U.S. Department of the Interior
U.S. Geological Survey

A Computer-Assisted Annotated Bibliography and Preliminary Survey of Nevada Paleobotany

by

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Open-File Report 94-441A (Paper Copy)
Open-File Report 94-441B (Macintosh® Version)
Open-File Report 94-441C (Microsoft DOS® Version)

1994

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INTRODUCTION

Fossils are a significant part of Nevada's natural resources. This bibliography presents literature related to the paleobotanical part of that fossil resource. It is intended to be a ready source of basic information for planning groups of the Nevada Bureau of Land Management, Nevada Bureau of Mines and Geology, Nevada Department of Transportation, Nevada Parks and Recreation, the Nevada State Museum, and geologists, paleontologists and all others interested in the study, management and conservation of this part of Nevada's natural heritage. Also, with the increasing interest in surveying our biological diversity, we consider it important that the fossil record be included in such a survey and we hope the present bibliography will help serve as a fundamental reference for this project (see for example, Hickman, C. S. 1993. Biological diversity: Elements of a paleontological agenda. Palaios, 8(4):309-310).

The Bibliography is developed on a commercial bibliographic program registered under the trade-name **Pro-Cite®** This program is produced by Personal Bibliographic Software, Inc., P.O. Box 4250, Ann Arbor, Michigan 48106. The program is available in either the Macintosh® or Microsoft DOS® environment. These programs are required to operate either **OF 94-441B** or **OF 94-441C,** respectively. The bibliographic data base for either system is available on 3.5 or 5 inch floppy discs.

The first section of this report is an Annotated Bibliography and Preliminary Survey of Nevada paleobotany arranged alphabetically by author and/or by the locality common name. We have used the prefix "ZZ" to denote entries for locality names; both published and unpublished localities are included in the "ZZ" section of the bibliography. All published locality entries are cross-referenced to the primary citations in which they are discussed. The Bibliography/Survey section is followed by a series of appendices arranged by topic headings: Appendix A is cross-referenced by an alphabetical listing of topographic quadrangles, Appendix B is cross-referenced by county, Appendix C by geologic unit, Appendix D by age, and Appendix E by subject. The numbered items in each

appendix correspond to the equivalent numbered reference(s) in the main body of the Bibliography.

EXPLANATION OF THE PRINTED CITATION

In the format developed for this bibliography each reference can contain up to seventeen fields of information. The printed form of any citation will appear somewhat different depending on the number of fields used in the citation. An explanation of the printed format is illustrated in the following example. In this example all seventeen fields are used.

1-Record number in bibliography, used to cross-reference
2-Author(s)
3-Date of publication
4-Title of publication

124. Axelrod, D.I. 1962a. A Pliocene *Sequoiadendron* forest from western Nevada. University of California Publications in Geological Sciences, 39(3):195-268.

5-Publisher
6-Volume
7-Number
8-Page(s)

*←Everything below the asterisk is annotation

9-Locality (if given)
10-USGS 7.5' topographic quadrangle

Locality UCMP P3526, Chalk Hills quadrangle, Storey County

11-County

Longitude 119/30/00, Latitude 39/22/30

12-Longitude-Latitude at bottom right-hand (SE) corner of quadrangle

13-Formation
14-Age (data in parens. = associated radioisotopic dates/mammals)

Coal Valley Formation, middle Miocene (12.5 Ma)

15-Reference to geologic map(s) if available

For geology see: Thompson, G.A. 1956. Geology of the Virginia City quadrangle, Nevada. U.S. Geological Survey Bulletin, 1042-C:45-77.

Bonham, H.F., Jr. and Bell, J.W. 1993. Geologic map, Steamboat quadrangle. Nevada Bureau of Mines and Geology Map 4Fg.

Leaf impressions, diatoms.

16-Type/s of plants and preservation present

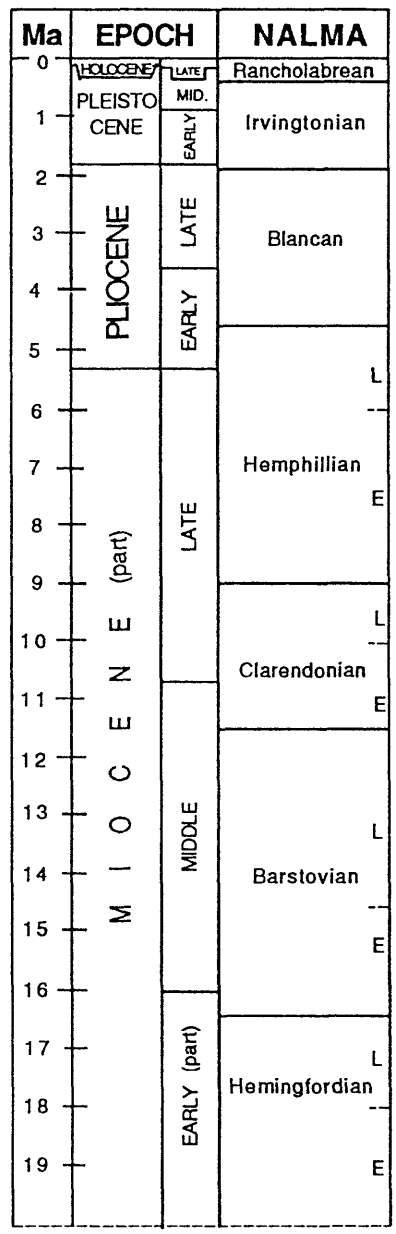
17-Major additional references/notes directly related to this citation

See also Axelrod, 1986b; Krebs and others, 1987.

NOTE: An airfall ash in continuous section just above the flora is dated ca. 12.5 Ma for H.F. Bonham, Jr. (*fide* D.I. Axelrod, oral comm. 1986).

NOTE: Setting the Miocene-Pliocene boundary at ca. 5.1 Ma requires this locality be reassigned to the Miocene.

Many of the later Cenozoic plant localities from Nevada are associated with vertebrate fossils or volcanic rocks that are dated radiometrically. When known, this information is recorded in parentheses in the AGE category (field 14). The Ma, for example, in 14.5 Ma, means "mega-annum", or 14.5 million years ago. Terms such as Barstovian, Clarendonian, etc. designate age assignments based on the stage of evolution of fossil mammals, and these terms are commonly referred to as North American Land Mammal Ages (NALMA). The approximate equivalency of these Mammal Ages to the more commonly used standard epochal terms is illustrated in the following chart, modified from Woodburne, M.O. (ed.), 1987, *Cenozoic Mammals of North America. Geochronology and Biostratigraphy*. University of California Press, Berkeley, Los Angeles and London, 336 pages.



CONTENT OF THE BIBLIOGRAPHY

Although this bibliography should be considered preliminary, we have attempted to be as comprehensive as possible in our coverage of fossil plants from the Paleozoic through the terminal Pleistocene. We were surprised at the end result of our efforts, but we do not claim to have included every reference that exists for the time span covered. If we have unknowingly excluded references, we apologize for the oversight. We would appreciate being notified of any corrections, additions, or other modifications. We have not attempted to include complete coverage of the voluminous archaeological literature, but have included some frequently cited references and also others that came to our attention during the preparation of the bibliography. We have also included some citations to localities on the border areas of adjoining states because of their proximity and/or relevance to study or interpretation of Nevada fossils. Some references have been included because they are of general or technical interest to studies of paleobotany in Nevada.

Whenever possible, references were physically checked by one of the authors. In some cases this proved difficult (especially for theses and dissertations), and we have relied upon pre-existing computer data bases or upon oral confirmations from our friends and associates. Pagination is not provided for any cited theses, dissertations or open-file reports. Every effort has been made to ensure the accuracy of the citations presented herein. This was especially important for the older citations containing the earliest references to fossil plants in Nevada. For some of these, a long history of inaccurate or incomplete citations is here corrected. To avoid any ambiguity in citations, these early references include exact titles *as they were printed on the title pages* of the publication in which they originally appeared (reprints and offprints of articles were occasionally found to differ in some aspects from the original). Points of clarification or supplementary comments pertaining to the citation may appear as a note following the annotation.

In some cases, limitations of the Pro-Cite program have forced minor modifications in formatting of certain references. In one instance (record 233 by COHMAP members) the author field cannot be searched in its entirety if all author names are included. In this single instance the entire author list is provided as a note at the end of the reference. When only a single name or initial of the senior author (and one or more co-authors) was published, program limitations necessitated the multiple use of "and" between authors (see for example record 212 by Byrne and others).

Where references for geology are indicated (under "for geology see"), full citations are provided for works not cited as primary references in the bibliography itself. Citations which are included in the bibliography are indicated only by author name(s) and date of publication.

Where readily available, locality numbers are provided in some citations. We have not made an exhaustive effort to determine locality numbers for all paleobotanical localities, but all those housed in the University of California Museum of Paleontology include the UCMP number.

For journals with long publication histories, we have cited the titles as they appeared on the title page at the time of publication, and not necessarily as they appear today. For example, consider the history of what today is known as *The Geological Society of America Bulletin*. The first issue in this series was published in 1890 as *Bulletin of the Geological Society of America*, a title that continued in use until December, 1960 [Volume 71(12 part 2)]. In January of 1961 [Volume 72(1)] the title was changed to *The Geological Society of America Bulletin*, which remained intact through May of 1964 [Volume 75(5)]. In the following issue, the cover of the journal changed to read *Geological Society of America Bulletin*, while the title page retained *The Geological Society of America Bulletin*; a situation that continued through Volume 76(7), July, 1965. In August, 1965 [Volume 76(8)] the title page was changed to match the cover and both read *Geological Society of America Bulletin*. In January, 1990 [Volume 102(1)] the title page was changed again to read *The Geological Society of America Bulletin*, which is still in use as of this writing.

Potassium-Argon dates presented in the literature prior to 1979 have in some places been recalculated according to the new decay constants provided by G.B. Dalrymple (1979. Critical tables for conversion of K-Ar ages from old to new constants. Geology, 7(11):558-560).

We follow U.S. Geological Survey policy in that the divisions of the Periods of the Paleozoic and Mesozoic are capitalized, those for the Tertiary and Quaternary are not (e.g., Late Jurassic, late Eocene). We also follow U.S. Geological Survey policy for the use of "(?)". The age middle(?) Miocene means that the flora or stratigraphic unit is definately of Miocene age and is probably middle Miocene. The age middle Miocene(?) means that the Miocene age is in question, but if the flora or stratigraphic unit is Miocene, it is middle Miocene.

ACKNOWLEDGMENTS

A number of people contributed comments, suggestions, corrections and additional references to this bibliography. We attempt to express our sincere thanks to all these people for their help, but, if we failed to include someone in our acknowledgments, please recognize it as an unintentional oversight. Our appreciation for their generous assistance is extended to Harold F. Bonham, Jr., J. Platt Bradbury, Margaret C. Brown, Debbie Bunn, Roger A. Byrne, Victor B. Call, Beverly K. Carter, D. Charles Dailey, James R. Firby, Larry J. Garside, Jennifer A. Hogler, Jennifer L. Fitzgerald, Nancy L. Gooch, Patricia A. Hicks, Richard P. Hilton, William N. Krebs, David A. Lawler, Prill E. Mecham, Norman W. Melvin, Scot A. Mensing, Dorothy R. Nylen, Virginia M. Page, Michael G. Robinson, Karen I. Rynberg, Donald E. Savage, Eric Seiple, W. Geoff Spaulding, John H. Stewart, Geraldine E. Swartz, David H. Thomas, Thomas (Hal) Turner, Vicki Van Why, Hazel D. Wald, Elisabeth A. Wheeler and Jack A. Wolfe. We also express a very special thanks to the staffs of the Mines Library on the University of Nevada Campus at Reno, and the Anthropology, Bancroft, Biosciences, Earth Sciences, Forestry and Main libraries on the University of California Berkeley Campus. Special appreciation is extended to Janet L. McVickar and Edward (Ned) S. Slagle who continually supported this bibliography with references, suggestions and ongoing encouragement. We especially thank Daniel I. Axelrod whose years of personal field experience in Nevada has been an invaluable source of information. This is contribution number 1626 of the University of California Museum of Paleontology.

ACRONYMS USED

A few acronyms are used, mainly in the LOCALITY field; these are:

NAUQSP = Northern Arizona University Quaternary Studies Program
SBCM = San Bernardino County Museum
SBCMA = San Bernardino County Museum Association
UCMP = University of California, Berkeley Museum of Paleontology
USNM = United States National Museum

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101. **Albers, J. P. and Stewart, J.H.** 1972. Geology and mineral deposits of Esmeralda County, Nevada. Nevada Bureau of Mines and Geology Bulletin,78:1-80.
*

Locality USNM 1133, Miller Mountain quadrangle, Esmeralda County.
Longitude 118/07/30, Latitude 38 /00/00.
Unnamed unit, Miocene(?).
For geology see: Stewart, J.H. 1981. Geologic map of the Basalt quadrangle, Mineral County, Nevada. U.S. Geological Survey Open-File Report OF 81-369.
Diatoms.
NOTE: See p. 62 for list of 3 diatom species;
See also Bradbury and Krebs, 1994 *in press*; VanLandingham, 1990, Table 2.

102. **Ambro, R. D.** 1967. Dietary-technological-ecological aspects of Lovelock Cave coprolites. Reports of the University of California Archaeological Survey,70:37-48.
*

Locality?, Lovelock Caves quadrangle, Churchill County.
Longitude 118/30/60, Latitude 39 /52/30.
Cave deposits (Lovelock Cave), Quaternary.
For geology see: Morrison, R.B. 1961. Lake Lahontan stratigraphy and history in the Carson Desert (Fallon) area, Nevada. *In*, Short Papers in the Geologic and Hydrologic Sciences, Articles 293-435. Geological Survey Research 1961. U.S. Geological Survey Professional Paper 424-D:111-114;
Morrison, 1964.
See also Cowan, 1967; Heizer, 1967; Heizer and Napton, 1970; Loud and Harrington, 1929; Napton, 1969, 1970; Napton and Heizer, 1970; Napton and Kelso, 1969.

103. **Anonymous.** 1952. Some Nevada localities. The Mineralogist,20(10):368-369.
*

Wood.
NOTE: Mentions permineralized wood from three localities: south of Coaldale (see also Boak, 1934), in Fish Lake Valley (see also Mitchell, 1981b; Page, 1964; Segerblom, 1966; Strong, 1978) and east of Goldfield near Wilsons Camp (see also Walker, 1936).

104. **Antevs, Ernst.** 1952. Cenozoic climates of the Great Basin. Geologische Rundschau,40(1):94-108.

105. **Arnold, J. R. and Libby, W.F.** 1951. Radiocarbon dates. Science,113(2927):111-120.
*
Quaternary.
NOTE: See pp. 116-117 for early radiocarbon dates from Gypsum Cave, Leonard Rock Shelter, and Lovelock Cave.

106. **Aschmann, H. H.** 1958. Great Basin climates in relation to human occupance. Reports of the University of California Archaeological Survey,42:23-40.
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Quaternary.

107. **Axelrod, D. I.** 1938. The stratigraphic significance of a southern element in later Tertiary floras of western America. Journal of the Washington Academy of Sciences,28(7):313-322.

108. **Axelrod, D. I.** 1939. Late Tertiary vegetation and climate of the Great Basin and border areas. Bulletin of the Geological Society of America,50(12 part 2):1945-1946.
*
Abstract.

109. **Axelrod, D. I.** 1940a. The Pliocene Esmeralda flora of west-central Nevada. Journal of the Washington Academy of Sciences,30(4):163-174.
*
1) Locality? - type locality of Esmeralda paleoflora, Rhyolite Ridge NE quadrangle, Esmeralda County.
Longitude 117/45/00, Latitude 37/52/30.
2) Locality UCMP P3924 - type locality of *Juniperus nevadensis* Axelrod, Coaldale quadrangle, Esmeralda County.
Longitude 117/52/30, Latitude 38/00/00.
Esmeralda Formation, late Miocene.
For geology see: Robinson, P.T., Stewart, J.H., Moiola, R.J. and Albers, J.P. 1976. Geologic map of the Rhyolite Ridge quadrangle, Esmeralda County, Nevada. U.S. Geological Survey Geologic Quadrangle Map, GQ-1325.
Stewart, 1989.
Impressions.
See also Evernden and James, 1964;
1) The type locality of the Esmeralda flora, Localities 89 and 92 of Turner (in Knowlton, 1900), has not been relocated. It is probably in section 28, T2N, R37E according to Turner's directions. An unsuccesful attempt was made by D.I. Axelrod and H.E.S. in 1987 to relocate the locality.
2) P3924, type locality for *Juniperus nevadensis* Axelrod 1956 (this species was first introduced by Axelrod in 1940, but was not completely described until 1956) just south of Coaldale.

NOTE: Setting the Miocene-Pliocene boundary at ca. 5.1 Ma requires these localities now be reassigned to the Miocene.

110. **Axelrod, D. I.** 1940b. Late Tertiary floras of the Great Basin and border areas. Bulletin of the Torrey Botanical Club,67(6):477-487.

111. **Axelrod, D. I.** 1941. Succession of late Tertiary vegetation in west-central Nevada. American Journal of Botany,28(10 Supplement):7.
*
Abstract.

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Abstract.

113. **Axelrod, D. I.** 1948. Climate and evolution in western North America during middle Pliocene time. Evolution,2(2):127-144.

114. **Axelrod, D. I.** 1949a. Discussion of sedimentary facies in geologic history. *In*, C.R. Longwell (chairman), Sedimentary Facies in Geologic History. Geological Society of America Memoir,39:155-164.

115. **Axelrod, D. I.** 1949b. Eocene and Oligocene formations in the western Great Basin. Bulletin of the Geological Society of America,60(12 part 2):1935-1936.
*
Abstract.

116. **Axelrod, D. I.** 1950. Evolution of desert vegetation in western North America. Carnegie Institution of Washington Publication,590(6):215-306.

117. **Axelrod, D. I.** 1955. Altitude of the Sierra Nevada and western Nevada during Mio-Pliocene time. Bulletin of the Geological Society of America,66(12 part 2):1527.
*
Miocene.
Abstract.

118. **Axelrod, D. I.** 1956. Mio-Pliocene floras from west-central Nevada. University of California Publications in Geological Sciences,33:1-322.
*
1) Locality UCMP P3915 (Horsethief Canyon), P3916 (Aldrich Station), Ninemile Ranch quadrangle, Mineral County.
Longitude 118/52/30, Latitude 38/22/30.
Aldrich Station Formation, middle Miocene.
2) Locality UCMP P4314 (Chloropagus), Desert Peak quadrangle, Churchill County.
Longitude 118/52/30, Latitude 39/45/00.

Chloropagus Formation, middle Miocene.
3) Locality UCMP 252 (Fallon), Sheckler Reservoir quadrangle, Churchill County.
Longitude 118/52/30, Latitude 39/22/30.
Desert Peak Formation, middle Miocene.
4) Locality UCMP P5101 (Middlegate), Eastgate quadrangle, Churchill County.
Longitude 117/52/30, Latitude 39/15/00.
Middlegate Formation, middle Miocene.
For geology see: this publication.
Impressions.
See also Axelrod, 1985; Evernden and James, 1964.

119. **Axelrod, D. I.** 1957a. Paleoclimate as a measure of isostasy. American Journal of Science,255(10):690-696.

120. **Axelrod, D. I.** 1957b. Late Tertiary floras and the Sierra Nevadan uplift. Bulletin of the Geological Society of America,68(1):19-46.

121. **Axelrod, D. I.** 1958a. The Pliocene Verdi flora of western Nevada. University of California Publications in Geological Sciences,34(2):91-160.
*
Locality UCMP 102 and Locality UCMP 2751, Locality USNM?, Verdi quadrangle, Washoe County.
Longitude 119/52/30, Latitude 39 /30/00.
Sandstone of Hunter Creek, late Miocene (5.85 Ma recalculated).
For geology see: Geologic map, present reference (Coal Valley Formation *sensu* Axelrod).
Bell, J.W. and Garside, L.J. 1987. Geologic map, Verdi quadrangle. Nevada Bureau of Mines and Geology, Map No. 4Gg.
Diatoms, impressions.
See also Chaney, 1944; Evernden and James, 1964.
NOTE: Setting the Miocene-Pliocene boundary at ca. 5.1 Ma requires this locality now be reassigned to the Miocene.

122. **Axelrod, D. I.** 1958b. Evolution of the Madro-Tertiary Geoflora. The Botanical Review,24(7):433-509.

123. **Axelrod, D. I.** 1959. Late Cenozoic evolution of the Sierran bigtree forest. Evolution,13(1):9-23.

124. **Axelrod, D. I.** 1962a. A Pliocene *Sequoiadendron* forest from western Nevada. University of California Publications in Geological Sciences,39(3):195-268.
*
Locality UCMP P3526, Chalk Hills quadrangle, Storey County.
Longitude 119/30/00, Latitude 39 /22/30.
Coal Valley Formation (*sensu* Axelrod, 1956), middle Miocene

(12.5 Ma).

For geology see: Bonham, H.F., Jr. and Bell, J.W. 1993. Geologic map, Steamboat quadrangle. Nevada Bureau of Mines and Geology Map, 4Fg;

Thompson, G.A. 1956. Geology of the Virginia City quadrangle, Nevada. U.S. Geological Survey Bulletin, 1042-C:45-77.

Diatoms, impressions.

See also Axelrod, 1986b; Krebs and others, 1987.

NOTE: An airfall ash just above the flora was dated at ca. 12.5 Ma for H.F. Bonham, Jr. (*fide* D.I. Axelrod, oral comm., 1986).

NOTE: Setting the Miocene-Pliocene boundary at ca. 5.1 Ma requires this locality be reassigned to the Miocene.

125. **Axelrod, D. I.** 1962b. Post-Pliocene uplift of the Sierra Nevada, California. The Geological Society of America Bulletin,73(2):183-198.

126. **Axelrod, D. I.** 1964. The Miocene Trapper Creek flora of southern Idaho. University of California Publications in Geological Sciences,51:1-181.

*

NOTE: Discusses Miocene stratigraphy and floras of northeastern Nevada.

127. **Axelrod, D. I.** 1966a. The Eocene Copper Basin flora of northeastern Nevada. University of California Publications in Geological Sciences,59:1-125.

*

Locality UCMP P3918, Jarbidge South quadrangle, Elko County. Longitude 115/22/30, Latitude 41 /45/00.

Dead Horse Tuff, late Eocene (40.93 ± 1.00 Ma or 41.04 ± 1.50 Ma, recalculated).

For geology see: Coats, R.R. 1964. Geology of the Jarbidge quadrangle, Nevada-Idaho. U.S. Geological Survey Bulletin, 1141-M:1-24.

Impressions.

NOTE: On p. 32 Axelrod indicates dates are from an air fall ash 150 feet above flora dated at 39.9 ± 1.0 Ma (biotite) and 40.0 ± 1.5 Ma (sanidine); recalculated to 40.93 ± 1.00 Ma and 41.04 ± 1.50 Ma, respectively.

128. **Axelrod, D. I.** 1966b. Potassium-Argon ages of some western Tertiary floras. American Journal of Science,264(7):497-506.

129. **Axelrod, D. I.** 1966c. A method for determining the altitudes of Tertiary floras. The Palaeobotanist,14(1-3):144-171.

130. **Axelrod, D. I.** 1968a. Tertiary floras and topographic history of the Snake River Basin, Idaho. Geological Society of America Bulletin,79(6):713-734.

131. **Axelrod, D. I.** 1968b. Eocene subalpine conifer forest, Idaho and Nevada. Geological Society of America Special Paper,115:310-311.
*
Abstract.

132. **Axelrod, D. I.** 1969. Paleotemperature analysis of Tertiary floras. Palaeogeography, Palaeoclimatology, Palaeoecology,6(3):163-195.

133. **Axelrod, D. I.** 1976a. History of the coniferous forests, California and Nevada. University of California Publications in Botany,70:1-62.

134. **Axelrod, D. I.** 1976b. Evolution of the Santa Lucia fir (*Abies bracteata*) ecosystem. Annals of the Missouri Botanical Garden,63(1):24-41.
*
1) Locality UCMP 702 (Purple Mountain), Fernley West quadrangle, Storey County.
Longitude 119/15/00, Latitude 39/30/00.
Chloropagus Formation, middle Miocene.
2) Locality UCMP P5101 (Middlegate), Eastgate quadrangle, Churchill County.
Longitude 117/52/30, Latitude 39/15/00.
Middlegate Formation, middle Miocene.
Impressions.
See also Axelrod 1994 *in press*.

135. **Axelrod, D. I.** 1976c. Evolution of desert vegetation in western North America. *In*, C.A. Ross (ed.), Paleobiogeography. Dowden, Hutchinson & Ross, Inc., Stroudsburg, Pennsylvania. Benchmark Papers in Geology,31:160-185.

136. **Axelrod, D. I.** 1977. Outline history of California vegetation. *In*, M.G. Barbour and J. Major (eds.), Terrestrial Vegetation of California. John Wiley Interscience, New York, pp. 139-220.

137. **Axelrod, D. I.** 1979a. Age and origin of Sonoran Desert vegetation. Occasional Papers of the California Academy of Sciences,132:1-74.

138. **Axelrod, D. I.** 1979b. Desert vegetation, its age and origin. *In*, J.R. Goodin and D.K. Northington (eds.), Arid Land Plant Resources. International Arid Lands Conference on Plant Resources, Texas Tech University, Lubbock, Texas, pp. 1-72.
*
NOTE: See discusion pp. 11-14.

139. **Axelrod, D. I.** 1981. Holocene climatic changes in relation to vegetation disjunction and speciation. The American Naturalist,117(6):847-870.
*
Quaternary.

140. **Axelrod, D. I.** 1983a. Biogeography of oaks in the Arcto-Tertiary Province. Annals of the Missouri Botanical Garden,70(4):629-657.
*

NOTE: See discussion pp. 649-653.

141. **Axelrod, D. I.** 1983b. Paleobotanical history of the western deserts. *In*, S.G. Wells and D.R. Haragan (eds.), Origin and evolution of deserts. Symposium of the Committee on Desert and Arid Zones Research of the Southwestern and Rocky Mountain Division of the American Association for the Advancement of Science. University of New Mexico Press, Albuquerque, New Mexico, pp. 113-129.

142. **Axelrod, D. I.** 1985. Miocene floras from the Middlegate Basin, west-central Nevada. University of California Publications in Geological Sciences,129:1-279.
*

Locality UCMP P5101 (Middlegate), UCMP P6507 (Eastgate), Eastgate quadrangle, Churchill County.
Longitude 117/52/30, Latitude 39 /15/00.
Middlegate Formation, middle Miocene.
For geology see: Axelrod, 1956; this publication.
Diatoms, impressions.
NOTE: The age of the floras given as 18.5 Ma (p. 86) appears to be too old on the basis of floristic evidence for this local area of west-central Nevada. Evernden and James (1964, p. 970), originally dated the Middlegate flora at 15.9 Ma (16.3 Ma recalculated), a date more in agreement with floristic evidence.
See also Axelrod, 1956, 1976b; Evernden and James, 1964.

143. **Axelrod, D. I.** 1986a. Analysis of some palaeogeographic and palaeoecologic problems of palaeobotany. The Palaeobotanist,35(1):115-129.
*

NOTE: See discussion pp. 126-128.

144. **Axelrod, D. I.** 1986b. The Sierra Redwood (*Sequoiadendron*) forest: end of a dynasty. Geophytology,16(1):25-36.

145. **Axelrod, D. I.** 1986c. Cenozoic history of some western American pines. Annals of the Missouri Botanical Garden,73(3):565-641.
*

1) p. 609, Locality UCMP 102, Verdi quadrangle, Washoe County (see ZZ Verdi).
2) p. 613, Locality UCMP 5107, PA608), Fernley West quadrangle, Storey County (see ZZ Purple Mountain).
3) p. 624, 629, Locality UCMP PA676, Derby Dam quadrangle, Storey County (see ZZ Celatom quarry).
4) p. 623, Locality UCMP P3916, Ninemile Ranch quadrangle, Mineral County (see ZZ Coal Valley, Aldrich Station).

5) p. 623, Locality UCMP 252, Sheckler Reservoir quadrangle, Churchill County (see ZZ Fallon).

6) p. 627, Locality UCMP PA658, Deep Creek quadrangle, Elko County (see ZZ Bull Run).

146. **Axelrod, D. I.** 1988a. An interpretation of high montane conifers in western Tertiary floras. Paleobiology,14(3):301-306.

147. **Axelrod, D. I.** 1988b. Outline history of California vegetation. *In*, M.G. Barbour and J. Major (eds.), Terrestrial Vegetation of California, New Expanded Edition, California Native Plant Society Special Publication,9:139-220.

148. **Axelrod, D. I.** 1989. Age and origin of chaparral. *In*, S. Keeley (ed.), The California Chaparral; Paridigms Reexamined. Natural History Museum of Los Angeles County Science Series,34:7-19.

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NOTE: See discussion p. 10.

149. **Axelrod, D. I.** 1990. Age and origin of subalpine forest zone. Paleobiology,16(3):360-369.

150. **Axelrod, D. I.** 1991. The early Miocene Buffalo Canyon flora of western Nevada. University of California Publications in Geological Sciences,135:1-76.

*

Locality UCMP 6101 and UCMP PA291, Buffalo Summit quadrangle, Churchill County.
Longitude 117/45/00, Latitude 39 /07/30.
Buffalo Canyon Formation, middle Miocene.
For geology see: this publication.
Diatoms, impressions.
See also Krebs and others, 1987; Seiple, 1988b; Smedman, 1969; Weight, 1952; Willden and Speed, 1974;
NOTE: Flora is listed as ca. 18.0 Ma (p. 29 and p. 69) based on the average of three dates from rocks 80-90 m below the plant-bearing beds. This age appears to be too old based on floristic evidence for this local area of west-central Nevada and the flora is considered by us to be more in the range of 15.5-15.0 Ma.

151. **Axelrod, D. I.** 1992a. The middle Miocene Pyramid flora of western Nevada. University of California Publications in Geological Sciences,137:1-50.

*

Locality UCMP 5202, Tule Peak quadrangle, Washoe County.
Longitude 119/37/30, Latitude 39 /52/30.
Pyramid Formation, middle Miocene (15.6 ± 2.4 Ma recalculated).
For geology see: this publication and McJannet, G.S. 1957. Geology of the Pyramid Lake - Red Rock Canyon area, Washoe

County, Nevada. Unpublished Ph.D. Dissertation. University of California, Los Angeles, California (map used by Axelrod is modified from McJannet).

Diatoms, impressions.

NOTE: Radiometric date given by Evernden and James (1964, p. 969) is from a unit unconformably above the plant-bearing beds. See Bonham (1969, p. 131), where date of 15.2 ± 2.4 Ma is from a basalt unit that directly overlies the plant-bearing beds; recalculated by Axelrod (1992a) to 15.6 Ma.

152. **Axelrod, D. I.** 1992b. Miocene floristic change at 15 Ma, Nevada to Washington, U.S.A. *In*, B.S. Venkatachala, D.L. Dilcher and H.K. Maheshwari (eds.), Essays in Evolutionary Plant Biology. The Palaeobotanist,41:234-239.

153. **Axelrod, D. I.** 1992c. Climatic pulses, a major factor in legume evolution. *In*, P.S. Herendeen and D.L. Dilcher (eds.), Advances in Legume Systematics: Part 4. The Fossil Record. The Royal Botanic Gardens, Kew, pp. 259-279.

154. **Axelrod, D. I.** 1994 *in press*. The Miocene Purple Mountain flora, western Nevada. University of California Publications in Geological Sciences.

*

Locality UCMP PA608, Fernley West quadrangle, Storey County.

Longitude 119/15/00, Latitude 38 /30/00.

Chloropagus Formation, middle Miocene (ranges from 14.8 Ma to 13.5 Ma).

For geology see: Rose, 1969 (see especially pp. 11-12).

Impressions.

See also Axelrod, 1976b, 1986c; Axelrod and Schorn, 1994.

155. **Axelrod, D. I. and Cota, Joseph.** 1993. A further contribution to closed-cone pine (Oocarpae) history. American Journal of Botany,80(7):743-751.

*

1) p. 750, Locality UCMP 102, Verdi quadrangle, Washoe County (See ZZ Verdi).

2) p. 750, Locality UCMP PA676, Derby Dam quadrangle, Storey County (See ZZ Celatom quarry).

3) p. 750, Locality UCMP P3916, Ninemile Ranch quadrangle, Mineral County (See ZZ Coal Valley, Aldrich Station).

4) p. 750, Locality UCMP 252, Sheckler Reservoir quadrangle, Churchill County (See ZZ Fallon).

Ovulate cone impressions.

156. **Axelrod, D. I. and Raven, P.H.** 1985. Origins of the Cordilleran flora. Journal of Biogeography,12(1):21-47.

157. **Axelrod, D. I. and Schorn, H.E.** 1994. The 15 Ma floristic crisis at Gillam Spring, Washoe County, northwestern Nevada.

PaleoBios,16(2):1-10.

*

1) Locality UCMP PA660 (Lower Gillam Spring), Chester Lyons Spring quadrangle, Washoe County.
Longitude 119/30/00, Latitude 41/07/30.
High Rock sequence, middle Miocene (15.4 ± 0.5 Ma).
2) Locality UCMP PA428 (Middle Gillam Spring), Hart Mountain quadrangle, Washoe County.
Longitude 119/30/00, Latitude 41/15/00.
High Rock sequence, middle Miocene (15.4 ± 0.5 Ma).
3) Locality UCMP PA639 (Upper Gillam Spring), Chester Lyons Spring quadrangle, Washoe County.
Longitude 119/30/00, Latitude 41/07/30.
High Rock sequence, middle Miocene (15.4 ± 0.5 Ma).
Diatoms, impressions.

158. **Axelrod, D. I. and Ting, W.S.** 1960. Late Pliocene floras east of the Sierra Nevada. Universtiy of California Publications in Geological Sciences,39(1):1-118.

*

Locality UCMP V3941, Pine Grove Spring quadrangle, Lyon County.
Longitude 119/00/00, Latitude 38 /37/30.
Wichman Formation, late Pliocene (Blancan, ca. 3.0 Ma).
For geology see: Stewart, J.H. and Reynolds, M.W. 1987. Geologic map of the Pine Grove Hills quadrangle, Lyon County, Nevada. U.S. Geological Survey Open-File Report, OF 87-658.
Palynomorphs.
NOTE: Age ca. 3.0 Ma *fide* D.E. Savage (oral comm., June, 1992).
See also Macdonald, J.R. 1956. A Blancan mammalian fauna from Wichman, Nevada. Journal of Paleontology, 30(1):213-216.

159. **Baker, R. G.** 1984. Holocene vegetational history of the western United States. *In*, H.E. Wright, Jr. (ed.), Late-Quaternary environments of the United States. Volume 2, H.E. Wright, Jr. (ed.), The Holocene. Longman Group Limited, Essex, England and University of Minnesota Press, Minneapolis, Minnesota, pp. 109-127.

*

Quaternary.

160. **Ball, S. H.** 1907. A geological reconnaissance in southwestern Nevada and eastern California. U.S. Geological Survey Bulletin,308:1-218.

*

Locality?, Split Mountain quadrangle, Esmeralda County.

Longitude 117/22/30, Latitude 37 /37/30.
Unnamed unit, Neogene.
Wood.
NOTE: Mention of silicified wood four miles west of Montezuma Peak (p. 58).

161. **Banwar, S. C.** 1970. Fossil leaves of *Lyonothamnus*. Madroño,20(7):359-364.
*
Locality UCMP PA203, Stewart Spring quadrangle, Mineral County.
Longitude 38/30/00, Latitude 117 /52/30.
Savage Canyon Formation, middle Miocene.
Impressions.

162. **Barghoorn, E. S.** 1951. Age and environment: a survey of North American Tertiary floras in relation to paleoecology. Journal of Paleontology,25(6):736-744.

163. **Barksdale, J. D.** 1939a. Silicified wood in dolomite. The American Mineralogist,24(3):181.
*
Locality?, Humboldt/Pershing County.
Osobb Formation(?), Late Triassic (Norian).
Abstract. Wood.
Araucarioxylon. See also Johnson, 1977 (p. 20).

164. **Barksdale, J. D.** 1939b. Silicified wood in dolomite. The American Mineralogist,24(11):699-704.
*
Locality?, Humboldt/Pershing County.
Osobb Formation(?), Late Triassic (Norian).
Wood.
Araucarioxylon. See also Johnson, 1977 (p. 20).

165. **Beatley, J. C.** 1975. Climates and vegetation pattern across the Mojave/Great Basin Desert transition of southern Nevada. The American Midland Naturalist,93(1):53-70.
*
Quaternary.

166. **Beck, G. F.** 1944a. Two newly discovered genera among the coniferous woods of the western Tertiary. Northwest Science,18(1):9-10.
*
Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.
NOTE: From the Rainbow Ridge Opal Mine.
See also Beck, 1944b, 1945; Brown, 1942; Crabtree, 1983.

167. **Beck, G. F.** 1944b. Notes on the fossil woods of Nevada. Mineral Notes and News,80:4.
*
Locality?, Virgin Vallay quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.
See also Beck, 1944a, 1945; Brown, 1942; Crabtree, 1983.
NOTE: Lists six genera from the Rainbow Ridge Opal Mine.
NOTE: "Mineral Notes and News" later changed to "Gems and Minerals".

168. **Beck, G. F.** 1945. Tertiary coniferous woods of western North America. Northwest Science,19(4):89-102.
*
Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Fyock, T.L. 1963. The structure and stratigraphy of the Virgin Valley - Thousand Creek area, northwestern Nevada. Unpublished M.S. Thesis. University of Washington, Seattle, Washington.
Wendell, W.G. 1969. The structure and stratigraphy of the Virgin Valley, McGee Mountain area (Cenozoic), Humboldt County, Nevada. Unpublished M.S. Thesis. Oregon State University, Corvallis, Oregon.
Henry, C.D. 1979. Geologic setting of Virgin Valley, Nevada. Bendix GJBX-22(79); available from Bendix Field Eng. Corp., Tech. Libr., Grand Junction, Colorado;
Brophy, J.G. 1980. Geology of the Virgin Valley - Rock Springs Table area, Humboldt County, Nevada. Unpublished M.S. Thesis. Colorado School of Mines, Golden, Colorado.
Wood.
NOTE: From the Rainbow Ridge Opal Mine.
See also Beck, 1944a, 1944b; Brown, 1942; Crabtree, 1983.

169. **Bell, C. J.** 1990. A Rancholabrean mammalian fauna from Cathedral Cave, White Pine County, Nevada. Unpublished M.S. Thesis. Northern Arizona University, Flagstaff, Arizona.
*
Locality NAUQSP 894, UCMP V94001, Little Horse Canyon quadrangle, White Pine County.
Longitude 114/00/00, Latitude 39 /15/00.
Cave deposits (Cathedral Cave), Quaternary.
Thesis.
See also Bryan, 1972; Mead and others, 1982, 1992; Thompson, 1979, 1984b, 1985b; Thompson and Mead, 1982.

170. **Benedict, E. M.** 1982. A paleoecological study of the northern Great Basin or rat amber, tephra, & fossil pollen. The Speleograph,18(4):47-48, 51.
*
Quaternary.
Palynomorphs, woodrat middens.

171. **Benson, Larry.** 1988. Preliminary paleolimnologic data for the Walker Lake subbasin, California and Nevada. U.S. Geological Survey Water-Resources Investigations Report,87-4258:1-50.
*
Quaternary.
Diatoms.
NOTE: See p. 12.

172. **Benson, Larry.** 1993. Factors affecting ^{14}C ages of lacustrine carbonates: timing and duration of the last highstand lake in the Lahontan Basin. Quaternary Research,39(2):163-174.
*
Quaternary.

173. **Benson, L. V.** 1978. Fluctuation in the level of pluvial Lake Lahontan during the last 40,000 years. Quaternary Research,9(3):300-318.
*
Quaternary.
Algae, wood.

174. **Benson, L. V.** 1981. Paleoclimatic significance of lake-level fluctuations in the Lahontan Basin. Quaternary Research,16(3):390-403.
*
Quaternary.
Algae, wood.

175. **Benson, L. V.** 1991. Timing of the last highstand of Lake Lahontan. Journal of Paleolimnology,5(2):115-126.
*
Quaternary.
Algae, wood.

176. **Benson, L. V. and Thompson, R.S.** 1987. Lake-level variation in the Lahontan Basin for the past 50,000 years. Quaternary Research,28(1):69-85.
*
Quaternary.

177. **Benson, L. V., Currey, D.R., Dorn, R.I., Lajoie, K.R., Oviatt, C.G., Robinson, S.W., Smith, G.I. and Stine, S.** 1990. Chronology of expansion and contraction of four Great Basin lake systems during the past 35,000 years. Palaeogeography, Palaeoclimatology, Palaeoecology,78(3 and 4):241-286.

