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## RECENT DEVELOPMENTS IN NAVAJO PROJECT SALVAGE ARCHÆOLOGY

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INVESTIGATIONS IN THE RESERVOIR of the Navajo Project of northwestern New Mexico were continued through the summer of 1958 under the cooperative agreement between the National Park Service, Region Three, and the School of American Research, a research affiliate of the Museum of New Mexico. Surveys and excavations during the previous summers, 1956 and 1957, demonstrated that a large number of aboriginal remains will be destroyed by construction activities, and that these remains offer many problems concerning which very little is known (Dittert 1958: 61, 71-72). Although the major aim of the 1958 season was the completion of salvage archæology in the section to be affected by rising waters from the cofferdam, the excavations were conducted in relation to questions which arose from the previous season.

Fieldwork for 1958 began in the first week of June and lasted for three months. A camp was established near the confluence of the Pine (Los Pinos) and San Juan Rivers, from which it was possible to reach the entire section where work was required. Minor surveys during the summer yielded nineteen sites, and excavations or tests were conducted at eleven sites. In addition, over 200 petroglyphs and pictographs were recorded at three stations besides those at sites, alluviation and botanical studies were started, and representative series of mammals, herpevoirs, and fish were collected. Members of the crew for various periods included Mr. Jim Hester and Mr. Frank W. Eddy, University of Arizona; Mr. W. D. Gerritsen and Mr. Arthur Harris, University of New Mexico; Mr. Jack Hester, Anthony, Kansas; Mr. Thomas M. Schmidt and Mr. Meredith M. Brown, Groton School; Mrs. Adrienne Hester, Tucson, Arizona; and the author. Mr. C. W. Ferguson from the University of Arizona was kind enough to visit the project and collect sagebrush specimens.

### EXCAVATIONS

*Site 104.* The earliest manifestation at which excavations have been made is Site 104. This is a lithic complex site located in a windgap between the Gobernador and San Juan Rivers near the confluence of those rivers. Artifacts and hearths rest on a fossil sand dune deposited as a pocket in an argillaceous alluvium and, subsequently, exposed by wind action. Exposure of this deposit may have been made during the Altithermal period, with the occupation of that surface occurring during the ensuing wetter period. After the initial occupation, a fine, grayish windblown sand was deposited on top of

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occupation of this group appears to have been more in the form of continual movements rather than permanent settlement. Many Navajos were already living far to the south and west before the upper San Juan drainage had been abandoned. At the time of the first homesteading in 1870, there were no Navajos here. Trade between the homesteaders and the Jicarilla Apaches was extensive in the early part of the period, especially for pottery which the Apaches brought in from the upper Rio Grande valley. Trade with the Utes was accomplished only when the people made trips into Colorado.

#### PRELIMINARY SURVEY OF THE VERTEBRATES OF THE NAVAJO DAM AREA\*

A preliminary survey of the vertebrates of the Navajo Dam area was made during the latter half of August, 1958. Efforts were concentrated on collecting mammals from a limited area near the confluence of the San Juan and Los Pinos Rivers, although other vertebrates were collected or noted as opportunity presented.

The survey was undertaken for the School of American Research and was designed primarily to give information on the kinds of vertebrates in the area and their ecology. A knowledge of such will allow a basis for recognition and interpretation of any differences between present conditions and those of the past, as revealed by remains from archæological sites. The importance of this to the archæologist should require no comment.

Although conducted primarily as an aid to such interpretation, the work had biological value, also. We now have definite records of occurrence in the area for many vertebrates and have some idea of their ecology. Furthermore, comparison with archæological remains should not only give much information on the environments of early cultures, but also provide a chronological record of variations in distribution of vertebrates and of physical variation within any one species.

Indicative of the small amount of collecting previously done was the capture of two Canyon Mice (*Peromyscus crinitus*). This provides the second station in New Mexico from which this mouse has been recorded. Another item of interest concerns the Colorado Chipmunk (*Eutamias quadrivittatus*). Specimens from the area were examined by Eugene Fleharty, who at present is working on members of this group. Although more material is needed, he has found evidence suggesting that these chipmunks differ somewhat from others of the same species.

During the survey, over 120 specimens were collected and preserved, and sight records, together with reports from people in the region, were noted. From these sources, twenty-five species of mammals (one bat, seven carnivores, sixteen rodents, and one artiodactyl), two species of amphibians, seven species of reptiles, and thirteen species of birds are known from the area.

We now have a rough idea of the situation in a small part of the area with which the Navajo Project is concerned. If the study can be continued over the entire area and in more detail, we may expect to learn much of value

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about the present ecology and to provide a strong base for the study of the past ecology.

GROWTH RINGS IN BIG SAGEBRUSH AS A POSSIBLE AID IN DATING  
ARCHÆOLOGICAL SITES\*

In coöperation with the Navajo Dam salvage archæology program, a collection of stem sections of big sagebrush, *Artemisia tridentata*, was made in that district during August, 1958, for growth ring analysis. Previously, big sagebrush has been shown to reach an age of over 200 years and to produce annual growth layers, the widths of which vary in response to changes in winter rain-fall<sup>1</sup>.

Stem sections of thirty-four plants, representing the range of growth types in the area, were collected and examined. Plants near the stream bottom and on moister sites are up to 12 feet in height, and fast-growing. In contrast, those on the benches and mesa tops are low and slow-growing. Some specimens reach an age of over 100 years on the more protected middle and upper benches. The central portion of older plants typically is eroded and lost, thus making it difficult to collect long ring series. Both types produce growth rings which occasionally contain an extra growth layer (false ring). These can be readily defined, and rather than complicating the identification of the growth layers as to the year in which each was formed, they add to the character of the ring and should facilitate the dating of shorter archæological ring series than otherwise would be datable.

Increment borings were taken from twelve piñon pine, *Pinus edulis*, and two one-seed juniper, *Juniperus monosperma*, to provide a local tree-ring chronology. Four of the piñon had pith dates in the mid-1600's. The slower growing

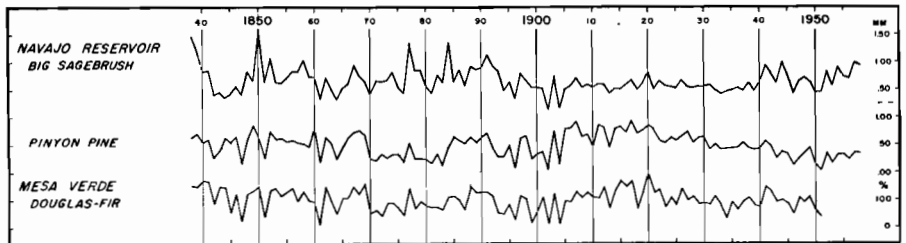


Fig. 5. Annual growth as indicated by ring widths of one specimen of big sagebrush, four of piñon pine, and seven of Douglas fir.

piñon had pith dates in the mid-1600's. The slower growing piñon is characterized by many missing rings, and the juniper by both missing rings and false rings; both are datable.

The diagram of measured ring sequences given herewith (Fig. 5) illustrates the close correlation between (1) a single plant of big sagebrush the inner

\* This section by C. W. Ferguson, Research Associate, Dept. of Watershed Management (in coöperation with the Laboratory of Tree-Ring Research), Univ. of Arizona.

<sup>1</sup> Ferguson, C. W., "Annual Rings in Big Sagebrush, *Artemisia tridentata*," (abstract), *Bulletin of the Ecological Society of America*, Vol. 38, No. 3, p. 72, 1957.