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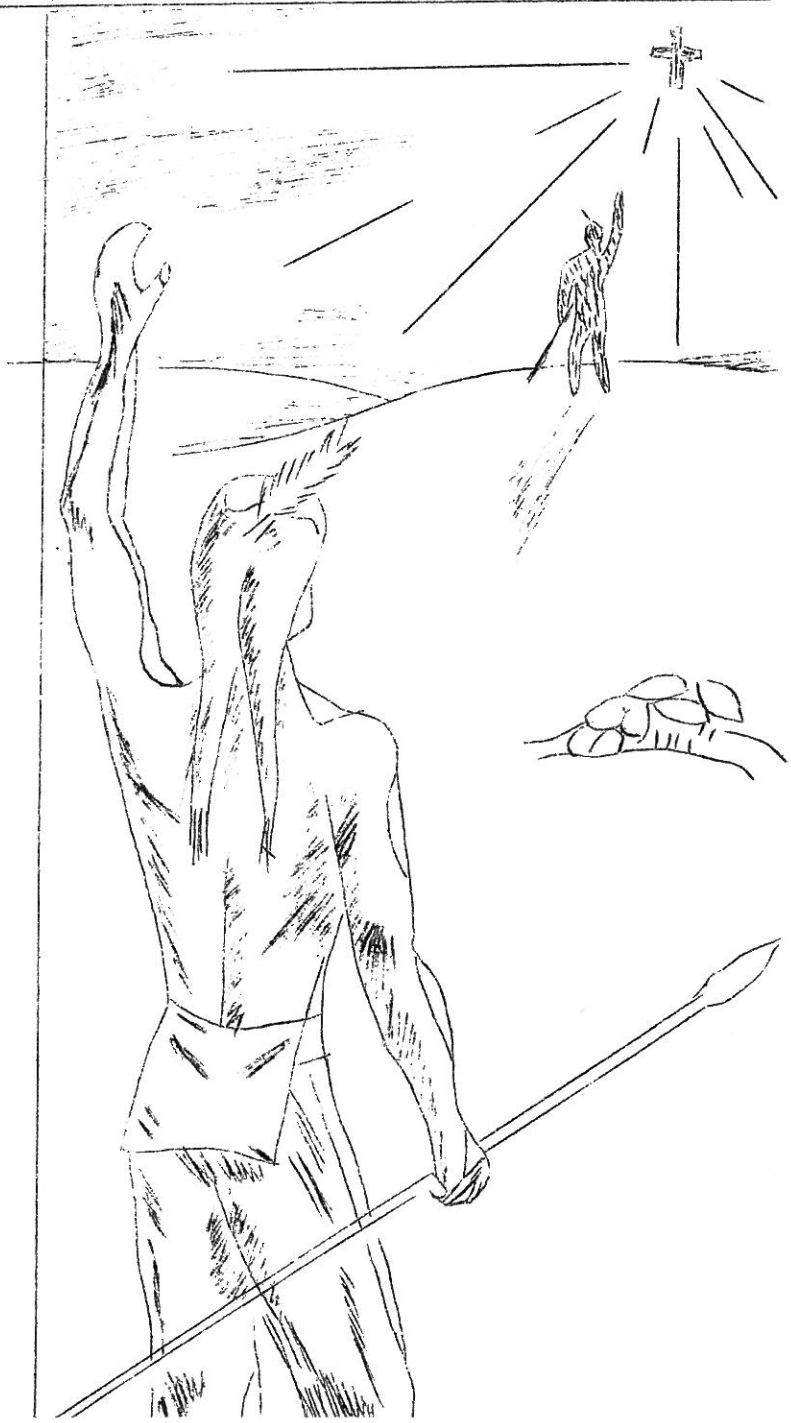

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DO SOMETHING MORE

We'd like to quote the following by Dr. Albert Schweitzer.

"It's not enough to merely exist. It's not enough to say, 'I'm earning enough to live and to support my family. I do my work well. I'm a good parent. I'm a good spouse. I'm a good churchgoer.'"

"That's all very well. But you must do something more. Seek always to do some good somewhere. Every man has to seek in his own way to make his own self more noble and to realize his own true worth."

"You must give some time to your fellow man. Even if it's a little thing, do something for those who have a need of man's help, something for which you get no pay but the privilege of doing it. For remember, you don't live in a world all your own. Your brothers are here, too."

