

THE TREE-RING SOCIETY

President.....Dr. A. E. Douglass
 Secretary.....Mr. Roy Lassetter
 Treasurer.....Mr. Edmund Schulman
 Tree-Ring Laboratory
 University of Arizona
 Tucson, Arizona

THE TREE-RING BULLETIN

Editor-in-chief.....Dr. A. E. Douglass
 Managing Editor.....Mr. E. Schulman
 Associate Editors:
 Archaeology.....Mr. W. S. Stallings, Jr.
 Botany.....Dr. Charles J. Lyon

AUTHORS

The Tree-Ring Bulletin will publish papers resulting from original research in tree-rings in relation to climatology, archaeology, and other fields. For reports of projects in tree-ring dating, a tabular form as in Vol. 6, No. 1 is suggested. Until funds are available authors will be requested to pay the cost of illustrations. Each contributor will be given twenty-five copies of the Bulletin in which his article appears.

SUBSCRIBERS

All correspondence regarding subscriptions should be addressed to Mr. Edmund Schulman, Tree-Ring Laboratory, University of Arizona, Tucson, Arizona.

 TREE-RINGS AS A RECORD OF PRECIPITATION IN
 WESTERN NEBRASKA

HARRY E. WEAKLY*

The material used in this study is entirely Eastern red cedar, *Juniperus virginiana*, from Lincoln County, Nebraska. For tree-ring study, this species leaves much to be desired. Perhaps one cross-section in four is of sufficient symmetry to be usable. This is the only softwood available; hardwoods have thus far proved of little value.

Numerous sections of logs which had been used in some of the buildings at Fort McPherson and also a number of specimens from old log houses erected by some of the early settlers of this territory have been studied. Also, some specimens have been uncovered in old fills in the bottoms of a number of canyons. Some of this old buried material has given very readable ring sequences, but as yet it has been impossible to assign actual dates.

The material that has been dated so far gives an unbroken sequence back to about 1480 A.D. Settlement of this section of the country began about 1860. The early settlers, tie cutters for the Union Pacific railroad, soldiers, and immigrants who passed along the old California and Oregon trail, cut practically every tree of any size in the country, so that very few of the cedars now growing in the canyons along the edge of the Platte Valley exceed 75 or 80 years in age.

The larger trees cut by the early settlers ran from about 175 years to over 200 years old. The buried trees predate these by many years, as in some cases they have been found beneath a substantial fill in old gully or canyon floors with the stumps of 200-year-old trees in place in the soil many feet above them. At the level of the tops of these old buried trees there is a three to six inch layer of charcoal, and all those observed by the writer or reported to him show evidence of having been burned off at the old level of the earth fill about them. This charcoal bed is present in practically all the canyons in this vicinity and lies at depths varying from one to as much as six or even more feet below the surface. The material below it is largely aeolian in nature, whereas that above is both colluvial and alluvial in its general aspect.

The amount of wind-blown material in the lower portion of these canyon fills would indicate a drought period of considerable duration and severity.

*Junior Agronomist, Bureau of Plant Industry, North Platte Sub-station, University of Nebraska.

The annual rings on the buried wood from these localities indicate a period of over 30 years with deficient moisture. Apparently this drought period contributed very largely to the death of these trees.

The correlation coefficient between ring width and the annual rainfall for 63 years at North Platte is 0.63 ± 0.05 . An occasional lag effect is observed.

The recorded droughts of 1856 to 1860, 1869 to 1873, 1893 to 1894, and the one culminating in 1910 are all reflected in tree growth very faithfully. The periods of 1676-84, 1765-70, 1795-1800, 1820-24, and 1839-43 were also apparently deficient in precipitation. The period from 1820 to 1824 is of special interest because of the apparently extreme severity of the drought and the fact that it was extraordinarily widespread, being a matter of record in the diaries of several persons in the New England States and showing in the growth of trees studied by Douglass at Flagstaff, Arizona.

The above study has been in progress for about five years; a complete report on it is in preparation.

PROBLEMS IN DATING RINGS OF CALIFORNIA COAST REDWOOD

EMANUEL FRITZ*

In this brief note are described several anomalies in growth rings of California redwood (*Sequoia sempervirens*) which the tree-ring analyst must consider when working on redwood as a possible means of dating past climatic events.

Discontinuous growth rings.—In leaning redwoods all growth rings will not completely encircle the tree. On the side toward the lean, they take an abnormal width and their anatomy is that of compression wood. On the opposite side, diameter growth is dormant for most of the period of the lean, with occasional years producing very narrow rings. One tree example may be cited. This tree stood on a slope that had slipped apparently 161 years before cutting. When felled, it showed a long diameter of 102 inches and a short one of 45. The radius of the side toward the lean was 82 inches but only 20 inches on the opposite side. There were 472 rings on the 82-inch radius and 363 on the 20-inch radius. There were 161 rings of the new type, but of these only 109 appeared also on the 20-inch radius. Thus 52 rings failed to be formed completely around the trunk. Since the time of the slide that slanted the tree, diameter growth on the long radius was 58 inches but only 4 inches on the short radius opposite. A tree-ring analyst would hardly spend much time on a leaning tree, but the observation is nevertheless of interest.

Discontinuous rings are very common in vertical and apparently normal old-growth redwood trees. At this time no reliable explanation can be offered. It is almost certain that in large and very old trees the ring count on any one radius fails to add up to the age of the tree. Several radii must be counted and then, for greater accuracy, the area between the radii must be studied intensively for evidences of "lost" rings. For example, tree section no. 1596, measuring 37 inches in diameter one way and 43 inches at right angles, gave the following ring counts on five separate radii: 268, 290, 348, 363, and 397. In this case it was possible to make a single count to obtain 397 by counting on the 268-year radius until discontinuity was noted and then moving circumferentially to other radii and continuing the count to the outer edge. Another section, no. 1546, with a diameter of about 10 feet, and cut about 20 feet above the ground, gave the following radial counts: 1755, 1809, 1901, 1911, 1941, 1984, 1995, 2015, and 2079. Later, the area between the "oldest" radius and the neighboring radii was examined and an additional 98 rings were picked up.

Discontinuous rings are found also in young trees and in the accelerated-growth portions of trees that have been released from long suppression¹

*Assoc. Professor of Forestry, University of California.