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THE TREE-RING BULLETIN
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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.

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EDITORIAL: A BIBLIOGRAPHY

A. E. DOUGLASS

The special feature which has made possible our development of tree-ring work or dendrochronology has been the recognition and identification of corresponding ring patterns in coexistent trees in the Pueblo area of the Southwest, a dry region roughly some four or five hundred miles east to west and north to south. This identification of patterns over large areas changed fundamentally the method of getting information from tree-rings by introducing as the unit of information not the individual tree but a group of trees whose ring patterns crossdate. The resulting careful comparisons between different trees not only locates and corrects the errors of the individuals as to false or missing rings but also, because these patterns are climatic, insures the climatic origin of the factors on which the cross-dating depends. Hence in chronology building we gather together units of this multiple, self-correcting type.

The principle of the unit just stated has controlled our tree-ring work since crossdating was fully recognized in 1911 and put to practical use in the spring of 1913 in the complete re-dating of 19 Flagstaff specimens (FL-7 to 25) as a group instead of as individuals. It was in that operation that the crossdating between Flagstaff and Prescott (70 miles away) was discovered and the annual character of our sharply marked microscopic or "lens" rings, such as 1904 at Prescott, was made evident. Previously such rings had been taken as part of the preceding annual ring, which is a natural first thought before one has really practiced crossdating. In fact, during all those early years of this work, we realized that crossdating could not be accepted in any new locality until it was proved by test to be there. So also, its absence in one locality carries no inference with respect to its genuineness in another locality that differs in climatic and topographic features.

This identification of rings through patterns has resulted in hundreds of prehistoric ruins dated and a 1900-year ring chronology giving an excellent record of rainfall. In this accomplishment we have had a score or two of students who have become familiar with our technique of selection of field material that preserves the climatic characters, proficient in the proper preparation of ring surfaces, and who have done enough crossdating to realize that patterns can be identified across a wide extent of country. For this realization it seems almost absolutely necessary to construct, as our students do, a real ring chronology several centuries in

length and to carry it to such detail that the patterns become memorized. For it is in that memory that crossdating become a living reality to the student.*

We are of course not only strongly interested in papers that have contributed directly to this phase of tree-ring work but also in numerous others such as detailed botanical studies of special ring structures. Also of much interest are the studies in special regions as the rainy semi-tropics where influences entirely different from those in our dry Southwest are dominant in ring growth, and studies in those large areas where so many factors seek control of the trees that it is very difficult for climatic influences to show through. In some instances, too, rough summarizing methods are employed, of practical value in general growth studies but of little use in the development of reliable climatic indices from tree-rings. It is in considering the conclusions of papers dealing directly with tree-rings as climatic indices, however, that one must specially look for the proper use of the principle of crossdating outlined in the first paragraph.

*We are seeking publication in quarto form of a "multiple chronology" containing some 900 photographs of our best ring records from the Southwest. Through most of this chronology any ring may be found as it appears in ten to thirty different trees. Such a publication is much desired as it will illustrate the fundamentals of our work as nothing else can do.

A BIBLIOGRAPHY OF TREE-RING ANALYSIS

EDMUND SCHULMAN

The present bibliography is with a few exceptions limited to papers dealing in whole or part with the analysis of tree-rings in relation to climatic and archaeological studies. For the literature on cycles, see Douglass ref. 124, about 200 titles; Antevs ref. 10 reviews about 350 titles (over 300 not in the present list), largely botanical and preceding 1917. Much relevant material may be found also in ref. 392 which lists some 700 papers on silviculture, and ref. 412 which contains about 1000 papers on forests and water.

For a survey of the precision dating of tree-rings in the Southwest, refs. 106, 124, 126, 127 and 173 will be helpful.

References for the archaeological contact are: 2, 20-24, 31, 32, 46, 70-72, 86, 87, 97, 108, 113, 121-123, 125, 128, 129, 148, 161, 162, 164, 165, 185, 194-196, 205-212, 214-217, 240, 241, 246, 264, 274, 280-290, 297, 304-309, 324, 337, 366, 373, 375, 376, 378-380, 406, 407.

Most but not all of the entries in the list were checked with the original papers. The Laboratory will be grateful for additional relevant titles, to be included in a supplement at some future date.

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1. Aandstad, S. Untersuchungen über das Dickenwachstum der Kiefer in Solör, Norwegen. *Nyt Mag. f. Naturvidenskaberne*, 74, 121-154, Oslo, 1934.
 2. ———. Die Jahresbestimmung der Kiefer und die Zeitbestimmungen älterer Gebäude in Solör im östlichen Norwegen. *Nyt Mag. f. Naturvidenskaberne*, 78, 1938.
 3. Adams, W. R. Effect of spacing in a jack pine plantation. *Vermont Agric. Exp. Sta. Bul.* 282, 1928.
 4. ———. Effect of thinning in plantations on some of the physical factors of the site and on the development of young northern white pine (*Pinus strobus* L.) and Scotch pine (*Pinus silvestris* L.). *Vermont Agric. Exp. Sta. Bul.* 390, 1935.
 5. Amilon, J. A. Om tiden för diametertillväxtens början hos barrträden och orsakerna härtill. *Skogsvårdsföreningens Tidskrift*, 8, Stockholm, 1910.
 6. André, H. Über die Ursachen des periodischen Dickenwachstums des Stammes. *Zts. f. Bot.* 12, 177-218, 1920. (See also *Naturw.*, 8, 998-1006, 1021-1027, 1920).
 7. Ångström, A. Teleconnections of climatic changes in present time. *Geografiska Annaler*, 17, Stockholm, 1935.