A MESSAGE FROM THE PRESIDENT

The Wyoming Archaeological Society is now ending another very successful year, and, as your president, I want to thank each and every member for the part he has contributed toward the Society's remarkable success. Some of our members have been able to devote more time and effort to our work and projects than others, but no matter what your contribution, it has helped us achieve a notable reputation and recognition from some of the leading institutions of archaeology.

Ours is an enviable position. As amateur archaeologists, we have achieved a long step toward the goal long sought by other froups such as ours, so to maintain this position we must keep moving forward and constantly imporove, or we will become static and fall by the wayside. To keep our Society moving forward can only be achieved by enthusiastic participation by all the membership, so with a new year just beginning, new ideas and suggestions will help us achieve new goals and maintain our progressive reputation.

The satisfaction one feels, from knowing the contributions he is making will help complete the archaeological picture of North America, is reward enough for all the long, hard hours spent shaking a screen, shoveling dirt or writing field reports.

During the past year the society:

1. Wrote new amendments into our constitution and by-laws to facilitate state-wide operation.

2. Organized an active local chapter at Casper.

3. Redesigned our monthly publication.

4. Raised funds for publications and new equipment through artifact sales and an archaeology course taught at Sheridan College.

5. Developed and improved recording forms for use at digs.

6. Continued work on a Carbon-14 laboratory.

7. Obtained improved equipment for dendrochronology.

8. Acquired a building for a museum.

9. Held our first Annual Banquet.

10. Made a major contribution to archaeology with our summer's finds.

11. Increased our membership substantially.

12. Helped the Billings Archaeological Society get a fresh start and renewed interest.

13. Increased our prestige and reputation.

14. Had our Medicine Wheel report published.

15. Received the State Historical Society's award for the best archaeological work done in the state during the year.

Glenn D. Sweem
President

NEW MEETING PLACE FOR SHERIDAN CHAPTER

The Sheridan chapter will meet the first Monday of each month in room 1 of the new Sheridan College building until further notice.

It was voted at the last meeting of the chapter to mail no copies of the monthly publication to local residents. In order to receive their copies, local members will have to attend the meetings. Copies not collected at any meeting will be saved until the next meeting or until collected.

ELEMENTS OF ARCHAEOLOGY III Dating

One of the most important pieces of information to be obtained from a site is that of age. The concept of age is viewed in two different ways. Sometimes it is only important to know how a site is related in time to some other site. Some particular cultural horizon in a site may be older or younger than a horizon in another site. In this case, only the relative ages of the two horizons are under consideration. In other cases it is important or desirable to know the actual age of the horizon as measured from the present. Thus dating falls into two categories--relative and absolute.

Relative dating.

The first and foremost relative dating tool of the archaeologist is stratigraphy. In any case where successive deposits of cultural materials occur in discernible layers in a vertical sequence, it is logical to assume that the uppermost must have been deposited last, and the lowest must have been deposited first. With such a stratigraphic column in a site, the archaeologist can establish relative ages for all the cultural horizons represented at that site. He can easily tell which occurred first temporally. He gets no information about the absolute ages from the stratigraphy. He cannot tell if the oldest layer is a hundred or ten thousand years old from stratigraphy alone. Depth is no guide to age at all, unless there is some additional information about the rate of deposition of the overlying material. Dr. Mulloy is fond of showing his archaeology students a buggy wheel protruding from the wall of a gulley some thirty feet below the surface. A flash flood probably buried it overnight.

Stratigraphy is not always a simple case of a sequence of horizontal layers, each clearly differentiated from its near neighbors. Often the sequence is complicated by uneven deposition or erosion of materials. Rodent burrows often move materials from one layer to another. The utmost care is often required to differentiate layers and to discover evidence of disturbances.

Strata in a site are distinguished from one another by several means. A difference in color, texture, or composition of soil may distinguish the layers. Sometimes a microscopic examination may be necessary to discover differences in grain size or composition. Varying content in the soil may include organic materials such as bone, charcoal, pollen, roots, and humus. Pollen requires microscopic examination to distinguish the presence and types. In other cases, cultural content may serve to distinguish layers in otherwise undifferentiated soil.

