry on photosynthesis, must have inevitably lost out in their competition with the evergreens which are active to a certain extent for nine or ten months of the year.

A complete detailed account of this study will be published shortly.

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THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

MINUTES OF THE EXECUTIVE COMMITTEE

THE fall meeting of the executive committee was held on October 14 and 15 at the Cosmos Club in Washington. Those present were J. McKeen Cattell, *chairman,* D. R. Curtiss, Philip Fox, B. E. Livingston, Henry N. Russell, Henry B. Ward, E. B. Wilson and A. F. Woods.

The first session was devoted to an extended discussion of major problems of policy. Plans were considered for supporting the prosecution of research under federal auspices, for maintaining and extending the membership of the association, for utilizing the funds available and for aiding effectively the various movements for national recovery. No formal action was taken on these items.

Specific questions on which action was recorded were the following:

(1) The treasurer's financial report for 1933 was received and read. It was ordered audited and referred to the Boston meeting of the council.

(2) The treasurer's budget for 1934 was presented, and after consideration referred to the council.

[1] Carnegie Institute Yearbook, No. 30, 1930–31, p. 243.