*

Quaternary.

178. **Benson, L. V., Hostetler, S.W. and Giorgi, F.** 1990. Climate induced variation in the hydrologic balances of Lake Lahontan and Lake Bonneville during the past 25,000 years. Geological Society of America Abstracts with Programs,22(7):A253.

*

Quaternary.
Abstract.

179. **Benson, L. V., Meyers, P.A. and Spencer, R.J.** 1991. Change in the size of Walker Lake during the past 5000 years. Palaeogeography, Palaeoclimatology, Palaeoecology,81(3 and 4):189-214.

*

Mineral County. Quaternary.
Algae, diatoms, palynomorphs.

180. **Berger, Rainer and Ting, W.S. and Libby, W.F.** 1966. Coprolites in western caves. Sixth International Conference on Radiocarbon and Tritium Dating, 1965. Proceedings of the U.S. Atomic Energy Commission Report CONF-650652, pp. 731-744.

*

Quaternary.
Palynomorphs.

181. **Berry, E. W.** 1927. The flora of the Esmeralda formation in western Nevada. Proceedings of the U.S. National Museum,72(23):1-15.

*

Locality?, = Locality UCMP P3917, Ninemile Ranch quadrangle, Lyon County.
Longitude 118/52/30, Latitude 38 /22/30.
Coal Valley Formation, late Miocene.
For geology see: Axelrod, 1956;
Gilbert, C.M. and Reynolds, M.W. 1973. Character and chronology of basin development, western margin of the Basin and Range Province. Geological Society of America Bulletin, 84(8):2489-2510.
Diatoms, impressions.
NOTE: This locality is from the Coal Valley Formation, not the Esmeralda Formation (see Axelrod, 1956); see also Herendeen and others, 1990.

182. **Berry, E. W.** 1928. A petrified walnut from the Miocene of Nevada. Journal of the Washington Academy of Sciences,18(6):158-160.

*

Locality?, Churchill County.
Truckee Formation(?), middle Miocene(?).
Permineralized fruit.
NOTE: Stated to come from about 50 miles east of Reno on Old Emigrant Trail. This could well place the locality in the Truckee Formation N-NW of Fallon, possibly in the Mopung Hills (see Taylor, D.W. and Smith, G.R. 1981. Pliocene molluscs and fishes from northeastern California and northwestern Nevada. Contributions from the Museum of Paleontology, The University of Michigan, 25(18):339-413).
See also Manchester, 1987.

183. **Betancourt, J. L.** 1987. Paleoecology of pinyon-juniper woodland: Summary. *In*, R.L. Everett (compiler), Proceedings of the Pinyon-Juniper Conference, Reno, Nevada, January 13-16, 1986. U.S. Department of Agriculture Forest Service, Intermountain Research Station, General Technical Report INT-215, pp. 129-139.
*

Quaternary.

184. **Blair, W. N.** 1978. Gulf of California in Lake Mead area of Arizona and Nevada during late Miocene time. American Association of Petroleum Geologists Bulletin,62(7):1159-1170.
*

Locality?, Clark County.
Muddy Creek Formation, Hualapai Limestone Member, late Miocene (8.44 ± 2.70 Ma).
Diatoms.

185. **Blair, W. N. and Bradbury, J.P.** 1979. Gulf of California in Lake Mead area of Arizona and Nevada during late Miocene time: Reply. American Association of Petroleum Geologists Bulletin,63(7):1140-1142.
*

Locality?, Clark County.
Muddy Creek Formation, Hualapai Limestone Member, late Miocene (8.44 ± 2.70 Ma).
Diatoms.
See also Cornell, 1979.

186. **Blair, W. N. , Bradbury, J.P. and Oscarson, R.L.** 1979. Upper Miocene Hualapai Limestone Member from the Proto-Gulf of California at Lake Mead, Arizona. *In*, G.W. Newman and H.D. Goode (eds.), Basin and Range Symposium and Great Basin Field Conference. Rocky Mountain Association of Geologists, Denver, Colorado, pp. 285-292.
*

Muddy Creek Formation, Hualapai Limestone Member, late Miocene (8.44 ± 2.70 Ma).

Diatoms.
NOTE: Applicable to extensions of the Hualapai Limestone Member of the Muddy Creek Formation into Nevada.

187. **Blair, W. N., McKee, E.H. and Armstrong, A.K.** 1977. Age and environment of deposition; Hualapai Limestone Member of the Muddy Creek Formation. Geological Society of America Abstracts with Programs,9(4):390-391.
*
Locality?, Clark County.
Muddy Creek Formation, Hualapai Limestone Member, late Miocene (8.44 ± 2.70 Ma).
Abstract. Diatoms.

188. **Boak, C. C.** 1934. Largest petrified tree in world found in Nevada by mineral collector. Oregon Mineralogist,2(6):22-23.
*
Locality?, Rhyolite Ridge NE quadrangle, Esmeralda County.
Longitude 117/45/00, Latitude 37 /52/30.
Esmeralda Formation, middle(?) Miocene.
For geology see: Robinson, P.T., Stewart, J.H., Moiola, R.J. and Albers, J.P. 1976. Geologic map of the Rhyolite Ridge quadrangle, Esmeralda County, Nevada. U.S. Geological Survey Geologic Quadrangle Map, GQ-1325;
Stewart, 1989.
Wood.
NOTE: On 23 May, 1993 a number of people from the Nevada State Museum, Nevada BLM and University of California, Berkeley were unsuccessful in an attempt to relocate this log. Until this reference is verified, the location can only be approximated from the directions given by Boak.
See also Anonymous, 1952; Ransom, 1955
NOTE: The name "Oregon Mineralogist" was later shortened to "The Mineralogist".

189. **Bonham, H. F.** 1969. Geology and mineral deposits of Washoe and Storey counties, Nevada (with a section on Industrial rock and mineral deposits by K. G. Parke). Nevada Bureau of Mines and Geology Bulletin,70:1-140.
*
NOTE: See various discussions of plant-bearing units, pp. 28, 29, 30, 36, 38.

190. **Bonham, H. F., Jr., and Garside, L.J.** 1979. Geology of the Tonopah, Lone Mountain, Klondike, and northern Mud Lake quadrangles, Nevada. Nevada Bureau of Mines and Geology Bulletin,92:1-142.
*
1) Locality?, Tonopah quadrangle, Nye County.
Longitude 117/07/30, Latitude 38/00/00.

Siebert Formation, middle Miocene.
Diatoms.
2) Locality?, Mt. Butte quadrangle, Nye County.
Longitude 117/15/00, Latitude 38/00/00.
Siebert Formation, middle Miocene.
Algae.

191. **Bower, C. E.** 1977. Digging for black opals at the Royal Peacock Opal Mines, Virgin Valley, Nevada. Lapidary Journal,31(2):526-533.
*
Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

192. **Bradbury, J. P.** 1984. Fossil *Actiinocyclus* [*sic*] species from freshwater Miocene deposits in China and the United States. *In*, D.G. Mann, (ed.), Proceedings of the Seventh International Diatom Symposium, Philadelphia, August 22-27, 1982. Otto Koeltz Scientific Books, Koenigstein, Germany,7:151-171.
*
Diatoms.
NOTE: Mentions presence of *Actinocyclus* sp. cf. *A. gorbunovii* at Coal Valley, Aldrich Station Formation.

193. **Bradbury, J. P.** 1986. Continental diatom biostratigraphy and paleolimnology: a review and evaluation of research directions and applications. *In*, M. Ricard, (ed.), Proceedings of the Eighth International Diatom Symposium, Paris, August 27-September 1, 1984. Otto Koeltz Scientific Books, Koenigstein, Germany,8:667-686.
*
Diatoms.
NOTE: Data applicable to evaluation of diatom floras in Nevada.

194. **Bradbury, J. P.** 1987. Late Holocene diatom paleolimnology of Walker Lake, Nevada. Archiv für Hydrobiologie, Supplement,79(1):1-27.
*
Mineral County. Quaternary.
Diatoms.
See also Bradbury and others, 1989.

195. **Bradbury, J. P. and Blair, W.N.** 1979. Paleoecology of the upper Miocene Hualapai Limestone Member of the Muddy Creek Formation, northwestern Arizona. *In*, G.W. Newman and H.D. Goode (eds.), Basin and Range Symposium and Great Basin Field Conference. Rocky Mountain Association of

Geologists, Denver, Colorado, pp. 293-303.
*
Muddy Creek Formation, Hualapai Limestone Member, late Miocene (8.44 ± 2.70 Ma).
Diatoms.
NOTE: Applicable to extensions of the Hualapai Limestone Member of the Muddy Creek Formation into Nevada.

196. **Bradbury, J. P. and Krebs, W.N.** 1982. Neogene and Quaternary lacustrine diatoms of the western Snake River Basin Idaho-Oregon, USA. Acta Geologica Academiae Scientiarum Hungaricae,25(1 and 2):97-122.
*
Diatoms.
NOTE: Data applicable to evaluation of diatom floras in Nevada.

197. **Bradbury, J. P. and Krebs, W.N.** 1994 *in press*. *Actinocyclus* species from lacustrine Miocene deposits of the western United States. *In*, J.P. Bradbury and W.N. Krebs (eds.), The diatom genus *Actinocyclus* in the western United States. U.S. Geological Survey Professional Paper,1543.
*
Miocene.
Diatoms.
See also Krebs and Bradbury, 1994 *in press*.

198. **Bradbury, J. P., Forester, R.M. and Thompson, R.S.** 1989. Late Quaternary paleolimnology of Walker Lake, Nevada. Journal of Paleolimnology,1(4):249-267.
*
Mineral County. Quaternary.
Diatoms, palynomorphs.
See also Bradbury, 1987.

199. **Bradley, W. H.** 1963. Unmineralized fossil bacteria. Science,141(3584):919-921.
*
Locality?, Eureka County.
Newark Canyon Formation, Early Cretaceous.
For geology see: Nolan, T.B., Merriam, C.W. and Brew, D.A. 1971. Geologic map of the Eureka quadrangle, Eureka and White Pine counties, Nevada. U.S. Geological Survey Miscellaneous Geologic Investigations Map, I-612.
Originally assigned to bacteria, later referred to spheres of fluorite (see Bradley, 1968).
See also Bradley, 1968.

200. **Bradley, W. H.** 1968. Unmineralized fossil bacteria: a retraction. Science,160(3826):437.
*

Locality?, Eureka County.
Newark Canyon Formation, Early Cretaceous.
For geology see: Nolan, T.B., Merriam, C.W. and Brew, D.A. 1971. Geologic map of the Eureka quadrangle, Eureka and White Pine counties, Nevada. U.S. Geological Survey Miscellaneous Geologic Investigations Map, I-612.
See also Bradley, 1963.

201. **Broecker, W. S. and Kaufman, Aaron.** 1965. Radiocarbon chronology of Lake Lahontan and Lake Bonneville II, Great Basin. The Geological Society of America Bulletin,76(5):537-566.
*
Quaternary.

202. **Broecker, W. S. and Orr, P.C.** 1958. Radiocarbon chronology of Lake Lahontan and Lake Bonneville. Bulletin of the Geological Society of America,69(8):1009-1032.
*
Quaternary.

203. **Broecker, W. S., Ewing, Maurice and Heezen, B.C.** 1960. Evidence for an abrupt change in climate close to 11,000 years ago. American Journal of Science,258(6):429-448.
*
Quaternary.

204. **Brown, A. J.** 1875. Carboniferous coal in Nevada. Transactions of the American Institute of Mining and Metallurgical Engineers,3:31-33.
*
Carboniferous.
Coal.

205. **Brown, J. H.** 1971. Mammals on mountaintops: nonequilibrium insular biogeography. The American Naturalist,105(945):467-478.
*
Quaternary.

206. **Brown, J. H.** 1978. The theory of insular biogeography and the distribution of boreal birds and mammals. *In*, K.T. Harper and J.L. Reveal (Symposium organizers), Intermountain Biogeography: a Symposium. Great Basin Naturalist Memoirs,2:209-227.
*
Quaternary.

207. **Brown, J. H. and Gibson, A.C.** 1983. Biogeography. The C.V. Mosby Company, St. Louis, Missouri.
*
Quaternary.
NOTE: See pages 424-427, 460-464.

208. **Brown, R. W.** 1937. Further additions to some fossil floras of the western United States. Journal of the Washington Academy of Sciences,27(12):506-517.
*
Locality?, Rhyolite Ridge NE quadrangle, Esmeralda County.
Longitude 117/45/00, Latitude 37 /52/30.
Esmeralda Formation, middle Miocene.
For geology see: Robinson, P.T., Stewart, J.H., Moiola, R.J. and Albers, J.P. 1976. Geologic map of the Rhyolite Ridge quadrangle, Esmeralda County, Nevada. U.S. Geological Survey Geological Quadrangle Map, GQ-1325;
Stewart, 1989.
Impressions.
NOTE: Brown reassigns *Spathyema? nevadensis* Knowlton (1900) and an unknown plant of Knowlton (1900) to *Nymphaeites nevadensis* (Knowlton) Brown *comb. nov.*
NOTE: Setting the Miocene-Pliocene boundary at ca. 5.1 Ma requires these localities now be reassigned to the Miocene.

209. **Brown, R. W.** 1942. A Miocene grapevine from the valley of Virgin Creek in northwestern Nevada. Journal of the Washington Academy of Sciences,32(10):287-291.
*
Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Fyock, T.L. 1963. The structure and stratigraphy of the Virgin Valley - Thousand Creek area, northwestern Nevada. Unpublished M.S. Thesis. University of Washington, Seattle, Washington.
Wendell, W.G. 1969. The structure and stratigraphy of the Virgin Valley, McGee Mountain area (Cenozoic), Humboldt County, Nevada. Unpublished M.S. Thesis. Oregon State University, Corvallis, Oregon.
Henry, C.D. 1979. Geologic setting of Virgin Valley, Nevada. Bendix GJBX-22(79); available from Bendix Field Engeering Corporation, Technical Library, Grand Junction, Colorado;
Brophy, J.G. 1980. Geology of the Virgin Valley - Rock Springs Table area, Humboldt County, Nevada. Unpublished M.S. Thesis. Colorado School of Mines, Golden, Colorado.
Wood.
NOTE: From the Rainbow Ridge Opal Mine;
See also Beck, 1944a, 1944b, 1945; Crabtree, 1983.

210. **Bryan, A. L.** 1972. Summary of the archaeology of Smith Creek and Council Hall caves, White Pine County, Nevada, 1971. The Nevada Archeological Survey Reporter,6(1):6-8.
*

Locality?, Little Horse Canyon quadrangle, White Pine County.
Longitude 114/00/00, Latitude 39 /15/00.
Cave deposits (Smith Creek Cave, Council Hall Cave), Quaternary.
See also Bell, 1990; Mead and others, 1982, 1992; Thompson, 1979, 1984b, 1985b; Thompson and Mead, 1982.

211. **Butler, G. A.** 1987. Opal in Virgin Valley. Rock & Gem,17(9):36-38.
*
Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

212. **Byrne, Roger and Busby, C. and Heizer, R.F.** 1979. The altithermal revisted: pollen evidence from the Leonard Rockshelter. Journal of California and Great Basin Anthropology,1(2):280-294.
*
Locality?, Wildhorse Pass quadrangle, Pershing County.
Longitude 118/22/30, Latitude 40 /00/00.
Cave deposits (Leonard Rockshelter), Quaternary.
Palynomorphs.

213. **Call, V. B.** 1988. Silicified wood of *Thuja, Robinia* and *Quercus* from Miocene rocks near Wall Canyon Creek, northwestern Nevada. Unpublished M.S. Thesis. Brigham Young University, Provo, Utah.
*
Locality?, Badger Mtn. SE quadrangle, Washoe County.
Longitude 119/15/00, Latidute 41 /30/00.
High Rock sequence, middle Miocene.
Thesis. Wood.

214. **Call, V. B. and Tidwell, W.D.** 1988. Fossil wood from the Miocene of Wall Canyon Creek, northwestern Nevada. American Journal of Botany,75(6 part 2):104-105.
*
Locality?, Badger Mtn. SE quadrangle, Washoe County.
Longitude 119/15/00, Latidute 41 /30/00.
High Rock sequence, middle Miocene.
Abstract. Wood.

215. **Campbell, E. C.** 1978. Palynology of late Tertiary lignites of the Goose Creek Basin, northern Great Basin. Geological Society of America Abstracts with Programs,10(4):212.
*
Locality?, Elko County.
Idavada Group, middle Miocene.

Abstract. Palynomorphs.
See also Axelrod, 1964; Campbell, 1979;
Hildebrand, R.T. and Newman, K.R. 1985. Miocene sedimentation in the Goose Creek Basin, south-central Idaho, northeastern Nevada, and northwestern Utah. *In*, R.M. Flores and S.S. Kaplan (eds.), Cenozoic paleogeography of the west-central United States: Rocky Mountain Paleogeography Symposium 3. The Rocky Mountain Section, Society of Economic Paleontologists and Mineralogists, Denver, Colorado, pp. 55-70.

216. **Campbell, E. C. A.** 1979. Palynology and paleoecology of the Miocene lignites of the Goose Creek Basin, Idaho, Nevada, and Utah. Unpublished M.A. Thesis. University of Utah, Salt Lake City, Utah.
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Locality?, Elko County.
Idavada Group, middle Miocene.
Thesis. Palynomorphs.
See also Axelrod, 1964; Campbell, 1978;
Hildebrand, R.T. and Newman, K.R. 1985. Miocene sedimentation in the Goose Creek Basin, south-central Idaho, northeastern Nevada, and northwestern Utah. *In*, R.M. Flores and S.S. Kaplan (eds.), Cenozoic paleogeography of the west-central United States: Rocky Mountain Paleogeography Symposium 3. The Rocky Mountain Section, Society of Economic Paleontologists and Mineralogists, Denver, Colorado, pp. 55-70.

217. **Casjens, L. A.** 1974. The prehistoric human ecology of southern Ruby Valley, Nevada. Unpublished Ph.D. Dissertation. Harvard University, Cambridge, Massachusetts.
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Quaternary.
Dissertation.
See also Thompson, 1992.

218. **Chamberlain, A. K.** 1990. *Stigmaria*: indicator for erosional surfaces of low sea level stands in the Mississippian Antler Basin, Utah and Nevada. American Association of Petroleum Geologists Bulletin,74(8):1319.
*
Late Mississippian.
Abstract. Impressions.

219. **Chamberlain, A. K. and Scott, Cheryl.** 1987. Possible relationships between Mississippian Antler Mountain fluvial systems and Tertiary disseminated gold deposits in the eastern Great Basin. *In*, R.S. Kopp and R.E. Cohenour (eds.), Cenozoic Geology of Western Utah: Sites for Precious Metal and

Hydrocarbon Accumulations. Utah Geological Association Publication,16:479-485.
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Palynomorphs.

220. **Chamberlain, A. K. and Waanders, G.L.** 1984. Preliminary study of palynomorphs and other plant fossils from Mississippian clastic sediments, Antler Basin, Nevada and Utah. American Association of Petroleum Geologists Bulletin,68(4):460.
*

Late Mississippian.
Abstract. Impressions, palynomorphs.

221. **Chaney, R. W.** 1924. Preliminary report on a Tertiary flora from northwestern Nevada. Bulletin of the Geological Society of America,35:162-163.
*

Locality UCMP 97, Fortynine Mtn. quadrangle, Washoe County.
Longitude 119/52/30, Latitude 41 /30/00.
High Rock sequence, middle Miocene.
Abstract. Impressions.
See also LaMotte, 1934, 1935a, 1936a.

222. **Chaney, R. W.** 1925. Tertiary forests and climates in the Great Basin and Great Plains. Bulletin of the Geological Society of America,36:218.
*

Abstract. Impressions.

223. **Chaney, R. W.** 1926. Relationships of the marine and the fresh-water Tertiary of western North America, based on recent collections of plant fossils. Bulletin of the Geological Society of America,37:213-214.
*

Abstract. Impressions.

224. **Chaney, R. W.** 1928. Distribution and correlation of Tertic floras of the Great Basin. Pan-American Geologist,49(4):314.
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Abstract. Impressions.

225. **Chaney, R. W.** 1938. Paleoecological interpretations of Cenozoic plants in western North America. The Botanical Review,4(7):371-396.

226. **Chaney, R. W.** 1940. Tertiary forests and continental history. Bulletin of the Geological Society of America,51(3):469-488.

227. **Chaney, R. W.** 1944. The Dalles flora. *In*, R.W. Chaney (ed.), Pliocene Floras of California and Oregon. Carnegie Institution of Washington Publication,553(11):285-321.
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Locality UCMP 102, Verdi quadrangle, Washoe County.

Longitude 119/52/30, Latitude 39 /30/00.
Sandstone of Hunter Creek, late Miocene.
For geology see: Axelrod, 1958a;
Bell, J.W. and Garside, L.J. 1987. Geologic map, Verdi quadrangle. Nevada Bureau of Mines and Geology, Map No. 4Gg.
Impressions.
NOTE: Chaney (p. 316) used Verdi, Nevada material as the type for *Salix truckeana* Chaney sp. nov. See also Axelrod, 1958a.
NOTE: Setting the Miocene-Pliocene boundary at ca. 5.1 Ma requires this locality now be reassigned to the Miocene.

228. **Chaney, R. W.** 1951. A revision of fossil *Sequoia* and *Taxodium* in western North America based on the recent discovery of *Metasequoia*. Transactions of the American Philosophical Society, New Series,40(3):171-263.
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Locality UCMP P3949, Elko West quadrangle, Elko County.
Longitude 115/45/00, Latitude 40 /45/00.
Elko Formation, late Eocene.
For geology see: Solomon, B.J. and Moore, S.W. 1982. Geologic map and oil shale deposits of the Elko West quadrangle, Elko County, Nevada. U.S. Geological Survey Miscellaneous Field Studies Map, MF-1410.
Impressions.
NOTE: See discussion under Lesquereux, 1873.
NOTE: It is interesting to note here for historical purposes that James F. Ashley (1939 term paper for the Department of Paleontology, University of California, Berkeley), using impression material he, B. Wilder and D.I. Axelrod collected from the Elko South locality (UCMP P3949), was the first to recognize a new and distinct form of taxodiaceous plant with opposite, rather than spiral, phylotaxis. In 1941 Shigeru Miki of Japan independently recognized and formally circumscribed *Metasequoia* (the Dawn Redwood) as a new genus in the Taxodiaceae (or Cupressaceae s.l.) See Miki, S. 1941. On the change of flora in eastern Asia since Tertiary Period (I). The clay or lignite beds flora in Japan with special reference to the *Pinus trifolia* beds in central Hondo. Japanese Journal of Botany, 11:237-303.
See also Chaney and Axelrod, 1959; Hedlund, 1965; Lesquereux, 1873;
Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Eocene and Oligocene lacustrine and volcanic rocks near Elko, Nevada. *In*, G.W. Newman and H.D. Goode (eds.), Basin and Range Symposium and Great Basin field conference. Rocky

Mountain Association of Geologists, Denver, Colorado, pp. 325-337. (gives dates on base and top of Unit 5 as 38.9 ± 0.7 - 37.1 ± 1.0 Ma not recalculated);

Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Stratigraphy and depositional environments of Paleogene rocks near Elko, Nevada. *In*, J.M. Armentrout, M.R. Cole and H. TerBest, Jr. (eds.), Cenozoic paleogeography of the western United States. Pacific Coast Paleogeography Symposium 3. The Pacific Section, Society of Economic Paleontologists and Mineralogists, pp. 75-88.

229. **Chaney, R. W. and Axelrod, D.I.** 1959. Miocene floras of the Columbia Plateau. Part II. Systematic considerations. Carnegie Institution of Washington Publication,617:135-237.

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Locality UCMP P3949, Elko West quadrangle, Elko County. Longitude 115/45/00, Latitude 40 /45/00.
Elko Formation, late Eocene.

For geology see: Solomon, B.J. and Moore, S.W. 1982. Geologic map and oil shale deposits of the Elko West quadrangle, Elko County, Nevada. U.S. Geological Survey Miscellaneous Field Studies Map, MF-1410.

Impressions.

NOTE: see discussion under Lesquereux, 1873.

See also Chaney, 1951; Hedlund, 1965;

Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Eocene and Oligocene lacustrine and volcanic rocks near Elko, Nevada. *In*, G.W. Newman and H.D. Goode (eds.), Basin and Range Symposium and Great Basin field conference. Rocky Mountain Association of Geologists, Denver, Colorado, pp. 325-337. (gives dates on base and top of Unit 5 as 38.9 ± 0.7 - 37.1 ± 1.0 Ma not recalculated);

Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Stratigraphy and depositional environments of Paleogene rocks near Elko, Nevada. *In*, J.M. Armentrout, M.R. Cole and H. TerBest, Jr. (eds.), Cenozoic paleogeography of the western United States. Pacific Coast Paleogeography Symposium 3. The Pacific Section, Society of Economic Paleontologists and Mineralogists, pp. 75-88.

230. **Clark, T. M. , Ehman, K.D. and Axelrod, D.I.** 1985. Late Eocene extensional faulting in the northern Basin and Range Province, Elko County, Nevada. Geological Society of America Abstracts with Programs,17(6):348.

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Abstract.

231. **Coats, R. R.** 1986. Invertebrate and paleobotanical fossils collected in Elko County, Nevada. Nevada Bureau of Mines and

Geology Open-File Report,OF 86-1.
*
Impressions, palynomorphs.
NOTE: Register of localities (see pp. A375-A397).

232. **Cockerell, T. D. A.** 1910. The Miocene trees of the Rocky Mountains. The American Naturalist,44(517):31-47.
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late Eocene.
NOTE: Includes plants from the Elko area.

233. **COHMAP Members.** 1988. Climatic changes of the last 18,000 years: observations and model simulations. Science,241(4869):1043-1052.
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Quaternary.
NOTE: Authors are Anderson, P.M., Barnosky, C.W., Bartlein, P.J., Behling, P.J., Brubaker, L., Cushing, E.J., Dodson, J., Dworetsky, B., Guetter, P.J., Harrison, S.P., Huntley, B., Kutzbach, J.E., Markgraf, V., Marvel, R., McGlone, M.S., Mix, A., Moar, N.T., Morley, J., Perrott, R.A., Peterson, G.M., Prell, W.L., Prentice, I.C., Ritchie, J.C., Roberts, N., Ruddiman, W.F., Salinger, M.J., Spaulding, W.G., Street-Perrott, F.A., Thompson, R.S., Wang, P.K., Webb, T., III, Winkler, M.G. and Wright, H.E., Jr.

234. **Cope, E. D.** 1873. On the Tertiary coal and fossils of Osino, Nevada. Proceedings of the American Philosophical Society Held at Philadelphia for Promoting Useful Knowledge,12:478-481.
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Locality? = UCMP PA299 (?; see discussion under Lesquereux, 1873), Coal Mine Basin quadrangle, Elko County.
Longitude 115/37/30, Latitude 41 /07/30.
Elko Formation, late Eocene.
For geology see: Ketner, K.B. 1973. Preliminary geologic map of the Coal Mine Basin quadrangle, Elko County, Nevada. U.S. Geological Survey Miscellaneous Field Studies Map, MF-528.
Impressions.
NOTE: This report was read before the American Philosophical Society on July 19, 1872 (see note under Lesquereux, 1872).
See also Lesquereux, 1872, 1873, 1874, 1878, 1883; Mason, 1927; Wingate, 1983;
Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Eocene and Oligocene lacustrine and volcanic rocks near Elko, Nevada. *In*, G.W. Newman and H.D. Goode (eds.), Basin and Range Symposium and Great Basin field conference. Rocky

Mountain Association of Geologists, Denver, Colorado, pp. 325-337 (gives dates on base and top of Unit 5 as 38.9 ± 0.7 - 37.1 ± 1.0 Ma not recalculated);

Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Stratigraphy and depositional environments of Paleogene rocks near Elko, Nevada. *In*, J.M. Armentrout, M.R. Cole and H. TerBest, Jr. (eds.), Cenozoic paleogeography of the western United States. Pacific Coast Paleogeography Symposium 3. The Pacific Section, Society of Economic Paleontologists and Mineralogists, pp. 75-88.

235. **Coplen, T. B., Winograd, I.J., Landwehr, J.M. and Riggs, A.C.** 1994. 500,000-year stable carbon isotopic record from Devils Hole, Nevada. Science,263(5145):361-365.

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Nye County. Quaternary.

236. **Cornell, W. C.** 1979. Gulf of California in Lake Mead area of Arizona and Nevada during late Miocene time: discussion. American Association of Petroleum Geologists Bulletin,63(7):1139-1140.

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Miocene.

Diatoms.

See also Blair and Bradbury, 1979.

237. **Cottam, W. P., Tucker, J.M. and Drobnick, Rudy.** 1959. Some clues to Great Basin postpluvial climates provided by oak distributions. Ecology,40(3):361-377.

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Quaternary.

238. **Cowan, R. A.** 1967. Lake-margin ecologic exploitation in the Great Basin as demonstrated by an analysis of coprolites from Lovelock Cave, Nevada. Reports of the University of California Archaeological Survey,70:21-36.

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Locality?, Lovelock Caves quadrangle, Churchill County. Longitude 118/30/00, Latitude 39 /52/30.

Cave deposits (Lovelock Cave), Quaternary.

For geology see: Morrison, R.B. 1961. Lake Lahontan stratigraphy and history in the Carson Desert (Fallon) area, Nevada. *In*, Short Papers in the Geologic and Hydrologic Sciences, Articles 293-435. Geological Survey Research 1961. U.S. Geological Survey Professional Paper 424-D:111-114;

Morrison, 1964.

See also Ambro, 1967; Heizer, 1967; Heizer and Napton, 1970; Loud and Harrington, 1929; Napton, 1969, 1970; Napton and Heizer, 1970; Napton and Kelso, 1969.

239. **Crabtree, D. R.** 1983. *Picea wolfei*, a new species of petrified cone from the Miocene of northwestern Nevada. American Journal of Botany,70(9):1356-1364.
*
Locality USNM 9014, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Fyock, T.L. 1963. The structure and stratigraphy of the Virgin Valley - Thousand Creek area, northwestern Nevada. Unpublished M.S. Thesis. University of Washington, Seattle, Washington.
Wendell, W.G. 1969. The structure and stratigraphy of the Virgin Valley, McGee Mountain area (Cenozoic), Humboldt County, Nevada. Unpublished M.S. Thesis. Oregon State University, Corvallis, Oregon.
Henry, C.D. 1979. Geologic setting of Virgin Valley, Nevada. Bendix GJBX-22(79); available from Bendix Field Eng. Corp., Tech. Libr., Grand Junction, Colorado;
Brophy, J.G. 1980. Geology of the Virgin Valley - Rock Springs Table area, Humboldt County, Nevada. Unpublished M.S. Thesis. Colorado School of Mines, Golden, Colorado.
Permineralized cones.
NOTE: From the Rainbow Ridge Opal Mine.
See also Beck, 1944a, 1944b, 1945; Brown, 1942.

240. **Craig, R. G. and Stamm, J.F.** 1990. Changes in the seasonal cycle of temperature and precipitation at 18 ka in a regional statistical model of climate. Geological Society of America Abstracts with Programs,22(7):A210.
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Quaternary.
Abstract.

241. **Crow, C. L. , Bradley, W.G. and Moor, K.S.** 1976. Ecological relationships of desert pack rat nests in Spring Range of southern Nevada. Journal of the Arizona Academy of Science,11(proceedings supplement):166-167.
*
Quaternary.
Abstract. Woodrat middens.

242. **Currey, D. R.** 1965. An ancient bristlecone pine stand in eastern Nevada. Ecology,46(4):564-566.
*
Quaternary.

243. **Currey, D. R. and James, S.R.** 1982. Paleoenvironments of the northeastern Great Basin and northeastern Basin Rim region: A review of geological and biological evidence. *In*, D.B.

Madsen and J.F. O'Connell (eds.), Man and Environment in the Great Basin. Society for American Archaeology Papers,2:27-52.
*
Quaternary.

244. **Dake, H. C.** 1933. Opals in Virgin Valley, Nevada. Rocks and Minerals,8(1):16-18.
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Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

245. **Dake, H. C.** 1941. History of Virgin Valley, Nevada: largest opal field. The Mineralogist,9(1):7-8, 22-24.
*
Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

246. **Dake, H. C.** 1947. Fossil cones found. The Mineralogist,15(5):233.
*
Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Permineralized cones.
NOTE: A brief review of the rarity of fossil cones; mentions the opalized cones from Virgin Valley area; probably Rainbow Ridge Opal Mine.

247. **Dake, H. C.** 1954. Fossil conifer cones. The Mineralogist,22(5):214, 216, 218.
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Permineralized cones.
NOTE: Mentions Virgin Valley area.

248. **Dansie, A. J. , Davis, J.O. and Stafford, T.W., Jr.** 1988. The Wizards Beach recession: Farmdalian (25,500 yr B.P.) vertebrate fossils co-occur with early Holocene artifacts. *In*, J.A. Willig, C.M. Aikens and J.L. Fagan (eds.), Early human occupation in far western North America: the Clovis-Archaic interface. Nevada State Museum Anthropological Papers,21:153-200.
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Quaternary.

249. **Davis, J. O.** 1982. Bits and pieces: the last 35,000 years in the Lahontan area. *In*, D.B. Madsen and J.F. O'Connell (eds.), Man and Environment in the Great Basin. Society for American Archaeology Papers,2:53-75.
*
Quaternary.

250. **Davis, J. O. and Elston, Robert.** 1972. New stratigraphic evidence of late Quaternary climatic change in northwestern Nevada. *In*, D.D. Fowler (ed.), Great Basin cultural ecology: a symposium. Desert Research Institute Publications in the Social Sciences,8:43-55.
*
Quaternary.
Palynomorphs.

251. **Davis, O. K.** 1980. Continuum and typal models for vegetation paleoecology in the northern Great Basin. Bulletin of the Ecological Society of America,61(2):121.
*
Quaternary.
Abstract.

252. **Diveley-White, D. V.** 1990. Mad Chipmunk Cave faunule: A late Pleistocene-late Holocene record for the north-central Great Basin. Journal of Vertebrate Paleontology,10(3 Supplement):20A-21A.
*
Locality?, Elko County.
Cave deposits (Mad Chipmunk Cave), Quaternary.
Abstract. Wood.

253. **Dorn, R. I. , Jull, A.J.T., Donahue, D.J., Linick, T.W. and Toolin, L.J.** 1990. Latest Pleistocene lake shorelines and glacial chronology in the western Basin and Range Province, U.S.A.: insights from AMS radiocarbon dating of rock varnish and paleoclimatic implications. Palaeogeography, Palaeoclimatology, Palaeoecology,78(3 and 4):315-331.
*
Quaternary.

254. **Eckert, A. W.** 1993. Opal-logue. Lapidary Journal,47(3):36-40.
*
Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

255. **Edwards, S. W.** 1983. Cenozoic history of Alaskan and Port Orford *Chamaecyparis* cedars. Unpublished Ph.D. Dissertation. University of California, Berkeley, California.

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Dissertation. Impressions.
See also Axelrod, 1985 (see especially pp. 118-124).

256. **Elston, R. G.** 1986. Prehistory of the western area. *In*, Handbook of North American Indians. Vol, 11: Great Basin (W.L. D'Azevedo, volume editor; W.C. Sturtevant, general editor). Smithsonian Institution, Washington, pp. 135-148.

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Quaternary.

257. **Emry, R. J.** 1990. Mammals of the Bridgerian (middle Eocene) Elderberry Canyon local fauna of eastern Nevada. *In*, T.M. Bown and K.D. Rose, (eds.), Dawn of the age of mammals in the northern part of the Rocky Mountain interior, North America. Geological Society of America Special Paper,243:187-210.

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Locality?, Ely quadrangle, White Pine County.
Longitude 114/52/30, Latitude 39 /07/30.
Sheep Pass Formation(?), middle Eocene (Bridgerian).
For geology see: Brokow, A.L. 1967. Geologic map and sections of the Ely quadrangle, White Pine County, Nevada. U.S. Geological Survey Geologic Quadrangle Map, GQ-697.
NOTE: Mentions plant material (reeds?) associated with mammals.

258. **Evernden, J. F. and James, G.T.** 1964. Potassium-argon dates and the Tertiary floras of North America. American Journal of Science,262(8):945-974.

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NOTE: Nevada sites included are: Pyramid, p. 969; Chloropagus, Esmeralda, Middlegate, Sutro, p. 970; Upper Cedarville, p. 971; and Verdi, p. 972.
NOTE: date for Pyramid is too young (see Axelrod, 1992a; Bonham, 1969), and date for 49-Camp is too old (see Axelrod, 1966b; Bonham, 1969). Dates of 20.1 and 18.1 Ma are more closely associated with the Sutro flora (Bonham, H.F., Jr. and Bell, J.W. 1993. Geologic map, Steamboat quadrangle. Nevada Bureau of Mines and Geology Map, 4Fg).

259. **Ferguson, C. W.** 1968. Bristlecone pine: science and esthetics. Science,159(3817):839-846.

260. **Ferguson, C. W.** 1980. Dendrochronology of bristlecone pine. Bulletin of the Ecological Society of America,61(2):120-121.

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Quaternary.
Abstract. Tree rings.

261. **Foster, Mark.** 1937. Occurrence of fluorescent semi-opal and moss opal in Virgin Valley, Nevada. Rocks and

Minerals,12(7):212-214.
*
Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

262. **Foster, M. M.** 1943. Seeing opal in the process of formation. Rocks and Minerals,18(8):233.
*
Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

263. **Fouch, T. D.** 1977. Sheep Pass (Cretaceous? to Eocene) and associated closed-basin deposits (Eocene to Oligocene?) in east-central Nevada - Implications for petroleum exploration. American Association of Petroleum Geologists Bulletin,61(8):1378.
*
Abstract. Palynomorphs.

264. **Fouch, T. D.** 1979. Character and paleogeographic distribution of Upper Cretaceous(?) and Paleogene nonmarine sedimentary rocks in east-central Nevada. *In*, J.M. Armentrout, M.R. Cole and H. TerBest, Jr. (eds.), Cenozoic paleogeography of the western United States. Pacific Coast Paleogeography Symposium 3. Pacific Section of the Society of Economic Paleontologists and Mineralogists, pp. 97-111.
*
Charophytes, palynomorphs, impressions.
See also Fouch and others, 1979, 1992.

265. **Fouch, T. D. , Hanley, J.H. and Forester, R.M.** 1979. Preliminary correlation of Cretaceous and Paleogene lacustrine and related nonmarine sedimentary and volcanic rocks in parts of the eastern Great Basin of Nevada and Utah. *In*, G.W. Newman and H.D. Goode (eds.), Basin and Range Symposium and Great Basin Field Conference. Rocky Mountain Association of Geologists, Denver, Colorado, pp. 305-312.
*
Palynomorphs.
See also Fouch, 1979; Fouch and others, 1992.

266. **Fouch, T. D. , Potter, C.J. and Dubiel, R.F.** 1992. Evolution of Maastrichtian and Paleogene lake basins and associated terranes, eastern Great Basin, Nevada. Geological Society of America Abstracts with Programs,24(6):12.

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Abstract. Algae, charophytes, palynomorphs.
See also Fouch, 1979; Fouch and others, 1979.

267. **French, Bill.** 1980. Virgin Valley venture. Gems and Minerals,514:17-19.

*

Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

268. **Garside, L. J.** 1973. Radioactive mineral occurrences in Nevada. Nevada Bureau of Mines and Geology Bulletin,70:1-121.

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Wood.
NOTE: Uranium associated with permineralized wood.

269. **Gianella, V. P.** 1942. Gold crystals in silicified wood. The Mineralogist,10(6):176, 191-192.

*

Locality?, Burnt Cabin Summit quadrangle, Churchill County.
Longitude 117/45/00, Latitude 39 /00/00.
Unnamed unit, Neogene.
Wood.
See also Gianella and Wheeler, 1937; Palmer, 1935a, 1935b.

270. **Gianella, V. P.** 1945. Bibliography of geologic literature of Nevada. Geology and Mining Series No. 43. Publication of the Nevada State Bureau of Mines and the Mackay School of Mines. University of Nevada Bulletin,39(6):1-188.

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271. **Gianella, V. P. and Wheeler, H.E.** 1937. Tertiary gold-bearing fossil wood in Nevada. Proceedings of the Geological Society of America for 1936: 301.

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Locality?, Burnt Cabin Summit quadrangle, Churchill County.
Longitude 117/45/00, Latitude 39 /00/00.
Unnamed unit, Neogene.
Abstract. Wood.
See also Gianella, 1942; Palmer, 1935a, 1935b.

272. **Giraud, R. E.** 1986. Stratigraphy of volcanic sediments in the McDermitt Mine, Humboldt County, Nevada. Unpublished M.S. Thesis. University of Idaho, Moscow, Idaho.

