3 March 1970

Mr. Herbert C. Sorensen
Department of Biochemistry
and Biophysics
University of California
Davis, California 95616

Dear Mr. Sorensen:

Your letter of 16 February has been circulated among interested members of the Laboratory staff. While we have come to rely heavily upon the computer and have developed correlation programs, we are extremely interested in your approach. The "archaeological" dating is very important to me in that I often am unable to date specimens with one or two thousand rings against a 7500-year master chronology, even with the "ball-park" placement provided by a radiocarbon date.

There are two immediate sources of tree-ring data. A major source is "Dendroclimatic Changes in Semi-arid America" by the late Edmund Schulman. It was published in 1956 by the University of Arizona Press and sells for $3.00. My 7104-year master chronology, a filtered indices format in tabular form, is in the latest Tree-Ring Bulletin (abstract enclosed). For your test purposes, I could also provide the Pine Alpha Series used in my plot illustration. These data could be provided in tabular form, as in the bulletin, or as punched cards, if the card form is compatible. We use the CDC 6400 computer.

In regard to computer dating: we certainly have not ignored this type of program; it has proven to be more complex than we figured. It involves, in addition to the computer statistics, a firm knowledge of dendrochronology. Not always do the tree rings do what is expected of them. In the bristlecone pine,
for example, up to 10% of the rings may be missing along a given radius. Quite often, by the time we have our data searched out to our satisfaction and ready for the computer, we have visually dated the specimen or plotted data therefrom. On the other hand, we have some that are real difficult.

Since you mention the 7104-year chronology, I assume you have seen the bulletin. There were strong reasons why I published the chronology as a filtered series; thus, I would not be able to release the index values to you. However, the filtered series should be usable for your purposes. The alternative, for index values, would be Schulman's book.

The 7104-year chronology has been extended to 7485-years, but the new data, along with some recently collected material in the 5000-4000 B.C. range, is still being studied. The 9000-year specimen, dated by C-14, indicates a potential of perhaps 10,000 years.

Dr. Valmore C. LaMarche of our staff is also working on a computer program of this nature, and we would be pleased either to advise you or to evaluate your program.

Sincerely yours,

C. W. Ferguson
Associate Professor
of Dendrochronology

CWF/rab

Enclosures

Myers
Dr. Hans E. Suess
Dept. of Chemistry, Revelle College
University of California at San Diego
P.O. Box 109
La Jolla, California 92038

Dear Hans:

In regard to Sunday phone calls:

During your call on Sunday, 14 May, our little girl became too distracting and I had to chase her out of the room and close the door—upon which she began to cry. Eileen, who was working in our new trailer, heard the cry and, not knowing what the problem, rushed inside. By the time our call was terminated, she was distraught—very mad, in fact.

On previous occasions, also, your calls have been disruptive. Since Sundays are the only day I am free to spend time with my family, she feels that your calls are an imposition on both me and my family. And, from my point of view, I of course do not have any notes at home and am forced to talk from memory on many points.

Hence, to enjoy my Sundays and to keep peace in my family, and to feel more efficient in regard to notes, I will not accept any further phone calls at home.

Sincerely,

C. W. Ferguson
Associate Professor
of Dendrochronology

GWF:aa
Dear Dr. Stokes:

The Methuselah tree (page 364 of the March, 1958, NATIONAL GEOGRAPHIC) is the oldest known bristlecone pine. It is neither the largest nor the most photogenic. However, I am enclosing two 5 x 7 prints of the tree for your consideration. Additional prints can be made to your specifications. We would like a credit line for the Laboratory; and the customary fee, whatever that is, will be appreciated.

Because of the relatively recent discovery of the age of bristlecone pine, not much of a technical nature has been published on this subject. The only information available for visitors to the Ancient Bristlecone Pine Forest consists of a guide booklet put out by the U.S. Forest Service and a brochure put out by the Bishop Boosters (enclosed).

DENDROCLIMATIC CHANGES by the late Dr. Edmund Schulman contained the first mention of the great age of bristlecone pine. The best reference is the article by Dr. Schulman in the March, 1958 issue of NATIONAL GEOGRAPHIC. Since Dr. Schulman’s death, there have been no publications on the bristlecone pine by the Laboratory of Tree-Ring Research. The Laboratory is now engaged in a four-year study, based upon the work of Dr. Schulman; and is aided by grants awarded by the National Science Foundation in 1961 and 1963. The tree-ring chronology is being worked out and the relationship of growth to climatic factors is being studied. A status report on the chronology building as of May 1, 1963, is contained in TREE-RINGS IN THE BREAT BASHIN. In only two instances have chronologies for the bristlecone pine been published: (a) on page 52 of DENDROCLIMATIC CHANGES, mentioned above, and (b) a comparative chronology from about 1760 in GROWTH RINGS IN BIG SAGEBRUSH.

I have been compiling a briefly annotated bibliography for bristlecone pine and the White Mountain area. Even though admittedly incomplete, a copy is enclosed. Any additional references would be appreciated.

