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Interim Report on the Dendrochronology of
Bristlecone Pine Prior to 4,000 B.C.

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The goal of the present study of bristlecone pine, Pinus aristata, was achieved with the development of a continuous tree-ring record extending back slightly over 6,600 years, to 4660 B.C. for the White Mountains of east-central California. Concurrent with the extension (from 3878 B.C. at the time of the writing of the proposal), the chronology has been greatly strengthened in the B.C. period.

Analysis of bristlecone pine cores from the Mount Moriah area in east-central Nevada provided a preliminary chronology, based solely on living trees, back to A.D. 126. This is one of many facets of the present study which led to the recent awarding by the U.S. Forest Service of \$53,500 contract for a three-year inventory and study of bristlecone pine stands in east-central Nevada. The basic inventory, to be conducted by the Department of Watershed Management, will provide the framework for tree-ring studies by C. W. Ferguson after his present N.S.F.-supported project ends. This new phase of the bristlecone pine program will supplement continued Laboratory studies of this species not only in the White Mountains, but in other areas.

Cooperative studies with various radiocarbon laboratories turned out to be a major aspect of the project (see, for example, Archeology and Its New Technology, Science 153(3743): 1481-1491). As of 16 December, 1966, we sent out 289 dated samples of wood for C-14 analysis; and more are continuously in preparation. These, usually in 10-year units, greatly strengthen the time control upon which radiocarbon analysis depends for an understanding of the fluctuations and trends inherent in the C-14 record. Distribution, through time, has been as follows:

<u>Interval</u>	<u>Number of Specimens</u>
A.D. period	45
1 - 1000 B.C.	29
1001 - 2000 B.C.	93
2001 - 3000 B.C.	68
3001 - 4000 B.C.	51
before 4000 B.C.	3

In addition, 31 samples from undated tree-ring sequences have been submitted for C-14 analysis. This has provided an approximate time bracket within which to more intensely search for the exact-year identity of the "floating" tree-ring chronology, and already had made possible the dating of 6 of the 31 unknowns.

The scope of the project is so wide that the monographic report presents a frightening perspective. A few shorter articles are in the immediate offing, however. One, with a 1 February submission date (Science), will deal with the general scientific and historic aspects of the bristlecone pine study. The second, for the Tree-Ring Bulletin, will present the year-to-year chronology back to 780 B.C., developed by Edmund Schulman at the time of his death and confirmed by subsequent study when the project was reopened (NSF G-19949). This portion of the chronology has been used to develop standard methods of procedure for statistical analysis and computer programing. A third report of greater scope will present the total chronology in terms of the data that have been processed on the computer by the time the chronology is published. A comprehensive report, still some distance in the future, will present all aspects of the chronologies on a site-by-site basis.

Publications:

Ferguson, C. W., B. Huber, and H. E. Suess, Determination of the age of Swiss Lake dwellings as an example of dendro-chronologically-calibrated radiocarbon dating. Zeitschrift für Naturforschung 21a, 1173-1177 (1966).

Manuscripts:

Adam, David P., C. W. Ferguson, and Valmore C. LaMarche, Jr. Enclosed bark as a pollen trap.