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Locality?, Humboldt County.
Unnamed unit, Neogene.
For geology see: Rytuba, J.J. 1976. Geology and ore deposits of

the McDermitt caldera, Nevada-Oregon. U.S. Geological Survey Open-File Report, OF 76-535.
Thesis. Wood.
See also Spendlove, 1979.

273. **Goodman, Stacy.** 1985. Material culture: Basketry and fiber artifacts. *In*, D.H. Thomas (ed.), The archaeology of Hidden Cave, Nevada. Anthropological Papers of the American Museum of Natural History,61(1):262-298.
*
Locality?, Grimes Point quadrangle, Churchill County.
Longitude 118/37/30, Latitude 39 /22/30.
Cave deposits (Hidden Cave), Quaternary.
See also Grayson, 1984; Pendleton, 1985; Wigand and Mehringer, 1985.

274. **Gordon, C. C.** 1928. The Virgin Valley, Nevada opal deposits. The Mining Review,30(6):7-8.
*
Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Permineralized cones, wood.

275. **Grayson, D. K.** 1981. A mid-Holocene record for the heather vole, *Phenacomys* cf. *intermedius*, in the central Great Basin and its biogeographic significance. Journal of Mammalogy,62(1):115-121.
*
Locality?, Wildcat Peak quadrangle, Nye County.
Longitude 116/45/00, Latitude 39 /00/00.
Cave deposits (Gatecliff Shelter), Quaternary.
Palynomorphs.
See also Kautz and Thomas, 1972; Lanner, 1983; Rhode and Thomas, 1983; Thompson and Hattori, 1983; Thompson and Kautz, 1983.

276. **Grayson, D. K.** 1984. Time of extinction and nature of adaptation of the noble marten, *Martes nobilis*. *In*, H.H. Genoways and M.R. Dawson (eds.), Contributions in Quaternary Vertebrate Paleontology: a Volume in Memorial to John E. Guilday. Special Publication of Carnegie Museum of Natural History,8:233-240.
*
Locality?, Grimes Point quadrangle, Churchill County.
Longitude 118/37/30, Latitude 39 /22/30.
Cave deposits, Quaternary.
Palynomorphs.

See also Goodman, 1985; Pendleton, 1985; Wigand and Mehringer, 1985.

277. **Grayson, D. K.** 1993. The Desert's Past: A Natural Prehistory of the Great Basin. Smithsonian Institution Press, Washington, D.C., pp. 1-356.
*
Quaternary.

278. **Hall, S. A.** 1985. Quaternary pollen analysis and vegetational history of the southwest. *In*, V.M. Bryant, Jr. and R.G. Holloway (eds.), Pollen Records of Late-Quaternary North American Sediments. American Association of Stratigraphic Palynologists, pp. 95-123.
*
Quaternary.
Palynomorphs.

279. **Harper, K. T.** 1984. Forging random immigrants into stable groupings: the role of biotic and abiotic forces in evolution of modern plant communities in the eastern Great Basin. Bulletin of the Ecological Society of America,65(2):141.
*
Quaternary.
Abstract.

280. **Harrington, M. R.** 1933. Gypsum Cave, Nevada. Southwest Museum Papers,8:1-197.
*
Locality?, Frenchman Mtn. quadrangle, Clark County.
Longitude 114/52/30, Latitude 36 /07/30.
Cave deposits (Gypsum Cave), Quaternary.
See also Laudermilk and Munz, 1934a, 1934b, 1935; Mehringer, 1967c.

281. **Harrison, Clark.** 1941. Nevada localities. The Mineralogist,9(1):11.
*
Neogene.
Wood.
NOTE: Mentions permineralized wood near Tonopah (see also Strong, 1967).

282. **Hattori, E. M.** 1982. The archaeology of Falcon Hill, Winnemucca Lake, Washoe County, Nevada. Nevada State Museum Anthropological Papers,18:1-178.
*
Quaternary.

283. **Hazen, G. E.** 1940. Some Nevada localities. The Mineralogist,8(1):11.
*
Neogene.

Wood.
NOTE: Discusses wood from south of Coaldale (see also Anonymous, 1952; Boak, 1934), Fish Lake Valley (see also Anonymous, 1952; Page, 1964; Segerblom, 1966; Mitchell, 1981), and Wilsons Camp east of Goldfield (see also Anonymous, 1952; Walker, 1936).

284. **Heaton, T. H.** 1985. Quaternary paleontology and paleoecology of Crystal Ball Cave, Millard County Utah: with emphasis on mammals and description of a new species of fossil skunk. The Great Basin Naturalist,45(3):337-390.
*
Locality?, Spring Mountain quadrangle, Millard County, Utah.
Longitude 114/00/00, Latitude 39 /22/30.
Cave deposits (Crystal Ball Cave), Quaternary.
NOTE: Locality is included because of its significance and because it is only 0.9 km east of the Nevada-Utah state line. See also Heaton, 1990.

285. **Heaton, T. H.** 1990. Quaternary mammals of the Great Basin: extinct giants, Pleistocene relicts, and recent immigrants. *In*, R.M. Ross and W.D. Allmon (eds.), Causes of Evolution: A Paleontological Perspective. The University of Chicago Press, Chicago, pp. 422-465.
*
Quaternary.

286. **Hedlund, R. W.** 1965. *Sigmopollis hispidus* gen. et sp. nov. from Miocene sediments, Elko County Nevada. Pollen et Spores,7(1):89-92.
*
Locality? = Locality UCMP 22609, Elko West quadrangle, Elko County.
Longitude 115/45/00, Latitude 40 /45/00.
Elko Formation, late Eocene.
For geology see: Solomon, B.J. and Moore, S.W. 1982. Geologic map and oil shale deposits of the Elko West quadrangle, Elko County, Nevada. U.S. Geological Survey Miscellaneous Field Studies Map, MF-1410.
Palynomorphs.
See also Lesquereux, 1873;
Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Eocene and Oligocene lacustrine and volcanic rocks near Elko, Nevada. *In*, G.W. Newman and H.D. Goode (eds.), Basin and Range Symposium and Great Basin field conference. Rocky Mountain Association of Geologists, Denver, Colorado, pp. 325-337. (gives dates on base and top of Unit 5 as 38.9 ± 0.7 - 37.1 ± 1.0 Ma not recalculated);
Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979.

Stratigraphy and depositional environments of Paleogene rocks near Elko, Nevada. *In*, J.M. Armentrout, M.R. Cole and H. TerBest, Jr. (eds.), Cenozoic paleogeography of the western United States. Pacific Coast Paleogeography Symposium 3. The Pacific Section, Society of Economic Paleontologists and Mineralogists, pp. 75-88;

Winchester, D.E. 1923. Oil shale of the Rocky Mountain region. U.S. Geological Survey Bulletin, 729:1-204.

287. **Heizer, R. F.** 1967. Analysis of human coprolites from a dry Nevada cave. Reports of the University of California Archaeological Survey,70:1-20.

*

Locality?, Lovelock Caves quadrangle, Churchill County. Longitude 118/30/00, Latitude 39 /52/30.
Cave deposits (Lovelock Cave), Quaternary.

For geology see: Morrison, R.B. 1961. Lake Lahontan stratigraphy and history in the Carson Desert (Fallon) area, Nevada. *In*, Short Papers in the Geologic and Hydrologic Sciences, Articles 293-435. Geological Survey Research 1961. U.S. Geological Survey Professional Paper 424-D:111-114;

Morrison, 1964.

See also Ambro, 1967; Cowan, 1967; Heizer and Napton, 1970; Loud and Harrington, 1929; Napton, 1969, 1970; Napton and Heizer, 1970; Napton and Kelso, 1969.

288. **Heizer, R. F. and Napton, L.K.** 1970. Archaeological investigations in Lovelock Cave, Nevada. *In*, R.F. Heizer and L.K. Napton (eds.), Archaeology and the prehistoric Great Basin lacustrine subsistence regime as seen from Lovelock Cave, Nevada. Contributions of the University of California Archaeological Research Facility,10:1-86.

*

Locality?, Lovelock Caves quadrangle, Churchill County. Longitude 118/30/00, Latitude 39 /52/30.
Cave deposits (Lovelock Cave), Quaternary.

For geology see: Morrison, R.B. 1961. Lake Lahontan stratigraphy and history in the Carson Desert (Fallon) area, Nevada. *In*, Short Papers in the Geologic and Hydrologic Sciences, Articles 293-435. Geological Survey Research 1961. U.S. Geological Survey Professional Paper 424-D:111-114;

Morrison, 1964.

See also Ambro, 1967; Cowan, 1967; Heizer, 1967; Loud and Harrington, 1929; Napton, 1969, 1970; Napton and Heizer, 1970; Napton and Kelso, 1969.

289. **Herendeen, P. S. , Les, D.H. and Dilcher, D.L.** 1990. Fossil *Ceratophyllum* (Ceratophyllaceae) from the Tertiary of North America. American Journal of Botany,77(1):7-16.

*

Locality? = UCMP P3917, Ninemile Ranch quadrangle, Lyon County.
Longitude 118/52/30, Latitude 38 /22/30.
Coal Valley Formation, late Miocene (Clarendonian).
For geology see: Axelrod, 1956;
Gilbert, C.M. and Reynolds, M.W. 1973. Character and chronology of basin development, western margin of the Basin and Range Province. Geological Society of America Bulletin, 84(8):2489-2510.
Diatoms, impressions.
See also Axelrod, 1956; Berry, 1927.

290. **Heylmun, E. B.** 1987. Virgin Valley. Lapidary Journal,41(3):33-44.

*

Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

291. **Hodson, G. K. and Dake, H.C.** 1950. Opal mines and mining in Nevada. The Mineralogist,18(4):171-179, 198, 200, 202, 204.

*

Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

292. **Hodson, Keith.** 1989. Mining rainbows. Lapidary Journal,43(3):41-43.

*

Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

293. **Irwin-Williams, C. C. , Osmond, C.B., Dansie, A.J. and Pitelka, L.F.** 1990. Man and plants in the Great Basin. *In*, C.B. Osmond, L.F. Pitelka and G.M. Hidy (eds.), Plant Biology of the Basin and Range. Ecological Studies: Analysis and Synthesis Volume 80. Springer-Verlag, Berlin, pp. 1-15.

294. **Jefferson, G. T.** 1982. Late Pleistocene vertebrates from a Mormon Mountain Cave in southern Nevada. Bulletin of the Southern California Academy of Sciences,81(3):121-127.

*

Locality?, Carp quadrangle, Lincoln County.

Longitude 114/22/30, Latitude 37 /00/00.
Cave deposits (Mormon Mountain Cave), Quaternary.

295. **Jennings, S. A. and Elliott-Fisk, D.L.** 1993. Packrat midden evidence of late Quaternary vegetation change in the White Mountains, California-Nevada. Quaternary Research,39(2):214-221.
*
Quaternary.
Woodrat middens.

296. **Johannesen, D. C. and Cole, M.R.** 1990. Blackburn Oil Field, Eureka County, Nevada. *In*, D.M.H. Flanigan, L.J. Garside, and M. Hansen (eds.), Oil fields and geology of the Pine Valley, Eureka County area, Nevada. Nevada Petroleum Society 1990 Fieldtrip Guidebook, pp. 39-53.
*
1) Locality? (Amoco #1)
2) Locality? (#10 BLackburn)
3) Locality? (#1 Big Pole Creek)
4) Locality? (see p. 45)
1) West of Coffin Mtn. quadrangle
2) Mineral Hill NW quadrange
3) West of Coffin Mtn. quadrangle
4) Quadrangle?
1-4) Eureka County
1) Longitude 116/07/30, Latitude 40/15/00
2) Longitude 116/07/30, Latitude 40/15/00
3) Longitude 116/07/30, Latitude 40/15/00
4) Longitude and Latitude?
1) Vinini Formation
2) Chainman Shale
3) Newark Canyon Formation
4) Formation?
1) Ordovician
2) Late Mississippian
3) Early Cretaceous
4) age?
1-3) Palynomorphs
4) Impressions

297. **Johnson, H. C.** 1990. Western Gem Hunters Atlas. Cy Johnson & Son, Susanville, California, 24th Edition.
*
Wood.
NOTE: A general guide to localities with gem quality materials, including opalized and permineralized wood.

298. **Johnson, H. C. and Johnson, R.N.** 1987. Coast to Coast Gem Atlas. Cy Johnson & Son, Susanville, California, 2nd Edition.

*

Wood.

NOTE: A very general guide to localities with gem quality materials, including opalized and permineralized wood.

299. **Johnson, M. G.** 1977. Geology and mineral deposits of Pershing County, Nevada. Nevada Bureau of Mines and Geology Bulletin,89:1-115.

*

Locality USNM 11283, Rabbithole quadrangle, Pershing County.
Longitude 118/45/00, Latitude 40 /45/00.
Unnamed unit, middle Miocene (Clarendonian).
Impressions.
NOTE: See p. 36 for USNM 11283; see p. 20 for mention of Late Triassic wood.

300. **Johnson, R. E.** 1982. Upper Ordovician dasyclad algae from the eastern Great Basin. Geological Society of America Abstracts with Programs,14(5):263.

*

Ordovician.
Abstract. Algae.

301. **Johnson, R. N.** 1989. Nevada-Utah Gem Atlas. Cy Johnson & Son, Susanville, California, 3rd Edition.

*

Wood.

NOTE: A general guide to localities with gem quality materials, including permineralized wood.

302. **Jones, Bob.** 1977. Virgin Valley opal find. Rock & Gem,7(2):36-37.

*

Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

303. **Jones, Bob.** 1984. 35 years at Rainbow Ridge. Rock & Gem,14(8):44-46.

*

Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

304. **Jones, Bob.** 1986. Virgin Valley opal. Rock & Gem,16(9):16-19.

*

Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.

Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

305. **Jones, R. W.** 1973. The opal of Nevada. Rock & Gem,3(10):38-45.
*
Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

306. **Kautz, R. R.** 1988. Palynology. *In*, D.H. Thomas (ed.), The archaeology of Montior Valley: 3. Survey and additional excavations. Anthropological Papers of the American Museum of Natural History,66(2):249-251.
*
Locality?, Wildcat Peak NW quadrangle, Nye County.
Longitude 116/52/30, Latitude 39 /00/00.
Cave deposits (Triple T Shelter), Quaternary.
Palynomorphs.

307. **Kautz, R. R. and Thomas, D.H.** 1972. Palynololgical investigations of two prehistoric cave middens in central Nevada. Tebiwa,15(2):43-54.
*
1) Locality?, (Toquima Cave), Kingston Ranch quadrangle, Lander County.
Longitude 117/00/00, Latitude 39/07/30.
Cave deposits.
Quaternary.
2) Locality?, (Gatecliff Shelter), Wildcat Peak quadrangle, Nye County.
Longitude 116/45/00, Latitude 39/00/00.
Cave deposits.
Quaternary.
Palynomorphs.
See also Grayson, 1981; Lanner, 1983; Rhode and Thomas, 1983; Thompson and Hattori, 1983; Thompson and Kautz, 1983
For background see Thomas, D.H. 1983. The archaeology of Monitor Valley. 1. Epistemology. Anthropological Papers of the American Museum of Natural History, 58(1):1-194.

308. **Kelly, T. S.** 1994. Two Pliocene (Blancan) vertebrate faunas from Douglas County, Nevada. PaleoBios,16(1):1-23.
*
Douglas County.
Unnamed unit, Pliocene (Blancan).
For geology see: this publication.
Wood.

309. **Klein, James.** 1983. Where to find gold and gems in Nevada. Gem Guides Book Company, Baldwin Park, California.
*
Neogene.
Wood.
NOTE: A general guide to localities with gem quality materials, including opalized and permineralized wood.

310. **Knowlton, F. H.** 1898. A catalogue of the Cretaceous and Tertiary plants of North America. Bulletin of the U.S. Geological Survey,152:1-247.
*
Catalogue.

311. **Knowlton, F. H.** 1900. Fossil plants of the Esmeralda formation. *In*, H.W. Turner, The Esmeralda Formation, a fresh-water lake deposit. *In*, Twenty-first Annual Report of the United States Geological Survey to the Secretary of the Interior. 1899-1900. Part II. General Geology, Economic Geology, Alaska. Government Printing office, Washington, pp. 209-222.
*
Locality?, Rhyolite Ridge NE quadrangle, Esmeralda County. Longitude 117/45/00, Latitude 37 /52/30.
Esmeralda Formation, late Miocene.
For geology see: Robinson, P.T., Stewart, J.H., Moiola, R.J. and Albers, J.P. 1976. Geologic map of the Rhyolite Ridge quadrangle, Esmeralda County, Nevada. U.S. Geological Survey Geologic Quadrangle Map, GQ-1325;
Stewart, 1989.
Impressions.
NOTE: Knowlton (1900) states this locality is 3.8-4.5 km northeast of Emigrant Peak. The type locality has never been relocated (see discussion under Axelrod, 1940a) but is probably in section 28, T.2N., R.37E. See UCMP PA430, ZZ Coaldale fern locality.
NOTE: Setting the Miocene-Pliocene boundary at ca. 5.1 Ma requires these localities now be reassigned to the Miocene.
NOTE: Publication date occasionally cited as 1901 (see for example Knowlton, 1919), but the report was published in 1900.
See also, Axelrod, 1940a; Brown, 1937; Evernden and James, 1964.

312. **Knowlton, F. H.** 1919. A catalogue of the Mesozoic and Cenozoic plants of North America. U.S. Geological Survey Bulletin,696:1-815.
*
Catalogue.

313. **Krebs, W. N. and Bradbury, J.P.** 1994 *in press*. Geologic ranges of lacustrine *Actinocyclus* species, western United States. *In*, J.P. Bradbury and W.N. Krebs (eds.), The diatom genus *Actinocyclus* in the western United States. U.S. Geological Survey Professional Paper,1543.
*

Diatoms.
See also Bradbury and Krebs, 1994 *in press*.

314. **Krebs, W. N. , Bradbury, J.P. and Theriot, Edward.** 1987. Neogene and Quaternary lacustrine diatom biochronology, western USA. Palaios,2(5):505-513.
*

Diatoms.
NOTE: Contains a list of localities within the Great Basin with known radiometric ages included.

315. **Lamarche, V. C. , Jr. and Mooney, H.A.** 1967. Altithermal timberline advance in western United States. Nature,213(5080):980-982.
*

Quaternary.

316. **Lamarche, V. C. , Jr. and Mooney, H.A.** 1972. Recent climatic change and development of the bristlecone pine (*P. longaeva* Bailey) Krummholz Zone, Mt. Washington, Nevada. Arctic and Alpine Research,4(1):61-72.
*

Quaternary.

317. **LaMotte, R. S.** 1934. Upper Miocene flora from 49 Camp, Nevada. Pan-American Geologist,62(1):74.
*

Locality UCMP 97, Fortynine Mtn. quadrangle, Washoe County.
Longitude 119/52/30, Latitude 41 /30/00.
High Rock sequence, middle Miocene.
Abstract. Compressions, diatoms, impressions, wood.
NOTE: K-Ar date of 19.8 Ma given by Evernden and James (1964, p. 971) is from a stratigraphically older unit than the plant-bearing beds; see discussion by Axelrod (1966b, p. 504) and Bonham (1969, p. 19) where the "49 Camp Beds" are shown to be equivalent to Bonham's High Rock sequence that elsewhere contains latest Hemingfordian and or early Barstovian paleofaunas that have been dated (Evernden, J.F., Savage, D.E., Curtis, G.H. and James, G.T. 1964. Potassium-Argon dates and the Cenozoic mammalian chronology of North America. American Journal of Science, 262(2):145-198. See p. 189) and are indicative of an age more in the 15.5-16.0 Ma range.

See also Axelrod, 1966b; Chaney, 1924; Everenden and James, 1964; LaMotte, 1935a, 1936a.

318. **LaMotte, R. S.** 1935a. Upper Miocene flora from 49 Camp, Nevada. Proceedings of the Geological Society of America for 1934, p. 389.

*

Locality UCMP 97, Fortynine Mtn. quadrangle, Washoe County.
Longitude 119/52/30, Latitude 41 /30/00.
High Rock sequence, middle Miocene.
Abstract. Compressions, diatoms, impressions, wood.
See also Axelrod, 1966b; Chaney, 1924; Everenden and James, 1964; LaMotte, 1934, 1936a.

319. **LaMotte, R. S.** 1935b. Climatic implications of *Sapindus oregonianus*. *In,* Middle Cenozoic Floras of Western North America. Carnegie Institution of Washington Publication,455(2):29-38.

*

Locality UCMP 97, Fortynine Mtn. quadrangle, Washoe County.
Longitude 119/52/30, Latitude 41 /30/00.
High Rock sequence, middle Miocene.
Compressions, diatoms, impressions.
See also discussion under LaMotte, 1934.
NOTE: The issue date for this paper was January 30, 1935, but the complete edition of the Carnegie Institution of Washington Publication 455 was not published until October, 1936.

320. **LaMotte, R. S.** 1935c. The Miocene Tilias of western America. *In,* Middle Cenozoic Floras of Western North America. Carnegie Institution of Washington Publication,455(3):39-48.

*

Locality UCMP 97, Fortynine Mtn. quadrangle, Washoe County.
Longitude 119/52/30, Latitude 41 /30/00.
High Rock sequence, middle Miocene.
Impressions.
See also discussion under LaMotte, 1934.
NOTE: The issue date for this paper was July 10, 1935, but the complete edition of the Carnegie Institution of Washington Publication 455 was not published until October, 1936.

321. **LaMotte, R. S.** 1936a. The Upper Cedarville flora of northwestern Nevada and adjacent California. *In,* Middle Cenozoic Floras of Western North America. Carnegie Institution of Washington Publication,455(5):57-142.

*

Locality UCMP 97, Fortynine Mtn. quadrangle, Washoe County.
Longitude 119/52/30, Latitude 41 /30/00.
High Rock sequence, middle Miocene.
Compressions, diatoms, impressions.
See also Axelrod, 1966b; Chaney, 1924; Everenden and James, 1964; LaMotte, 1934, 1935a; Lohman, 1936.

322. **LaMotte, R. S.** 1936b. Some systematic revisions in Miocene palaeobotany, 1934-36. *In*, Middle Cenozoic Floras of Western North America. Carnegie Institution of Washington Publication,455(Supplement):145-148.
*
Catalogue.

323. **LaMotte, R. S.** 1944. Supplement to catalogue of Mesozoic and Cenozoic plants of North America, 1919-37. U.S. Geological Survey Bulletin,924:1-330.
*
Catalogue.

324. **LaMotte, R. S.** 1952. Catalogue of the Cenozoic plants of North America through 1950. Geological Society of America Memoir,51:1-381.
*
Catalouge.

325. **Lanner, R. M.** 1983. The expansion of singleleaf piñon in the Great Basin. *In*, D.H. Thomas (ed.), The archaeology of Monitor Valley. 2. Gatecliff Shelter. Anthropological Papers of the American Museum of Natural History,59(1):167-171.
*
Locality?, Wildcat Peak quadrangle, Nye County.
Longitude 116/45/00, Latitude 39 /00/00.
Cave deposits (Gatecliff Shelter), Quaternary.
See also Grayson, 1981; Kautz and Thomas, 1972; Madsen and Rhode, 1990; Rhode and Thomas, 1983; Thompson and Hattori, 1983; Thompson and Kautz, 1983.
For background see Thomas, D.H. 1983. The archaeology of Monitor Valley. 1. Epistemology. Anthropological Papers of the American Museum of Natural History, 58(1):1-194.

326. **Lanner, R. M.** 1984. Trees of the Great Basin: A Natural History. University of Nevada Press, Reno, Nevada, pp. 1-215.

327. **Laudermilk, J. C. [sic]. and Munz, P.A.** 1934a. Plants in *Nothrotherium* dung from Gypsum Cave, Nevada. Pan-American Geologist,61(5):375-376.
*
Locality?, Frenchman Mtn. quadrangle, Clark County.
Longitude 114/52/30, Latitude 36 /07/30.
Cave deposits (Gypsum Cave), Quaternary.

Abstract.
See also Harrington, 1933; Laudermilk and Munz, 1934b, 1935; Mehringer, 1967c.
NOTE: senior author's initials are J.D.

328. **Laudermilk, J. D. and Munz, P.A.** 1934b. Plants in the dung of *Nothrotherium* from Gypsum Cave, Nevada. Carnegie Institution of Washington Publication,453:31-37.
*
Locality?, Frenchman Mtn. quadrangle, Clark County.
Longitude 114/52/30, Latitude 36 /07/30.
Cave deposits (Gypsum Cave), Quaternary.
See also Harrington, 1933; Laudermilk and Munz, 1934a, 1935; Mehringer, 1967c.

329. **Laudermilk, J. D. and Munz, P.A.** 1935. Plants in *Nothrotherium* dung from Gypsum Cave, Nevada. Proceedings of the Geological Society of America for 1934: 333.
*
Locality?, Frenchman Mtn. quadrangle, Clark County.
Longitude 114/52/30, Latitude 36 /07/30.
Cave deposits (Gypsum Cave), Quaternary.
Abstract.
See also Harington, 1933; Laudermilk and Munz, 1934a, 1934b; Mehringer, 1967c.

330. **Leskinen, P. H.** 1969. Late Pleistocene vegetation change in the Christmas Tree Pass area, Newberry Mountains, southern Nevada. Journal of the Arizona Academy of Science,5 (proceedings supplement):27-28.
*
Quaternary.
Abstract.

331. **Leskinen, P. H.** 1970. Late Pleistocene vegetation change in the Christmas Tree Pass area, Newberry Mountains, Nevada. Unpublished M.S. Thesis. University of Arizona, Tuscon, Arizona.
*
Quaternary.
Thesis.

332. **Leskinen, P. H.** 1975. Occurrence of oaks in late Pleistocene vegetation in the Mojave Desert of Nevada. Madroño,23(4):234-235.
*
Quaternary.

333. **Lesquereux, Leo.** 1872. Fossil flora. *In*, F.V. Hayden (ed.), Preliminary Report of the United States Geological Survey of Montana and Portions of Adjacent Territories; Being a Fifth Annual Report of Progress, pp. 283-318.

*

Locality? = UCMP PA299 (?; see discussion under Lesquereux, 1873), Coal Mine Basin quadrangle, Elko County.
Longitude 115/37/30, Latitude 41 /07/30.
Elko Formation, late Eocene.

For geology see: Ketner, K.B. 1973. Preliminary geologic map of the Coal Mine Basin quadrangle, Elko County, Nevada. U.S. Geological Survey Miscellaneous Field Studies Map, MF-528.

Impressions.

NOTE: This appears to be the earliest published reference to fossil plants in the State of Nevada. This report was communicated to F.V. Hayden on February 28, 1872. See also Cope (1873) for another early reference to this locality.

NOTE: See discussion under Lesquereux, 1873.

See also Cope, 1873; Lesquereux 1873, 1874, 1878, 1883; Mason, 1927; Wingate, 1983.

334. **Lesquereux, Leo.** 1873. Lignitic formation and fossil flora. *In*, F.V. Hayden (ed.), Sixth Annual Report of the United States Geological Survey of the Territories, embracing portions of Montana, Idaho, Wyoming, and Utah; being a report of progress of the explorations for the year 1872. Government Printing Office, Washington, pp. 317-427.

*

Locality? = UCMP PA299 (?; see discussion below), Coal Mine Basin quadrangle, Elko County.
Longitude 115/37/30, Latitude 41 /07/30.
Elko Formation, late Eocene.

For geology see: Ketner, K.B. 1973. Preliminary geologic map of the Coal Mine Basin quadrangle, Elko County, Nevada. U.S. Geological Survey Miscellaneous Field Studies Map, MF-528.

Impressions, palynomorphs.

NOTE: Some confusion exists within the paleobotanical community regarding the various sites from which the Elko floras were collected. Three main sites are now known: 1) Osino Coal Mine UCMP PA299, 2) Elko south [both Catlin Oil Shale Mine UCMP 22609, and mine shafts farther east UCMP P3949, now closed] and 3) Elko north UCMP PA115. Of these three, the Elko North locality was the most recently discovered (ca. 1954) and was not known at the time of Lesquereux's early descriptions of floras from the area (Lesquereux, 1872, 1873). In these and subsequent publications (Lesquereux, 1874, 1878, 1883), he refers to all of the material from the Elko area as having come from "Elko Station". The specific geographical affinities of these fossils remain unkown,

but at least some of the material appears to have been derived from the Osino Coal Mine locality. The plants from the Osino Coal Mine and the Elko South localities reflect somewhat different local paleoenvironments. The Osino Coal Mine material is associated with fresh-water snails and fish (Cope, 1873) and appears to represent a more lacustrine environment, while the Elko South material is indicative of a swamp environment. The extinct species of arborvitae, *Thuja garmani* Lesquereux 1873, is known only from the Osino Coal Mine and suggests that Lesquereux's "Elko Station" floras included at least some material from that locality. Following the closure of the Osino Coal Mine, the existence of the Osino locality was forgotten, and all fossil plants from the "Elko area" came to mean only that material derived from the Elko South localities (eg. Chaney and Axelrod, 1959). One of us (HES) recognized from the literature that "Elko Station" included the "lost" locality of Osino Coal Mine and relocated and recollected the site in 1964. This 1964 collection was accessioned as UCMP PA299 and *Thuja garmani* is abundant. Because of the absense of *Thuja* at the Elko South localities, we suggest that UCMP PA299 is equivalent to at least one of the localties from which Lesquereux obtained his material.

See also Cope, 1873; Hedlund, 1965; Lesquereux, 1872, 1874, 1878, 1883; Mason, 1927; Wingate 1983;

Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Eocene and Oligocene lacustrine and volcanic rocks near Elko, Nevada. *In*, G.W. Newman and H.D. Goode (eds.), Basin and Range Symposium and Great Basin field conference. Rocky Mountain Association of Geologists, Denver, Colorado, pp. 325-337. (gives dates on base and top of Unit 5 as 38.9 ± 0.7 - 37.1 ± 1.0 Ma not recalculated);

Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Stratigraphy and depositional environments of Paleogene rocks near Elko, Nevada. *In*, J.M. Armentrout, M.R. Cole and H. TerBest, Jr. (eds.), Cenozoic paleogeography of the western United States. Pacific Coast Paleogeography Symposium 3. The Pacific Section, Society of Economic Paleontologists and Mineralogists, pp. 75-88.

335. **Lesquereux, Leo.** 1874. The lignitic formation and its fossil flora. *In*, F.V. Hayden (ed.), Annual Report of The United States Geological and Geographical Survey of the Territories, embracing Colorado, being a report of progress of the exploration for the year 1873. Government Printing Office, Washington, pp. 365-425.

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Locality? = UCMP PA299 (?; see discussion under Lesquereux,

1873), Coal Mine Basin quadrangle, Elko County.
Longitude 115/37/30, Latitude 41 /07/30.
Elko Formation, late Eocene.
For geology see: Ketner, K.B. 1973. Preliminary geologic map of the Coal Mine Basin quadrangle, Elko County, Nevada. U.S. Geological Survey Miscellaneous Field Studies Map, MF-528.
Impressions, palynomorphs.
NOTE: See pp. 408-418
NOTE: This is volume 7 (the seventh Annual Report) in the Hayden Survey Reports series, but the title page of the actual edition seen by us does not directly indicate this.
See also Cope, 1873; Lesquereux, 1872, 1873, 1878, 1883; Mason, 1927; Wingate, 1983;
Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Eocene and Oligocene lacustrine and volcanic rocks near Elko, Nevada. *In*, G.W. Newman and H.D. Goode (eds.), Basin and Range Symposium and Great Basin field conference. Rocky Mountain Association of Geologists, Denver, Colorado, pp. 325-337. (gives dates on base and top of Unit 5 as 38.9 ± 0.7 - 37.1 ± 1.0 Ma not recalculated);
Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Stratigraphy and depositional environments of Paleogene rocks near Elko, Nevada. *In*, J.M. Armentrout, M.R. Cole and H. TerBest, Jr. (eds.), Cenozoic paleogeography of the western United States. Pacific Coast Paleogeography Symposium 3. The Pacific Section, Society of Economic Paleontologists and Mineralogists, pp. 75-88.

336. **Lesquereux, Leo.** 1878. Contributions to the fossil flora of the Western Territories. Part II. The Tertiary flora. *In*, F.V. Hayden (ed.), Report of the United States Geological Survey of the Territories. Volume 7. Government Printing Office, Washington, pp. 1-366.
*
Locality? = UCMP PA299 (?; see discussion under Lesquereux, 1873), Coal Mine Basin quadrangle, Elko County.
Longitude 115/37/30, Latitude 41 /07/30.
Elko Formation, late Eocene.
For geology see: Ketner, K.B. 1973. Preliminary geologic map of the Coal Mine Basin quadrangle, Elko County, Nevada. U.S. Geological Survey Miscellaneous Field Studies Map, MF-528.
Impressions, palynomorphs.
NOTE: This publication is not in the "Annual Report" Series edited by Hayden, but is a Department of the Interior Report. The title page for this paper by Lesquereux can be found on

page xi.

See also Cope, 1873; Lesquereux, 1872, 1873, 1874, 1883; Mason, 1927; Wingate 1983;

Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Eocene and Oligocene lacustrine and volcanic rocks near Elko, Nevada. *In*, G.W. Newman and H.D. Goode (eds.), Basin and Range Symposium and Great Basin field conference. Rocky Mountain Association of Geologists, Denver, Colorado, pp. 325-337. (gives dates on base and top of Unit 5 as 38.9 ± 0.7 - 37.1 ± 1.0 Ma not recalculated);

Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Stratigraphy and depositional environments of Paleogene rocks near Elko, Nevada. *In*, J.M. Armentrout, M.R. Cole and H. TerBest, Jr. (eds.), Cenozoic paleogeography of the western United States. Pacific Coast Paleogeography Symposium 3. The Pacific Section, Society of Economic Paleontologists and Mineralogists, pp. 75-88.

337. **Lesquereux, Leo.** 1883. Contributions to the fossil flora of the Western Territories. Part III. The Cretaceous and Tertiary floras. *In*, F.V. Hayden (ed.), Report of the United States Geological Survey of the Territories. Volume 8. Government Printing Office, Washington, pp. 1-283.

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Locality? = UCMP PA299 (?; see discussion under Lesquereux, 1873), Coal Mine Basin quadrangle, Elko County.
Longitude 115/37/30, Latitude 41 /07/30.
Elko Formation, late Eocene.

For geology see: Ketner, K.B. 1973. Preliminary geologic map of the Coal Mine Basin quadrangle, Elko County, Nevada. U.S. Geological Survey Miscellaneous Field Studies Map, MF-528.

Impressions, palynomorphs.

NOTE: This publication is not in the "Annual Report" Series edited by Hayden, but is a Department of the Interior Report.

NOTE: See pp. 127-212 and p. 214.

See also Cope, 1873; Lesquereux, 1872, 1873, 1874, 1878; Mason, 1927; Wingate, 1983;

Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Eocene and Oligocene lacustrine and volcanic rocks near Elko, Nevada. *In*, G.W. Newman and H.D. Goode (eds.), Basin and Range Symposium and Great Basin field conference. Rocky Mountain Association of Geologists, Denver, Colorado, pp. 325-337. (gives dates on base and top of Unit 5 as 38.9 ± 0.7 - 37.1 ± 1.0 Ma not recalculated);

Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Stratigraphy and depositional environments of Paleogene

rocks near Elko, Nevada. *In*, J.M. Armentrout, M.R. Cole and H. TerBest, Jr. (eds.), Cenozoic paleogeography of the western United States. Pacific Coast Paleogeography Symposium 3. The Pacific Section, Society of Economic Paleontologists and Mineralogists, pp. 75-88.

338. **Li, X. and Starr, J.** 1994. Physical controls on Early and Middle Ordovician sponge-algal mounds in the Great Basin of Utah and Nevada. PaleoBios,16(1 Supplement):10.
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Ordovician.
Abstract. Algae.

339. **Lohman, K. E.** 1936. The diatoms from 49 Camp. *In*, R.S. LaMotte, The Upper Cedarville flora of northwestern Nevada and adjacent California. *In*, Middle Cenozoic Floras of Western North America. Carnegie Institution of Washington Publication,455(5):97-99.
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Locality UCMP 97, Fortynine Mtn. quadrangle, Washoe County.
Longitude 119/52/30, Latitude 41 /30/00.
High Rock sequence, middle Miocene.
Diatoms.
NOTE: This brief summary is included as a separate section within LaMotte's paper.
See also LaMotte, 1936a.

340. **Lohman, K. E.** 1957. Cenozoic nonmarine diatoms from the Great Basin. Unpublished Ph.D. Dissertation. California Institute of Technology, Pasadena, California.
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1a) Localities USGS 3523-3531, 3534-3537, 1b) USGS 3540, Virgin Valley quadrangle, Humboldt County.
Longitude 118/52/30, Latitude 41/45/00.
1a) lower Virgin Valley beds, 1b) upper Virgin Valley beds, middle Miocene (Barstovian).
2) Localities USGS 3543-3545, Bog Hot Spring quadrangle, Humboldt County.
Longitude 118/52/30, Latitude 41/52/30.
Thousand Creek beds, late Miocene (Hemphillian).
3) Localities USGS 3394, 3396, 3397, 3403-3405, 3407, 3410, Black Spring quadrangle, Mineral County.
Longitude 117/37/30, Latitude 38/30/00.
"Esmeralda" Formation, middle Miocene.
Dissertation. Diatoms.

341. **Lohman, K. E.** 1961. Geologic ranges of Cenozoic nonmarine diatoms. U.S. Geological Survey Professional Paper,424-D:234-236.

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Diatoms.

342. **Lohman, K. E.** 1962. Stratigraphic and paleoecologic significance of Tertiary diatoms of California and Nevada. American Association of Petroleum Geologists Bulletin,46(2):271-272.

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Abstract. Diatoms.

343. **Lohman, K. E.** 1964. Stratigraphic and paleoecologic significance of the Mesozoic and Cenozoic diatoms of California and Nevada. In, A.T. Cross (ed.), Palynology in Oil Exploration: A Symposium. Society of Economic Paleontologists and Mineralogists Special Publication,11:58-64.

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Diatoms.

344. **Long, Austin and Siegel, R.D. and Warneke, L.F.** 1984. Paleoclimatic significance of deuterium/hydrogen ratios in Pleistocene and Holocene wood. Geological Society of America Abstracts with Programs,16(6):578.

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Quaternary.

Abstract. Wood.

See also Siegel, 1983.

345. **Loud, L. L. and Harrington, M.R.** 1929. Lovelock Cave. University of California Publications in American Archaeology and Ethnology,25(1):1-183.

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Locality?, Lovelock Caves quadrangle, Churchill County. Longitude 118/30/60, Latitude 39 /52/30.

Cave deposits (Lovelock Cave), Quaternary.

For geology see: Morrison, R.B. 1961. Lake Lahontan stratigraphy and history in the Carson Desert (Fallon) area, Nevada. *In*, Short Papers in the Geologic and Hydrologic Sciences, Articles 293-435. Geological Survey Research 1961. U.S. Geological Survey Professional Paper 424-D:111-114;

Morrison, 1964.

See also Ambro, 1967; Cowan, 1967; Heizer, 1967; Heizer and Napton, 1970; Napton, 1969; 1970; Napton and Heizer, 1970; Napton and Kelso, 1969.

346. **Lugaski, T. P. and Firby, J.R.** 1987. Paleoecologic and paleodepositional environments of non-marine sediments of Stewart Valley, Nevada. Geological Society of America Abstracts with Programs,19(5):316.

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Abstract.

347. **MacNeil, F. S.** 1939. Fresh-water invertebrates and land plants of Cretaceous age from Eureka, Nevada. Journal of

Paleontology,13(3):355-360.
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Locality?, Eureka County.
Newark Canyon Formation, Early Cretaceous.
For geology see: Nolan, T.B., Merriam, C.W. and Brew, D.A. 1971. Geologic map of the Eureka quadrangle, Eureka and White Pine counties, Nevada. U.S. Geological Survey Miscellaneous Geologic Investigations Map I-612.
Impressions.
See also David, Lore 1941. *Leptolepis nevadensis*, a new Cretaceous fish. Journal of Paleontology, 15(3):318-321;
Nolan, T.B., Merriam, C.W. and Williams, J.S. 1956. The stratigraphic section in the vicinity of Eureka, Nevada. U.S. Geological Survey Professional Paper, 276:1-77 (see especially p. 70);
Roberts and others, 1967.

348. **Madden-McGuire, D. J., Hutter, T.J. and Suczek, C.A.** 1991. Late Cambrian-Early Ordovician microfossils from the allochthonous Harmony Formation at its type locality, northern Sonoma Range, Humboldt County, Nevada. Geological Society of America Abstracts with Programs,23(2):75.
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Locality?, Humboldt County.
Harmony Formation, Late Cambrian and Early Ordovician.
Abstract. Algae, palynomorphs.