Sincerely,

C. W. Ferguson
Assistant Professor of Dendrochronology
MEMORANDUM TO: Professors J. S. Dean, C. W. Ferguson, H. C. Fritts, V. C. LaMarche, W. J. Robinson, and M. A. Stokes

REGARDING: Promotion and Tenure Review of Dr. Charles W. Stockton

As permanent members of the Laboratory of Tree-Ring Research Advisory Committee on Tenure and Promotion, I am requesting that you meet under the chairmanship of Dr. LaMarche to review the case for Dr. Stockton's possible promotion to Associate Professor of Dendrochronology with tenure. The documentation on Dr. Stockton, including letters from off-campus reviewers, has now been compiled and will be made available to you by Dr. LaMarche. I would very much appreciate receiving your written recommendation concerning Dr. Stockton by December 1, 1978.

Bryant Bannister
Director

BB:aa

cc: Dean H. Odishaw
   Vice President A. B. Weaver
Charles W. Stockton

Curriculum Vitae

July 1, 1978

PERSONAL: Born October 10, 1938, in Pueblo, Colorado

EDUCATION

1956-58 Pueblo College (now Southern Colorado State College)
1958-60 Colorado State University; Bachelor of Science (Geology)
1963-65 Colorado State University; Master of Science (Hydrogeology)
1966-71 The University of Arizona; Doctor of Philosophy (Hydrology)
   Dissertation Title: The Feasibility of Augmenting Hydrologic
   Records Using Tree-Ring Data
   H. C. Fritts, Director

PROFESSIONAL REGISTRATION

Professional Ground Water Geologist, No. 10568 (1976), State of
Arizona (by examination)

ACADEMIC AND PROFESSIONAL POSITIONS

1960-61 Well-Site Geological Engineer (petroleum industry)
1961-63 U. S. Army (foreign assignment in Korea with Army Engineers)
1963-65 Graduate Research and Teaching Assistant, Colorado State
   University
1965-66 Hydrogeologist with consulting engineering firm, Los Angeles,
   California
1966-70 Graduate Associate in Research, Laboratory of Tree-Ring Re-
   search, The University of Arizona, Tucson
1970-74 Research Associate, Laboratory of Tree-Ring Research, The
   University of Arizona, Tucson
1974-78 Assistant Professor-Research Associate, Laboratory of Tree-
   Ring Research, The University of Arizona, Tucson
1978- Assistant Professor, Laboratory of Tree-Ring Research, The
   University of Arizona, Tucson
STATEMENT OF FIELD: Hydrology and dendrochronology with emphasis in hydroclimatolology and dendrohydrology; the study of climatic variation as documented by tree-ring data and its influence on hydrological processes.

GRANTS AND CONTRACTS

Principal Investigator:


National Science Foundation, Atmospheric Sciences Section: "Long-term spatial and temporal drought frequency analysis in western United States utilizing tree-rings," 1975, $40,000.


Major Contributor:


In Negotiation Stage:

An informal proposal submitted to various California agencies: "Long-term drought history of the Central Valley, California," approximately $31,000.
A proposed major study of the climatic influences on the hydrology of the Columbia River System: "Long-term drought history of the Columbia River Basin," approximately $200,000.

COURSES TAUGHT

1963-65 Colorado State University: laboratory sessions in General and Historical Geology; received favorable reviews from the students.

1971-78 No formal teaching assignments at The University of Arizona; however, have participated annually in various "Short Courses" sponsored by The Laboratory of Tree-Ring Research.

Have given annual guest lectures in hydrology, course H-280.

Have been invited to lecture in the 1978-79 Chautauqua Short Course Program, sponsored by the American Association for the Advancement of Science and the National Science Foundation, at two locations: Christian Brothers College in Memphis and Michigan State University in East Lansing.

PROFESSIONAL ORGANIZATIONS

Geological Society of America
American Water Resources Association
The Society of Sigma Xi
Arizona Section, American Water Resources Association
Colorado River Water Users Association

UNIVERSITY AND PROFESSIONAL COMMITTEES

College Committees:

Earth Science Colloquium Series, 1972-present
College of Earth Sciences Committee on Non-Renewable Resources, 1975
College of Earth Sciences Environment Committee, 1975
Ecology Curriculum Planning Committee, 1975

Professional Committees:

Executive Committee of the International Tree-Ring Data Bank, 1974-present

THESIS AND DISSERTATION COMMITTEES

Ph. D. Dissertation Director:

A. V. Douglas, Geosciences, "Past air-sea interactions over the eastern north Pacific Ocean as revealed by tree-ring data" (1976)

D. M. Meko, Hydrology, "Reconstruction of drought-producing circulations in the far western United States using tree rings" (in preparation)

M. S. Thesis Director:


B. Tunnicliff, Watershed Management, "The historical potential of snowfall as a water resource in Arizona" (1975)

C. L. Winter, Geosciences, "Relationships among climate, tree-ring widths and grass production on the Santa Rita Experimental Range" (1976)

Special Paper Director:


Ph. D. Dissertation Committees: Three students (2 Geosciences, 1 Anthropology)

Ph. D. Preliminary Committees: Three students (all Geosciences)

M. S. Thesis Committees: Four students (3 Geosciences, 1 Hydrology)

M. S. Advisor: Three students (2 Hydrology, 1 Applied Mathematics)


___, 1975b. (Contributor). Tree-Ring Chronologies of Western America VI. Western Canada and Mexico, edited by Linda G. Drew. Chronology Series I. Laboratory of Tree-Ring Research, The University of Arizona, Tucson.