In cases where the soil is completely undifferentiable from layer to layer, the archaeologist usually measures off equal intervals of depth at the site and labels each "layer" according to depth. Whether this process is justified depends on whether the recovered materials show a clear preference for certain levels in the site according to classification. In essence, the process of excavating by measured levels is merely a way of determining is there is a natural stratigraphy by cultural types. Such a process makes it impossible to distinguish horizons lying close together in a site.

There are many other methods used in relative dating. Cultural evolution follows a fairly common sequence in any given area, and it is often possible to make some educated guesses about the relative ages of cultural components in a site by observing the techniques of artifact production that are used. The more modern techniques indicate the most recent cultures. The method is fraught with peril, however, in the event that unfamiliar material is being studied. It does not always follow that the finest workmanship indicates the most modern material, as is well

exemplified by the Yuma-type projectile points in this country. Workmanship in the thousands of years since these points were made has become much less artistic.

The laboratories of the physical sciences have furnished the archaeologist with some of his tools for both relative and absolute dating. Fluorine analysis of bones, for example, can determine whether two bones from the same site are of the same age. Bones accumulate fluorine from the surrounding soil at a rate which depends upon a great many factors, such as the amount of fluorine minerals present, the amount of ground water and the soil density, etc. When two bones have been exposed to the same conditions, which in practise means the same site, the amount of fluorine they contain will depend on the length of time they have been in the site. Thus an analysis can tell if the bones are of the same age by the fluorine content, provided that they come from the same site.

Another relative dating method from the laboratories is the potassium-argon method. This has potentialities of some applications to absolute dating, but because of inherent difficulties, is best used for relative dating at present. In essence, the method depends on the radioactive decay of an isotope of potassium present in all bone materials. The decaying potassium turns to argon, and a measure of the ratio of these two materials present in the bone determines the age of the bone. However, potassium chemicals are soluble in water, and thus may be leached out of, or carried into, the bone. For this reason, absolute dates by this method are not too reliable as yet, but relative dates can be pretty well established for materials from the same environment.

In areas where paleontologists have established a good picture of the evolution of the fauna, it is sometimes possible to obtain relative ages of cultural remains by means of their associations with animal remains. Similarly, in areas where geological studies have given information about climatic sequences, it may be possible to assign relative ages to cultural deposits through the study of climatic factors asindicated by soil structures or pollen content of the soils. Even animal remains often give climatological information.

It hardly need be said that any method which will give absolute dates also gives relative dates. If the exact ages are known, it is certainly possible to tell which cultures came first.

Absolute dating.

The term absolute here does not imply any infinite degree of accuracy, but rather a measure of age related to a fixed standard, such as our present date or the basis of our calendar system.

One of the first absolute dating methods in pre-historical investigations was dendrochronology or tree-ring dating. This dating method can be used whenever sufficiently large samples of wood can be obtained from a site that is not too old. In basic principle, the method consists of matching growth patterns of the sample with those of wood of known age. When such a match can be obtained, the death date of the sample can be

determined within a year or two. If the use of the wood cem shortly after its death, the site can be accurately dated by this means. It is one of the most accurate methods known, but is somewhat limited in application. It can only be used for a few hundred years before the present time in most cases, and the specimen, in order to be datable must be of the proper kind of wood, and must be grown under suitably difficult conditions, so as to make the growth pattern sensitive to climatic changes.

Another recent method of dating in archaeology is that of dating radioactive carbon from charcoal or other organic samples found in the site. This method depends on the fact that cosmic rays are continually changing some of the nitrogen of the atmosphere into carbon-14, which is radioactive. All the life forms on earth assimilate some of this carbon, and all have nearly the same fraction of this material in their systems. As long as the organism lives, this radioactive carbon is in balance between assimilative processes and radioactive decay. When the organism dies, its intake ceases, and the carbon which is present begins to disappear radioactively at the rate of fifty percent every 5,568 years. By measuring the amount of radioactive carbon present at any time, the physicist can determine how long the carbon has been decaying. The method is subject to tremendous experimental difficulties, and of course is subject to certain limitations of sample nature. The best samples are of pure charcoal from a dry environment. Any others are subject to possible contamination by micro-organisms which may tend to give far too yound a date.