349. **Madsen, D. B.** 1972. Paleoecological investigations in Meadow Valley Wash, Nevada. *In*, D.D. Fowler (ed.), Great Basin Cultural Ecology: A Symposium. Desert Research Institute Publications in the Social Sciences,8:57-65.
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Locality?, Islen quadrangle, Lincoln County.
Longitude 114/15/00, Latitude 37 /30/00.
Cave deposits (O'Malley Shelter), Quaternary.
Palynomorphs, woodrat middens.
See also Madsen, 1973a.

350. **Madsen, D. B.** 1973a. The pollen analysis of O'Malley Shelter. *In*, D.D. Fowler, D.B. Madsen and E.M. Hattori (eds.), Prehistory of southeastern Nevada. Desert Research Institute Publications in the Social Sciences,6:137-142.
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Locality?, Islen quadrangle, Lincoln County.
Longitude 114/15/00, Latitude 37 /30/00.
Cave deposits (O'Malley Shelter), Quaternary.
Palynomorphs.
See also Madsen 1972.

351. **Madsen, D. B.** 1973b. Late Quaternary paleoecology of the southeastern Great Basin. Unpublished Ph.D. Dissertation. University of Missouri, Columbia, Missouri.
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Quaternary.
Dissertation.

352. **Madsen, D. B.** 1976. Pluvial - post-pluvial vegetation changes in the southeastern Great Basin. *In*, R. Elston (ed.), Holocene Environmental Change in the Great Basin. Nevada Archeological Survey Research Paper,6:104-119.
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Quaternary.
Woodrat middens.

353. **Madsen, D. B.** 1982. Get it where the gettin's good: a variable model of Great Basin subsistence and settlement based on data from the eastern Great Basin. *In*, D.B. Madsen and J.F. O'Connell (eds.), Man and Environment in the Great Basin. Society for American Archaeology Papers,2:207-226.
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Quaternary.

354. **Madsen, D. B.** 1985a. Two Holocene pollen records from the central Great Basin. *In*, B.F. Jacobs, P.L. Fall and O.K. Davis (eds.), Late Quaternary vegetation and climates of the American southwest. American Association of Stratigraphic Palynologists, Contributions Series,16:113-126.
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1) Locality? (Potato Canyon Bog), Walti Hot Springs quadrangle, Lander County.
Longitude 116/30/00, Latitude 39/52/30.
2) Locality? (Mahala Creek), Mahala Creek West quadrangle, Elko County.
Longitude 115/52/30, Latitude 41/15/00.
Unnamed unit, Quaternary.
Palynomorphs.

355. **Madsen, D. B.** 1985b. Correlation between vegetative and lake level changes: the pollen evidence. *In*, P.A. Kay and H.F. Diaz (eds.), Problems of and Prospects for Predicting Great Salt Lake Levels: Papers from a Conference Held in Salt Lake City, March 26-28, 1985. Center for Public Affairs and Administration, University of Utah, pp. 54-62.
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Quaternary.
Palynomorphs.

356. **Madsen, D. B.** 1986. Great Basin nuts: A short treatise on the distribution, productivity and prehistoric use of pinyons. *In*, C.J. Condie and D.D. Fowler (eds.), Anthropology of the Desert

West: Essays in Honor of Jesse D. Jennings. University of Utah Anthropological Papers,110:21-41.
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Quaternary.

357. **Madsen, D. B. and Rhode, David.** 1990. Early Holocene Pinyon (*Pinus monophylla*) in the northeastern Great Basin. Quaternary Research,33(1):94-101.
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Quaternary.
See also Lanner, 1983.

358. **Major, Jack and Bamberg, S.A.** 1968. Some cordilleran plants disjunct in the Sierra Nevada of California and their bearing on Pleistocene ecological conditions. *In*, Arctic and Alpine Environments. International Association of Quaternary Research, 7th Congress, Boulder-Denver, 1965, Proceedings, Vol. 10. Indiana University Press, pp. 171-188.
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Quaternary.

359. **Mamet, Bernard and Roux, Alain.** 1982. Sur le mode de croissance de *Nuia*, algue *incertae sedis*. Geobios,15(6):959-965.
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Locality?, Ninemile Peak quadrangle, Eureka County.
Longitude 116/15/00, Latitude 39 /07/30.
Pogonip Group, Ordovican or Silurian.
For geology see: Merriam, C.W. 1963. Paleozoic rocks of Antelope Valley, Eureka and Nye counties Nevada. U.S. Geological Survey Professional Paper 423:1-67.
?Algae.

360. **Manchester, S. R.** 1987. The fossil history of the Juglandaceae. Monographs in Systematic Botany from the Missouri Botanical Garden,21:1-137.
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Locality?, Churchill County.
Truckee Formation(?), middle Miocene.
Permineralized fruit.
NOTE: See p. 109 reference to *Juglans nevadensis* Berry. See also Berry, 1928.

361. **Marino, B. D. , McElroy, M.B., Salawitch, R.J. and Spaulding, W.G.** 1992. Glacial-to-interglacial variations in the carbon isotopic composition of atmospheric CO_2. Nature,357(6378):461-466.
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Quaternary.
Palynomorphs, woodrat middens.

362. **Martin, P. S. and Mehringer, P.J., Jr.** 1965. Pleistocene pollen analysis and biogeography of the southwest. *In*, H.E. Wright, Jr. and D.G. Frey (eds.), The Quaternary of the United States.

Princeton University Press, Princeton, New Jersey, pp. 433-451.
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Quaternary.
Palynomorphs.

363. **Mason, H. L.** 1927. Fossil records of some west American conifers. *In*, R. Kellogg, J.C. Merriam, C. Stock, R.W. Chaney and H.L. Mason, Additions to the Palaeontology of the Pacific Coast and Great Basin Regions of North America. Carnegie Institution of Washington Publication,346(5):139-158.
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Locality? = UCMP PA299 (?; see discussion under Lesquereux, 1873), Coal Mine Basin quadrangle, Elko County.
Longitude 115/37/30, Latitude 41 /07/30.
Elko Formation, late Eocene (38.9 ± 0.7 - 37.1 ± 1.0 Ma not recalculated).
For geology see: Ketner, K.B. 1973. Preliminary geologic map of the Coal Mine Basin quadrangle, Elko County, Nevada. U.S. Geological Survey Miscellaneous Field Studies Map, MF-528.
Impressions, palynomorphs.
See also Cope, 1873; Lesquereux, 1872, 1873, 1874, 1878, 1883; Wingate, 1983;
Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Eocene and Oligocene lacustrine and volcanic rocks near Elko, Nevada. *In*, G.W. Newman and H.D. Goode (eds.), Basin and Range Symposium and Great Basin field conference. Rocky Mountain Association of Geologists, Denver, Colorado, pp. 325-337. (gives dates on base and top of Unit 5 as 38.9 ± 0.7 - 37.1 ± 1.0 Ma not recalculated);
Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Stratigraphy and depositional environments of Paleogene rocks near Elko, Nevada. *In*, J.M. Armentrout, M.R. Cole and H. TerBest, Jr. (eds.), Cenozoic paleogeography of the western United States. Pacific Coast Paleogeography Symposium 3. The Pacific Section, Society of Economic Paleontologists and Mineralogists, pp. 75-88.
NOTE: Records the reference to *Thuja garmani* of Lesquereux (1873).

364. **McVickar, Janet and Spaulding, W.G.** 1993. Monitoring and mitigation of paleontologic resources. Final draft, technical report: Upper Las Vegas wash flood control facility, Clark County, Nevada. Report prepared for Clark County Flood Control District, Las Vegas, Nevada.
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Locality SBCM 02.006.037
1) Gass Peak SW quadrangle

2) Tule Springs Park quadrangle
1-2) Clark County.
1) Longitude 115/07/30, Latitude 36/15/00
2) Longitude 115/15/00, Latitude 36/15/00.
1-2) Las Vegas Formation, Quaternary.
For geology see: Haynes, C.V. 1967. Quaternary geology of the Tule Springs area, Clark County, Nevada. *In*, H.M. Wormington and Dorothy Ellis (eds.), Pleistocene Studies in Southern Nevada. Nevada State Museum Anthropological Papers, 13(1):15-104.
Wood.
See also Mehringer, 1967b, 1967c, 1968; Quade, 1986.

365. **Mead, J. I.** 1990. Pika (*Ochotona*) and paleoecological reconstructions of the Intermountain Region. Abstracts of Proceedings, 1990 Mojave Desert Quaternary Research Symposium. San Bernardino County Museum Association Quarterly,37(2):30.
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Quaternary.
Abstract. Woodrat middens.

366. **Mead, J. I. and Murray, L.K.** 1991. Late Pleistocene vertebrates from the Potosi Mountain packrat midden, Spring Range, Nevada. *In*, Crossing the Borders: Quaternary Studies in Eastern California and Southwestern Nevada. San Bernardino County Museum Association Special Publication, 1991 Mojave Desert Quaternary Research Center Symposium, pp. 124-126.
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Locality?, Clark County.
Unnamed unit, Quaternary.
Woodrat middens.
See also Mead and others, 1978.

367. **Mead, J. I. , Bell, C.J. and Murray, L.K.** 1992. *Mictomys borealis* (northern bog lemming) and the Wisconsin paleoecology of the east-central Great Basin. Quaternary Research,37(2):229-238.
*
Locality?, Little Horse Canyon quadrangle, White Pine County.
Longitude 114/00/00, Latitude 39 /15/00.
Cave deposits (Cathedral Cave, Smith Creek Cave), Quaternary.
See also Bell, 1990; Bryan, 1972; Mead and others, 1982; Thompson, 1979, 1984b, 1985b; Thompson and Mead, 1982.

368. **Mead, J. I. , Thompson, R.S. and Long, Austin.** 1978. Arizona radiocarbon dates IX: carbon isotope dating of packrat middens. Radiocarbon,20(2):171-191.

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Quaternary.
Woodrat middens.
See also Webb, 1986.

369. **Mead, J. I., Thompson, R.S. and Van Devender, T.R.** 1982. Late Wisconsinan and Holocene fauna from Smith Creek Canyon, Snake Range, Nevada. Transactions of the San Diego Society of Natural History,20(1):1-26.

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Quaternary.
See also Bell, 1990; Bryan, 1972; Mead and others, 1992; Thompson, 1979, 1984b, 1985b; Thompson and Mead, 1982.

370. **Meeuwig, R. O.** 1987. Index to Nevada stratigraphic units mentioned in NBMG bulletins and reports. Nevada Bureau of Mines and Geology Open-File Report, 87-1.

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371. **Mehringer, P. J., Jr.** 1965. Late Pleistocene vegetation in the Mohave Desert of southern Nevada. Journal of the Arizona Academy of Science,3(3):172-188.

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Quaternary.
Palynomorphs.

372. **Mehringer, P. J., Jr.** 1966. Some notes on the late Quaternary biogeography of the Mohave Desert. University of Arizona Geochronology Laboratories Interim Research Report,11:1-17.

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Quaternary.

373. **Mehringer, P. J., Jr.** 1967a. Late Quaternary vegetation in the Mohave Desert (U.S.A.). Review of Palaeobotany and Palynology,2(1-4):319-320.

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Quaternary.

374. **Mehringer, P. J., Jr.** 1967b. Pollen analysis of the Tule Springs area, Nevada. *In*, H.M. Wormington and Dorothy Ellis (eds.), Pleistocene Studies in Southern Nevada. Nevada State Museum Anthropological Papers,13(3):129-200.

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Locality?, Gass Peak SW quadrangle, Clark County.
Longitude 115/07/30, Latitude 36 /15/00.
Unnamed unit, Quaternary.
For geology see: Haynes, C.V. 1967. Quaternary geology of the Tule Springs area, Clark County, Nevada. *In*, H.M. Wormington and Dorothy Ellis (eds.), Pleistocene Studies in Southern Nevada. Nevada State Museum Anthropological Papers, 13(1):15-104.

Palynomorphs.
See also McVickar and Spaulding, 1993; Mehringer, 1967c, 1968; Quade, 1986.

375. **Mehringer, P. J., Jr.** 1967c. The environment of extinction of the late-Pleistocene megafauna in the arid southwestern United States. *In*, P.S. Martin and H.E. Wright, Jr. (eds.), Pleistocene Extinctions: The Search for a Cause. Volume 6 of the Proceedings of the VII Congress of the International Association for Quaternary Research, Yale University Press, New Haven and London, pp. 247-266.
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Quaternary.
See also Harrington, 1933; Laudermilk and Munz, 1934a, 1934b, 1935; McVickar and Spaulding, 1993; Mehringer, 1967b, 1968; Quade, 1986.

376. **Mehringer, P. J., Jr.** 1968. Pollen analysis (late Quaternary) of the Tule Spring site, Nevada. Unpublished Ph.D. Dissertation, University of Arizona, Tucson, Arizona.
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Locality?, Gass Peak SW quadrangle, Clark County.
Longitude 115/07/30, Latitude 36 /15/00.
Unnamed unit, Quaternary.
For geology see: Haynes, C.V. 1967. Quaternary geology of the Tule Springs area, Clark County, Nevada. Nevada State Museum Anthropological Papers, 13(1):15-104.
Dissertation. Palynomorphs.
See also McVickar and Spaulding, 1993; Mehringer, 1967b, 1967c; Quade, 1986.

377. **Mehringer, P. J., Jr.** 1973. Great Basin salt marshes and Quaternary environments. *In*, B.F. Perkins (ed.), Proceedings of the Fourth Annual Meeting of the American Association of Stratigraphic Palynologists. Geoscience and Man,7:122.
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Quaternary.
Abstract.

378. **Mehringer, P. J., Jr.** 1977. Great Basin late Quaternary environments and chronology. *In*, D.D. Fowler (ed.), Models and Great Basin prehistory: a symposium. Desert Research Institute Publications in the Social Sciences,12:113-167.
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379. **Mehringer, P. J., Jr.** 1985a. Late-Quaternary pollen records from the interior Pacific Northwest and northern Great Basin of the United States. *In*, V.M. Bryant, Jr. and R.G. Holloway (eds.), Pollen Records of Late-Quaternary North American Sediments. American Association of Stratigraphic

Palynologists, pp. 167-189.
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Quaternary.
Palynomorphs.

380. **Mehringer, P. J., Jr.** 1985b. Prehistoric distribution of western juniper. *In*, Proceedings of the Western Juniper Management Short Course, Bend, Oregon, October 15-16, 1984. Oregon State University Extension Service, Corvallis, pp. 1-9.
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Quaternary.

381. **Mehringer, P. J., Jr.** 1986. Prehistoric environments. *In*, Handbook of North American Indians. Vol, 11: Great Basin (W.L. D'Azevedo, volume editor; W.C. Sturtevant, general editor). Smithsonian Institution, Washington, pp. 31-50.
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Quaternary.

382. **Mehringer, P. J., Jr. and Ferguson, C.W.** 1969a. Pluvial occurrence of bristlecone pine (*Pinus aristata*) in a Mohave Desert mountain range. University of Arizona Geochronology Laboratories Interim Research Report,14:1-16.
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Quaternary.
Woodrat middens.
See also Mehringer and Ferguson, 1969b.

383. **Mehringer, P. J., Jr. and Ferguson, C.W.** 1969b. Pluvial occurrence of bristlecone pine (*Pinus aristata*) in a Mohave Desert mountain range. Journal of the Arizona Academy of Science,5(4):284-292.
*
Quaternary.
Woodrat middens.
See also Mehringer and Ferguson, 1969a.

384. **Mehringer, P. J., Jr. and Warren, C.N.** 1976. Marsh, dune and archaeological chronology, Ash Meadows, Amargosa Desert, Nevada. *In*, R. Elston (ed.), Holocene Environmental Change in the Great Basin. Nevada Archeological Survey Research Paper,6:120-150.
*
Quaternary.
Paynomorphs.
See also Sheppard and others, 1979.

385. **Mehringer, P. J., Jr. and Wigand, P.E.** 1987. Western juniper in the Holocene. *In*, R.L. Everett (compiler), Proceedings of the Pinyon-Juniper Conference, Reno, Nevada, January 13-16, 1986. U.S. Department of Agriculture Forest Service, Intermountain Research Station, General Technical Report

INT-215, pp. 109-119.
*
Quaternary.

386. **Meko, D. M. and Stockton, C.W.** 1985. Tree-ring inferences on historical changes in the level of Great Salt Lake. *In*, P.A. Kay and H.F. Diaz (eds.), Problems of and Prospects for Predicting Great Salt Lake Levels: Papers from a Conference Held in Salt Lake City, March 26-28, 1985. Center for Public Affairs and Administration, University of Utah, pp. 63-76.
*
Quaternary.
Tree rings.

387. **Merriam, C. W. and Daugherty, L.H.** 1938. Protophycean algae in the Ordovician of Nevada. Journal of the Washington Academy of Sciences,28(7):322-326.
*
Locality?, Roberts Creek Mtn. quadrangle, Eureka County.
Longitude 116/15/00, Latitude 39 /45/00.
Formation?, Middle Ordovician (Chazyan).
For geology see: Murphy, M.A., McKee, E.H., Winterer, E.L., Matti, J.C. and Dunham, J.B. 1978. Preliminary geologic map of the Roberts Creek Mtn. quadrangle, Nevada. U.S. Geological Survey Open-File Report, OF 78-376.
Algae.

388. **Meyer, H. W.** 1977. Quaternary pollen profile from Winnemucca Lake, Nevada. *In*, L.G. Quintero, F.S. Martinez and J. Garcia-Barcena (organizadores), Tercer Coloquio sobre Paleobotanica y Palinologia en Mexico, Programa y Resumenes de los Trabajos. Instituto Nacional de Antropologia e Historia, Mexico. (Unpaginated).
*
Locality?, Washoe County. Quaternary.
Abstract. Palynomorphs.

389. **Meyer, H. W.** 1992. Lapse rates and other variables applied to estimating paleoaltitudes from fossil floras. Palaeogeography, Palaeoclimatology, Palaeoecology,99(1 and 2):71-99.

390. **Mifflin, M. D. and Wheat, M.M.** 1979. Pluvial lakes and estimated pluvial climates of Nevada. Nevada Bureau of Mines and Geology Bulletin,94:1-57.
*
Quaternary.

391. **Mitchell, J. R.** 1981a. A wide variety of cutting materials between Coaldale and Gilbert, Nevada. Lapidary Journal,35(2):440-442.
*
Localities?, Esmeralda County.
Esmeralda Formation, middle Miocene.

For geology see: Moore, 1981a, 1981b; Stewart, 1989.
Wood.

392. **Mitchell, J. R.** 1981b. The Sump - an opportunity to collect in 'another world'. Gems and Minerals,529:34-38.
*
Locality? = UCMP 605, Volcanic Hills East quadrangle, Esmeralda County.
Longitude 118/00/00, Latitude 37 /52/30.
Unnamed unit, middle Miocene (Clarendonian) (11.7 Ma recalculated).
For geology see: Page, 1964.
Wood.
See also Anonymous, 1952; Page, 1964; Segerblom, 1966; Strong, 1978.

393. **Mitchell, J. R.** 1981c. Famous silver mine area still rich in treasure. Lost Treasure,6(5):48-50.
*
1) Locality?, Tonopah quadrangle, Nye County.
Longitude 117/07/30, Latitude 38/00/00.
Siebert Formation, middle Miocene.
For geology see: Bonham and Garside, 1979 (see especially pp. 66-69);
Kleinhampl, F.J. and Ziony, J.I. 1985. Geology of Northern Nye County, Nevada. Nevada Bureau of Mines and Geology, Bulletin 99A:1-172 (see especially pp. 136-137).
2) Locality?, Camp Douglas quadrangle, Mineral County.
Longitude 118/07/30, Latitude 38/15/00.
Unnamed unit, Neogene.
For geology see: Garside, L.J. 1979. Geology of the Camp Douglas quadrangle, Mineral County, Nevada. Nevada Bureau of Mines and Geology Open-File Report, OF 79-1.
Wood.
See also Garside, L.J. and Silberman, M.L. 1978. New K-Ar ages of volcanic and plutonic rocks from the Camp Douglas quadrangle, Mineral County, Nevada. Isochron/West, 22:29-32;
Sasser, 1985; Strong, 1967; 1985.

394. **Mitchell, J. R.** 1990. Virgin Valley opal. Rock & Gem,20(9):56-59, 78, 80.
*
Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

395. **Mitchell, J. R.** 1991a. The gifts of Gabbs. Rock & Gem,21(3):48-51.
*

1) Locality? (Site A), Mount Annie NE quadrangle, Nye County.
Longitude 118/00/00, Latitude 38/52/30. Miocene(?).
For geology see: Ekren, E.B. and Byers, F.M., Jr. 1986. Geologic map of the Mount Annie NE, Mount Annie, Ramsey Spring, and Mount Annie SE quadrangles, Mineral and Nye counties, Nevada. U.S. Geological Survey Miscellaneous Investigations Series Map, I-1579.
2) Locality? (Site B), Broken Hills quadrangle, Mineral County.
Longitude 118/00/00, Latitude 39/00/00. Miocene(?).
3) Locality? (Site C), Broken Hills quadrangle, Mineral County.
Longitude 118/00/00, Latitude 39/00/00. Miocene(?).
Wood.
See also Strong, 1972, 1978.

396. **Mitchell, J. R.** 1991b. North of Las Vegas. Rock & Gem,21(4):64-67, 98.
*

1) Locality? (Site A), Ralston quadrangle, Esmeralda County.
Longitude 117/07/30, Latitude 37/30/00. Miocene(?)
2) Locality? (Site B), Ralston quadrangle, Esmeralda County.
Longitude 117/07/30, Latitude 37/30/00. Miocene(?)
3) Locality? (Site C), Stonewall Pass quadrangle, Esmeralda County.
Longitude 117/07/30, Latitude 37/22/30. Miocene(?).
Wood.
See also Strong, 1968, 1978.

397. **Mitchell, J. R.** 1991c. Southwest of Virgin Valley. Rock & Gem,21(10):52-54, 84-85.
*

1) Locality? (site G =UCMP PA659), Hart Mountain quadrangle, Washoe County.
Longitude 119/30/00, Latitude 41/15/00.
High Rock sequence, middle Miocene (15.4 ± 0.5 Ma).
2) Locality? (site H), Chester Lyons Spring quadrangle, Washoe County.
Longitude 119/30/00, Latitude 41/07/30.
High Rock sequence, middle Miocene (15.4 ± 0.5 Ma).
For geology see: Bonham, 1969.
Wood.
See also Axelrod and Schorn, 1994.

398. **Mitchell, J. R.** 1991d. Gem trails of Nevada. Gem Guide Books Company, Baldwin Park, California.

*

Neogene.
Wood.
NOTE: A general guide to localities with gem quality materials, including opalized and permineralized wood.

399. **Moore, J. G.** 1969. Geology and mineral deposits of Lyon, Douglas and Ormsby counties, Nevada (with a section on Industrial Mineral Deposits by N.L. Archbold). Nevada Bureau of Mines and Geology Bulletin,75:1-45.

*

NOTE: Mentions impressions at the ZZ Sutro localities near Virginia City (p. 11), impressions at the ZZ Coal Valley localities south of Yerington (p. 13), and wood at ZZ Wilson Canyon wood (p. 13; see also Weight, 1951).

400. **Moore, S. W.** 1981a. Geology of part of the southern Monte Cristo Range, Esmeralda County, Nevada. Unpublished M.S. Thesis. San Jose State University, San Jose, California.

*

Locality?, Blair Junction quadrangle, Esmeralda County.
Longitude 117/45/00, Latitude 38 /00/00.
Esmeralda Formation, middle and late Miocene.
Thesis. Wood.
See also Mitchell, 1981a; Moore, 1981b; Stewart, 1989.

401. **Moore, S. W.** 1981b. Geology of part of the southern Monte Cristo Range, Esmeralda County, Nevada. U.S. Geological Survey Open-File Report, OF 81-710.

*

Locality?, Blair Junction quadrangle, Esmeralda County.
Longitude 117/45/00, Latitude 38 /00/00.
Esmeralda Formation, middle and late Miocene.
Wood.
See also Mitchell, 1981a; Moore, 1981a; Stewart, 1989.

402. **Morrison, R. B.** 1964. Lake Lahontan: geology of southern Carson Desert, Nevada. U.S. Geological Survey Professional Paper,401:1-156.

*

Quaternary.

403. **Morrison, R. B.** 1965. Quaternary geology of the Great Basin. *In*, H.E. Wright, Jr. and D.G. Frey (eds.), The Quaternary of the United States. Princeton University Press, Princeton, New Jersey, pp. 265-285.

*

Quaternary.

404. **Mozingo, H. N.** 1987. Shrubs of the Great Basin: A Natural History. University of Nevada Press, Reno - Las Vegas, Nevada, pp. 1-342.

405. **Murbarger, Nell.** 1953. Our largest petrified tree. Natural History,62(10):466-471.
*
Locality? = UCMP PA661, Butte Spring quadrangle, Washoe County.
Longitude 119/22/30, Latitude 41 /07/30.
High Rock sequence, middle Miocene.
For geology see: Bonham, 1969 (see especially p. 18, fig. 7).
Wood.
See also ZZ Lund Petrified Forest (trees *in situ*).
NOTE: This wood has been referred to the form genus *Sequoioxylon*, and considered most likely to represent the extant dawn redwood (*Metasequoia*). The many publications by Axelrod (see e.g., 1986b) indicate these large trees were more likely the Sierra redwood or bigtree (*Sequoiadendron*).

406. **Murbarger, Nell.** 1955. Opal miner of Rainbow Ridge. Desert Magazine,18(8):11-15.
*
Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

407. **Napton, L. K.** 1969. The lacustrine subsistence pattern in the desert west. *In*, Archaeological and paleobiological investigations in Lovelock Cave, Nevada. Kroeber Anthropological Society Papers, Special Publication,2:28-67.
*
Locality?, Lovelock Caves quadrangle, Churchill County.
Longitude 118/30/00, Latitude 39 /52/30.
Cave deposits (Lovelock Cave), Quaternary.
For geology see: Morrison, R.B. 1961. Lake Lahontan stratigraphy and history in the Carson Desert (Fallon) area, Nevada. *In*, Short Papers in the Geologic and Hydrologic Sciences, Articles 293-435. Geological Survey Research 1961. U.S. Geological Survey Professional Paper 424-D:111-114; Morrison, 1964.
See also Ambro, 1967; Cowan, 1967; Heizer, 1967; Heizer and Napton, 1970; Loud and Harrington, 1929; Napton, 1970; Napton and Heizer, 1970; Napton and Kelso, 1969.

408. **Napton, L. K.** 1970. Archaeological investigations in Lovelock Cave, Nevada. Unpublished Ph.D. Dissertation. University of California, Berkeley, California.
*
Locality?, Lovelock Caves quadrangle, Churchill County.
Longitude 118/30/00, Latitude 39 /52/30.

Cave deposits, Quaternary.
For geology see: Morrison, R.B. 1961. Lake Lahontan stratigraphy and history in the Carson Desert (Fallon) area, Nevada. *In*, Short Papers in the Geologic and Hydrologic Sciences, Articles 293-435. Geological Survey Research 1961. U.S. Geological Survey Professional Paper 424-D:111-114; Morrison, 1964.
See also Ambro, 1967; Cowan, 1967; Heizer, 1967; Heizer and Napton, 1970; Loud and Harrington, 1929; Napton, 1969; Napton and Heizer, 1970; Napton and Kelso, 1969.

409. **Napton, L. K. and Heizer, R.F.** 1970. Analysis of human coprolites from archaeological contexts, with primary reference to Lovelock Cave, Nevada. *In*, R.F. Heizer and L.K. Napton (eds.), Archaeology and the prehistoric Great Basin lacustrine subsistence regime as seen from Lovelock Cave, Nevada. Contributions of the University of California Archaeological Research Facility,10:87-130.
*
Locality?, Lovelock Caves quadrangle, Churchill County. Longitude 118/30/00, Latitude 39 /52/30.
Cave deposits (Lovelock Cave), Quaternary.
For geology see: Morrison, R.B. 1961. Lake Lahontan stratigraphy and history in the Carson Desert (Fallon) area, Nevada. *In*, Short Papers in the Geologic and Hydrologic Sciences, Articles 293-435. Geological Survey Research 1961. U.S. Geological Survey Professional Paper 424-D:111-114; Morrison, 1964.
See also Ambro, 1967; Cowan, 1967; Heizer, 1967; Heizer and Napton, 1970; Loud and Harrington, 1929; Napton, 1969, 1970; Napton and Kelso, 1969.

410. **Napton, L. K. and Kelso, G.K.** 1969. Preliminary palynological analysis of human coprolites from Lovelock Cave, Nevada. *In*, Archaeological and paleobiological investigations in Lovelock Cave, Nevada. Kroeber Anthropological Society Papers, Special Publication,2:19-27.
*
Locality?, Lovelock Caves quadrangle, Churchill County. Longitude 118/30/00, Latitude 39 /52/30.
Cave deposits (Lovelock Cave), Quaternary.
For geology see: Morrison, R.B. 1961. Lake Lahontan stratigraphy and history in the Carson Desert (Fallon) area, Nevada. *In*, Short Papers in the Geologic and Hydrologic Sciences, Articles 293-435. Geological Survey Research 1961. U.S. Geological Survey Professional Paper 424-D:111-114; Morrison, 1964.
Palynomorphs.

See also Ambro, 1967; Cowan, 1967; Heizer, 1967; Heizer and Napton, 1970; Loud and Harrington, 1929; Napton, 1969, 1970; Napton and Heizer, 1970.

411. **Nichols, R. A.** 1979a. Virgin Valley opals. Rock & Gem,9(4):52-53, 81-82.

*

Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

412. **Nichols, R. A.** 1979b. Opal mines of Nevada. Lapidary Journal,33(7):1638-1644.

*

Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

413. **Nowak, C. L.** 1991. Reconstruction of post-glacial vegetation and climate history in western Nevada: evidence from plant macrofossils in *Neotoma* middens. Unpublished M.S. thesis. University of Nevada, Reno, Nevada.

*

Quaternary.
Thesis. Woodrat middens.

414. **Okuno, Haruo.** 1956. Electron-microscopic fine structure of fossil diatoms. Part IV. Transactions and Proceedings of the Palaeontological Society of Japan, New Series,21:133-139.

*

Locality?, Churchill County [see erratum in Okuno (1958), where locality is placed in Churchill, not Esmeralda, County].
Diatoms.
NOTE: Stated to come from the quarry near Basalt, Nevada, but see erratum in Okuno (1958): corrects locality for *Navicula maculata* var. *gigantea* Okuno *var. nov.* from near Basalt, to a locality in upper Miocene or lower Pliocene rocks 15 miles south of Fallon in Churchill County.

415. **Okuno, Haruo.** 1958. Electron-microscopic fine structure of fossil diatoms. Part V. Observation on some diatoms found in the "Celatoms". Transactions and Proceedings of the Palaeontological Society of Japan, New Series,31:237-242.

*

Locality?, Derby Dam quadrangle, Storey County.
Longitude 119/22/30, Latitude 39 /30/00.
Coal Valley Formation, middle Miocene.

For geology see: Rose, 1969 (see especially pp. 11-12).
Diatoms.
NOTE: See this article p. 242, erratum; corrects locality for *Navicula maculata* var. *gigantea* Okuno *var. nov.* of Okuno (1956) from near Basalt, to upper Miocene or lower Pliocene rocks 15 miles south of Fallon.
NOTE: Axelrod (1986c, Figure 86, p. 631) states that the Celetom Quarry is in the basal part of the Coal Valley Formation and is dated at ca. 12.0 Ma.

416. **Okuno, Haruo.** 1959. Electron-microscopic fine structure of fossil diatoms. Part VI. Stereoscopic observation. Transactions and Proceedings of the Palaeontological Society of Japan, New Series,36:185-191.
*
Churchill County.
Diatoms.

417. **Opler, P. A.** 1973. Fossil lepidopterous leaf mines demonstrate the age of some insect-plant relationships. Science,179(4080):1321-1323.
*
Locality UCMP PA99, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Gilbert Andesite (shale member), middle Miocene.
For general geology see: Schorn and others, 1989.
Impressions (insect leaf mines).
See also Wolfe, 1964.
NOTE: In Stewart Valley, the plant-bearing shales, interbedded in the andesites referred to the Gilbert Andesite, are essentially equivalent to the McLean Formation as recognized in the Gilbert area (J.H. Stewart, oral comm., 1986).

418. **Orr, P. C.** 1956. Pleistocene man in Fishbone Cave, Pershing County, Nevada. The Nevada State Museum Department of Archeology Bulletin,2:1-20.
*
Locality?, Pershing County.
Cave deposits (Fishbone Cave), Quaternary.
See also Sears and Roosma, 1961; Thompson and others, 1987.

419. **Orsen, D. A.** 1977. Correlation of selected Nevada lignite deposits by pollen analysis. Unpublished M.S. Thesis. University of Nevada, Reno, Nevada.
*
1a) Locality?, Verdi quadrangle, Washoe County.
Longitude 119/52/30, Latitude 39/30/00.
Sandstone of Hunter Creek, middle Miocene.
1b) Locality?, Dogskin Mtn. quadrangle, Washoe County.

Longitude 119/45/00, Latitude 39/52/30.
Sandstone of Hunter Creek, middle Miocene.
2) Locality? = UCMP Locality P3949, Elko West quadrangle, Elko County.
Longitude 115/45/00, Latitude 40/45/00.
Elko Formation, late Eocene.
3) Locality? = UCMP Locality P3917, Ninemile Ranch quadrangle, Lyon County.
Longitude 118/52/30, Latitude 38/22/30.
Coal Valley Formation, middle Miocene.
4) Locality?, Rhyolite Ridge NE quadrangle, Esmeralda County.
Longitude 117/45/00, Latitude 37/52/30.
Esmeralda Formation, late Miocene.
Thesis. Palynomorphs.

420. **Page, V. M.** 1964. *Lyonothamnoxylon* from the lower Pliocene of western Nevada. Madroño,17(8):257-266.
*
Locality? = UCMP 605, Volcanic Hills East quadrangle, Esmeralda County.
Longitude 118/00/00, Latitude 37 /52/30.
Unnamed unit, middle Miocene (Clarendonian; 11.7 Ma recalculated).
For geology see: Robinson, P.T. and Crowder, D.F. 1973. Geologic map of the Davis Mountain quadrangle, Esmeralda and Mineral counties, Nevada, and Mono County, California. U.S. Geological Survey Geologic Quadrangle Map, GQ-1078;
Suthard, J.A. 1966. Stratigraphy and paleontology in Fish Lake Valley, Esmeralda County, Nevada. Unpublished M.S. Thesis. Department of Geology, University of California Riverside, Riverside, California.
Wood.
See also Anonymous, 1952; Mitchell, 1981b; Segerblom, 1966; Strong, 1978;
Clark, J.B., Dawson, M.R. and Wood, A.E. 1964. Fossil mammals from the lower Pliocene of Fish Lake Valley, Nevada. Bulletin of the Museum of Comparative Zoology, Harvard University, 131(2):27-63.
NOTE: 11.7 Ma (recalculated from date given in Evernden, J.F., Savage, D.E., Curtis, G.H. and James, G.T. 1964. Potassium-Argon dates and the Cenozoic mammalian chronology of North America. American Journal of Science, 262(2):145-198.

421. **Page, V. M.** 1993. Anatomical variation in the wood of *Robinia pseudoacacia* L. and the identity of Miocene fossil woods from southwestern United States. Journal of the International

Association of Wood Anatomists,14(3):299-314.
*
UCMP Locality PA516, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene (Barstovian).
For general geology see: Schorn and others, 1989.
Wood.

422. **Palmer, W. S.** 1935a. Gold in petrified wood. Rocks and Minerals,10(7):102-103.
*
Locality?, Burnt Cabin Summit quadrangle, Churchill County.
Longitude 117/45/00, Latitude 39 /00/00.
Unnamed unit, Neogene.
Wood.
See also Gianella, 1942; Gianella and Wheeler, 1937; Palmer, 1935b.

423. **Palmer, W. S.** 1935b. Gold in petrified wood. Mining and Metallurgy,16(344):335.
*
Locality?, Burnt Cabin Summit quadrangle, Churchill County.
Longitude 117/45/00, Latitude 39 /00/00.
Unnamed unit, Neogene.
Abstract. Wood.
See also Gianella, 1942; Gianella and Wheeler, 1937; Palmer, 1935a.

424. **Pendleton, L. S. A.** 1985. Material culture: Artifacts of wood. *In*, D.H. Thomas (ed.), The Archaeology of Hidden Cave, Nevada. Anthropological Papers of the American Museum of Natural History,61(1):251-261.
*
Locality?, Grimes Point quadrangle, Churchill County.
Longitude 118/37/30, Latitude 39 /22/30.
Cave deposits (Hidden Cave), Quaternary.
See also Goodman, 1985; Grayson, 1984; Wigand and Mehringer, 1985.

425. **Platen, Paul.** 1908. Untersuchungen fossiler Hölzer aus dem Westen der Vereinigten Staaten von Nordamerika. Sitzungsberichte der Naturforschenden Gesellschaft zu Leipzig,34:1-155, 161-164.
*
Neogene.
Wood.
NOTE: See p. 95 (*Cupressinoxylon*) locality unknown; p. 97 (*Taxodioxylon*) Big Smoky Valley, near Austin.

426. **Poole, F. G., Houser, F.N. and Orkild, P.P.** 1961. Eleana Formation of Nevada Test Site and vicinity, Nye County, Nevada. U.S. Geological Survey Professional Paper,424-D:104-111.
*
Tippipah Limestone, Carboniferous.
?Algae.

427. **Povey, D. A. R.** 1994. Palaeobotanical determination of Tertiary palaeoelevations in the northern Basin and Range, western U.S. Geological Society of America Abstracts with Programs,26(2):82.
*
Abstract. Impressions.

428. **Quade, Jay.** 1986. Late Quaternary environmental changes in the upper Las Vegas Valley, Nevada. Quaternary Research,26(3):340-357.
*
1) Locality?, Corn Creek Springs NW quadrangle, Longitude 115/22/30, Latitude 36/22/30.
2) Locality?, Gass Peak SW quadrangle, Longitude 115/07/30, Latitude 36/15/00. Clark County.
Unnamed unit, Quaternary.
For geology see: (Locality 2, Tule Springs) Haynes, C.V. 1967. Quaternary geology of the Tule Springs area, Clark County, Nevada. Nevada State Museum Anthropological Papers, 13(1):15-104.
Palynomorphs, woodrat middens.
See also McVickar and Spaulding, 1993; Mehringer, 1967b, 1967c, 1968.

429. **Quade, Jay and Pratt, W.L.** 1989. Late Wisconsin groundwater discharge environments of the southwestern Indian Springs Valley, southern Nevada. Quaternary Research,31(3):351-370.
*
Quaternary.
Wood.

430. **Ransom, J. E.** 1955. Petrified Forest Trails. A Guide to Petrified Forests of America. A Handbook for the Collector of Petrified Woods. Mineralogist Publishing Company, Portland, Oregon.
*
Miocene.
Wood.
NOTE: Includes brief discussions of Lund Petrified Forest (see also Murbarger, 1953), Wilson Canyon (see also Weight, 1951), Wilsons Camp (see also Anonymous, 1952; Walker, 1936) and large tree south of Coaldale (see also Boak, 1934).

431. **Ransom, K. L. and Hansen, J.B.** 1990. Off-shelf Devonian sediments, northern Simpson Park Range. *In*, D.M.H. Flanigan, L.J. Garside, and M. Hansen (eds.), Oil fields and geology of the Pine Valley, Eureka County area, Nevada. Nevada Petroleum Society 1990 Fieldtrip Guidebook, pp. 17-18.
*
Locality?, Eureka County. Devonian.
Palynomorphs.

432. **Raven, P. H. and Axelrod, D.I.** 1978. Origin and relationships of the California flora. University of California Publications in Botany,72:1-134.
*
NOTE: See especially pp. 9-43.

433. **Raymond, R. Jr.** 1976. Early Cambrian shallow subtidal environment - time and place for taxonomic expansion. American Association of Petroleum Geologists Bulletin,60(4):712.
*
Locality?,
Deep Springs and Poleta intervals, Early Cambrian.
Abstract. Algae.

434. **Read, C. B. and Ash, S.R.** 1961. Stratigraphic significance of the Cretaceous fern *Tempskya* in the western conterminous United States. U.S. Geological Survey Professional Paper,424-D:250-254.
*
Locality?, Valley of Fire East quadrangle, Clark County.
Longitude 114/22/30, Latitude 36 /22/30.
Overton Fanglomerate, Early Cretaceous.
Wood.
See also Read and Brown, 1937.

435. **Read, C. B. and Brown, R.W.** 1937. American Cretaceous ferns of the genus *Tempskya*. U.S. Geological Survey Professional Paper,186-F:105-131.
*
Locality?, Valley of Fire East quadrangle, Clark County.
Longitude 114/22/30, Latitude 36 /22/30.
Overton Fanglomerate, Early Cretaceous.
Wood.
See also Read and Ash, 1961.