PUBLICATIONS


____, 1965b. Hydrogeology of part of Upper Boxelder Valley, Larimer County, Colorado: presented at the 18th annual meeting, Rocky Mountain Section, Geological Society of America.

____, and D. V. Harris, 1965c. Karst features in northern Larimer County, Colorado: presented at the 18th annual meeting, Rocky Mountain Section, Geological Society of America.


____, 1972a (Contributor). Tree-Ring Chronologies of Western America II. Arizona, New Mexico, Texas, edited by Linda G. Drew. Chronology Series I. Laboratory of Tree-Ring Research, The University of Arizona, Tucson.
November 9-11, 1976. The Mitre Corporation Symposium on "Living with Climate Change"; panel member on Climatic Change and Water Supply.


September 11-14, 1978. Invited participant for seminar on Solar Variability to be held at the National Center for Atmospheric Research, Boulder, Colorado.


October 9-12, 1978. Invited participant in the workshop on Estimating and Interpreting Climatic Spectra, to be held at the National Center for Atmospheric Research, Boulder, Colorado, sponsored by the National Science Foundation, Climate Dynamics Research Section.
Stockton, C. W., and D. M. Meko, 1975. A long-term history of
drought occurrence in western United States as inferred from

Stockton, C. W., 1976a (Contributor). *Tree-Ring Chronologies for
Dendroclimatic Analysis*. An Expanded Western North American
Grid, edited by Linda G. Drew. *Chronology Series II*. Labora-
tory of Tree-Ring Research, The University of Arizona, Tucson.

____, 1976b. Long-term streamflow reconstruction in the Upper
Colorado River Basin using tree-rings. *Colorado River Basin
Modeling Studies*, edited by C. G. Clyde, D. H. Falkenberg
and J. P. Riley; Utah Water Research Laboratory, Utah State
University, Logan, Utah, pp. 401-441.

____, and G. C. Jacoby, Jr., 1976. Long-term surface-water supply
and streamflow trends in the Upper Colorado River Basin based
on tree-ring analysis. *Lake Powell Research Project Bulletin
No. 18*, sponsored by National Science Foundation and Research
Applied to National Needs, Institute of Geophysics and Planetary
Physics, The University of California, Los Angeles, Cal-
ifornia.

Lawson, Merlin P. and C. W. Stockton, 1977. Exploration of the
Great American Desert in the context of climatic reality:
presented at the 73rd annual meeting of the Association of
American Geographers, Salt Lake City, Utah, April 24-27, 1977.

United States as reconstructed from tree-rings: presented at
the 73rd annual meeting of the Association of American Geo-
graphers, Salt Lake City, Utah, April 24-27, 1977.

Stockton, C. W., 1977. Interpretation of Past Climatic Variabil-
ity from Paleoenvironmental Indicators. In *Climate, Climatic
Change, and Water Supply*, Studies in Geophysics, National


apparent 20+year periodicity in drought occurrence in western
United States (tentative): to be submitted to *Science* (in
preparation).
OTHER PROFESSIONAL ACTIVITIES


April 15-26, 1974. Participant in International Symposium on Dendroclimatology. Sponsored by Advanced Research Projects Agency and National Science Foundation, held at the Laboratory of Tree-Ring Research, The University of Arizona, Tucson.


February 23, 1976. American Association for the Advancement of Science Symposium on Climate in the United States Since 1776, Boston, Massachusetts. Paper entitled "A two-hundred year history of drought occurrences in western United States as inferred from tree rings."

April 12, 1976. American Geophysical Union panel on Water and Climate, Washington, D. C. Paper entitled "Interpretation of past climatic variability from paleoenvironmental indicators."

April 23-24, 1976. The Nebraska Academy of Sciences Bicentennial Symposium on "Our Changing Climate Since 1776." Invited paper entitled "A two-hundred year history of drought occurrences in western United States as inferred from tree rings."

September 9-12, 1976. Sierra Club panel member on "Water Supply and Distribution in the Colorado River System."
October 23-27, 1978, February 26-March 2, 1979. Invited course director for the 1978-79 Chautauqua-Type Short Courses for College Teachers, sponsored by the American Association for the Advancement of Science and the National Science Foundation. To present a course entitled "Climatic, Hydrologic and Ecologic Records of the Past as Reconstructed from Tree-Rings and Other Paleoenvironmental Indicators," to be held at two locations: Christian Brothers College in Memphis, and Michigan State University in East Lansing.

January 3-8, 1979. Invited participant in the American Association for the Advancement of Science Symposium on "Climatic Change as a Potential Hazard Revealed by Geologic and Contemporary Records," to be held in Houston, Texas. To present a paper entitled "Climatic Variability and Water Supply."


Consultant:

The City of Denver: Board of Water Commissioners, court testimony involving projected long-term water supply for the City of Denver, Colorado, 1975.