The method of thermoluminescence, still under development, may add an important third technique to absolute dating. The method depends upon the measurement of the thermal glow curve of a specimen which was heated to a sufficient activation temperature during pre-historic times. The trapped energy of excitation disappears at a time-dependent rate, and by measuring the fluorescent glow under thermal excitation, the age can be determined, subject to certain sources of error which are not completely understood as yet.

The methods of geology and paleontology can sometimes give absolute dating in a sense, but the accuracy is very poor in most cases. In one particular case, however, the study of glacial geology, rather accurate dates may be obtained for some sites. As glaciers melt, the meltwater reaches a maximum during the warm months and drops to zero in winter. This annual fluctuation is reflected in the deposits of fine clays in lakes downstream. These clays form layers called varves or rhythmites which show a periodic record of melting. By counting back, the dates of sediment formation can be determined with good accuracy. While these are not likely to contain artifacts, the accurate knowledge of climatic dates which they furnish can often be of great help in dating artifacts found in the vicinity through comparative studies of the climatic sequences at the site.

Palynology, the study of pollen, can often produce absolute dates of poor accuracy when coupled with an overall master chart of pollen frequencies from the area in which the site lies. The procedure is to examine soils, or better, lakebed silts, from the area under a microscope to determine what types and amounts of pollen are present. A percentage figure is

prepared for each type, and a chart made of the relative frequencies of each type of pollen. If the pollen chart can be dated absolutely at intervals by reference to carbon dates, geologic information, or other sources, it can then be used to give absolute dates for specimens from the same area. The frequency charts for the specimen are compared with the master chart, and the date estimated from the portion of the master chart which they seem to match best. With or without an absolute dating correllation, the pollen count gives a good picture of the climate of the times, which is a good thing for the anthropologist to know in interpreting conditions which influence man's behavior.

Many other methods of dating, both relative and absolute, occur from time to time in connection with individual sites. The archaeologist must always keep his eyes open for possible answers to the dating question. He must have an understanding of many different fields, and must be prepared to sieze the opportunities which fortune might place in his way.

This meager sketch of dating methods should not be used as a final reference on any of the methods mentioned. Books could be, and have been, written about any of these topics, much less the entire picture. The reader is urged to consult standard references in archaeology for some of the more exact details. Such things as patination, fairy rings, crystallization, and many others can be useful under certain conditions and when properly interpreted.

Certainly, a basic concept of the many dating methods brings home one fact very strongly--save everything from a dig until it is certain that it is of no value. A lot of charcoal was probably wasted before carbon dating came true.

SEASON'S GREETINGS

During the exchange of warm wishes this season, several old members and friends of the society were heard from. George Frison sends best wishes, as does Celeste Caldwell. Lou Steege sends greetings, and tells us he hopes to get a new chapter started in Cheyenne soon. He also tells us he has gotten on the track of a new site that was exposed in a trench cut for a water line right in the city of Cheyenne, Chuck McIntosh is home from Stanford where he is majoring in Art and Languages. He has three quarters left for his degree. The burton DePues of Meeteetse, sent greetings from Bodo and Ingrid, whom we learned, are grandchildren. Jeannie is at Stanford.

We hope everybody had a Merry Christmas and will have a Happy New Year. Make a resolution to spend a day or two at the digs this summer. We'll see you there.

ANNUAL ELECTIONS COMING

Be sure to get out and stump for your favorite candidates. The January meeting is the time for election of officers. Be sure to get some good men into office, because there is a lot of work ahead this summer.

CURRENT MEMBERSHIP LIST

Sheridan:

Chuck Bentzen	Dr. Ray Bentzen	Bud Campbell
Elizabeth Carlson	Ed Cattrell	H. E. Cattrell
Mr & Mrs T.C. Colket	Albert Dumont	Suzanne Dumont
Byron Elmgren	Bill Emery	Roger K. Edstrom
Mrs. Roger Edstrom	Henrietta Exon	Hila Gilbert
Don Grey	Zane Hilman	Elaine Hilman
Deyo Hasbrouck	Herman Kusel	Mrs. H. Kusel
Mary Kusel	Dr. Richard MacLean	Mrs. D.P.B. Marshall
Charles McIntosh	David McIntosh	Jon Masters
Mrs. G. L. Nantkes	Robert L. Nantkes	Harold Newton
Lenus A. Nielsen	Dr. Wm. F. Schunk	Dave Scrutchfield
David Sowada	Robert Sowada, Jr	Mrs. Alice Stolcis
Ronald Stolcis	Glenn Sweem	Glenn Sweem, Jr.
Bill Vehnekamp	Clifton Woods	Mrs. Clifton Woods
Louis E. Allen, Jr.	Mrs. Louis Allen	James Goodwin
Mrs. James Goodwin	Dr. C. D. Dawson	John Lowe
Mrs. John Lowe	Mrs. Frank Eads	