436. **Reveal, J. L.** 1979. Biogeography of the intermountain region: a speculative appraisal. Mentzelia,4:1-92.
*
Quaternary.

437. **Reynolds, R. E. , Mead, J.I. and Reynolds R.L.** 1991. A Rancholabrean fauna from the Las Vegas Formation, North

Las Vegas, Nevada. *In,* Crossing the Borders: Quaternary Studies in Eastern California and Southwestern Nevada. San Bernardino County Museum Association Special Publication, 1991 Mojave Desert Quaternary Research Center Symposium, pp. 140-146.

*

Locality SBCM 2.006.001, Clark County.
Las Vegas Formation, Quaternary.

438. **Rhode, David.** 1994 *in press.* Plant macrofossil assemblages from Alta Toquima. *In,* D.H. Thomas (ed.), The archaeology of Monitor Valley. 4. Alta Toquima and the Mt. Jefferson complex. Anthropological Papers of the American Museum of Natural History.

*

Quaternary.

439. **Rhode, David and Thomas, D.H.** 1983. Flotation analysis of selected hearths. *In,* D.H. Thomas (ed.), The archaeology of Monitor Valley. 2. Gatecliff Shelter. Anthropological Papers of the American Museum of Natural History,59(1):151-157.

*

Locality?, Wildcat Peak quadrangle, Nye County.
Longitude 116/45/00, Latitude 39 /00/00.
Cave deposits (Gatecliff Shelter), Quaternary.
See also Grayson, 1981; Kautz and Thomas, 1972; Lanner, 1983; Thompson and Hattori, 1983; Thompson and Kautz, 1983.
For background see Thomas, D.H. 1983. The archaeology of Monitor Valley. 1. Epistemology. Anthropological Papers of the American Museum of Natural History, 58(1):1-194.

440. **Rich, Mark.** 1962. Mississippian stigmarian plant fossil from southern Nevada. Journal of Paleontology,36(2):347-349.

*

Locality?, Charleston Peak NE quadrangle, Clark County.
Longitude 115/30/00, Latitude 36 /22/30.
Bird Spring Formation, Late Mississippian.
Impressions.

441. **Robbins, E. I., D'Agostino, J.P. and Hass, J.L., Jr.** 1987. Palynological assessment of gold-bearing carbonaceous limestones of the Hanson Creek Formation (Ord.-Sil.) in the Jerritt Canyon mining district, Elko County, Nevada. Palynology,11:250-251.

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Locality?, Elko County.
Hanson Creek Formation, Ordovician and Silurian.
Abstract. Palynomorphs.

442. **Robbins, E. I. , D'Agostino, J.P., Hass, J.L., Jr., Larson, R.R. and Dulong, F.T.** 1990. Palynological assessment of organic tissues and metallic minerals in the Jerritt Canyon gold deposist, Nevada. *In*, E.I. Robbins (ed.), Palynology of ore deposits. Ore Geology Reviews,5(5 and 6):399-422.
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Locality?, Elko County.
Hanson Creek Formation and Roberts Mountains Formation, Ordovician, Silurian and Devonian.
Palynomorphs.

443. **Roberts, R. J. , Montgomery, K.M. and Lehner, R.E.** 1967. Geology and Mineral Resources of Eureka County, Nevada. Nevada Bureau of Mines and Geology Bulletin,64:1-152.
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Eureka County.
NOTE: Mentions fossil plants from a variety of localities and ages in Eureka County.

444. **Robertson, Dorothy.** 1981. Tonopah wood and agate. Rock & Gem,11(7):22-25.
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Locality?, San Antonio Ranch quadrangle, Nye County.
Longitude 117/15/00, Latitude 38 /22/30.
Unnamed unit, Neogene.
Wood.

445. **Robichaux, R. H. and Taylor, D.W.** 1977. Vegetation-analysis techniques applied to late Tertiary fossil floras from the western United States. Journal of Ecology,65(2):643-660.

446. **Rose, R. L.** 1969. Geology of parts of the Wadsworth and Churchill Butte quadrangles, Nevada. Nevada Bureau of Mines Bulletin,71:1-27.

447. **Roust, N. L.** 1967. Preliminary examination of prehistoric human coprolites from four western Nevada caves. Reports of the University of California Archaeological Survey,70:49-88.
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Quaternary.

448. **Rowland, S. M.** 1994. Atmospheric CO_2 and the rise and fall of metazoan reefs in the Cambrian. Geological Society of America Abstracts with Programs,26(2):86.
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Cambrian.
Abstract. Stromatolites.

449. **Sasser, C. W.** 1985. Rockhounding in wild horse country. Lapidary Journal,39(4):31-37.
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Locality?, Tonopah quadrangle, Nye County.
Longitude 117/07/30, Latitude 38 /00/00.

Siebert Formation, middle Miocene.
For geology see: Bonham and Garside, 1979 (see especially pp. 67-69);
Kleinhampl, F.J. and Ziony, J.I. 1985. Geology of Northern Nye County, Nevada. Nevada Bureau of Mines and Geology Bulletin, 99A:1-172, (see especially pp. 136-137).
Wood.
See also Mitchell, 1981c; Strong, 1967.

450. **Schnabel, Andrew and Hamrick, J.L. and Wells, P.V.** 1993. Influence of Quaternary history on the population genetic structure of Douglas-fir (*Pseudotsuga menziesii*) in the Great Basin. Canadian Journal of Forest Research,23(9):1900-1906.
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Quaternary.
Woodrat middens.

451. **Schorn, H. E.** 1966. Revision of the fossil species of *Mahonia* from North America. Unpublished M.A. Thesis. University of California, Berkeley, California.
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Thesis. Impressions.

452. **Schorn, H. E.** 1984. Palynology of the late Middle Miocene sequence, Stewart Valley, Mineral County, Nevada. Palynology,8:259-260.
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Localities UCMP ZA14-ZA67, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Gilbert Andesite (shale member) and Savage Canyon Formation, middle Miocene.
Abstract. Palynomorphs.

453. **Schorn, H. E.** 1986. Vegetation and climate ca. 17-12 Ma in the Great Basin of western Nevada: data from Stewart Valley. Geological Society of America Abstracts with Programs,18(5):410.
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Locality?, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Gilbert Andesite (shale member) and Savage Canyon Formation, middle Miocene.
Abstract. Impressions.

454. **Schorn, H. E. and Gooch, N.L.** 1994. *Amelanchier hawkinsae sp. nov.* (Rosaceae, *Maloideae*) from the middle Miocene of Stewart Valley, Nevada, and a review of the genus in the Nevada Neogene. PaleoBios,16(3):1-17.
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Locality UCMP PA237, Stewart Spring quadrangle, Mineral

County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene.
For general geology see: Schorn and others, 1989.
Impressions.

455. **Schorn, H. E. and Shelton, W.H.** 1991. A seed cone of *Pinus* sp. (Subsect. *Oocarpae*) from the late Miocene of Mickey Wash area, Lyon County, Nevada. PaleoBios,13(51):1-2.
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UCMP Locality PA628, Mount Etna quadrangle, Lyon County.
Longitude 119/07/30, Latitude 38 /37/30.
Aldrich Station Formation, middle Miocene.
For geology see: Stewart, J.H. and Reynolds, M.W. 1987. Geologic map of the Pine Grove Hills quadrangle, Lyon County, Nevada. U.S. Geological Survey Open-File Report, OF 87-658.
Gilbert, C.M. and Reynolds, M.W. 1973. Character and chronology of basin development, western margin of the Basin and Range province. Geological Society of America Bulletin, 84(8):2489-2510.
Permineralized cone.
NOTE: Title incorrectly states "late Miocene"; should read "later Miocene".

456. **Schorn, H. E. , Scudder, H.I., Savage, D.E. and Firby, J.R.** 1989. General stratigraphy and paleontology of the Miocene continental sequence in Stewart Valley, Mineral County, Nevada, U.S.A. *In,* G. Liu, R. Tsuchi and Q. Lin (eds.), Proceedings of International Symposium on Pacific Neogene Continental and Marine Events. National Working Group of China for IGCP-246. Nanjing University Press, Nanjing, June, 1989, pp. 157-173.
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NOTE: See pp.167-169.

457. **Schubert, J. K. and Bottjer, D.J.** 1989a. Stromatolite beds from Lower Triassic Virgin Formation, Spring Mountains, Nevada. American Association of Petroleum Geologists Bulletin,73(4):551.
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Locality?, Clark County.
Virgin Formation, Early Triassic.
Abstract. Stromatolites.

458. **Schubert, J. K. and Bottjer, D.J.** 1989b. Stromatolite beds from the Lower Triassic Virgin Formation, Spring Mountains, Nevada. *In,* J.D. Cooper (ed.), Cavalcade of Carbonates. Field Trip Guidebook - Pacific Section, Society of Economic Paleontologists and Mineralogists,Book 61:127-133.

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Locality?, Lost Cabin Spring quadrangle, Clark County.
Longitude 115/37/30, Latitude 36 /00/00.
Virgin Formation, Early Triassic.
Stromatolites.

459. **Schubert, J. K. and Bottjer, D.J.** 1992. Early Triassic stromatolites as post-mass extinction disaster forms. Geology,20(10):883-886.

*

Locality?, Clark County.
Moenkopi Formation, Early Triassic.
Stromatolites.

460. **Sears, P. B. and Roosma, Aino.** 1961. A climatic sequence from two Nevada caves. American Journal of Science,259(9):669-678.

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Locality?, Pershing County.
Cave deposits (Fishbone and Guano caves), Quaternary.
Palynomorphs.
NOTE: North end of Winnemucca Lake, elevation 4060 feet
See also Orr, 1956; Thompson and others, 1987.

461. **Segerblom, Cliff.** 1966. Detour to Nevada's ancient fossil forest. Sunset Magazine,137(5):50.

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Locality? = UCMP 605, Volcanic Hills East quadrangle, Esmeralda County.
Longitude 118/00/00, Latitude 37 /52/30.
Unnamed unit, middle Miocene (Clarendonian; 11.7 Ma recalculated).
For geology see: Page, 1964.
Wood.
See also Anonymous, 1952; Mitchell, 1981b; Page, 1964; Strong, 1978.

462. **Seiple, Eric.** 1986. Stewart Valley fossils. Rock & Gem,16(2):8-11.

*

Locality?, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /39/00.
Savage Canyon Formation, middle Miocene (Barstovian).
Impressions, wood.
See also Wolfe, 1964.

463. **Seiple, Eric.** 1987. Fossil leaves at Verdi. Rock & Gem,17(5):64-66.

*

Locality? = UCMP 102 and 2751, Verdi quadrangle, Washoe County.
Longitude 119/52/30, Latitude 39 /30/00.
Sandstone of Hunter Creek, late Miocene (5.85 Ma recalculated).

For geology see: Axelrod, 1958a.
Impressions.
See also Axelrod, 1958a.

464. **Seiple, Eric.** 1988a. Fossil plants at Aldrich Hill. Rock & Gem,18(2):68-71.
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Locality? = UCMP P3916, Ninemile Ranch quadrangle, Mineral County.
Longitude 118/52/30, Latitude 38 /22/30.
Aldrich Station Formation, middle Miocene.
For geology see: Axelrod, 1956.
Impressions.
See also Axelrod, 1956.

465. **Seiple, Eric.** 1988b. Buffalo Canyon opals. Rock & Gem,18(9):22-26.
*
Locality? = UCMP PA291, Buffalo Summit quadrangle, Churchill County.
Longitude 117/45/00, Latitude 39 /07/30.
Buffalo Canyon Formation, middle Miocene.
For geology see: Axelrod, 1991.
Impressions.
See also Axelrod, 1991; Weight, 1952.

466. **Seiple, Eric.** 1989. Comstock fossil plants. Rock & Gem,19(8):68-71.
*
Locality? = UCMP P3526, Chalk Hills quadrangle, Storey County.
Longitude 119/30/00, Latitude 39 /22/30.
Coal Valley Formation, middle Miocene (12.5 Ma).
For geology see: Bonham, H.F., Jr. and Bell, J.W. 1993. Geologic map, Steamboat quadrangle. Nevada Bureau of Mines and Geology Map, 4Fg;
Thompson, G.A. 1956. Geology of the Virginia City quadrangle, Nevada. U.S. Geological Survey Bulletin, 1042-C:45-77.
Impressions.
See also Axelrod, 1962a.

467. **Sharp, R. P.** 1939. The Miocene Humboldt Formation in northeastern Nevada. The Journal of Geology,47(2):133-160.
*
Locality UCMP 22609, Elko West quadrangle, Elko County.
Longitude 115/45/00, Latitude 40 /45/00.
Elko Formation, late Eocene.
Impressions.
NOTE: See also ZZ Elko Catlin Oil Shale Mine.

468. **Shedenhelm, W. R. C.** 1973. Treasures on Rainbow Ridge. Rock & Gem,3(10):62-65.
*
Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

469. **Sheppard, J. C., Ali, S.Y. and Mehringer, P.J., Jr.** 1979. Radiocarbon dating of organic components of sediments and peats. *In*, R. Berger and H.E. Suess (eds.), Radiocarbon Dating: Proceedings of the Ninth International Conference, Los Angeles and La Jolla, 1976. University of California Press, Berkeley and Los Angeles, pp. 284-305.
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Quaternary.
See also Mehringer and Warren, 1976.

470. **Siegel, R. D.** 1983. Paleoclimatic significance of D/H and $^{13}C/^{12}C$ ratios in Pleistocene and Holocene wood. Unpublished M.S. Thesis. University of Arizona, Tucson, Arizona.
*
Quaternary.
Thesis. Wood.
See also Long and others, 1984.

471. **Simms, S. R.** 1985. Pine nut use in three Great Basin cases: data, theory, and a fragmentary material record. Journal of California and Great Basin Anthropology,7(2):166-175.
*
Quaternary.

472. **Sleeper, E. L.** 1968. A new fossil weevil from Nevada (Coleoptera: Curculionidae). Bulletin of the Southern California Academy of Sciences,67(3):196-198.
*
Locality?, Hazen quadrangle, Lyon County.
Longitude 119/00/00, Latitude 39 /30/00.
Truckee Formation, late Miocene (late Clarendonian).
Wood.
NOTE: Weevil preserved in place in a burrow in a fossilized pine branch.
See also MacDonald, J.R. and Pelletier, W.J. 1958. The Pliocene mammalian faunas of Nevada, U.S.A. Congreso Geologico Internacional, 20th Sesión, Ciudad de México, Sección 7, Paleontología, Taxonomía y Evolución, pp. 365-388; Strong, 1966.

473. **Smedman, Gunilla.** 1969. An investigation of the diatoms from four Tertiary lake bed deposits in western Nevada.

PaleoBios,9:1-16.
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1) Locality? (Coal Valley), Ninemile Ranch quadrangle, Lyon County.
Longitude 118/52/30, Latitude 38/22/30
Coal Valley Formation, late Miocene.
For geology see: Axelrod, 1956.
Diatoms.
See also Axelrod, 1956.
2) Locality? (Buffalo Canyon), Buffalo Summit quadrangle, Churchill County.
Longitude 117/45/00, Latitude 39/07/30.
Buffalo Canyon Formation, middle Miocene.
For geology see: Axelrod, 1991.
Diatoms.
See also Axelrod, 1991; Krebs and others, 1987.
3) Locality? (Ione Road), Buffalo Summit quadrangle, Churchill County.
Longitude 117/45/00, Latitude 39/07/30.
Buffalo Canyon Formation, middle Miocene.
For geology see: Axelrod, 1991.
Diatoms.
See also Axelrod, 1991; Krebs and others, 1987.
4) Locality? (Diatomite Ridge), Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38/30/00.
Savage Canyon Formation, middle Miocene (Barstovian).
For geology see: Schorn and others, 1989.
Diatoms.
See also Krebs and others, 1987; Starratt 1986a, 1987a, 1987b.

474. **Smith, J. F. , Jr. and Ketner, K.B.** 1976. Stratigraphy of post-Paleozoic rocks and summary of resources in the Carlin-Pinon Range area, Nevada. U.S. Geological Survey Professional Paper,867-B:1-48.
*
1) Locality USNM 9930, Bullion quadrangle, Elko County.
Longitude 115/52/30, Latitude 40/30/00.
Elko Fomation, late Eocene (44.4 ± 0.4 Ma recalculated).
2) Locality?, East of Bailey Mtn. quadrangle, Elko County.
Longitude 115/45/00, Latitude 40/15/00.
Elko Fomation, late Eocene (44.4 ± 0.4 Ma recalculated).,
For geology see: this reference.
Impressions.
NOTE: See p. 22; both are small collections of 3-5 specimens.

475. **Spaulding, W. G.** 1974a. Pollen analysis of fossil dung of *Ovis canadensis* from southern Nevada. Unpublished M.S. Thesis.

University of Arizona, Tucson, Arizona.
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Locality?, Clark County. Quaternary.
Thesis. Palynomorphs.

476. **Spaulding, W. G.** 1974b. Dynamics of late Pleistocene vegetation change in southern Nevada. *In*, Proceedings of the 18th Annual Meeting of the Arizona Academy of Science, April 19-20, 1974, Flagstaff, Arizona. Journal of the Arizona Academy of Science,9 (proceedings supplement):19.
*
Quaternary.
Abstract. Woodrat middens.

477. **Spaulding, W. G.** 1976a. Southwestern montane communities during the late Pleistocene. Bulletin of the Eclogical Society of America,57(1):9.
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Quaternary.
Abstract.

478. **Spaulding, W. G.** 1976b. Late Quaternary vegetation change in the Sheep Range, Clark County, Nevada. American Quaternary Association, Abstracts of the Fourth Biennial Meeting, October 9-10, 1976, pp. 160-161.
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Locality?, Clark County. Quaternary.
Abstract. Palynomorphs.

479. **Spaulding, W. G.** 1977. Late Quaternary vegetational change in the Sheep Range, southern Nevada. Journal of the Arizona Academy of Science,12(1):3-8.
*
Locality?, Clark County. Quaternary.
Woodrat middens.

480. **Spaulding, W. G.** 1978. The changing vegetation of a southern Nevada mountain range. American Quaternary Association, Abstracts of the Fifth Biennial Meeting, September 2-4, 1978, p. 177.
*
Locality?, Clark County. Quaternary.
Abstract. Palynomorphs.

481. **Spaulding, W. G.** 1980a. Synecology and the late Quaternary fossil record. Bulletin of the Ecological Society of America,61(2):119-120.
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Quaternary.
Abstract.

482. **Spaulding, W. G.** 1980b. Use of plant fossils to interpret Pleistocene and Holocene climates and hydrologic conditions.

In, Geological Survey Research 1980. U.S. Geological Survey Professional Paper,1175:281.
*

Quaternary.

483. **Spaulding, W. G.** 1981. The late Quaternary vegetation of a southern Nevada mountain range. Unpublished Ph.D. Dissertation. University of Arizona, Tucson, Arizona.
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Locality?, Clark County. Quaternary.
Dissertation.

484. **Spaulding, W. G.** 1983a. Late Wisconsin macrofossil records of desert vegetation in the American Southwest. Quaternary Research,19(2):256-264.
*

Quaternary.

485. **Spaulding, W. G.** 1983b. Vegetation and climates of the last 45,000 years in the vicinity of the Nevada Test Site, south-central Nevada. U.S. Geological Survey Open-File Report, OF 83-535.
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Quaternary.

486. **Spaulding, W. G.** 1984a. The last glacial-interglacial climatic cycle: its effects on woodlands and forests in the America west. *In*, R.M. Lanner (ed.), Proceedings of the Eighth North American Forest Biology Workshop. Utah State University, pp. 42-69.
*

Quaternary.

487. **Spaulding, W. G.** 1984b. Paleoecological indicators of seasonal climatic variations in the American west since 18,000 B.P. American Quaternary Association, Abstracts of the Eighth Biennial Meeting, 13-15 August, pp. 121-123.
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Quaternary.
Abstract.

488. **Spaulding, W. G.** 1985a. Ice-age desert in the southern Great Basin. Current Research in the Pleistocene,2:83-85.
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Quaternary.

489. **Spaulding, W. G.** 1985b. Vegetation and climates of the last 45,000 years in the vicinity of the Nevada Test Site, south-central Nevada. U.S. Geological Survey Professional Paper,1329:1-83.
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Quaternary.

490. **Spaulding, W. G.** 1990a. Packrat midden evidence of environmental conditions at 10,680 ± 160 yr B.P.: southern Great Basin and northern Sonoran Desert. Geological Society of America Abstracts with Programs,22(3):85.
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Quaternary.
Abstract. Woodrat middens.

491. **Spaulding, W. G.** 1990b. Vegetation dynamics during the last deglaciation, southeastern Great Basin, U.S.A. Quaternary Research,33(2):188-203.
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Quaternary.

492. **Spaulding, W. G.** 1990c. Comparison of pollen and macrofossil based reconstructions of late Quaternary vegetation in western North America. Review of Palaeobotany and Palynology,64(1-4):359-366.
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Quaternary.

493. **Spaulding, W. G.** 1990d. Environments of the last 50,000 years in the vicinity of Yucca Mountain, central-southern Nevada. High-level Radioactive Waste Management, Volume 2. The American Nuclear Society Inc., La Grange Park, Illinois, and The American Society of Civil Engineers, New York, pp. 1251-1258.
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Quaternary.
Woodrat middens.

494. **Spaulding, W. G.** 1990e. Vegetational and climatic development of the Mojave Desert: the last glacial maximum to the present. *In*, J.L. Betancourt, T.R. Van Devender and P.S. Martin (eds.), Packrat Middens: the Last 40,000 Years of Biotic Change. University of Arizona Press, Tucson, Arizona, pp. 166-199.
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Quaternary.
Woodrat middens.

495. **Spaulding, W. G.** 1991a. Pluvial climatic episodes in North America and North Africa: types and correlation with global climate. Palaeogeography, Palaeoclimatology, Palaeoecology,84(1-4):217-227.
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Quaternary.

496. **Spaulding, W. G.** 1991b. A brief overview of the late Quaternary paleoecology in the Upper Las Vegas Valley and the Amargosa Desert, Nevada. *In*, Crossing the Borders: Quaternary Studies in Eastern California and Southwestern Nevada. San Bernardino County Museum Association Special Publication,

1991 Mojave Desert Quaternary Research Center Symposium, pp. 147-150.
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Quaternary.
Palynomorphs, woodrat middens.

497. **Spaulding, W. G.** 1991c. A middle Holocene vegetation record from the Mojave Desert of North America and its paleoclimatic significance. Quaternary Research,35(3):427-437.
*

Quaternary.

498. **Spaulding, W. G.** 1992a. The effects of pluvial climates in the vicinity of Yucca Mountain: a summary. *In*, Ground Water at Yucca Mountain. How High Can it Rise? Final Report of the Panel on Coupled Hydrologic/Tectonic/Hydrothermal Systems at Yucca Mountain. National Academy Press, pp. 190-211.
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Quaternary.

499. **Spaulding, W. G.** 1992b. Packrat middens: a novel information source on repository stability. Nuclear Engineering International,37(459):27, 30.
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Quaternary.
Woodrat middens.

500. **Spaulding, W. G.** 1994. Mid-postglacial environments of the Mojave Desert: understanding the effects of climatic warming. *In*, J. Reynolds (compiler), Abstracts from Proceedings, the 1994 Desert Research Symposium. San Bernardino County Museum Association Quarterly,41(3):29-30.
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Quaternary.
Abstract.

501. **Spaulding, W. G. and Graumlich, L.J.** 1986. The last pluvial climatic episodes in the deserts of southwestern North America. Nature,320(6061):441-444.
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Quaternary.

502. **Spaulding, W. G. , Betancourt, J.L., Croft, L.K. and Cole, K.L.** 1990. Packrat middens: their composition and methods of analysis. *In*, J.L. Betancourt, T.R. Van Devender and P.S. Martin (eds.), Packrat Middens: the Last 40,000 Years of Biotic Change. University of Arizona Press, Tucson, Arizona, pp. 59-84.
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Quaternary.
Woodrat middens.

503. **Spaulding, W. G. , Leopold, E.B. and Van Devender, T.R.** 1983. Late Wisconsin paleoecology of the American southwest. *In*, H.E. Wright, Jr. (ed.), Late Quaternary environments of the United States. Volume 1, S.C. Porter (ed.), The late Pleistocene. University of Minnesota Press, Minneapolis, Minnesota, pp. 259-293.
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Quaternary.

504. **Spaulding, W. G. , Robinson, S.W. and Paillet, F.L.** 1984. Preliminary assessment of climatic change during late Wisconsin time, southern Great Basin and vicinity, Arizona, California, and Nevada. U.S. Geological Survey Water Resources Investigations Report, WRI 84-4328.
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Quaternary.

505. **Spendlove, Earl.** 1979. Wood, wonderstone, and chicken tracks. Rock & Gem,9(6):32-35, 68-70.
*

Locality? = UCMP 617, Bretz Mine quadrangle, Malheur County, Oregon.
Longitude 117/52/30, Latitude 42 /00/00.
Unnamed unit, Neogene.
For geology see: Ronkos, C.J. 1981. Geology, alteration, and mineralization in the pyroclastic and sedimentary deposits of the Bretz-Aurora Basin, McDermitt caldera, Nevada-Oregon. Unpublished M.S. Thesis, University of Nevada, Reno, Nevada.
Rytuba, J.J. 1976. Geology and ore deposits of the McDermitt caldera, Nevada-Oregon. U.S. Geological Survey Open-File Report, OF 76-535.
Wood.
NOTE: Although this area is in Oregon it is just north of the Nevada-Oregon state line and is reached by road through Nevada.
See also Giraud, 1986.

506. **Spendlove, Earl.** 1987. Hubbard Basin petrified wood. Rock & Gem,17(6):33-35.
*

Locality?, Hubbard Basin quadrangle, Elko County.
Longitude 114/52/30, Latitude 41 /37/30.
Unnamed unit, Neogene.
Wood.

507. **Stamm, J. F.** 1991. Modeling local paleoclimates and validation in the Southwest United States. Unpublished Ph.D. Dissertation. Kent State University, Kent, Ohio.
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Quaternary.
Dissertation. Palynomorphs.

508. **Stamm, J. F. and Craig, R.G.** 1989. A climate model for the Southwestern U.S. suitable for paleoclimatic reconstructions. Geological Society of America Abstracts with Programs,21(7):A281.
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Quaternary.
Abstract. Palynomorphs.

509. **Starratt, S. W.** 1986a. Middle Miocene diatomaceous shale deposits in Stewart Valley, Nevada. Geological Society of America Abstracts with Programs,18(5):416.
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Locality?, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene.
Abstract. Diatoms.

510. **Starratt, S. W.** 1986b. Paleoecology of middle Miocene diatomaceous shale deposits in Stewart Valley, Nevada. Transactions of the North American Geophysical Union. Eos,67(44):986-987.
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Locality?, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene.
Abstract. Diatoms.

511. **Starratt, S. W.** 1986c. Micropaleontology and paleoecology of middle Miocene lacustrine facies belonging to the "Esmeralda" Formation in Stewart Valley, Nevada. Geological Society of America Abstracts with Programs,18(6):761.
*
Locality?, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene.
Abstract. Diatoms.

512. **Starratt, S. W.** 1987a. Micropaleontology, paleolimnology, and biochronology of middle Miocene lacustrine and nearshore facies belonging to the "Esmeralda" Formation in Stewart Valley, west-central Nevada. Geological Society of America Abstracts with Programs,19(5):336.
*
Locality?, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene.
Abstract. Diatoms.

513. **Starratt, S. W.** 1987b. Biochronology and paleoecology of fine-grained sediments belonging to "Esmeralda" Formation in Stewart Valley, Nevada. American Association of Petroleum Geologists Bulletin,71(5):618.
*
Locality?, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene.
Abstract. Diatoms.

514. **Starratt, S. W.** 1993. Paleolimnology of lacustrine rocks in Stewart Valley, Nevada: evidence for middle Miocene climatic cooling? Geological Society of America Abstracts with Programs,25(5):150.
*
Locality?, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene.
Abstract. Diatoms.

515. **Stewart, J. H.** 1989. Description, stratigraphic sections, and maps of middle and upper Miocene Esmeralda Formation in Alum, Blanco Mine, and Coaldale areas, Esmeralda County, Nevada. U.S. Geological Survey Open-File Report, OF 89-324.
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Locality?, Esmeralda County.
Esmeralda Formation, middle and late Miocene.
Impressions, wood.
See also Axelrod, 1940; Moore, S.W. 1981a, 1981b.

516. **Strong, M. F.** 1966. Wood and wonderstone near Fernley, Nevada. Gems and Minerals,343:19-20.
*
Locality?, Hazen quadrangle, Lyon County.
Longitude 119/00/00, Latitude 39 /30/00.
Truckee Formation, late Miocene (late Clarendonian).
Wood.
See also Sleeper, 1968.

517. **Strong, M. F.** 1967. Tonopah's gem fields. Gems and Minerals,356:24-27.
*
Locality ?, Tonopah quadrangle, Nye County.
Longitude 117/07/30, Latitude 38 /00/00.
Siebert Formation, middle Miocene.
For geology see: Bonham and Garside, 1979 (see especially pp. 66-69);
Kleinhampl, F.J. and Ziony, J.I. 1985. Geology of Northern Nye County, Nevada. Nevada Bureau of Mines and Geology Bulletin, 99A:1-172 (see especially pp. 136-137).

Wood.
See also Mitchell, 1981c; Sasser, 1985.

518. **Strong, M. F.** 1968. Petrified wood near Stonewall Pass. Gems and Minerals,367:30-33.
*
Locality?, Stonewall Pass quadrangle, Esmeralda County.
Longitude 117/07/30, Latitude 37 /07/30.
Unnamed unit, Neogene.
Wood.
See also Mitchell, 1991b; Strong, 1978.

519. **Strong, M. F.** 1971. Desert Gem Trails. Gembooks, Mentone, California, 2nd Edition.
*
Neogene.
Wood.
NOTE: A general guide to localities with gem quality materials, included permineralized wood from the Mojave and Colorado deserts in California and adjacent areas of Nevada.

520. **Strong, M. F.** 1972. Wood in Broken Hills. Desert Magazine,35(9):28-31.
*
1) Locality? (Boulder Hill), Broken Hills quadrangle, Mineral County.
2) Locality? (Greenwood), Broken Hills quadrangle, Churchill County.
Longitude 118/00/00, Latitude 39/00/00.
Unnamed unit, Neogene.
Wood.
See also Mitchell, 1991a; Strong, 1978.

521. **Strong, M. F.** 1978. Collecting petrified wood in the southwest, part 2. Gems and Minerals,488:48-51.
*
Wood.
NOTE: Discusses wood from Fish Lake Valley (see also Anonymous, 1952; Mitchell, 1981; Page, 1964; Segerblom, 1966), Stonewall Pass (see also Mitchell, 1991b; Strong, 1968) and two Broken Hills sites (see also Mitchell, 1991a; Strong, 1972).

522. **Strong, M. F.** 1982. Montezuma country. Gems and Minerals,541:40-43.
*
Locality?, Montezuma Peak quadrangle, Esmeralda County.
Longitude 117/15/00, Latitude 37 /37/30.
Unnamed unit, Neogene.
Wood.

523. **Strong, M. F.** 1985. Unexpected Sodaville. Gems and Minerals,569:34-38.
*
Locality?, Camp Douglas quadrangle, Mineral County.
Longitude 118/07/30, Latitude 38 /15/00.
Unnamed unit, Neogene.
For geology see Garside, L.J. 1979. Geology of the Camp Douglas quadrangle, Nevada. Nevada Bureau of Mines and Geology Open-File Report, OF 79-1.
Wood (mentioned).
See also Garside, L.J. and Silberman, M.L. 1978. New K-Ar ages of volcanic and plutonic rocks from the Camp Douglas quadrangle, Mineral County, Nevada. Isochron/West, 22:29-32;
Mitchell, 1981c.

524. **Stutz, H. C.** 1978. Explosive evolution of perennial *Atriplex* in western America. *In*, K.T. Harper and J.L. Reveal (symposium organizers), Intermountain Biogeography: a Symposium. Great Basin Naturalist Memoirs,2:161-168.
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Quaternary.

525. **Svoboda, Mark.** 1988. The depositional and petrographic analysis of the Diamond Peak Formation, western White Pine County, Nevada. Unpublished M.S. Thesis. University of Nevada, Reno, Nevada.
*
Locality?, White Pine County.
Diamond Peak Formation, Late Mississippian.
Thesis. Impressions.
See also ZZ Pogues Station. Information from D. Charles Dailey and R. Hilton, Sierra College, Rocklin, California.

526. **Tanai, Toshimasa and Wolfe, J.A.** 1977. Revisions of *Ulmus* and *Zelkova* in the middle and late Tertiary of western North America. U.S. Geological Survey Professional Paper,1026:1-14.
*
Impressions.
NOTE: See following pages for references to Nevada material: *Ulmus knowltoni* from 49 Camp, p. 5; *Ulmus moorei* from Aldrich Station, p. 6; *Ulmus pseudo-americana* from Fingerrock, p. 7; *Zelkova browni* from Fingerrock and Aldrich Station, p. 8.

527. **Tausch, R. J. , Wigand, P.E. and Burkhardt, J.W.** 1993. Viewpoint: plant community thresholds, multiple steady states, and multiple successional pathways: legacy of the Quaternary? The Journal of Range Management,46(5):439-447.

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Quaternary.

528. **Taylor, D. W.** 1976. Disjunction of Great Basin plants in the northern Sierra Nevada. Madroño,23(6):301-310.

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Quaternary.

529. **Theriot, Edward.** 1990. New species of *Mesodictyon* (Bacillariophyta: Thalassiosiraceae) in late Miocene lacustrine deposits of the Snake River Basin, Idaho. Proceedings of the Academy of Natural Sciences of Philadelphia,142:1-19.

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Locality USGS Bradbury 12 VII 85-1, Humboldt County.
Thousand Creek beds, late Miocene (early Hemphillian).
Diatoms.
NOTE: *Mesodycton* is present in sample (Bradbury 12 VII 85-1) from the Thousand Creek beds, unsurveyed T.46N., R.25E., Thousand Creek Spring or Big Spring Butte quadrangle.

530. **Thomas, D. H.** 1982. An overview of central Great Basin prehistory. *In*, D.B. Madsen and J.F. O'Connell (eds.), Man and Environment in the Great Basin. Society for American Archaeology Papers,2:156-171.

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Quaternary.

531. **Thompson, R. S.** 1979. Late Pleistocene and Holocene packrat middens from Smith Creek Canyon, White Pine County, Nevada. *In*, D.R. Tuohy and D.L. Rendall (eds.), The archaeology of Smith Creek Canyon, Eastern Nevada. Nevada State Museum Anthropological Papers,17:362-380.

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Locality?, Little Horse Canyon quadrangle, White Pine County.
Longitude 114/00/00, Latitude 39 /15/00.
Cave deposits (Smith Creek Cave), Quaternary.
Woodrat middens.
See also Bell, 1990; Bryan, 1972; Mead and others, 1982, 1992; Thompson, 1984b, 1985b; Thompson and Mead, 1982.

532. **Thompson, R. S.** 1980. Late Quaternary biota of east-central Nevada. American Quaternary Association, Abstracts of the Sixth Biennial Meeting, August 18-20, 1980, p. 189.

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Quaternary.
Abstract. Palynomorphs, woodrat middens.

533. **Thompson, R. S.** 1981. Late-Quaternary environments of the eastern Great Basin. Bulletin of the Ecological Society of America,62(2):144.

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Quaternary.
Abstract.

534. **Thompson, R. S.** 1984a. Holocene dispersal of woodland plants from the southwest into the Great Basin. Bulletin of the Ecological Society of America,65(2):141.
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Quaternary.
Abstract.

535. **Thompson, R. S.** 1984b. Late Pleistocene and Holocene environments in the Great Basin. Unpuplished Ph.D. Dissertation. University of Arizona, Tuscon, Arizona.
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Locality?, Little Horse Canyon quadrangle, White Pine County.
Longitude 114/00/00, Latitude 39 /15/00.
Cave deposits (Smith Creek Cave), Quaternary.
Dissertation.
See also Bell, 1990; Bryan, 1972; Mead and others, 1982, 1992; Thompson, 1979, 1985b; Thompson and Mead, 1982.

536. **Thompson, R. S.** 1985a. Palynology and *Neotoma* middens. *In*, B. Fine-Jacobs, P.L. Fall and O.K. Davis (eds.), Late Quaternary Vegetation and Climates of the American Southwest. American Association of Stratigraphic Palynologists, Contributions Series,16:89-112.
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Quaternary.
Palynomorphs, woodrat middens.

537. **Thompson, R. S.** 1985b. The age and environment of the Mount Moriah (Lake Mohave) occupation at Smith Creek Cave, Nevada. *In*, J.I. Mead and D.J. Meltzer (eds.), Environments and Extinctions: Man in Late Glacial North America. Center for the Study of Early Man, University of Maine at Orono, pp. 111-119.
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Locality?, Little Horse Canyon Quadrangle, White Pine County.
Longitude 114/00/00, Latitude 39 /15/00.
Cave deposits (Smith Creek Cave), Quaternary.
Woodrat Middens.
See also Bell, 1990; Bryan, 1972; Mead and others, 1982, 1992; Thompson, 1979, 1984b; Thompson and Mead, 1982.

538. **Thompson, R. S.** 1988. Vegetation dynamics in the western United States: modes of response to climatic fluctuations. *In*, B. Huntley and T. Webb, III (eds.), Vegetation History. Kluwer Academic Publishers, Dordrecht,7:415-458.
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Quaternary.

539. **Thompson, R. S.** 1990. Late Quaternary vegetation and climate in the Great Basin. *In*, J.L. Betancourt, T.R. Van Devender and P.S. Martin (eds.), Packrat Middens: The Last 40,000 Years of Biotic Change. University of Arizona Press, Tucson, Arizona, pp. 200-239.
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Quaternary.
Woodrat middens.

540. **Thompson, R. S.** 1991. Pliocene environments and climates in western the United States. Quaternary Science Reviews,10(2 and 3):115-132.
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Pliocene.

541. **Thompson, R. S.** 1992. Late Quaternary environments in Ruby Valley, Nevada. Quaternary Research,37(1):1-15.
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Locality?, Ruby Lake NW quadrangle, Elko County.
Longitude 115/22/30, Latitude 40 /07/30.
Unnamed unit, Quaternary.
Palynomorphs.
See also Casjens, 1974.

542. **Thompson, R. S. and Hattori, E.M.** 1983. Packrat (*Neotoma*) middens from Gatecliff Shelter and Holocene migrations of woodland plants. *In*, D.H. Thomas (ed.), The archaeology of Monitor Valley. 2. Gatecliff Shelter. Anthropological Papers of the American Museum of Natural History,59(1):167-171.
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Locality?, Wildcat Peak quadrangle, Nye County.
Longitude 116/45/00, Latitude 39 /00/00.
Cave deposits (Gatecliff Shelter), Quaternary.
Woodrat middens.
See also Grayson, 1981; Kautz and Thomas, 1972; Lanner, 1983; Rhode and Thomas, 1983; Thompson and Kautz, 1983.
For background see Thomas, D.H. 1983. The archaeology of Monitor Valley. 1. Epistemology. Anthropological Papers of the American Museum of Natural History, 58(1):1-194.

543. **Thompson, R. S. and Kautz, R.R.** 1983. Pollen analysis. *In*, D.H. Thomas (ed.), The archaeology of Monitor Valley. 2. Gatecliff Shelter. Anthropological Papers of the American Museum of Natural History,59(1):136-151.
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Locality?, Wildcat Peak quadrangle, Nye County.
Longitude 116/45/00, Latitude 39 /00/00.
Cave deposits (Gatecliff Shelter), Quaternary.
Palynomorphs.
See also Grayson, 1981; Kautz and Thomas, 1972; Lanner,

1983; Rhode and Thomas, 1983; Thompson and Hattori, 1983.
For background see Thomas, D.H. 1983. The archaeology of Monitor Valley. 1. Epistemology. Anthropological Papers of the American Museum of Natural History, 58(1):1-194.

544. **Thompson, R. S. and Mead, J.I.** 1982. Late Quaternary environments and biogeography in the Great Basin. Quaternary Research,17(1):39-55.
*
Quaternary.
See also Bell, 1990; Bryan, 1972; Mead and others, 1982, 1992; Thompson, 1979, 1984b, 1985b.

545. **Thompson, R. S. , Benson, Larry and Hattori, E.M.** 1986. A revised chronology for the last Pleistocene lake cycle in the central Lahontan Basin. Quaternary Research,25(1):1-9.
*
Quaternary.

546. **Thompson, R. S. , Hattori, E.M. and Tuohy, D.R.** 1987. Paleoenvironmental and archaeological implications of early Holocene - late Pleistocene cave deposits from Winnemucca Lake, Nevada. Nevada Archaeologist,6(1):34-38.
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Washoe and Pershing counties.
Cave deposits (numerous caves in the former Winnemucca Lake area), Quaternary.
Woodrat middens.
See also Orr, 1956; Sears and Roosma, 1961.

547. **Thompson, R. S. , Toolin, L.J., Forester, R.M. and Spencer, R.J.** 1990. Accelerator-mass spectrometer (AMS) radiocarbon dating of Pleistocene lake sediments in the Great Basin. Palaeogeography, Palaeoclimatology, Palaeoecology,78(3 and 4):301-313.
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Quaternary.

548. **Thompson, R. S. , Whitlock, Cathy, Bartlein, P.J., Harrison, S.P. and Spaulding, W.G.** 1993. Climatic changes in the western United States since 18,000 yr B.P. *In*, H.E. Wright, Jr., J.E. Kutzbach, T. Webb III, W.F. Ruddiman, F.A. Street-Perrott and P.J. Bartlein (eds.), Global Climates Since the Last Glacial Maximum. University of Minnesota Press, Minneapolis, Minnesota, pp. 468-513.
*
Quaternary.
Palynomorphs, woodrat middens.

549. **Tidwell, W. D. and Parker, L.R.** 1990. *Protoyucca shadishii gen. et sp. nov.*, an arborescent monocotyledon with secondary growth from the middle Miocene of northwestern Nevada,

U.S.A. Review of Palaeobotany and Palynology,62(1 and 2):79-95.

*

Locality?, Blowout Mtn. quadrangle, Humboldt County.
Longitude 119/15/00, Latitude 41 /37/30.
High Rock sequence, middle Miocene.
Wood.

550. **Tidwell, W. D. , Rushforth, S.R. and Simper, Daniel.** 1972. Evolution of floras in the Intermountain Region. *In*, A. Cronquist, A.H. Holmgren, N.H. Holmgren and J.L. Reveal (eds.), Intermountain Flora, Vascular Plants of the Intermountain West, U.S.A. Volume 1. Hafner Publishing Company, New York, pp. 19-39.

551. **Tidwell, W. D. , Thayn, G.F. and Roth, J.L.** 1976. Cretaceous and early Tertiary floras of the intermountain area - a summary. Brigham Young University Geology Studies,22(3):77-98.

552. **Ting, W. S.** 1968. Fossil pollen grains of Coniferales from early Tertiary of Idaho, Nevada and Colorado (I). Pollen et Spores,10(3):557-598.

*

Locality? = UCMP PA658, Deep Creek quadrangle, Elko County.
Longitude 116/07/30, Latitude 41 /30/00.
Unnamed unit, late Eocene.
For geology see: Decker, R.W. 1962. Geology of the Bull Run quadrangle, Elko County, Nevada. Nevada Bureau of Mines and Geology Bulletin, 60:1-65.
NOTE: Area has been mapped in detail by D.I. Axelrod (oral comm., 1990) and new formations defined, but not yet formally published.
Palynomorphs.

553. **Trimble, Stephen.** 1989. The Sagebrush Ocean. A Natural History of the Great Basin. University of Nevada Press, Reno and Las Vegas, Nevada, pp. 1-248.

554. **Tschanz, C. M.** 1960. Regional significance of some lacustrine limestones in Lincoln County, Nevada, recently dated as Miocene. U.S. Geological Survey Professional Paper,400-B:293-295.

*

Locality?, Lincoln County.
Unnamed unit, early Miocene.
Palynomorphs.
See also Tschanz and Pampeyan, 1970.

555. **Tschanz, C. M. and Pampeyan, E.H.** 1970. Geology and mineral deposits of Lincoln County, Nevada. Nevada Bureau of Mines and Geology Bulletin,73:1-188.

*

Locality?, Lincoln County. Late Mississippian, Miocene.
Algae, impressions, palynomorphs.
NOTE: See pp. 50 and 70;
see also Tschanz, 1960.

556. **Turnmire, K. L.** 1987. An analysis of the mammalian fauna from Owl Cave One and Two, Snake Range, east-central Nevada. Unpublished M.S. Thesis. University of Maine, Orono, Maine.

*

Locality?, Garrison quadrangle, White Pine County.
Longitude 114/00/00, Latitude 38 /52/30.
Cave deposits (Owl Caves 1 and 2), Quaternary.
Thesis.

557. **Van de Water, P. K., Leavitt, S.W. and Betancourt, J.L.** 1994. Trends in stomatal density and $^{13}C/^{12}C$ ratios of *Pinus flexilis* needles during last glacial-interglacial cycle. Science,264(5156):239-243.

*

Locality?, Rainier Mesa quadrangle, Nye County.
Longitude 116/07/00, Latitude 37 /07/30. Quaternary.
Woodrat middens.

558. **Van Devender, T. R.** 1976. The biota of the hot deserts of North America during the last glaciation: the packrat midden record. American Quaternary Association, Abstracts of the Fourth Biennial Meeting, October 9-10, 1976, pp. 62-69.

*

Quaternary.
Woodrat middens.

559. **Van Devender, T. R.** 1977. Holocene woodlands in the southwestern deserts. Science,198(4313):189-192.

*

Locality?, Clark County. Quaternary.
Woodrat middens.

560. **Van Devender, T. R. and Spaulding, W.G.** 1979. Development of vegetation and climate in the southwestern United States. Science,204(4394):701-710.

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Quaternary.
Woodrat middens.

561. **Van Devender, T. R. and Spaulding, W.G.** 1983. Development of vegetation and climate in the southwestern United States. *In*, S.G. Wells and D.R. Haragan (eds.), Origin and evolution of deserts. Symposium of the Committee on Desert and Arid Zones Research of the Southwestern and Rocky Mountain Division of the American Association for the Advancement

of Science. University of New Mexico Press, Albuquerque, New Mexico,20:131-156.
*

Quaternary.

562. **Van Devender, T. R. , Thompson, R.S. and Betancourt, J.L.** 1987. Vegetation history of the deserts of southwestern North America: the nature and timing of the late Wisconsin-Holocene transition. *In*, W.F Ruddiman and H.E. Wright, Jr. (eds.), North America and adjacent oceans during the last deglaciation. Geological Society of America, The geology of North America,K-3:323-352.
*

Quaternary.

563. **Van Houten, F. B.** 1956. Reconnaissance of Cenozoic sedimentary rocks of Nevada. American Association of Petroleum Geologists,40(12):2801-2825.
*

NOTE: This publication covers the occurrences of a number of fossil sites and is an important article for it coverage at the time it was written.

564. **VanLandingham, S. L.** 1966. Microfloristics and origin of early non-marine Bacillariophyta and Chrysophyta from diatomites of North America. Unpublished Ph.D. Dissertation. University of Louisville, Louisville, Kentucky.
*

Locality?, Cole Spring quadrangle, Esmeralda County.
Longitude 117/37/30, Latitude 38 /22/30.
"Esmeralda" Formation, middle Miocene.
Dissertation. Diatoms.
NOTE: Includes discussion of floras from three open-pit diatomite mines (#2, #3, #4), Velvin Industrial Products and Mining Inc., sec. 15, T.7N., R.38E., Esmeralda County.

565. **VanLandingham, S. L.** 1968. Investigation of a diatom population from mine tailings in Nye County, Nevada, U.S.A. Journal of Phycology,4(4):306-310.
*

Locality?, Ellsworth quadrangle, Nye County.
Longitude 117/45/00, Latitude 38 /52/30.
Unnamed unit, Quaternary.
Diatoms.

566. **VanLandingham, S. L.** 1985. Potential Neogene diagnostic diatoms from the western Snake River Basin, Idaho and Oregon. Micropaleontology,31(2):167-174.
*

Diatoms.

NOTE: Presents a biochronologic scheme for Neogene units in the Snake River Basin and the Great Basin.

567. **VanLandingham, S. L.** 1988. Comment and Reply on "Paleomagnetic and structural evidence for middle Tertiary counterclockwise block rotation in the Dixie Valley region, west-central Nevada". Geology,16(8):756-757.

*

Diatoms.

568. **VanLandingham, S. L.** 1990. Observations on the biostratigraphy of Pliocene and Pleistocene diatomites from the Terrebonne district, Deschutes County, Oregon. Micropaleontology,36(2):182-196.

*

Diatoms.

NOTE: See Table 2 for Nevada diatom localities that record dominant species and are plotted stratigraphically.

569. **Volk, J. A. and Zimmerman, J.M.** 1991. Stratigraphic framework of Ordovician-Devonian rocks at the Goldstrike Mine area, Eureka and Elko counties, Nevada; the Roberts Mountains Thrust revisited. Geological Society of America Abstract with Programs,23(2):106.

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Abstract. Palynomorphs.

570. **Walker, David and Walker, Clois.** 1990. Hunting for opals. Lapidary Journal,44(5):97.

*

Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

571. **Walker, Paul.** 1936. Fossil redwood from Nevada. The Mineralogist,4(6):7-8.

*

Locality?, (may be equivalent to UCMP P3435, Wilsons Camp wood), Trappman Hills quadrangle, Nye County.
Longitude 116/37/30, Latitude 37 /30/00.
Unnamed unit, Neogene.
Wood.
See also Anonymous, 1952; Ransom, 1955.

572. **Ward, L. F.** 1889. The geographical distribution of fossil plants. *In*, J.W. Powell (ed.), Eighth Annual Report of the United States Geological Survey to the Secretary of the Interior 1886-'87. Part II, pp. 663-960.

*

Locality? = UCMP PA299 (?; see discussion under Lesquereux,

1873), Coal Mine Basin quadrangle, Elko County.
Longitude 115/37/30, Latitude 41 /07/30.
Elko Formation, late Eocene.
For geology see: Ketner, K.B. 1973. Preliminary geologic map of the Coal Mine Basin quadrangle, Elko County, Nevada. U.S. Geological Survey Miscellaneous Field Studies Map, MF-528.
Impressions, wood.
NOTE: See p. 919, mentions the "Elko Station" impressions, and wood from three additional unspecified sites.
NOTE: We list Powell as the editor for this volume for the purpose of consistency in citation; the original publication identifies Powell as "Director". This Eighth Annual Report is Volume III, Part 2 of the five-volume series "Report of the Secretary of the Interior for the Fiscal Year Ending June 30, 1887. Government Printing Office, Washington."
See also Cope, 1873; Lesquereux, 1872, 1873, 1874, 1878, 1883.

573. **Webb, R. H.** 1986. Spatial and temporal distribution of radiocarbon ages on rodent middens from the southwestern United States. Radiocarbon,28(1):1-8.
*
Quaternary.
Woodrat middens.
See also Mead and others, 1978.

574. **Webb, R. H. and J.L. Betancourt.** 1990. The spatial and temporal distribution of radiocarbon ages from packrat middens. *In*, J.L. Betancourt, T.R. Van Devender and P.S. Martin (eds.), Packrat Middens: The Last 40,000 Years of Biotic Change. University of Arizona Press, Tucson, Arizona, pp. 85-102.
*
Quaternary.
Woodrat middens.

575. **Weide, D. L.** 1982. Paleoecological models in the southern Great Basin: methods and measurements. *In*, D.B. Madsen and J.F. O'Connell (eds.), Man and Environment in the Great Basin. Society for American Archaeology Papers,2:8-26.

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Quaternary.

576. **Weide, D. L. and Weide, M.L.** 1977. Time, space, and intensity in Great Basin paleoecological models. *In*, D.D. Fowler and A. Smith (eds.), Models and Great Basin Prehistory: A Symposium. Desert Research Institute Publications in the Social Sciences,12:79-111.
*

Quaternary.
Palynomorphs.

577. **Weight, H. O.** 1951. Fossil wood in Nevada. Desert Magazine,14(4):11-15.
*
Locality?, Wilson Canyon quadrangle, Lyon County.
Longitude 119/07/30, Latitude 38 /45/00.
Coal Valley Formation, late Miocene (early Hemphillian).
For geology see: Stewart, J.H. and Dohrenwend, J.C. 1984. Geologic Map of the Yerington quadrangle, Nevada. U.S. Geological Survey Open-File Report, OF 84-212.
Wood.
See also Macdonald, J.R. 1959. The middle Pliocene mammalian fauna from Smiths Valley, Nevada. Journal of Paleontology, 33(5):872-887;
Moore, 1969.

578. **Weight, H. O.** 1952. Fossil leaves from an ancient Nevada forest. Desert Magazine,15(1):12-17.
*
Locality? = UCMP 6101, Buffalo Summit quadrangle, Churchill County.
Longitude 117/40/00, Latitude 39 /07/30.
Buffalo Canyon Formation, middle Miocene.
For geology see Axelrod, 1991.
Diatoms, impressions.
See also Axelrod, 1991; Seiple, 1988b.

579. **Weimer-McMillion, Becky and Tingley, S.L. and Schilling, John.** 1983. Bibliography of Nevada geology and mineral resources through 1980, an alphabetical listing by author. Nevada Bureau of Mines and Geology Special Publication,7:1-184.
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Bibliography.

580. **Wells, P. V.** 1969. Preuves paléontologiques d'une végétation tardi-Pleistocène (datée par le ^{14}C) dans les régions aujourd'hui désertiques d'Amérique du Nord. Revue de Géographie Physique et de Géologie Dynamique, Série 2,11(3):335-340.
*
Quaternary.
Woodrat middens.

581. **Wells, P. V.** 1976. Macrofossil analysis of wood rat (*Neotoma*) middens as a key to the Quaternary vegetational history of arid America. Quaternary Research,6(2):223-248.
*
Quaternary.
Woodrat middens.

582. **Wells, P. V.** 1979. An equable glaciopluvial in the west: pleniglacial evidence of increased precipitation on a gradient from the Great Basin to the Sonoran and Chihuahuan deserts. Quaternary Research,12(3):311-325.
*
Quaternary.

583. **Wells, P. V.** 1980. Quaternary vegetational history of the Great Basin. Bulletin of the Ecological Society of America,61(2):106.
*
Quaternary.
Abstract.

584. **Wells, P. V.** 1983. Paleobiogeography of montane islands in the Great Basin since the last glaciopluvial. Ecological Monographs,53(4):341-382.
*
Quaternary.

585. **Wells, P. V.** 1987. Systematics and distribution of pinyons in the late Quaternary. *In*, R.L. Everett (compiler), Proceedings of the Pinyon-Juniper Conference, Reno, Nevada, January 13-16, 1986. U.S. Department of Agriculture Forest Service, Intermountain Research Station, General Technical Report INT-215, pp. 104-108.
*
Quaternary.

586. **Wells, P. V. and Berger, Rainer.** 1967. Late Pleistocene history of coniferous woodland in the Mohave Desert. Science,155(3770):1640-1647.
*
Quaternary.
Woodrat middens.

587. **Wells, P. V. and Hunziker, J.H.** 1976. Origin of the creosote bush (*Larrea*) deserts of southwestern North America. Annals of the Missouri Botanical Garden,63(4):843-861.
*
Quaternary.

588. **Wells, P. V. and Jorgensen, C.D.** 1964. Pleistocene wood rat middens and climatic change in Mohave Desert: a record of juniper woodlands. Science,143(3611):1171-1174.
*
Quaternary.
Woodrat middens.

589. **Wells, P. V. and Woodcock, Deborah.** 1985. Full-glacial vegetation of Death Valley, California: juniper woodland opening to *Yucca* semidesert. Madroño,32(1):11-23.
*
Quaternary.

590. **Westgate, L. G. and Knopf, Adolph.** 1932. Geology and ore deposits of the Pioche district, Nevada. U.S. Geological Survey Professional Paper,171:1-79.
*

1) Locality?, Sample 173, Bennett Pass quadrangle, Lincoln County.
Longitude 114/30/00, Latitude 37/45/00.
Panaca Formation, Miocene (late(?) Clarendonian).
2) Locality?, Sample 182, Panaca quadrangle, Lincoln County.
Longitude 114/22/30, Latitude 37/45/00.
Panaca Formation, Miocene (late(?) Clarendonian).
3) Locality?, Samples 1563 and 1566, Condor Canyon quadrangle, Lincoln County.
Longitude 114/15/00, Latitude 37/45/00.
Panaca Formation, Miocene (late(?) Clarendonian).
4) Locality?, Sample 1583, Mt. Wilson SW quadrangle, Lincoln County.
Longitude 114/22/30, Latitude 38/00/00.
Panaca Formation, Miocene (late(?) Clarendonian).
Diatoms.
See also Stock, Chester. 1921. Late Cenozoic mammalian remains from the Meadow Valley region, southeastern Nevada. Bulletin of the Geological Society of America, 32:146-147, where the beds were originally considered to be late Pliocene (i.e, ≈ Blancan) in age;
R.A. Stirton (oral comm. to Tschanz and Pampeyan, 1970, p. 78), however, indicates the mammalian fossils are no younger than late Clarendonian;
MacDonald, J.R. and Pelletier, W.J. 1958. The Pliocene mammalian faunas of Nevada, U.S.A. Congreso Geologico Internacional, 20th Sesión, Ciudad de México, Sección 7, Paleontología, Taxonomía y Evolución, pp. 365-388.

591. **Wharton, R. A. , Wigand, P.E., Rose, M.R., Reinhardt, R.L., Mouat, D.A., Klieforth, H.E., Ingraham, N.L., Davis, J.O., Fox, C.A. and Ball, J.T.** 1990. The North American Great Basin: a sensitive indicator of climatic change. *In*, C.B. Osmond, L.F. Pitelka and G.M. Hidy (eds.), Plant Biology of the Basin and Range. Ecological Studies: Analysis and Synthesis Volume 80. Springer-Verlag, Berlin, pp. 323-359.
*

Quaternary.

592. **Wheeler, E. A. and Bass, Pieter.** 1991. A survey of the fossil record for dicotyledonous wood and its significance for evolutionary and ecological wood anatomy. International Association of Wood Anatomists Bulletin new series,12:272-332.

*

Wood.

593. **Wheeler, E. A. , Pearson, R.G., LaPasha, C.A., Zack, Tom and Hatley, Webster.** 1986. Computer-aided wood identification. The North Carolina Agricultural Research Service Bulletin,474:1-160.

*

Wood.

NOTE: This Reference Manual is to be used in conjunction with the companion User's Guide: LaPasha, C.A. 1986. General unknown entry and search system. A program package for computer-assisted identification. Supplement to: Computer-aided wood identification. The North Carolina Agricultural Research Service Bulletin, 474A:1-18.

594. **White, David.** 1930. Letter to H.L. Ferguson regarding small collection of plant fossils from near Garfield Mine, Mineral County, Nevada. Letter is in Field Record File, Geologic Division, U.S. Geological Survey, Menlo Park, California.

*

Locality?, Marble Mountain quadrangle, Mineral County.
Longitude 118/15/00, Latitude 38 /22/30.
Excelsior Formation(?), Triassic.

For geology see: Ponsler, H.E. 1977. The geology and mineral deposits of the Garfield district, Mineral County, Nevada. Unpublished M.S. Thesis. University of Nevada, Reno, Reno, Nevada.

Impressions.

NOTE: Small collection of seven species "indicative of the Triassic". Collected "...700 feet east of summit of high hill [Garfield Peak?] northeast of Garfield mine...".

595. **Wigand, P. E.** 1990. Vegetation history. *In*, S.D. Livingston and F.L. Nials, Archaeological and paleoenvironmental investigations in the Ash Meadows National Wildlife Refuge, Nye County, Nevada. Quaternary Sciences Center Technical Report 70. Desert Research Institute, Reno, Nevada, pp. 15-45.

*

Quaternary.

Palynomorphs, woodrat middens.

596. **Wigand, P. E. and Mehringer, P.J., Jr.** 1985. Pollen and seed analysis. *In*, D.H. Thomas (ed.), The Archaeology of Hidden Cave, Nevada. Anthropological Papers of the American Museum of Natural History,61(1):108-124.

*

Locality?, Grimes Point quadrangle, Churchill County.
Longitude 118/37/30, Latitude 39 /22/30.
Cave deposits (Hidden Cave), Quaternary.

Palynomorphs, seeds.
See also Goodman, 1985; Grayson, 1984; Pendleton, 1985.

597. **Wigand, P. E. and Nowak, C.L.** 1992. Dynamics of northwest Nevada plant communities during the last 30,000 years. *In*, C.A. Hall, Jr., Victoria Doyle-Jones and Barbara Widawski (eds.), The history of water: eastern Sierra Nevada, Owens Valley, White-Inyo Mountains. White Mountain Research Station Symposium Volume 4. University of California White Mountain Research Station, Los Angeles, California, pp. 40-61.
*
Quaternary.
Woodrat middens.

598. **Wigand, P. E., Rose, M.K. and Hemphill, M.L.** 1991. Calibration of high-frequency pollen records and tree-ring sequences to reconstruct past climate in the southern Great Basin. Palynology,15:254-255.
*
Quaternary.
Abstract. Palynomorphs, tree rings.

599. **Willden, Ronald and Speed, R.C.** 1974. Geology and Mineral Deposits of Churchill County, Nevada. Nevada Bureau of Mines and Geology Bulletin,83:1-95.
*
Locality UCMP 6101 and UCMP PA291, Buffalo Summit quadrangle, Churchill County.
Longitude 117/45/00, Latitude 39 /07/30.
Buffalo Canyon Formation, middle Miocene.
Impressions.
See also Axelrod, 1991
NOTE: Specimens identified by J.A. Wolfe; see especially p. 26.

600. **Wing, S. L.** 1987. Eocene and Oligocene floras and vegetation of the Rocky Mountains. Annals of the Missouri Botanical Garden,74(4):748-784.
*
Eocene.
NOTE: Discussion includes several Nevada localities.

601. **Wingate, F. H.** 1983. Palynology and age of the Elko Formation (Eocene) near Elko, Nevada. Palynology,7:93-132.
*
Locality?, in part = UCMP Locality PA299 (?; see discussion under Lesquereux, 1873), Coal Mine Basin quadrangle, Elko County.
Longitude 115/37/30, Latitude 41 /07/30.
Elko Formation, late Eocene.

For geology see: Ketner, K.B. 1973. Preliminary geologic map of the Coal Mine Basin quadrangle, Elko County, Nevada. U.S. Geological Survey Miscellaneous Field Studies Map, MF-528.

Palynomorphs.

See also Lesquereux, 1872, 1873, 1874, 1878, 1883; Mason, 1927;

Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Eocene and Oligocene lacustrine and volcanic rocks near Elko, Nevada. *In*, G.W. Newman and H.D. Goode (eds.), Basin and Range Symposium and Great Basin field conference. Rocky Mountain Association of Geologists, Denver, Colorado, pp. 325-337 (gives dates on base and top of Unit 5 as: 38.9 ± 0.7 - 37.1 ± 1.0 Ma not recalculated);

Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Stratigraphy and depositional environments of Paleogene rocks near Elko, Nevada. *In*, J.M. Armentrout, M.R. Cole and H. TerBest, Jr. (eds.), Cenozoic paleogeography of the western United States. Pacific Coast Paleogeography Symposium 3. The Pacific Section, Society of Economic Paleontologists and Mineralogists, pp. 75-88.

602. **Winterer, J. I.** 1975. Biostratigraphy of the Bouse Formation: a Pliocene Gulf of California deposit in California, Arizona and Nevada. Unpublished M.S. Thesis. California State University, Long Beach, California.

*

Bouse Formation, Pliocene.

Thesis. Algae, thallophytes.

603. **Wolfe, J. A.** 1964. Miocene floras from Fingerrock Wash southwestern Nevada. U.S. Geological Survey Professional Paper,454-N:1-36.

*

1) Locality USNM 9881 (Fingerrock) = UCMP PA99, Stewart Valley quadrangle, Mineral County.

Longitude 117/52/30, Latitude 38/30/00.

Gilbert Andesite (shale member), middle Miocene,

2) Localities USNM 9696, 9697, 9698 (Stewart Spring flora), Stewart Spring quadrangle, Mineral County.

Longitude 117/52/30, Latitude 38/30/00.

Savage Canyon Formation, middle Miocene

Impressions.

604. **Wolfe, J. A.** 1969. Neogene floristic and vegetational history of the Pacific northwest. Madroño,20(3):83-110.

605. **Wolfe, J. A.** 1971. Tertiary climatic fluctuations and methods of analysis of Tertiary floras. Palaeogeography, Palaeoclimatology, Palaeoecology,9(1):27-57.

606. **Wolfe, J. A.** 1977. Paleogene floras from the Gulf of Alaska region. U.S. Geological Survey Professional Paper,997:1-108.
*

Impressions.
See also Axelrod, 1966a.
NOTE: Makes taxonomic changes to certain taxa in the Copper Basin flora of Axelrod, 1966a: see p. 71, *Prunus axelrodi*; p. 87, *Salix coatsi*; p. 90, *Crataegus cuprovallis*; *Heteromeles cuprovallis*.

607. **Wolfe, J. A.** 1978. A paleobotanical interpretation of Tertiary climates in the Northern Hemisphere. American Scientist,66(6):694-703.

608. **Wolfe, J. A.** 1981. A chronologic framework for Cenozoic megafossil floras of northwestern North America and its relation to marine geochronology. *In*, J.M. Armentrout (ed.), Pacific Northwest Cenozoic biostratigraphy. Geological Society of America Special Paper,184:39-47.

609. **Wolfe, J. A.** 1985. Distribution of major vegetational types during the Tertiary. *In*, E.T. Sundquist and W.S. Broeker (eds.), The Carbon Cycle and Atmospheric CO_2: Natural Variations Archean to Present. American Geophysical Union, Geophysical Monograph,32:357-375.

610. **Wolfe, J. A.** 1987. An overview of the origins of the modern vegetation and flora of the northern Rocky Mountains. Annals of the Missouri Botanical Garden,74(4):785-803.

611. **Wolfe, J. A.** 1992. An analysis of present-day terrestrial lapse rates in the western conterminous United States and their significance to paleoaltitudinal estimates. U.S. Geological Survey Bulletin,1964:1-35.

612. **Wolfe, J. A.** 1993. A method of obtaining climatic parameters from leaf assemblages. U.S. Geological Survey Bulletin,2040:1-71.

613. **Wolfe, J. A. and Barghoorn, E.S.** 1960. Generic change in Tertiary floras in relation to age. American Journal of Science,258A:388-399.

614. **Wolfe, J. A. and Tanai, Toshimasa.** 1987. Systematics, phylogeny, and distribution of *Acer* (maples) in the Cenozoic of western North America. Journal of the Faculty of Science, Hokkaido University, Geology Series,22(1):1-246.
*

Impressions.
NOTE: From numerous localities and ages, see index map p. 49.

615. **Wright, H. E., Jr.** 1971. Late Quaternary vegetational history of North America. *In*, K.K. Turekian (ed.), The late Cenozoic glacial ages. Yale University Press, New Haven, Connecticut,

pp. 425-464.
*
Quaternary.
Palynomorphs.

616. **Wright, Karen.** 1993. Revelations of rat scat. Discover,14(9):64-71.
*
Quaternary.
Woodrat middens.
NOTE: General discussion of the formation and varied paleoecological values of woodrat middens.

617. **Young, M. W.** 1987. Jackpot limb casts. Rock & Gem,17(8):66-67.
*
Locality?, Texas Spring quadrangle, Elko County.
Longitude 114/30/00, Latitude 41 /37/30.
Unnamed unit, Neogene.
Wood.

618. **Zancanella, J. K.** 1988. Early lowland prehistory in south-central Nevada. *In*, J.A. Willig, C.M. Aikens and J.L. Fagan (eds.), Early human occupation in far western North America: the Clovis-Archaic interface. Nevada State Museum Anthropological Papers,21:251-272.
*
Quaternary.

619. **Zeitner, J. C.** 1986. Opal in the United States. Lapidary Journal,40(3):42-48.
*
Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

620. **Zielinski, R. A.** 1982. Uraniferous opal, Virgin Valley, Nevada: conditions of formation and implications for uranium exploration. Journal of Geochemical Exploration,16(3):197-216.
*
Locality?, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Beck, 1945.
Wood.

621. **ZZ 49-Camp.**
*
Locality UCMP 96, Fortynine Mtn. quadrangle, Washoe County.
Longitude 119/52/30, Latitude 41 /30/00.

High Rock sequence, middle Miocene.
Diatoms, impressions, wood.
See Evernden and James, 1964; LaMotte, 1934, 1936a.

622. **ZZ 49-Camp.**
*
Locality UCMP 97, Fortynine Mtn. quadrangle, Washoe County.
Longitude 119/52/30, Latitude 41 /30/00.
High Rock sequence, middle Miocene.
Diatoms, impressions.
See Evernden and James, 1964; LaMotte, 1934, 1936a.

623. **ZZ 49-Camp.**
*
Locality UCMP P3528, Fortynine Mtn. quadrangle, Washoe County.
Longitude 119/52/30, Latitude 41 /30/00.
High Rock sequence, middle Miocene.
Diatoms, impressions.
See Evernden and James, 1964; LaMotte, 1934, 1936a.

624. **ZZ 49-Camp.**
*
Locality UCMP P464, Fortynine Mtn. quadrangle, Washoe County.
Longitude 119/52/30, Latitude 41 /30/00.
High Rock sequence, middle Miocene.
Diatoms, impressions.
See Evernden and James, 1964; LaMotte, 1934, 1936a.

625. **ZZ Aldrich Station.**
*
NOTE: see ZZ Coal Valley, Aldrich Station.

626. **ZZ Arrow Canyon.**
*
Locality UCMP PA175, Moapa West quadrangle, Clark County.
Longitude 114/37/30, Latitude 36 /37/30.
Chainman Formation, Late Mississippian.
Impressions.

627. **ZZ Arrow Canyon, Lookout Hill.**
*
Locality UCMP PA675, Arrow Canyon SE quadrangle, Clark County.
Longitude 114/45/00, Latitude 36 /30/00.
Bird Spring Formation, Early Permian (Leonardian).
Dasyclad algae.
NOTE: Silicified algae associated with invertebrate fauna.

628. **ZZ Basalt Junction diatomite.**
*

Locality USGS 1133, Miller Mountain quadrangle and/or Basalt quadrangle, Esmeralda County and/or Mineral County. Longitude 118/07/30, Latitude 38 /00/00 and/or 118/15/00, 38/ 00/00.
Unnamed unit, Miocene(?).
For geology see: Stewart, J.H. 1981. Geologic map of the Basalt quadrangle, Mineral County, Nevada. U.S. Geological Survey Open-File Report OF 81-369.
Diatoms.
See Albers and Stewart, 1972 (p. 62 for list of 3 species); Bradbury and Krebs, 1994 *in press*; VanLandinghan, 1990, Table 2.

629. **ZZ Bell Spring.**
*
Locality UCMP PA241, Simon quadrangle, Mineral County.
Longitude 117/45/00, Latitude 38 /30/00.
"Esmeralda" Formation, late Miocene.
For geology see: Mottern, H.H., Jr. 1962. Pre-Tertiary geology of a portion of Cedar Mountain, Nevada, Unpublished M.S. Thesis. University of California, Berkeley, Berkeley, California.
Wood (permineralized monocot stems).
NOTE: Specimens weathered out on surface.

630. **ZZ Boulder Hill.**
*
Locality UCMP PA444, Desert Creek Ranch quadrangle, Douglas County.
Longitude 119/15/00, Latitude 38 /37/30.
Unnamed unit, early Miocene.
For geology see: Stewart, J.H., Brem, G.F. and Dohrenwend, J.C. 1989. Geologic map of Desert Creek Peak quadrangle, Lyon and Douglas counties, Nevada, and Mono County, California. U.S. Geological Survey Miscellaneous Field Studies Map, MF-2050.
Impressions.
NOTE: John H. Stewart (oral comm., 1984) states that a K/Ar date on the andesites above the flora is ca. 18 Ma.

631. **ZZ Bretz Mine.**
*
Locality UCMP 617, Bretz Mine quadrangle, Malheur County, Oregon.
Longitude 117/52/30, Latitude 42 /00/00.
Unnamed unit, Neogene.
For geology see: Rytuba, J.J. 1976. Geology and ore deposits of the McDermitt caldera, Nevada-Oregon. U.S. Geological Survey Open-File Report, OF 76-535.

Wood.
NOTE: Although this area is in Oregon it is just north of the Nevada-Oregon state line and is reached by road through Nevada.
See Giraud, 1986; Spendlove, 1979.

632. **ZZ Buffalo Canyon.**
*
Localities UCMP 6101 and UCMP PA291, Buffalo Summit quadrangle, Churchill County.
Longitude 117/45/00, Latitude 39 /07/30.
Buffalo Canyon Formation, middle Miocene.
For geology see: Axelrod, 1991.
Diatoms, impressions.
See Axelrod, 1991; Krebs and others, 1987; Seiple, 1988b; Smedman, 1969; Weight, 1952; Willden and Speed, 1974.

633. **ZZ Bull Head Ranch.**
*
Locality UCMP PA427, Fairbanks Canyon quadrangle, Humboldt County.
Longitude 117/15/00, Latitude 41 /22/30.
Unnamed unit, middle Miocene.
For geology see: Willden, Ronald. 1964. Geology and mineral deposits of Humboldt County, Nevada. Nevada Bureau of Mines and Geology Bulletin, 59:1-154 (see especially p. 64).
Impressions.
NOTE: Small collection of four species identified by R.W. Brown; larger collection at UCMP.

634. **ZZ Bull Head Ranch, west.**
*
Locality UCMP PA515, Fairbanks Canyon quadrangle, Humboldt County.
Longitude 117/15/00, Latitude 41 /22/30.
Unnamed unit, middle Miocene.
For geology see: Willden, Ronald. 1964. Geology and mineral deposits of Humboldt County, Nevada. Nevada Bureau of Mines and Geology Bulletin, 59:1-154.
Impressions.

635. **ZZ Bull Run Basin.**
*
Locality UCMP PA658, Deep Creek quadrangle, Elko County.
Longitude 116/07/30, Latitude 41 /30/00.
Unnamed unit, middle Eocene.
For geology see: Decker, R.W. 1962. Geology of the Bull Run quadrangle, Elko County, Nevada. Nevada Bureau of Mines and Geology Bulletin, 60:1-65;

Coats, R.R. 1987. Geology of Elko County, Nevada. Nevada Bureau of Mines and Geology Bulletin, 101:1-112 (see especially p. 54).

NOTE: Area has been mapped in detail and new formations set up (by D.I. Axelrod; oral comm., 1990) but not yet formally published.

Impressions, palynomorphs.

See Ting, 1968; Wolfe and Tanai, 1987.

636. **ZZ Burnt Cabin Summit.**

*

Locality?, Burnt Cabin Summit quadrangle, Churchill County.
Longitude 117/45/00, Latitude 39 /00/00.
Unnamed unit, Neogene.

Wood.

See Gianella, 1942; Gianella and Wheeler, 1937; Palmer, 1935a, 1935b.

637. **ZZ California Basin.**

*

Locality?, Mountain City quadrangle, Elko County.
Longitude 115/52/30, Latitude 41 /45/00.
Unnamed unit, Neogene.

For geology see: Coats, R.R. 1987. Geology of Elko County, Nevada. Nevada Bureau of Mines and Geology Bulletin, 101:1-112 (see especially p. 63);

Coats, Robert R. and Greene, R. C. 1984. Geologic map of the southwest quarter of the Mountain City quadrangle, Elko County, Nevada. U. S. Geological Survey Open-File Report, OF 84-686.

Wood.

638. **ZZ Cathedral Cave.**

*

Locality NAUQSP 894, UCMP V94001, Little Horse Canyon quadrangle, White Pine County.
Longitude 114/00/00, Latitude 39 /15/00.
Cave deposits, Quaternary.

See Bell, 1990; Bryan, 1972; Mead and others, 1982, 1992; Thompson, 1979, 1984b, 1985b; Thompson and Mead, 1982.

639. **ZZ Catlin Oil Shale Mine.**

*

NOTE: see ZZ Elko Catlin Oil Shale Mine.

640. **ZZ Celatom Quarry.**

*

Locality UCMP PA676, Derby Dam quadrangle, Storey County.
Longitude 119/22/30, Latitude 39 /30/00.
Coal Valley Formation, middle Miocene.

For geology see: Rose, 1969 (see especially pp. 11-12).

Diatoms, ovulate cone impressions.
See Axelrod, 1986c; Okuno, 1958.
NOTE: Axelrod, 1986c, Figure 86, p. 631, states that Celetom Quarry is in the basal part of the Coal Valley Formation and dated at ca. 12 Ma.

641. **ZZ Chalk Hills.**
*
Locality UCMP P3526, Chalk Hills quadrangle, Storey County.
Longitude 119/30/00, Latitude 39 /22/30.
Coal Valley Formation (*sensu* Axelrod, 1956), middle Miocene.
For geology see: Bonham, H.F., Jr. and Bell, J.W. 1993. Geologic map, Steamboat quadrangle. Nevada Bureau of Mines and Geology Map, 4Fg;
Thompson, G.A. 1956. Geology of the Virginia City quadrangle, Nevada. U.S. Geological Survey Bulletin, 1042-C:45-77.
Diatoms, impressions.
See Axelrod, 1962a; Krebs and others, 1987;
LaRivers, Ira. 1953. A lower Pliocene frog from western Nevada. Journal of Paleontology, 27(1):77-81;
Seiple, 1989.

642. **ZZ Chloropagus.**
*
Locality UCMP P4134, Desert Peak quadrangle, Churchill County.
Longitude 118/52/30, Latitude 39 /45/00.
Chloropagus Formation, middle Miocene (14.3 Ma recalculated).
For geology see: Axelrod, 1956;
Voegtly, N.E. 1981. Reconnaissance of the Hot Springs Mountains and adjacent areas, Churchill County, Nevada. U.S. Geological Survey Open-File Report, OF 81-134.
Impressions.
See Axelrod, 1956; Evernden and James, 1964.

643. **ZZ Coal Mine Canyon.**
*
NOTE: see ZZ Elko Osino Coal Mine.

644. **ZZ Coal Valley, Aldrich Station.**
*
Locality UCMP P3916, Ninemile Ranch quadrangle, Mineral County.
Longitude 118/52/30, Latitude 38 /22/30.
Aldrich Station Formation, middle Miocene.
For geology see: Axelrod, 1956;
Gilbert, C.M. and Reynolds, M.W. 1973. Character and chronology of basin development, western margin of the

Basin and Range Province. Geological Society of America Bulletin, 84(8):2489-2510.
Diatoms, impressions.
See Axelrod, 1956.

645. **ZZ Coal Valley, Horsethief Canyon.**
*
Locality UCMP P3915, Ninemile Ranch quadrangle, Mineral County.
Longitude 118/52/30, Latitude 38 /22/30.
Aldrich Station Formation, middle Miocene.
For geology see: Axelrod, 1956;
Gilbert, C.M. and Reynolds, M.W. 1973. Character and chronology of basin development, western margin of the Basin and Range Province. Geological Society of America Bulletin, 84(8):2489-2510.
Impressions.
See Axelrod, 1956.

646. **ZZ Coal Valley, Lewis Coal Mine.**
*
Locality UCMP P3917, Ninemile Ranch quadrangle, Lyon County.
Longitude 118/52/30, Latitude 38 /22/30.
Coal Valley Formation, late Miocene (Clarendonian).
For geology see: Axelrod, 1956;
Gilbert, C.M. and Reynolds, M.W. 1973. Character and chronology of basin development, western margin of the Basin and Range Province. Geological Society of America Bulletin, 84(8):2489-2510.
Diatoms, impressions.
See Axelrod, 1956; Berry, 1927; Herendeen and others, 1990.

647. **ZZ Coal Valley, lower 1.**
*
Locality UCMP PA372, Ninemile Ranch, Mineral County.
Longitude 118/52/30, Latitude 38 /22/30.
Aldrich Station Formation, middle Miocene.
For geology see: Axelrod, 1956;
Gilbert, C.M. and Reynolds, M.W. 1973. Character and chronology of basin development, western margin of the Basin and Range Province. Geological Society of America Bulletin, 84(8):2489-2510.
Impressions.

648. **ZZ Coal Valley, lower 2.**
*
Locality UCMP PA373, Mitchell Spring quadrangle, Mineral County.
Longitude 118/52/30, Latitude 38 /30/00.

Aldrich Station Formation, middle Miocene.
For geology see: Axelrod, 1956;
Gilbert, C.M. and Reynolds, M.W. 1973. Character and chronology of basin development, western margin of the Basin and Range Province. Geological Society of America Bulletin, 84(8):2489-2510;
Stewart, J.H., Reynolds, M.W.. and Johannesen, D.C. 1981. Geologic map of the Mount Grant quadrangle, Lyon and Mineral counties, Nevada. U.S. Geological Survey Miscellaneous Field Studies Map, MF-1278.
Impressions.