Casper:

Wally Alford	Jim Bain	Geo. L. Biggs
Mrs. Geo. L. Biggs	James D. Barnhart	Leo Behmer
Mrs. Leo Behmer	Robert W. Brown	Creighton Burk
Thad Custis	Pat Culver	Mrs. Pat Culver
Ray C. Conkling	Bob Carpenter	Mrs. Bob Carpenter
Jack M. DeLong	Robert David	Gordon Dolton
Richard Eklund	Martha Foster	Jean Goedicke
F. E. Goedicke	Mrs. Sidna Gunn	Harold E. Hodges
Mrs. Jerald Henthorn	Mrs. Raymond Hahn	Dr. H. L. Harvey
Freida Hudson	Mrs. Harold Jassman	Mrs. Grace Kukura
Mary Nichols	Paul Netterstrom	Mrs. Paul Netterstrom
Grover Phelan	Mrs. Grover Phelan	Cleo Potmesil
Quinsen Pfaff	Art G. Randall	Bayard D. Rea
Wendell R. Smith	Harold D. Shippen	Mrs. Harold Shippen
Albert Singleton	John Strecker	Ruth Strecker
Ross A. Swaigert	Joseph Snowden	Bruce Ward
J. C. Warkley	Edness Wilkins	Mrs. Frances Smith
David S. Baskett	Anne Selden	John Thompson
Barbara Brooks	Mrs. Lucy Rognstad	Mrs. A. C. Keyes
Mrs. Otis L. Walker	Mr. Lorin W. Grace	Orvel Scully
Mrs. Orvel Scully	Mrs. Kathleen Weiser	Mrs. Ruby Lee

Buffalo:

Mrs. Thelma Condit	Anita Deininger	Bob Frison
Mrs. Bob Frison	Vivienne Hesse	Albert Kester
Mrs. Albert Kester	William Sand	Mrs. William Sand
Kay E. Sullivan	Mrs. Kay Sullivan	

Wyoming other than above:

Mrs. Irene Custis, Big Horn
Fred Hilman, Big Horn
Hans Kleiber, Dayton
Alger LaToush, Dayton
W. C. Lawrence, Moran
Charles Nelson, Jackson
Margaret Powers, Big Horn
Louis C. Steege, Cheyenne
Mrs. Wailes Wolfe, Wolf
Myra Waltman, Thermopolis
Stanley Zumbrunnen, Lander
George E. Goble, Lingle
Bill Ratliff, Laramie
Don Eckerson, Big Horn
Mrs. Fred Hilman, Big Horn
Mrs. Hans Kleiber, Dayton
Louis LaToush, Dayton
Dr. Wm. T. Mulloy, Laramie
Otto Nelson, Jackson
James Russell, Thermopolis
Clara White, Big Horn
Mrs. Helen Worden, Clearmont
Mrs. Pauline Yost, Tensleep
Mrs. Stanley Zumbrunnen, Lander
Buss Shulz, Kaycee
Eugene Galloway, Laramie
Dr. George Agogino, Laramie

Montana:

Stuart Connor, Billings
Joe Medicine Crow, Lodge Grass
Billings Archaeological Society
Mrs. Ralph Wallace, Billings
Garry Blackburn, Billings
Stanley Houck, Billings
R. D. McCurdy, Broadus
Dr. Dee Taylor, Missoula
Historical Society of Mont., Helena
Harold N. Hagen, Billings
Ken Feyhl, Billings
Alberta Francis, Billings

Miscellaneous areas:

H. N. McConnell, Boulder, Colo.
Richard Forbis, Calgary, Alberta
Wm. Buckles, Vermillion, So. Dak.
Carl Humphrey, Mullen, Neb
Thomas Kehoe, Regina, Sask