649. **ZZ Coal Valley, lower 3.**
*
Locality UCMP PA374, Ninemile Ranch quadrangle, Mineral County.
Longitude 118/52/30, Latitude 38 /22/30.
Aldrich Station Formation, middle Miocene.
For geology see: Axelrod, 1956;
Gilbert, C.M. and Reynolds, M.W. 1973. Character and chronology of basin development, western margin of the Basin and Range Province. Geological Society of America Bulletin, 84(8):2489-2510.
Impressions.

650. **ZZ Coal Valley, upper 1.**
*
Locality UCMP PA375, Ninemile Ranch quadrangle, Lyon County.
Longitude 118/52/30, Latitude 38 /22/30.
Aldrich Station Formation, middle Miocene.
For geology see: Axelrod, 1956;
Gilbert, C.M. and Reynolds, M.W. 1973. Character and chronology of basin development, western margin of the Basin and Range Province. Geological Society of America Bulletin, 84(8):2489-2510.
Impressions.

651. **ZZ Coal Valley, upper 2.**
*
Locality UCMP PA376, Ninemile Ranch quadrangle, Mineral County.
Longitude 118/52/30, Latitude 38 /22/30.
Coal Valley Formation, middle Miocene.
For geology see: Axelrod, 1956;
Gilbert, C.M. and Reynolds, M.W. 1973. Character and chronology of basin development, western margin of the Basin and Range Province. Geological Society of America

Bulletin, 84(8):2489-2510.
Impressions.

652. **ZZ Coal Valley, upper 3.**
*
Locality UCMP PA377, Ninemile Ranch quadrangle, Lyon County.
Longitude 118/52/30, Latitude 38 /22/30.
Coal Valley Formation, middle Miocene.
For geology see: Axelrod, 1956;
Gilbert, C.M. and Reynolds, M.W. 1973. Character and chronology of basin development, western margin of the Basin and Range Province. Geological Society of America Bulletin, 84(8):2489-2510.
Impressions.

653. **ZZ Coal Valley, upper 4.**
*
Locality UCMP PA378, Ninemile Ranch quadrangle, Lyon county.
Longitude 118/52/30, Latitude 38 /22/30.
Coal Valley Formation, middle Miocene.
For geology see: Axelrod, 1956;
Gilbert, C.M. and Reynolds, M.W. 1973. Character and chronology of basin development, western margin of the Basin and Range Province. Geological Society of America Bulletin, 84(8):2489-2510.
Impressions.

654. **ZZ Coal Valley, upper 5.**
*
Locality UCMP PA379, Ninemile Ranch quadrangle, Lyon County.
Longitude 118/52/30, Latitude 38 /22/30.
Coal Valley Formation, middle Miocene.
For geology see: Axelrod, 1956;
Gilbert, C.M. and Reynolds, M.W. 1973. Character and chronology of basin development, western margin of the Basin and Range Province. Geological Society of America Bulletin, 84(8):2489-2510.
Impressions.

655. **ZZ Coal Valley, upper 6.**
*
Locality UCMP PA380, Mitchell Spring quadrangle, Lyon County.
Longitude 118/52/30, Latitude 38 /30/00.
Coal Valley Formation, middle Miocene.
For geology see: Axelrod, 1956
Gilbert, C.M. and Reynolds, M.W. 1973. Character and

chronology of basin development, western margin of the Basin and Range Province. Geological Society of America Bulletin, 84(8):2489-2510;

Stewart, J.H., Reynolds, M.W.. and Johannesen, D.C. 1981. Geologic map of the Mount Grant quadrangle, Lyon and Mineral counties, Nevada. U.S. Geological Survey Miscellaneous Field Studies Map, MF-1278.

Impressions.

656. **ZZ Coaldale Esmeralda.**

*

Locality?, Rhyolite Ridge NE quadrangle, Esmeralda County.
Longitude 117/45/00, Latitude 37 /52/30.
Esmeralda Formation, late Miocene.

For geology see: Robinson, P.T., Stewart, J.H., Moiola, R.J. and Albers, J.P. 1976. Geologic map of the Rhyolite Ridge Quadrangle, Esmeralda County, Nevada. U.S. Geological Survey Geologic Quadrangle Map, GQ-1325;

Stewart, 1989.

Impressions.

See Axelrod, 1940; Brown, 1937; Evernden and James, 1964; Knowlton, 1900.

NOTE: Knowlton (1900) states that this locality is 3.8-4.5 km northeast of Emigrant Peak. The type locality has never been relocated (see discussion under Axelrod 1940a) but is estimated to be in either section 28, T.2N., R.37E. See also ZZ Coaldale fern locality (UCMP PA430).

NOTE: Setting the Miocene-Pliocene boundary at ca. 5.1 Ma requires these localities now be reassigned to the Miocene.

657. **ZZ Coaldale fern locality.**

*

Locality UCMP PA430, Rhyolite Ridge NW quadrangle, Esmeralda County.
Longitude 117/52/30, Latitude 37 /52/30.
Esmeralda Formation, late Miocene.

For geology see: Robinson, P.T., Stewart, J.H., Moiola, R.J. and Albers, J.P. 1976. Geologic map of the Rhyolite Ridge Quadrangle, Esmeralda County, Nevada. U.S. Geological Survey Geologic Quadrangle Map, GQ-1325;

Stewart, 1989.

Impressions.

See Evernden and James, 1964.

NOTE: Four rather poorly preserved leaves originally assigned to UCMP P3924, but renumbered to PA430 because this fern site is about 3.0 km SE of P3924.

658. **ZZ Coaldale, Fossil Tree.**

*

Locality?, Rhyolite Ridge NE quadrangle, Esmeralda County.
Longitude 117/45/00, Latitude 37 /52/30.
Esmeralda Formation(?), middle(?) Miocene.
For geology see: Robinson, P.T., Stewart, J.H., Moiola, R.J. and Albers, J.P. 1976. Geologic map of the Rhyolite Ridge Quadrangle, Esmeralda County, Nevada. U.S. Geological Survey Geologic Quadrangle Map, GQ-1325;
Stewart, 1989.
Wood.
See Anonymous, 1952; Boak, 1934; Ransom, 1955.

659. **ZZ Coaldale Juniper.**
*

Locality UCMP P3924, Coaldale quadrangle, Esmeralda County.
Longitude 117/52/30, Latitude 38 /00/00.
Esmeralda Formation, late Miocene.
For geology see: Stewart, 1989.
Impressions.
See Axelrod, 1940a, 1956; Evernden and James, 1964.

660. **ZZ Coaldale wood.**
*

Locality UCMP PA552, Rhyolite Ridge NE quadrangle, Esmeralda County.
Longitude 117/45/00, Latitude 37 /52/30.
Esmeralda Formation, late Miocene.
For geology see: Moore, 1981a, 1981b;
Robinson, P.T., Stewart, J.H., Moiola, R.J. and Albers, J.P. 1976. Geologic map of the Rhyolite Ridge Quadrangle, Esmeralda County, Nevada. U.S. Geological Survey Geologic Quadrangle Map, GQ-1325;
Stewart, 1989.
Wood.

661. **ZZ Cobre.**
*

Locality?, Cobre SE quadrangle, Elko County.
Longitude 114/22/30, Latitude 41 /00/00.
Unnamed unit, late Eocene.
For geology see: Coats, R.R. 1987. Geology of Elko County, Nevada. Nevada Bureau of Mines and Geology Bulletin, 101:1-112.
Impressions.
NOTE: Locality information via oral communications from William Rohrer to HES, 1969.

662. **ZZ Connors Pass.**
*

Locality?, Majors Place quadrangle, White Pine County.
Longitude 114/30/00, Latitude 39 /00/00.

Unnamed unit, Late Cretaceous or Paleocene.
For geology see: Drewes, Harald. 1967. Geology of the Connors Pass quadrangle, Schell Creek Range, east-central Nevada. U.S. Geological Survey Professional Paper, 557:1-93 (see especially p. 53).
Impressions.
NOTE: Four species identified by D.I. Axelrod.

663. **ZZ Copper Basin.**
*
Locality UCMP P3918, Jarbidge South quadrangle, Elko County.
Longitude 115/22/30, Latitude 41 /45/00.
Dead Horse Tuff, late Eocene (40 ± 1 or 41.0 ± 1.5 Ma recalculated).
For geology see: Coats, R.R. 1964. Geology of the Jarbidge quadrangle, Nevada-Idaho. U.S. Geological Survey Bulletin, 1141-M:1-24.
Impressions.
See Axelrod, 1966a.

664. **ZZ Council Hall Cave.**
*
Locality?, Little Horse Canyon quadrangle, White Pine County.
Longitude 114/00/00, Latitude 39 /15/00.
Cave deposits, Quaternary.
See Bell, 1990; Bryan, 1972; Mead and others, 1982, 1992; Thompson, 1979, 1984b, 1985b; Thompson and Mead, 1982.

665. **ZZ Crystal Ball Cave.**
*
Locality?, Spring Mountain quadrangle, Millard County, Utah.
Longitude 114/00/00, Latitude 39 /22/30.
Cave deposits, Quaternary.
NOTE: Locality is included because of its significance and because it is only 0.9 km east of the Nevada-Utah state line.
See Heaton, 1985, 1990.

666. **ZZ Currant Creek.**
*
Locality UCMP PA330, Currant quadrangle, Nye County.
Longitude 115/22/30, Latitude 38 /37/30.
Currant Tuff(?), late Eocene(?).
For geology see: Moores, E.M., Scott, R.B. and Lumsden, W.W. 1968. Tertiary tectonics of the White Pine - Grant Range region, east-central Nevada, and some regional implications. Geological Society of America Bulletin, 79(12):1703-1726.
Permineralized stems, wood.
NOTE: This is a rare example of permineralized monocots preserved *in situ* in a 'chert' very similar to the classic

Devonian Rhyne Chert. Presently under study by Diane M. Erwin, University of Pennsylvania and Ruth A. Stockey, University of Alberta, Edmonton.

NOTE: A brief attempt in November, 1992 by Norman Melvin and HES to relocate this locality was unsuccessful and the precise stratigraphic position of the site is unknown. Available information from the original collectors indicate the material probably came from the Currant Tuff.

667. **ZZ Double Hot Springs.**

*

Locality UCMP PA677, Pidgeon Spring SW quadrangle, Humboldt County.
Longitude 118/52/30, Latitude 41 /00/00.
Unnamed unit, middle Miocene.

For geology see: Willden, Ronald. 1964. Geology and mineral deposits of Humboldt County, Nevada. Nevada Bureau of Mines and Geology Bulletin, 59:1-154 (see especially p. 64).

Impressions.

NOTE: Small collection of four species identified by R.W. Brown.

NOTE: This locality was relocated in September, 1993 by Vicki Van Why, Debbi Bunn and Karen I. Rynberg (Penn Valley, California).

668. **ZZ Duck Flat Wood.**

*

Locality?, Juniper Springs quadrangle, Washoe County.
Longitude 119/45/00, Latitude 41 /00/00.
High Rock sequence, middle Miocene.

For geology see: Bonham, 1969.

Wood.

669. **ZZ Eastgate.**

*

Locality UCMP PA533, Eastgate quadrangle, Churchill County.
Longitude 117/52/30, Latitude 39 /15/00.
Middlegate Formation, middle Miocene (Barstovian).

For geology see: Axelrod, 1985.

Diatoms, impressions.

See Axelrod, 1985.

670. **ZZ Elko.**

*

NOTE: see ZZ Elko south.

671. **ZZ Elko Catlin Oil Shale Mine.**

*

Locality UCMP 22609, Elko West quadrangle, Elko County.
Longitude 115/45/00, Latitude 40 /45/00.

Elko Formation, late Eocene.
For geology see: Solomon, B.J. and Moore, S.W. 1982. Geologic map and oil shale deposits of the Elko West quadrangle, Elko County, Nevada. U.S. Geological Survey Miscellaneous Field Studies Map, MF-1410.
Impressions, palynomorphs.
See Hedlund, 1965; Lesquereux, 1873;
Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Eocene and Oligocene lacustrine and volcanic rocks near Elko, Nevada. *In*, G.W. Newman and H.D. Goode (eds.), Basin and Range Symposium and Great Basin field conference. Rocky Mountain Association of Geologists, Denver, Colorado, pp. 325-337. (gives dates on base and top of Unit 5 as 38.9 ± 0.7 - 37.1 ± 1.0 Ma not recalculated);
Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Stratigraphy and depositional environments of Paleogene rocks near Elko, Nevada. *In*, J.M. Armentrout, M.R. Cole and H. TerBest, Jr. (eds.), Cenozoic paleogeography of the western United States. Pacific Coast Paleogeography Symposium 3. The Pacific Section, Society of Economic Paleontologists and Mineralogists, pp. 75-88;
Winchester, D.E. 1923. Oil shale of the Rocky Mountain region. U.S. Geological Survey Bulletin, 729:1-204 (see especially pp. 21-32, 91-102).

672. **ZZ Elko north.**
*
Locality UCMP PA115, Kittridge Spring quadrangle, Elko County.
Longitude 115/45/00, Latitude 40 /52/30.
Elko Formation, late Eocene.
For geology see: Silitonga, P.H. 1974. Geology of part of the Kittridge Springs quadrangle, Elko County, Nevada. Unpublished M.S. Thesis. Colorado School of Mines, Golden, Colorado.
Impressions.
See Axelrod and Raven, 1985; Lesquereux, 1873;
Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Eocene and Oligocene lacustrine and volcanic rocks near Elko, Nevada. *In*, G.W. Newman and H.D. Goode (eds.), Basin and Range Symposium and Great Basin field conference. Rocky Mountain Association of Geologists, Denver, Colorado, pp. 325-337. (gives dates on base and top of Unit 5 as 38.9 ± 0.7 - 37.1 ± 1.0 Ma not recalculated);
Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Stratigraphy and depositional environments of Paleogene rocks near Elko, Nevada. *In*, J.M. Armentrout, M.R. Cole and

H. TerBest, Jr. (eds.), Cenozoic paleogeography of the western United States. Pacific Coast Paleogeography Symposium 3. The Pacific Section, Society of Economic Paleontologists and Mineralogists, pp. 75-88.

673. **ZZ Elko Osino Coal Mine.**

*

Locality UCMP PA299, Coal Mine Basin quadrangle, Elko County.
Longitude 115/37/30, Latitude 41 /07/30.
Elko Formation, late Eocene.

For geology see: Ketner, K.B. 1973. Preliminary geologic map of the Coal Mine Basin quadrangle, Elko County, Nevada. U.S. Geological Survey Miscellaneous Field Studies Map, MF-528.

Impressions, palynomorphs.

See Cope, 1873; Lesquereux, 1872, 1873, 1874, 1878, 1883; Mason, 1927; Wingate, 1983;

Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Eocene and Oligocene lacustrine and volcanic rocks near Elko, Nevada. *In*, G.W. Newman and H.D. Goode (eds.), Basin and Range Symposium and Great Basin field conference. Rocky Mountain Association of Geologists, Denver, Colorado, pp. 325-337. (gives dates on base and top of Unit 5 as 38.9 ± 0.7 - 37.1 ± 1.0 Ma not recalculated);

Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Stratigraphy and depositional environments of Paleogene rocks near Elko, Nevada. *In*, J.M. Armentrout, M.R. Cole and H. TerBest, Jr. (eds.), Cenozoic paleogeography of the western United States. Pacific Coast Paleogeography Symposium 3. The Pacific Section, Society of Economic Paleontologists and Mineralogists, pp. 75-88.

674. **ZZ Elko south.**

*

Locality UCMP P3949, Elko West quadrangle, Elko County.
Longitude 115/45/00, Latitude 40 /45/00.
Elko Formation, late Eocene.

For geology see: Solomon, B.J. and Moore, S.W. 1982. Geologic map and oil shale deposits of the Elko West quadrangle, Elko County, Nevada. U.S. Geological Survey Miscellaneous Field Studies Map, MF-1410.

Impressions, palynomorphs.

NOTE: From old coal mine adits that are now closed and largely buried.

See Chaney, 1951; Chaney and Axelrod, 1959; Hedlund, 1965; Lesquereux, 1873; Wolfe and Tanai, 1987;

Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Eocene and Oligocene lacustrine and volcanic rocks near Elko, Nevada. *In*, G.W. Newman and H.D. Goode (eds.), Basin and Range Symposium and Great Basin field conference. Rocky Mountain Association of Geologists, Denver, Colorado, pp. 325-337. (gives dates on base and top of Unit 5 as 38.9 ± 0.7 - 37.1 ± 1.0 Ma not recalculated);

Solomon, B.J., McKee, E.H. and Andersen, D.W. 1979. Stratigraphy and depositional environments of Paleogene rocks near Elko, Nevada. *In*, J.M. Armentrout, M.R. Cole and H. TerBest, Jr. (eds.), Cenozoic paleogeography of the western United States. Pacific Coast Paleogeography Symposium 3. The Pacific Section, Society of Economic Paleontologists and Mineralogists, pp. 75-88.

675. **ZZ Esmeralda.**

*

NOTE: see ZZ Coaldale Esmeralda.

676. **ZZ Esmeralda Road Cut.**

*

Locality UCMP PA432, Blair Junction quadrangle, Esmeralda County.
Longitude 117/45/00, Latitude 38 /00/00.
Esmeralda Formation, late Miocene.

For geology see: Moore, 1981a, 1981b;

Stewart, J.H. 1989. Description, stratigraphic sections, and maps of the middle and upper Miocene Esmeralda Formation in Alum, Blanco Mine, and Coaldale areas, Esmeralda County, Nevada. U.S. Geological Survey Open-File Report, OF 89-234.

Impressions.

NOTE: Six moderately preserved leaf impressions collected by Annie M. Alexander and Louise Kellogg from a roadcut; an attempt by HES to relocate the original locality was unsuccessful; recent highway construction may have destroyed or buried the original locality.

677. **ZZ Eureka.**

*

Locality UCMP PA447, Eureka quadrangle, Eureka County.
Longitude 115/52/30, Latitude 39 /30/00. Early Cretaceous.

Impressions.

NOTE: Site needs to be relocated.

678. **ZZ Fallon.**

*

Locality UCMP 252, Sheckler Reservoir quadrangle, Churchill County.
Longitude 118/52/30, Latitude 39 /22/30.
Desert Peak Formation, middle Miocene.

For geology see: Axelrod, 1956.
Impressions.
See Axelrod, 1956.

679. **ZZ Fallon.**
*
Locality UCMP 268, Sheckler Reservoir quadrangle, Churchill County.
Longitude 118/52/30, Latitude 39 /22/30.
Desert Peak Formation, middle Miocene.
For geology see: Axelrod, 1956.
Impressions.
See Axelrod, 1956.

680. **ZZ Fingerrock.**
*
NOTE: see ZZ Stewart Valley, Fingerrock.

681. **ZZ Fish Lake Valley.**
*
Locality UCMP 605, Volcanic Hills East quadrangle, Esmeralda County.
Longitude 118/00/00, Latitude 37 /52/30.
"Esmeralda" Formation, middle Miocene (Clarendonian, 11.7 Ma recalculated).
For geology see: Robinson, P.T. and Crowder, D.F. 1973. Geologic map of the Davis Mountain quadrangle, Esmeralda and Mineral counties, Nevada, and Mono County, California. U.S. Geological Survey Geologic Quadrangle Map, GQ-1078;
Suthard, J.A. 1966. Stratigraphy and paleontology in Fish Lake Valley, Esmeralda County, Nevada. Unpublished M.S. Thesis. Department of Geology, University of California Riverside, Riverside, California.
Wood.
See Anonymous, 1952; Page, 1964; Segerblom, 1966.
See also Clark, J.B., Dawson, M.R. and Wood, A.E. 1964. Fossil mammals from the Lower Pliocene of Fish Lake Valley, Nevada. Bulletin of the Museum of Comparative Zoology, Harvard University, 131(2):27-63;
Evernden, J.F., Savage, D.E., Curtis, G.H. and James, G.T. 1964. Potassium-argon dates and the Cenozoic mammalian chronology of North America. American Journal of Science, 262(2):145-198.

682. **ZZ Fishbone Cave.**
*
Locality?, Pershing County.
Cave deposits, Quaternary.
Palynomorphs.

See Orr, 1956; Sears, and Roosma, 1961; Thompson and others, 1987.

683. **ZZ Fitzgerald cone.**

*

Locality UCMP PA690, Stockton Well quadrangle, Lyon County.
Longitude 119/15/00, Latitude 39 /22/30.
Coal Valley Formation, middle Miocene.
For geology see: Rose, 1969 (see especially pp. 11-12).
Permineralized cone.
NOTE: Collected and presented by Jennifer L. Fitzgerald, Silver Springs, Nevada.

684. **ZZ Garfield Peak.**

*

Locality?, Marble Mountain quadrangle, Mineral County.
Longitude 118/15/00, Latitude 38 /22/30.
Excelsior Formation(?), Triassic.
For geology see: Ponsler, H.E. 1977. The geology and mineral deposits of the Garfield district, Mineral County, Nevada. Unpublished M.S. Thesis. University of Nevada, Reno, Reno, Nevada.
Impressions.
See White, 1930; small collection of seven species indicative of the Triassic. Collected "...700 feet east of summit of high hill [Garfield Peak?] northeast of Garfield mine...". Letter is in Field Record File, Geologic Division, U.S. Geological Survey, Menlo Park, California.

685. **ZZ Gatecliff Shelter.**

Locality?, Wildcat Peak quadrangle, Nye County.
Longitude 116/45/00, Latitude 39 /00/00.
Cave deposits, Quaternary.
Palynomorphs.
See Grayson, 1981; Kautz and Thomas, 1972; Lanner, 1983; Rhode and Thomas, 1983; Thompson and Hattori, 1983; Thompson and Kautz, 1983.

686. **ZZ Gilbert.**

*

Locality UCMP PA531, Gilbert quadrangle, Esmeralda County.
Longitude 117/37/30, Latitude 38 /07/30.
McLeans Formation, middle Miocene.
Impressions.
See Wolfe and Tanai, 1987, p. 49.

687. **ZZ Gillam Spring lower.**

*

Locality UCMP PA660, Chester Lyons Spring quadrangle, Washoe County.

Longitude 119/30/00, Latitude 41 /07/30.
High Rock sequence, middle Miocene (15.4 ± 0.5 Ma).
For geology see: Bonham, 1969.
Diatoms, impressions.
See Axelrod and Schorn, 1994.

688. **ZZ Gillam Spring middle.**
*

Locality UCMP PA428, Hart Mountain quadrangle, Washoe County.
Longitude 119/30/00, Latitude 41 /15/00.
High Rock sequence, middle Miocene (15.4 ± 0.5 Ma).
For geology see: Bonham, 1969.
Diatoms, impressions.
See Axelrod and Schorn, 1994.

689. **ZZ Gillam Spring upper.**
*

Locality UCMP PA639, Chester Lyons Spring quadrangle, Washoe County.
Longitude 119/30/00, Latitude 41 /07/30.
High Rock sequence, middle Miocene (15.4 ± 0.5 Ma).
For geology see: Bonham, 1969.
Impressions.
See Axelrod and Schorn, 1994.

690. **ZZ Gillam Spring wood.**
*

Locality UCMP PA659, Hart Mountain quadrangle, Washoe County.
Longitude 119/30/00, Latitude 41 /15/00.
High Rock sequence, middle Miocene (15.4 ± 0.5 Ma).
For geology see: Bonham, 1969.
Wood.
NOTE: Permineralized woody material preserved as debris in an "*in situ*" pond.

691. **ZZ Golden Opal Mine.**
*

NOTE: see ZZ Virgin Valley, Golden Opal Mine.

692. **ZZ Goldyke Road.**
*

NOTE: see ZZ Stewart Valley, Goldyke Road.

693. **ZZ Guano Cave.**
*

Locality?, Pershing County.
Cave deposits, Quaternary.
Palynomorphs.
See Sears and Roosma, 1961; Thompson and others, 1987.

694. **ZZ Gypsum Cave.**
*

Locality?, Frenchman Mtn. quadrangle, Clark County.
Longitude 114/52/30, Latitude 36 /07/30.
Cave deposits, Quaternary.
See Arnold and Libby, 1951; Harrington, 1933; Laudermilk and Munz, 1934a, 1934b, 1935; Mehringer, 1967c.

695. **ZZ Hazen.**
*

Locality UCMP P3947, Hazen quadrangle, Churchill County.
Longitude 119/00/00, Latitude 39 /30/00.
Truckee Formation, late Miocene (late(?) Clarendonian).
Diatoms, impressions.
NOTE: A small collection of 8-10 specimens deposited relatively far out in the deeper, anoxic part of the ancient "Truckee" lake.
See also MacDonald, J.R. 1956. A new Clarendonian mammalian fauna from the Truckee Formation of western Nevada. Journal of Paleontology, 30(1):186-202;
MacDonald, J.R. and Pelletier, W.J. 1958. The Pliocene mammalian faunas of Nevada, U.S.A. Congreso Geologico Internacional, 20th Sesión, Ciudad de México, Sección 7, Paleontología, Taxonomía y Evolución, pp. 365-388.

696. **ZZ Hidden Cave.**
*

Locality?, Grimes Point quadrangle, Churchill County.
Longitude 118/37/30, Latitude 39 /22/30.
Cave deposits, Quaternary.
See Goodman, 1985; Grayson, 1984; Pendleton, 1985; Wigand and Mehringer, 1985.

697. **ZZ Horsethief Canyon.**
*

NOTE: see ZZ Coal Valley, Horsethief Canyon.

698. **ZZ Indian Creek.**
*

Locality?, Mt. Lewis quadrangle, Lander County.
Longitude 116/45/00, Latitude 40 /22/30.
Unnamed unit, Eocene or Oligocene.
For geology see: Gilluly, J. and Gates, O. 1965. Tectonics and igneous geology of the northern Shoshone Range, Nevada. U.S. Geological Survey Professional Paper, 465:1-153 (see especially pp. 60 and 89);
Gilluly, J. and Masursky, H. 1965. Geology of the Cortez quadrangle, Nevada. U.S. Geological Survey Bulletin, 1175:1-117;
Wrucke, C.T. and Silberman, M.L. 1975. Cauldron

subsidence of Oligocene age at Mount Lewis, northern Shoshone Range, Nevada. U.S. Geological Survey Professional Paper, 876:1-20;

Gilluly, James. 1977. Cauldron subsidence near Mount Lewis, Nevada - a misconception. U.S. Geological Survey Journal of Research, 5(3):325-329;

Wrucke, C.T. and Silberman, M.L. 1977. Cauldron subsidence of Oligocene age at Mount Lewis, Shoshone Range, Nevada - a resonable interpretation. U.S. Geological Survey Journal of Research, 5(3):331-335.

Impressions.

699. **ZZ Ione Summit.**

*

Locality UCMP PA517, Ione quadrangle, Nye County.
Longitude 117/30/00, Latitude 38 /52/30.
Unnamed unit, Oligocene or Miocene.

For geology see: Vitaliano, C.J. 1963. Cenozoic geology and sections of the Ione quadrangle, Nye County, Nevada. U.S. Geological Survey Miscellaneous Field Investigations Map, MF-255;

Whitebread, D.H., Silberling, N.J., Brem, G.F. and Andrews, T.D. 1988. Preliminary geologic map of the eastern half of the Ione quadrangle, Nye County, Nevada. U.S. Geological Survey Open-File Report, OF 88-48.

Impressions.

700. **ZZ Kane Springs Wash.**

*

Locality UCMP PA174, Delmar 3 NE quadrangle, Lincoln County.
Longitude 114/45/00, Latitude 37 /00/00.
Chainman Formation, Late Mississippian.

Impressions.

701. **ZZ La Plata.**

*

Locality USGS field number 87-DJ-232, La Plata Canyon quadrangle, Churchill County.
Longitude 118/15/00, Latitude 39 /22/30.
Unnamed unit, middle Miocene.

For geology see: John, D.A. and Silberling, N.J. 1993. Geologic map of the La Plata Canyon quadrangle, Churchill County, Nevada. U.S. Geological Survey Geologic Quadrangle Map, GQ-1710.

Impressions.

Reported by David John to HES, Oct., 1987.

702. **ZZ Leonard Rockshelter.**

*

Locality?, Wildhorse Pass quadrangle, Pershing County.
Longitude 118/22/30, Latitude 40 /00/00.
Cave deposits, Quaternary.
Palynomorphs.
See Arnold and Libby, 1951; Byrne and others, 1979.

703. **ZZ Lewis Coal Mine.**
*

NOTE: see ZZ Coal Valley, Lewis Coal Mine.

704. **ZZ Long Valley.**
*

Locality UCMP PA439, Constantia quadrangle, Lassen County, California.
Longitude 120/00/00, Latitude 39 /52/30.
Hallelujah formation (informal), Pliocene (early Blancan).
For geology see: Koehler, B.M. 1989. Stratigraphy and depositional environments of the late Pliocene (Blancan) Hallelujah Formation, Long Valley, Lassen County, California, Washoe County, Nevada. Unpublished M.S. Thesis. University of Nevada, Reno, Nevada.
Thesis. Impressions.
NOTE: This locality is in California approximately one mile west of the Nevada-California state line. It is included here because of its proximity and its important geographic and stratigraphic position.

705. **ZZ Lovelock Cave.**
*

Locality?, Lovelock Caves quadrangle, Churchill County.
Longitude 118/30/00, Latitude 39 /52/30.
Cave deposits, Quaternary.
For geology see: Morrison, R.B. 1961. Lake Lahontan stratigraphy and history in the Carson Desert (Fallon) area, Nevada. *In*, Short Papers in the Geologic and Hydrologic Sciences, Articles 293-435. Geological Survey Research 1961. U.S. Geological Survey Professional Paper 424-D:111-114; Morrison, 1964.
Palynomorphs.
See Ambro, 1967; Arnold and Libby, 1951; Cowan, 1967; Heizer, 1967; Heizer and Napton, 1970; Loud and Harrington, 1929; Napton, 1969, 1970; Napton and Heizer, 1970; Napton and Kelso, 1969.

706. **ZZ Lund Petrified Forest.**
*

Locality UCMP PA661, Butte Spring quadrangle, Washoe County.
Longitude 119/22/30, Latitude 41 /07/30.
High Rock sequence, middle Miocene.

For geology see: Bonham, 1969 (see especially p. 18, fig. 7).
Wood.
NOTE: Trees *in situ*.
See Murbarger, 1953.
NOTE: This wood has been referred to the form genus *Sequoioxylon*, and considered most likely to represent the extant dawn redwood (*Metasequoia*). The many publications by Axelrod (see e.g., 1986b) indicate these large trees were more likely the Sierra redwood or bigtree (*Sequoiadendron*).

707. **ZZ Majors Place.**
*
Locality?, Majors Place quadrangle, White Pine County.
Longitude 114/30/00, Latitude 39 /00/00.
Unnamed unit, Late Cretaceous or Paleocene.
For geology see: Drewes, Harald. 1967. Geology of the Connors Pass quadrangle, Schell Creek Range, east-central Nevada. U.S. Geological Survey Professional Paper, 557:1-93 (see especially p. 53).
Impressions.
NOTE: Four species identified by D.I. Axelrod.

708. **ZZ Mansfield Ranch.**
*
Locality UCMP PA429, Fraser Flat quadrangle, Washoe County.
Longitude 117/37/30, Latitude 39 /45/00.
Unnamed unit, late Miocene (Hemphillian(?)).
Impressions.
NOTE: A small collection preserved in silicified shales. Only surface collecting is possible.
NOTE: A small collection of mammalian fossils (UCMP V3415) was collected by V.P. Gianella from a site estimated to be northeast of the plant locality near the old ranch site of Mansfield Ranch. These bones of camel and rhino(?) indicate a Hemphillian(?) age. An initial search by CJB and HES in 1993 failed to relocate the vertebrate site.

709. **ZZ Mansfield Ranch, Hungry Spring Hill.**
*
Locality UCMP PA688, Fraser Flat quadrangle, Washoe County.
Longitude 117/37/30, Latitude 39 /45/00.
Unnamed unit, late Miocene (Hemphillian(?)).
Impressions.
NOTE: A small collection preserved in silicified shales. Only surface collecting is possible.
NOTE: A small collection of mammalian fossils (UCMP V3415) was collected by V.P. Gianella at a site estimated to be

northeast of the plant locality near the old ranch site of Mansfield Ranch. These bones of camel and rhino(?) indicate a Hemphillian(?) age. An initial search by CJB and HES in 1993 failed to relocate the vertebrate site.

710. **ZZ Medicine Creek.**

*

Locality UCMP PA689, Wine Cup Ranch SW quadrangle, Elko County.
Longitude 114/37/30, Latitude 41 /15/00.
Unnamed unit, late Eocene.
For geology see: Coats, R.R. 1987. Geology of Elko County, Nevada. Nevada Bureau of Mines and Geology Bulletin, 101:1-112.
Impressions.
NOTE: Locality information via oral communications from William Rohrer to HES in 1969 and subsequently a small collection made by David Povey in 1993.

711. **ZZ Medicine Spring wood.**

*

Locality?, Medicine Spring quadrangle, Elko County.
Longitude 115/07/30, Latitude 40 /15/00.
Sheep Pass Formation(?), early? Eocene.
For geology see: Collinson, J.W. 1968. Permian and Triassic biostratigraphy of the Medicine Range, northeastern Nevada. Earth Science Bulletin, 1(4):25-44;
Coats, R.R. 1987. Geology of Elko County, Nevada. Nevada Bureau of Mines and Geology Bulletin, 101:1-112 (see especially p. 55).
Wood.
NOTE: Assigned to *Cupressinoxylon*.

712. **ZZ Mickey Canyon Spring, leaf horizon.**

*

Locality UCMP PA624, Mount Etna quadrangle, Lyon County.
Longitude 119/07/30, Latitude 38 /37/30.
Aldrich Station Formation, middle Miocene.
For geology see: Stewart, J.H. and Reynolds, M.W. 1987. Geologic map of the Pine Grove Hills quadrangle, Lyon County, Nevada. U.S. Geological Survey Open-File Report, OF 87-658;
Gilbert, C.M. and Reynolds, M.W. 1973. Character and chronology of basin development, western margin of the Basin and Range Province. Geological Society of America Bulletin, 84(8):2489-2510.
Impressions.

713. **ZZ Mickey Canyon Spring, pine cone.**

*

Locality UCMP PA628, Mount Etna quadrangle, Lyon County.
Longitude 119/07/30, Latitude 38 /37/30.
Aldrich Station Formation, middle Miocene.
For geology see: Stewart, J.H. and Reynolds, M.W. 1987. Geologic map of the Pine Grove Hills quadrangle, Lyon County, Nevada. U.S. Geological Survey Open-File Report, OF 87-658;
Gilbert, C.M. and Reynolds, M.W. 1973. Character and chronology of basin development, western margin of the Basin and Range Province. Geological Society of America Bulletin, 84(8):2489-2510.
Permineralized cone.
See Schorn and Shelton, 1991.

714. **ZZ Mickey Pass.**
*

Locality UCMP PA436, Yerington quadrangle, Lyon County.
Longitude 119/07/30, Latitude 38 /52/30.
Mickey Pass Tuff, late Oligocene (≈ 28.0 Ma).
For geology see: Proffett, J.M., Jr. and Proffett, B.H. 1976. Stratigraphy of the Tertiary ash-flow tuffs in the Yerington District, Nevada. Nevada Bureau of Mines and Geology Report, 27:1-28 (see especially figure 5 and p. 18); flora from the upper unit (map unit 7) of the Mickey Pass Tuff;
Stewart, J.H. and Dohrenwend, J.C. 1984. Geologic Map of the Yerington quadrangle, Nevada. U.S. Geological Survey Open-File Report, OF 84-212.
Impressions.

715. **ZZ Mickey Wash, Dailey site.**
*

Locality UCMP PA557, Wilson Canyon quadrangle, Lyon County.
Longitude 119/07/30, Latitude 38 /45/00.
Coal Valley Formation(?), late Miocene (early Hemphillian).
For geology see: Gilbert, C.M. and Reynolds, M.W. 1973. Character and chronology of basin development, western margin of the Basin and Range Province. Geological Society of America Bulletin, 84(8):2489-2510;
Stewart, J.H. and Dohrenwend, J.C. 1984. Geologic Map of the Yerington quadrangle, Nevada. U.S. Geological Survey Open-File Report, OF 84-212.
Impressions.
See also Macdonald, J.R. 1959. The middle Pliocene mammalian fauna from Smiths Valley, Nevada. Journal of Paleontology, 33(5):872-887.

716. **ZZ Mickey Wash, Discovery Site.**
*

Locality UCMP PA335, Wilson Canyon quadrangle, Lyon County.
Longitude 119/07/30, Latitude 38 /45/00.
Coal Valley Formation(?), late Miocene (early Hemphillian).
For geology see: Gilbert, C.M. and Reynolds, M.W. 1973. Character and chronology of basin development, western margin of the Basin and Range Province. Geological Society of America Bulletin, 84(8):2489-2510;
Stewart, J.H. and Dohrenwend, J.C. 1984. Geologic Map of the Yerington quadrangle, Nevada. U.S. Geological Survey Open-File Report, OF 84-212.
Impressions.
See also Macdonald, J.R. 1959. The middle Pliocene mammalian fauna from Smiths Valley, Nevada. Journal of Paleontology, 33(5):872-887.

717. **ZZ Middlegate.**
*
Locality UCMP P5101, Eastgate quadrangle, Churchill County.
Longitude 117/52/30, Latitude 39 /15/00.
Middlegate Formation, middle Miocene.
For geology see: Axelrod, 1985.
Impressions.
See Axelrod, 1956, 1985; Evernden and James, 1964.

718. **ZZ Mormon Mountain Cave.**
*
Locality?, Carp quadrangle, Lincoln County.
Longitude 114/22/30, Latitude 37 /00/00.
Cave deposits, Quaternary.
See Jefferson, 1982.

719. **ZZ Newark Canyon, float wood.**
*
Locality UCMP PA571, Diamond Peak quadrangle, Eureka County.
Longitude 115/45/00, Latitude 39 /30/00.
Newark Canyon Formation, Early Cretaceous.
For geology see: Nolan, T.B., Merriam, C.W. and Brew, D.A. 1971. Geologic map of the Eureka quadrangle, Eureka and White Pine counties, Nevada. U.S. Geological Survey Miscellaneous Geologic Investigations Map, I-612.
Wood.
NOTE: Single specimen ca. 30 cm diameter found as float near mouth of Green Canyon.
See also Nolan, T.B., Merriam, C.W. and Williams, J.S. 1956. The stratigraphic section in the vicinity of Eureka, Nevada. U.S. Geological Survey Professional Paper, 276:1-77 (see

especially p. 70);
Roberts and others, 1967.

720. **ZZ Newark Canyon, Leptolepis site.**
*
Locality UCMP PA575, Diamond Peak quadrangle, Eureka County.
Longitude 115/45/00, Latitude 39 /30/00.
Newark Canyon Formation, Early Cretaceous.
For geology see: Nolan, T.B., Merriam, C.W. and Brew, D.A. 1971. Geologic map of the Eureka quadrangle, Eureka and White Pine counties, Nevada. U.S. Geological Survey Miscellaneous Geologic Investigations Map, I-612.
Impressions.
See MacNeil, 1939;
See also David, Lore. 1941. *Leptolepis nevadensis*, a new Cretaceous fish. Journal of Paleontology, 15(3):318-321;
Nolan, T.B., Merriam, C.W. and Williams, J.S. 1956. The stratigraphic section in the vicinity of Eureka, Nevada. U.S. Geological Survey Professional Paper, 276:1-77 (see especially p. 70);
Roberts and others, 1967.

721. **ZZ Nightingale Road, Brady Pocket wood.**
*
Locality UCMP PA332, Telephone Well quadrangle, Churchill County.
Longitude 119/00/00, Latitude 39 /52/30.
Truckee Formation, late Miocene (late Clarendonian).
Permineralized seeds, wood.
See also MacDonald, J.R. 1956. A new Clarendonian mammalian fauna from the Truckee Formation of western Nevada. Journal of Paleontology, 30(1):186-202.

722. **ZZ Nightingale Road, Trapa locality.**
*
Locality UCMP PA672, Telephone Well quadrangle, Churchill County.
Longitude 119/00/00, Latitude 39 /52/30.
Truckee Formation, late Miocene (late Clarendonian).
Diatoms, fruit impressions.
See also MacDonald, J.R. 1956. A new Clarendonian mammalian fauna from the Truckee Formation of western Nevada. Journal of Paleontology, 30(1):186-202.

723. **ZZ Norton Ranch.**
*
Locality USGS diatom locality 4409, Sugarloaf Knob quadrangle, Humboldt County.
Longitude 118/30/00, Latitude 40 /52/30.

Unnamed unit, middle(?) Miocene.
For geology see: Willden, Ronald. 1964. Geology and mineral deposits of Humboldt County, Nevada. Nevada Bureau of Mines and Geology Bulletin, 59:1-154 (see especially p. 65).
Diatoms.

724. **ZZ O'Malley Shelter.**
*
Locality?, Islen quadrangle, Lincoln County.
Longitude 114/15/00, Latitude 37 /30/00.
Cave deposits, Quaternary.
Palynomorphs, woodrat middens.
See Madsen, 1972, 1973a.

725. **ZZ Owl Cave One and Owl Cave Two.**
*
Locality?, Garrison quadrangle, White Pine County.
Longitude 114/00/00, Latitude 38 /52/30.
Cave deposits, Quaternary.
See Turnmire, 1987.

726. **ZZ Pacific Union.**
*
NOTE: see ZZ Stewart Valley, Pacific Union.

727. **ZZ Parran Junction.**
*
Locality UCMP PA437, Desert Peak quadrangle, Churchill County.
Longitude 118/52/30, Latitude 39 /45/00.
Truckee Formation, late Miocene (late Clarendonian).
For geology see: Axelrod, 1956;
Voegtly, N.E. 1981. Reconnaissance of the Hot Springs Mountains and adjacent areas, Churchill County, Nevada. U.S. Geological Survey Open-File Report, OF 81-134.
Diatoms, impressions.
See also MacDonald, J.R. 1956. A new Clarendonian mammalian fauna from the Truckee Formation of western Nevada. Journal of Paleontology, 30(1):186-202.

728. **ZZ Pierson Canyon.**
*
Locality UCMP PA481, Olinghouse quadrangle, Washoe County.
Longitude 119/22/30, Latitude 39 /37/30.
Chloropagus Formation, middle Miocene (13.6 Ma).
For geology see: Geason, D.L. 1980. The geology of a part of the Olinghouse mining district, Washoe County, Nevada. Unpublished M.S. Thesis. University of Nevada, Reno, Reno, Nevada.

Impressions.
NOTE: This is the stratigraphically highest flora in the Chloropagus Formation. A tuff about 100 m above the flora has been dated at 13.6 Ma (information *fide* D.I. Axelrod, oral comm., 1992).

729. **ZZ Pine Valley Devonian.**
*
Locality UCMP PA90, West of Coffin Mtn. quadrangle, Eureka County.
Longitude 116/07/30, Latitude 40 /15/00.
Roberts Mountains Formation, Devonian.
For geology see: Murphy, M.A., McKee, E.H., Winterer, E.L., Matti, J.C. and Dunham, J.B. 1978. Preliminary geologic map of the Roberts Creek Mountain quadrangle, Nevada. U.S. Geological Survey Open-File Report, OF 78-376.
Impressions.
NOTE: Rare example of Devonian land plants from Nevada.

730. **ZZ Pogues Station.**
*
Locality?, Pogues Station quadrangle, White Pine County.
Longitude 115/45/00, Latitude 39 /07/30.
Diamond Peak Formation, Mississippian.
Impressions.
See Svoboda, 1988.
NOTE: Information from D. Charles Dailey, Sierra Collage, Rocklin, California.

731. **ZZ Protoyucca site.**
*
Locality?, Blowout Mtn. quadrangle, Humboldt County.
Longitude 119/15/00, Latitude 41 /37/30.
High Rock sequence, middle Miocene.
Wood.
See Tidwell and Parker, 1990.

732. **ZZ Purple Mountain.**
*
Locality UCMP P5107 and UCMP PA608, Fernley West quadrangle, Storey County.
Longitude 119/15/00, Latitude 38 /30/00.
Chloropagus Formation, middle Miocene (ranges from 14.8 Ma to 13.5 Ma).
For geology see: Rose, 1969 (see especially pp. 11-12).
Impressions.
See Axelrod, 1976b, 1994 *in press*; Axelrod and Schorn, 1994.

733. **ZZ Pyramid.**
*
Locality UCMP 5202, Tule Peak quadrangle, Washoe County.

Longitude 119/37/30, Latitude 39 /52/30.
Pyramid Formation, middle Miocene (15.6 ± 2.4 Ma recalculated).
For geology see: McJannet, G.S. 1957. Geology of the Pyramid Lake - Red Rock Canyon area, Washoe County, Nevada. Unpublished Ph.D. Dissertation. University of California, Los Angeles, Los Angeles, California;
Axelrod, 1992a.
Diatoms, impressions.
See Axelrod, 1992a; Evernden and James, 1964
NOTE: Date in Bonham (1969) given as 15.2 ± 2.4 Ma, changed by Axelrod (1992a) to 15.6 Ma.

734. **ZZ Rabbithole.**
*
Locality USNM 11283, Rabbithole quadrangle, Pershing County.
Longitude 118/45/00, Latitude 40 /45/00.
Unnamed unit, middle Miocene (Clarendonian).
For geology see: Johnson, M.G. 1977. Geology and mineral deposits of Pershing County, Nevada. Nevada Bureau of Mines and Geology Bulletin, 89:1-115 (see especially p. 36).
Impressions.
NOTE: Collected by J.H. Stewart, 1972. E&R WMR-72-1M. Collection identified by Jack A. Wolfe.

735. **ZZ Ramsey.**
*
Locality UCMP PA636, Stockton Well quadrangle, Lyon County.
Longitude 119/15/00, Latitude 39 /22/30.
"Pre-Hartford Hill" sediments, late Oligocene.
For geology see: Rose, 1969 (see especially pp. 11-12).
Impressions.
NOTE: Small collection; leaf impressions very difficult to collect because of overburden (*fide* D.I. Axelrod, oral comm., 1990).
See also Bingler, E.C. 1978. Abandonment of the name Hartford Hill Rhyolite Tuff and adoption of new formation names for middle Tertiary ash-flow tuffs in the Carson City - Silver City area, Nevada. U.S. Geological Survey Bulletin, 1457-D:1-19.

736. **ZZ Red Hill.**
*
Locality UCMP PA630, Pete Hanson Creek quadrangle, Eureka County.
Longitude 116/15/00, Latitude 40 /00/00.
Denay Formation, Red Hill beds, Late Devonian (Frasnian).

Algae?
See also Morgan, T.G. 1974. Lithostratigraphy and paleontology of the Red Hill area, Eureka County, Nevada. Unpublished M.S. Thesis. University of California, Riverside, Riverside, California;
Gregory, J.T., Morgan, T.G. and Reed, J.W. 1977. Devonian fishes in central Nevada. Geological Society of America Abstracts with Programs, 9(7):996;
Reed, J.W. 1980. The Devonian fish fauna of Red Hill, Nevada. Unpublished Ph.D. Dissertation. University of California, Berkeley, Berkeley, California.

737. **ZZ Sage Hen Creek.**
*
Locality UCMP PA438, Bluewing Spring quadrangle, Pershing County.
Longitude 119/00/00, Latitude 45 /00/00.
Unnamed unit, late(?) Miocene.
Impressions.

738. **ZZ San Antonio Mountains.**
*
Locality UCMP PA336, Baxter Spring NW quadrangle, Nye County.
Longitude 117/07/30, Latitude 38 /22/30.
Siebert Formation(?), middle Miocene.
Impressions, wood.
See Wolfe and Tanai, 1987.

739. **ZZ Smith Creek Cave.**
*
Locality?, Little Horse Canyon quadrangle, White Pine County.
Longitude 114/00/00, Latitude 39 /15/00.
Cave deposits, Quaternary.
See Bell, 1990; Bryan, 1972; Mead and others, 1982, 1992; Thompson, 1979, 1984b, 1985b; Thompson and Mead, 1982.

740. **ZZ Stewart Valley.**
*
Locality UCMP PA333, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene (Barstovian).
For general geology see: Schorn and others, 1989.
Impressions.

741. **ZZ Stewart Valley, above Rattlesnake Cliff.**
*
Locality UCMP PA217, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.

Savage Canyon Formation, middle Miocene (Barstovian).
For general geology see: Schorn and others, 1989.
Algae, wood.

742. **ZZ Stewart Valley, algal horizon.**
*
Locality UCMP PA42, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene (Barstovian).
For general geology see: Schorn and others, 1989.
Algae.

743. **ZZ Stewart Valley, Diatomite Ridge.**
*
Locality UCMP PA219, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene (Barstovian).
For general geology see: Schorn and others, 1989.
Diatoms, impressions.
See Krebs and others, 1987.

744. **ZZ Stewart Valley, Fingerrock.**
*
Locality UCMP PA99, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Gilbert Andesite (shale member), middle Miocene (Hemingfordian or Barstovian).
For general geology see: Schorn and others, 1989.
Impressions.
See Opler, 1973; Wolfe, 1964; Wolfe and Tanai, 1987.

745. **ZZ Stewart Valley, general.**
*
Locality UCMP PA203, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene (Barstovian).
For general geology see: Schorn and others, 1989.
Impressions.
See Wolfe, 1964.

746. **ZZ Stewart Valley, Goldyke Road.**
*
Locality UCMP PA342, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Gilbert Andesite (shale member), middle Miocene (Hemingfordian or Barstovian).

For general geology see: Schorn and others, 1989.
Impressions.
See Wolfe and Tanai, 1987.

747. **ZZ Stewart Valley, Howard's Hunch.**
*
Locality UCMP PA518, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene (Barstovian).
For general geology see: Schorn and others, 1989.
Impressions.

748. **ZZ Stewart Valley, Melvin site.**
*
Locality UCMP PA572, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene (Barstovian).
For general geology see: Schorn and others, 1989.
Impressions.

749. **ZZ Stewart Valley, Pacific Union.**
*
Locality UCMP PA518, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene (Barstovian).
For general geology see: Schorn and others, 1989.
Impressions.

750. **ZZ Stewart Valley, Petrified Forest.**
*
Locality UCMP PA516 (=? UCMP PA216), Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene (Barstovian).
For general geology see: Schorn and others, 1989.
Wood.
See Page, 1993.

751. **ZZ Stewart Valley, Savage Canyon wood.**
*
Locality UCMP PA216 (=? UCMP PA516), Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene (Barstovian).
For general geology see: Schorn and others, 1989.
Wood.

752. **ZZ Stewart Valley, south end.**
*

Locality UCMP PA98, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene (Barstovian).
For general geology see: Schorn and others, 1989.
Impressions.

753. **ZZ Stewart Valley, Two Tips.**
*
Locality UCMP PA327, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene (Barstovian).
For general geology see: Schorn and others, 1989.
Impressions.

754. **ZZ Stewart Valley, Two Tips fish horizon.**
*
Locality UCMP PA218, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene (Barstovian).
For general geology see: Schorn and others, 1989.
Impressions.

755. **ZZ Stewart Valley, upper.**
*
Locality UCMP PA544, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene (Barstovian).
For general geology see: Schorn and others, 1989.
Impressions.
See Wolfe, 1964.

756. **ZZ Stewart Valley, Upper Savage Canyon horizon.**
*
Locality UCMP PA341, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene (Barstovian).
For general geology see: Schorn and others, 1989.
Impressions.

757. **ZZ Stewart Valley, UREP.**
*
Locality UCMP PA543, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene (Barstovian).

For general geology see: Schorn and others, 1989.
Impressions.

758. **ZZ Stewart Valley, west of Two Tips.**
*
Locality UCMP PA573, Stewart Spring quadrangle, Mineral County.
Longitude 117/52/30, Latitude 38 /30/00.
Savage Canyon Formation, middle Miocene (Barstovian).
For general geology see: Schorn and others, 1989.
Impressions.

759. **ZZ Stonehouse wood.**
*
Locality UCMP 272, Trinity Pass quadrangle, Pershing County.
Longitude 118/37/30, Latitude 40 /15/00.
Unnamed unit, Neogene.
Wood.

760. **ZZ Sutro.**
*
Locality UCMP P482, Virginia City quadrangle, Lyon County.
Longitude 119/37/30, Latitude 39 /15/00.
Alta Formation, early Miocene.
For geology see: Gianella, V.P. 1936. Geology of the Silver City district and the southern portion of the Comstock Lode, Nevada. Bulletin of Nevada State Bureau of Mines and Mackay School of Mines. University of Nevada Bulletin, 30(9):1-105;
Calkins, F.C. 1944. Outline of the geology of the Comstock Lode district, Nevada. U.S. Geological Survey Mimeographed Report, 105154:1-35 (see p. 15);
Thompson, G.A. 1956. Geology of the Virginia City quadrangle, Nevada. U.S. Geological Survey Bulletin, 1042-C:45-77;
Bingler, E.C., Silberman, M.L. and McKee, E.H. 1978. K-Ar ages of Tertiary ash-flow tuffs in the Carson City-Silver City area, central western Nevada. Isochron/West, 22:23-24.
Impressions.
See Bonham, 1969 (see especially pp. 25-28); Evernden and James, 1964, p. 970.
NOTE: Dates of 20.1 Ma and 18.1 Ma are more closely associated with the Sutro flora (Bonham, H.F., Jr. and Bell, J.W. 1993. Geologic map, Steamboat quadrangle. Nevada Bureau of Mines and Geology Map, 4Fg).

761. **ZZ Sutro.**
*
Locality UCMP PA104, Virginia City quadrangle, Lyon County.
Longitude 119/37/30, Latitude 39 /15/00.

Alta Formation, early Miocene.

For geology see: Gianella, V.P. 1936. Geology of the Silver City district and the southern portion of the Comstock Lode, Nevada. Bulletin of Nevada State Bureau of Mines and Mackay School of Mines. University of Nevada Bulletin, 30(9):1-105;

Calkins, F.C. 1944. Outline of the geology of the Comstock Lode district, Nevada. U.S. Geological Survey Mimeographed Report, 105154:1-35 (see p. 15);

Thompson, G.A. 1956. Geology of the Virginia City quadrangle, Nevada. U.S. Geological Survey Bulletin, 1042-C:45-77;

Bingler, E.C., Silberman, M.L. and McKee, E.H. 1978. K-Ar ages of Tertiary ash-flow tuffs in the Carson City-Silver City area, central western Nevada. Isochron/West, 22:23-24.

Impressions.

See Bonham, 1969 (see especially pp. 25-28); Evernden and James, 1964, p. 970.

NOTE: Dates of 20.1 Ma and 18.1 Ma are more closely associated with the Sutro flora (Bonham, H.F., Jr. and Bell, J.W. 1993. Geologic map, Steamboat quadrangle. Nevada Bureau of Mines and Geology Map, 4Fg).

762. **ZZ Swingle Ranch.**

*

Locality UCMP PA434, Washoe County.
High Rock sequence(?), middle Miocene.

Impressions.

NOTE: Location of site not yet determined; probably from just north of the old Swingle Ranch site (located near southern boundary T.38N., R.23E.) in the area of ZZ Lund Petrified Forest.

763. **ZZ Tempskya site.**

*

Locality?, Valley of Fire East quadrangle, Clark County.
Longitude 114/22/30, Latitude 36 /22/30.
Overton Fanglomerate, Early Cretaceous.

Wood.

See Read and Ash, 1961; Read and Brown, 1937.

764. **ZZ The Sump.**

*

NOTE: see Fish Lake Valley wood.

765. **ZZ Thurston Ranch.**

*

Locality UCMP 5505, Wine Cup Ranch SW quadrangle, Elko County.
Longitude 114/37/30, Latitude 41 /15/00.

Unnamed unit, late Miocene.
For geology see: Coats, R.R. 1987. Geology of Elko County, Nevada. Nevada Bureau of Mines and Geology Bulletin, 101:1-112 (see especially p. 63).
Impressions.
See Wolfe and Tanai, 1987.

766. **ZZ Toquima Cave.**
*
Locality?, Kingston Ranch quadrangle, Lander County.
Longitude 117/00/00, Latitude 39 /07/30.
Cave deposits, Quaternary.
Palynomorphs.
See Kautz and Thomas, 1972; Lanner, 1983; Rhode and Thomas, 1983; Thompson and Hattori, 1983; Thompson and Kautz, 1983.

767. **ZZ Triple T Shelter.**
*
Locality?, Wildcat Peak NW Quadrangle, Nye County.
Longitude 116/52/30, Latitude 39 /00/00.
Cave deposits, Quaternary.
Palynomorphs.
See Kautz, 1988.

768. **ZZ Tule Springs.**
*
Locality?, Gass Peak SW quadrangle, Clark County.
Longitude 115/07/30, Latitude 36 /15/00.
Unnamed unit, Quaternary.
For geology see: Haynes, C.V. 1967. Quaternary geology of the Tule Springs area, Clark County, Nevada. Nevada State Museum Anthropological Papers, 13(1):15-104.
Palynomorphs.
See McVickar and Spaulding, 1993; Mehringer, 1967b, 1967c, 1968; Quade, 1986.

769. **ZZ Two Tips.**
*
NOTE: see ZZ Stewart Valley,Two Tips.

770. **ZZ Velvin diatomite quarry.**
*
Locality?, Cole Spring quadrangle, Esmeralda County.
Longitude 117/37/30, Latitude 38 /22/30.
"Esmeralda" Formation, middle Miocene.
Diatoms.
See VanLandingham, 1966.

771. **ZZ Verdi.**
*
Locality UCMP 102, Verdi quadrangle, Washoe County.

Longitude 119/52/30, Latitude 39 /30/00.
Sandstone of Hunter Creek, late Miocene (5.85 Ma recalculated).
For geology see: Axelrod, 1958a (Coal Valley Formation *sensu* Axelrod, 1956);
Bell, J.W. and Garside, L.J. 1987. Geologic map, Verdi quadrangle. Nevada Bureau of Mines and Geology Map, 4Gg.
Diatoms, impressions.
See Axelrod, 1958a; Chaney, 1944; Evernden and James, 1964; Seiple, 1987.

772. **ZZ Verdi.**
*

Locality UCMP 2751, Verdi quadrangle, Washoe County.
Longitude 119/52/30, Latitude 39 /30/00.
Sandstone of Hunter Creek, late Miocene (5.85 Ma recalculated).
For geology see: Axelrod, 1958a (Coal Valley Formation *sensu* Axelrod, 1956);
Bell, J.W. and Garside, L.J. 1987. Geologic map, Verdi quadrangle. Nevada Bureau of Mines and Geology Map, 4Gg.
Diatoms, impressions.
See Axelrod, 1958a; Chaney, 1944; Evernden and James, 1964; Seiple, 1987.

773. **ZZ Virgin Valley, Black Beauty Opal Mine.**
*

Locality UCMP PA685, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: Fyock, T.L. 1963. The structure and stratigraphy of the Virgin Valley - Thousand Creek area, northwestern Nevada. Unpublished M.S. Thesis. University of Washington, Seattle, Washington;
Wendell, W.G. 1969. The structure and stratigraphy of the Virgin Valley, McGee Mountain area (Cenozoic), Humboldt County, Nevada. Unpublished M.S. Thesis. Oregon State University, Corvallis, Oregon;
Henry, C.D. 1979. Geologic setting of Virgin Valley, Nevada. Bendix GJBX-22(79); available from Bendix Field Eng. Corp., Tech. Libr., Grand Junction, Colorado;
Brophy, J.G. 1980. Geology of the Virgin Valley - Rock Springs Table area, Humboldt County, Nevada. Unpublished M.S. Thesis. Colorado School of Mines, Golden, Colorado.
Permineralized cones, wood.
See Beck, 1945; Brown, 1942; Crabtree, 1983.

774. **ZZ Virgin Valley, Black Beauty Wash.**
*
Locality UCMP PA686, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: references under ZZ Virgin Valley, Black Beauty Opal Mine.
Permineralized cones.
See Beck, 1945; Brown, 1942; Crabtree, 1983.

775. **ZZ Virgin Valley, Bonanza Opal Mine.**
*
Locality UCMP PA684, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: references under ZZ Virgin Valley, Black Beauty Opal Mine.
Wood.
See Beck, 1945; Brown, 1942; Crabtree, 1983.

776. **ZZ Virgin Valley, Cessil-Anne permineralized "hash" bed.**
*
Locality UCMP PA679, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: references under ZZ Virgin Valley, Black Beauty Opal Mine.
Permineralized seeds, wood.
See Beck, 1945; Brown, 1942; Crabtree, 1983.

777. **ZZ Virgin Valley, Coal Knob.**
*
Locality UCMP PA687, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: references under ZZ Virgin Valley, Black Beauty Opal Mine.
Palynomorphs.

778. **ZZ Virgin Valley, Corn Point.**
*
Locality USNM 1111-W, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: references under ZZ Virgin Valley, Black

Beauty Opal Mine.
Impressions.

779. **ZZ Virgin Valley, Dirty Dan Clam.**
*
Locality UCMP PA681, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: references under ZZ Virgin Valley, Black Beauty Opal Mine.
Impressions.

780. **ZZ Virgin Valley, Golden Opal Mine.**
*
Locality UCMP 179, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: references under ZZ Virgin Valley, Black Beauty Opal Mine.
Permineralized cones, wood.
See Beck, 1945; Brown, 1942; Crabtree, 1983.

781. **ZZ Virgin Valley, Green flagstone.**
*
Locality UCMP PA680, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: references under ZZ Virgin Valley, Black Beauty Opal Mine.
Algae.

782. **ZZ Virgin Valley, Hewitt Opal Mine lower.**
*
Locality UCMP PA682, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: references under ZZ Virgin Valley, Black Beauty Opal Mine.
Impressions.

783. **ZZ Virgin Valley, Hewitt Opal Mine upper.**
*
Locality UCMP PA683, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: references under ZZ Virgin Valley, Black

Beauty Opal Mine.
Impressions.

784. **ZZ Virgin Valley, Opal Queen Mine.**
*
Locality UCMP PA678, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: references under ZZ Virgin Valley, Black Beauty Opal Mine.
Permineralized cones, wood.
See Beck, 1945; Brown, 1942; Crabtree, 1983.

785. **ZZ Virgin Valley, permineralized cone bed.**
*
Locality UCMP PA510, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: references under ZZ Virgin Valley, Black Beauty Opal Mine.
Permineralized cones, seeds, wood.
See Beck, 1945; Brown, 1942; Crabtree, 1983.

786. **ZZ Virgin Valley, Tullar site.**
*
Locality UCMP P4138, Virgin Valley quadrangle, Humboldt County.
Longitude 119/00/00, Latitude 41 /45/00.
Virgin Valley beds, middle Miocene (Barstovian).
For geology see: references under ZZ Virgin Valley, Black Beauty Opal Mine.
Permineralized cones, wood.
See Beck, 1945; Brown, 1942; Crabtree, 1983.

787. **ZZ Wabuska.**
*
Locality UCMP PA435, Lyon County.
late Oligocene.
Impressions.
NOTE: this site must be field checked for exact location.

788. **ZZ Wall Canyon.**
*
Locality?, Badger Mtn. SE quadrangle, Washoe County.
Longitude 119/15/00, Latitude 41 /30/00.
High Rock sequence, middle Miocene.
Wood.
See Call, 1988; Call and Tidwell, 1988.

789. **ZZ Walti.**

*

Locality UCMP PA449, Walti Hot Springs quadrangle, Eureka County.
Longitude 116/30/00, Latitude 39 /52/30.
Unnamed unit (Newark Canyon Formation(?)), Early Cretaceous.
Impressions.
NOTE: Two species identified by R.W. Brown.

790. **ZZ Wichman.**

*

Locality? = UCMP V3941, Pine Grove Spring quadrangle, Lyon County.
Longitude 119/00/00, Latitude 38 /37/30.
Wichman Formation, late Pliocene (Blancan, ca. 3.0 Ma).
For geology see: Stewart, J.H. and Reynolds, M.W. 1987. Geologic map of the Pine Grove Hills quadrangle, Lyon County, Nevada. U.S. Geological Survey Open-File Report, OF 87-658.
Palynomorphs.
Age *ca.* 3.0 Ma (*fide* D.E. Savage, oral comm., June, 1992).
See Axelrod and Ting, 1960.
See also Macdonald, J.R. 1956. A Blancan mammalian fauna from Wichman, Nevada. Journal of Paleontology, 30(1):213-216.

791. **ZZ Wildhorse Canyon.**

*

Locality?, Gillis Canyon quadrangle, Mineral County.
Longitude 118/37/30, Latitude 38 /45/00.
Mickey Pass Tuff(?), late Oligocene (≈ 28.0 Ma).
For geology see: Hardyman, R.F. 1980. Geologic map of the Gillis Canyon quadrangle, Mineral County, Nevada. U.S. Geological Survey Miscellaneous Investigations Series Map, I-1237.
Impressions.
NOTE: A small field survey collection is available. This flora needs to be collected in detail because of its significant geographic and stratigraphic position.
See ZZ Mickey Pass for discussion of the occurrence of the Mickey Pass flora.
See also Ekren, E.B., Byers, F.M., Jr., Hardyman, R.F., Marvin, R.F. and Silberman, M.L. 1980. Stratigraphy, preliminary petrology, and some structural features of Tertiary volcanic rocks in the Gabbs Valley and Gillis ranges, Mineral County, Nevada. U.S. Geological Survey Bulletin, 1464:1-54.

792. **ZZ Wilson Canyon leaves.**
*
Locality UCMP PA667, Wilson Canyon quadrangle, Lyon County.
Longitude 119/07/30, Latitude 38 /45/00.
Coal Valley Formation, late Miocene (early Hemphillian).
For geology see: Stewart, J.H. and Dohrenwend, J.C. 1984. Geologic Map of the Yerington quadrangle, Nevada. U.S. Geological Survey Open-File Report, OF 84-212.
Impressions.
See also Macdonald, J.R. 1959. The middle Pliocene mammalian fauna from Smiths Valley, Nevada. Journal of Paleontology, 33(5):872-887.

793. **ZZ Wilson Canyon wood.**
*
Locality?, Wilson Canyon quadrangle, Lyon County.
Longitude 119/07/30, Latitude 38 /45/00.
Coal Valley Formation, late Miocene (early Hemphillian).
For geology see: Stewart, J.H. and Dohrenwend, J.C. 1984. Geologic Map of the Yerington quadrangle, Nevada. U.S. Geological Survey Open-File Report, OF 84-212.
Wood.
See Moore, 1969; Weight, 1951.
See also Macdonald, J.R. 1959. The middle Pliocene mammalian fauna from Smiths Valley, Nevada. Journal of Paleontology, 33(5):872-887.

794. **ZZ Wilsons Camp wood.**
*
Locality UCMP P3435, Trappman Hills quadrangle, Nye County.
Longitude 116/37/30, Latitude 37 /30/00.
Unnamed unit, Neogene.
Wood.
See Anonymous, 1952; Ransom, 1955; Walker, 1936.
NOTE: Now on Nellis Air Force Range.

APPENDICES

The following appendices are provided for convenience in searching major subject areas covered in the bibliography. Not all references are included, nor are all categories within the references. The five appendices cross-reference the main bibliography by record number. Note that both primary citations and the locality citations ("ZZ" entries in the bibliography) are included, resulting in some duplication of information but providing the most thorough coverage possible.

Appendix A is arranged alphabetically by topographic quadrangle; all citations reporting paleobotanical remains recovered from sediments within the quadrangle are listed. Only quadrangles from Nevada are included. **Appendix B** is arranged alphabetically by county and lists all citations reporting information from within each county. Only Nevada counties are included. **Appendix C** is arranged alphabetically by geologic unit. Both formal and informal units are included, but unnamed units are excluded. Geologic units referred to in the few citations from outside Nevada are included. **Appendix D** is arranged chronologically by age. **Appendix E** is arranged by subject (or nature of the paleobotanical remains reported). We have selected the subject headings we hope will be most useful for broad searches, but not all possible subjects are included.

The following list of Nevada counties and the quadrangles within each county is provided to facilitate searches:

Churchill County:
- Broken Hills quadrangle
- Buffalo Summit quadrangle
- Burnt Cabin Summit quadrangle
- Desert Peak quadrangle
- Eastgate quadrangle
- Grimes Point quadrangle
- La Plata Canyon quadrangle
- Lovelock Caves quadrangle
- Sheckler Reservoir quadrangle
- Telephone Well quadrangle

Clark County:
- Arrow Canyon SE quadrangle
- Charleston Peak NE quadrangle
- Corn Creek Springs NW quadrangle
- Frenchman Mtn. quadrangle
- Gass Peak SW quadrangle
- Lost Cabin Spring quadrangle

Clark County (cont')
Moapa West quadrangle
Tule Springs Park quadrangle
Valley Of Fire East quadrangle

Douglas County:
Desert Creek Ranch quadrangle

Elko County:
Bullion quadrangle
Coal Mine Basin quadrangle
Cobre SE quadrangle
Deep Creek quadrangle
East Of Bailey Mtn. quadrangle
Elko West quadrangle
Hubbard Basin quadrangle
Jarbidge South quadrangle
Kittridge Spring quadrangle
Mahala Creek West quadrangle
Medicine Spring quadrangle
Mountain City quadrangle
Ruby Lake NW quadrangle
Texas Spring quadrangle
Wine Cup Ranch SW quadrangle

Esmeralda County:
Blair Junction quadrangle
Coaldale quadrangle
Cole Spring quadrangle
Gilbert quadrangle
Miller Mountain quadrangle
Montezuma Peak quadrangle
Ralston quadrangle
Rhyolite Ridge NE quadrangle
Rhyolite Ridge NW quadrangle
Split Mountain quadrangle
Stonewall Pass quadrangle
Volcanic Hills East quadrangle

Eureka County:
Diamond Peak quadrangle
Eureka quadrangle
Mineral Hill NW quadrangle
Ninemile Peak quadrangle
Pete Hanson Creek quadrangle
Roberts Creek Mtn. quadrangle
West Of Coffin Mountain quadrangle

Humboldt County:
Blowout Mtn. quadrangle

Humboldt County (cont')

Bog Hot Spring quadrangle
Fairbanks Canyon quadrangle
Pidgeon Spring SW quadrangle
Sugarloaf Knob quadrangle
Virgin Valley quadrangle

Lander County:

Kingston Ranch quadrangle
Mt. Lewis quadrangle
Walti Hot Springs quadrangle

Lincoln County:

Bennett Pass quadrangle
Carp quadrangle
Delmar 3 NE quadrangle
Islen quadrangle
Mt. Wilson SW quadrangle
Panaca quadrangle

Lyon County:

Hazen quadrangle
Mount Etna quadrangle
Ninemile Ranch quadrangle
Pine Grove Spring quadrangle
Stockton Well quadrangle
Virginia City quadrangle
Wilson Canyon quadrangle
Yerington quadrangle

Mineral County:

Basalt quadrangle
Black Spring quadrangle
Broken Hills quadrangle
Camp Douglas quadrangle
Gillis Canyon quadrangle
Marble Mountain quadrangle
Mitchell Spring quadrangle
Ninemile Ranch quadrangle
Simon quadrangle
Stewart Spring quadrangle

Nye County:

Baxter Spring NW quadrangle
Currant quadrangle
Ellsworth quadrangle
Ione quadrangle
Mount Annie NE quadrangle
Mt. Butte quadrangle
Rainier Mesa quadrangle

Nye County (cont')
San Antonio Ranch quadrangle
Tonopah quadrangle
Trappman Hills quadrangle
Wildcat Peak quadrangle
Wildcat Peak NW quadrangle

Pershing County:
Bluewing Spring quadrangle
Rabbithole quadrangle
Trinity Pass quadrangle
Wildhorse Pass quadrangle

Storey County:
Chalk Hills quadrangle
Derby Dam quadrangle
Fernley West quadrangle

Washoe County:
Badger Mtn. SE quadrangle
Butte Spring quadrangle
Chester Lyons Spring quadrangle
Dogskin Mtn. quadrangle
Fortynine Mtn. quadrangle
Fraser Flat quadrangle
Hart Mountain quadrangle
Olinghouse quadrangle
Tule Peak quadrangle
Verdi quadrangle

White Pine County:
Ely quadrangle
Garrison quadrangle
Juniper Springs quadrangle
Little Horse Canyon quadrangle
Majors Place quadrangle
Pogues Station quadrangle

APPENDIX A
Arranged by Quadrangle

Arrow Canyon SE quadrangle (Clark County):
627

Badger Mtn. SE quadrangle (Washoe County):
213, 214, 788

Basalt quadrangle (Mineral County):
628

APPENDIX A - Arranged by Quadrangle (cont')

Baxter Spring NW quadrangle (Nye County):
738

Bennett Pass quadrangle (Lincoln County):
590

Black Spring quadrangle (Mineral County):
340

Blair Junction quadrangle (Esmeralda County):
400, 401, 676

Blowout Mtn. quadrangle (Humboldt County):
549, 731

Bluewing Spring quadrangle (Pershing County):
737

Bog Hot Spring quadrangle (Humboldt County):
340

Broken Hills quadrangle (Churchill County; Mineral County):
395, 520

Buffalo Summit quadrangle (Churchill County):
150, 465, 473, 578, 599,
632

Bullion quadrangle (Elko County):
474

Burnt Cabin Summit quadrangle (Churchill County):
269, 271, 422, 423, 636

Butte Spring quadrangle (Washoe County):
405, 706

Camp Douglas quadrangle (Mineral County):
393, 523

Carp quadrangle (Lincoln County):
294, 718

Chalk Hills quadrangle (Storey County):
124, 466, 641

Charleston Peak NE quadrangle (Clark County):
440

APPENDIX A - Arranged by Quadrangle (cont')

Chester Lyons Spring quadrangle (Washoe County):
157, 397, 687, 689

Coaldale quadrangle (Esmeralda County):
109, 659

Coal Mine Basin quadrangle (Elko County):
234, 333, 334, 335, 336,
337, 363, 572, 601, 673

Cobre SE quadrangle (Elko County):
661

Cole Spring quadrangle (Esmeralda County):
564, 770

Corn Creek Springs NW quadrangle (Clark County):
428

Currant quadrangle (Nye County):
666

Deep Creek quadrangle (Elko County):
145, 552, 635

Delmar 3 NE quadrangle (Lincoln County):
700

Derby Dam quadrangle (Storey County):
145, 155, 415, 640

Desert Creek Ranch quadrangle (Douglas County):
630

Desert Peak quadrangle (Churchill County):
118, 258, 642, 727

Diamond Peak quadrangle (Eureka County):
719, 720

Dogskin Mtn. quadrangle (Washoe County):
419

Eastgate quadrangle (Churchill County):
118, 134, 142, 669, 717

East of Bailey Mtn. quadrangle (Elko County):
474

APPENDIX A - Arranged by Quadrangle (cont')

Elko West quadrangle (Elko County):
228, 229, 286, 419, 467,
671, 674

Ellsworth quadrangle (Nye County):
565

Ely quadrangle (White Pine County):
257

Eureka quadrangle (Eureka County):
677

Fairbanks Canyon quadrangle (Humboldt County):
633, 634

Fernley West quadrangle (Storey County):
134, 145, 154, 732

Fortynine Mtn. quadrangle (Washoe County):
221, 258, 317, 318, 319,
320, 321, 339, 526, 621,
622, 623, 624

Fraser Flat quadrangle (Washoe County):
708, 709

Frenchman Mtn. quadrangle (Clark County):
280, 327, 328, 329, 694

Garrison quadrangle (White Pine County):
556, 725

Gass Peak SW quadrangle (Clark County):
364, 374, 376, 428, 768

Gilbert quadrangle (Esmeralda County):
686

Gillis Canyon quadrangle (Mineral County):
791

Grimes Point quadrangle (Churchill County):
273, 276, 424, 696

Hart Mountain quadrangle (Washoe County):
157, 397, 688, 690

APPENDIX A - Arranged by Quadrangle (cont')

Hazen quadrangle (Lyon County):
472, 516, 695

Hubbard Basin quadrangle (Elko County):
506

Ione quadrangle (Nye County):
699

Islen quadrangle (Lincoln County):
349, 350, 724

Jarbidge South quadrangle (Elko County):
127, 606, 663

Juniper Springs quadrangle (Washoe County):
668

Kingston Ranch quadrangle (Lander County):
307, 766

Kittridge Spring quadrangle (Elko County):
672

La Plata Canyon quadrangle (Churchill County):
701

Little Horse Canyon quadrangle (White Pine County):
169, 210, 367, 531, 535,
537, 638, 664, 739

Lost Cabin Spring quadrangle (Clark County):
458

Lovelock Caves quadrangle (Churchill County):
102, 238, 287, 288, 345,
407, 408, 409, 410, 705

Mahala Creek West quadrangle (Elko County):
354

Majors Place quadrangle (White Pine County):
662, 707

Marble Mountain quadrangle (Mineral County):
594, 684

Medicine Spring quadrangle (Elko County):
711

APPENDIX A - Arranged by Quadrangle (cont')

Miller Mountain quadrangle (Esmeralda County; Mineral County):
101, 628

Mineral Hill NW quadrangle (Eureka County):
296

Mitchell Spring quadrangle (Mineral County):
648, 655

Moapa West quadrangle (Clark County):
626

Montezuma Peak quadrangle (Esmeralda County):
522

Mount Annie NE quadrangle (Nye County):
395

Mount Etna quadrangle (Lyon County):
455, 712, 713

Mountain City quadrangle (Elko County):
637

Mt. Butte quadrangle (Nye County):
190

Mt. Lewis quadrangle (Lander County):
698

Mt. Wilson SW quadrangle (Lincoln County):
590

Ninemile Peak quadrangle (Eureka County):
359

Ninemile Ranch quadrangle (Lyon County; Mineral County):
118, 145, 155, 181, 289,
399, 419, 464, 473, 526,
644, 645, 646, 647, 649,
650, 651, 652, 653, 654

Olinghouse quadrangle (Washoe County):
728

Panaca quadrangle (Lincoln County):
590

APPENDIX A - Arranged by Quadrangle (cont')

Pete Hanson Creek quadrangle (Eureka County):
736

Pidgeon Spring SW quadrangle (Humboldt County):
667

Pine Grove Spring quadrangle (Lyon County):
158, 790

Pogues Station quadrangle (White Pine County):
730

Rabbithole quadrangle (Pershing County):
299, 734

Rainier Mesa quadrangle (Nye County):
557

Ralston quadrangle (Esmeralda County):
396

Rhyolite Ridge NE quadrangle (Esmeralda County):
109, 188, 208, 311, 419,
656, 658, 660

Rhyolite Ridge NW quadrangle (Esmeralda County):
657

Roberts Creek Mtn. quadrangle (Eureka County):
387

Ruby Lake NW quadrangle (Elko County):
541

San Antonio Ranch quadrangle (Nye County):
444

Sheckler Reservoir quadrangle (Churchill County):
118, 145, 155, 678, 679

Simon quadrangle (Mineral County):
629

Split Mountain quadrangle (Esmeralda County):
160

Stewart Spring quadrangle (Mineral County):
161, 417, 421, 452, 453,
454, 462, 473, 509, 510,

APPENDIX A - Arranged by Quadrangle (cont')
Stewart Spring quadrangle (Mineral County) (cont')
511, 512, 513, 514, 526,
603, 740, 741, 742, 743,
744, 745, 746, 747, 748,
749, 750, 751, 752, 753,
754, 755, 756, 757, 758

Stockton Well quadrangle (Lyon County):
683, 735

Stonewall Pass quadrangle (Esmeralda County):
396, 518

Sugarloaf Knob quadrangle (Humboldt County):
723

Telephone Well quadrangle (Churchill County):
721, 722

Texas Spring quadrangle (Elko County):
617

Tonopah quadrangle (Nye County):
190, 393, 449, 517

Trappman Hills quadrangle (Nye County):
571, 794

Trinity Pass quadrangle (Pershing County):
759

Tule Springs Park quadrangle (Clark County):
364

Tule Peak quadrangle (Washoe County):
151, 258, 733

Valley Of Fire East quadrangle (Clark County):
434, 435, 763

Verdi quadrangle (Washoe County):
121, 145, 155, 227, 258,
419, 463, 771, 772

Virgin Valley quadrangle (Humboldt County):
166, 167, 168, 191, 209,
211, 239, 244, 245, 246,
247, 254, 261, 262, 267,
274, 290, 291, 292, 302,

APPENDIX A - Arranged by Quadrangle (cont')
Virgin Valley quadrangle (cont')
303, 304, 305, 340, 394,
406, 411, 412, 468, 570,
619, 620, 773, 774, 775,
776, 777, 778, 779, 780,
781, 782, 783, 784, 785,
786

Virginia City quadrangle (Lyon County):
258, 399, 760, 761

Volcanic Hills East quadrangle (Esmeralda County):
392, 420, 461, 681

Walti Hot Springs quadrangle (Lander County):
354, 789

West Of Coffin Mtn. quadrangle (Eureka County):
296, 729

Wildcat Peak quadrangle (Nye County):
275, 307, 325, 439, 542,
543, 685

Wildcat Peak NW quadrangle (Nye County):
306, 767

Wildhorse Pass quadrangle (Pershing County):
212, 702

Wilson Canyon quadrangle (Lyon County):
399, 577, 715, 716, 792,
793

Wine Cup Ranch quadrangle (Elko County):
710, 765

Yerington quadrangle (Lyon County):
714

APPENDIX B
Arranged by County

Churchill County:
102, 118, 134, 142, 145,
150, 155, 182, 238, 258,
269, 271, 273, 276, 287,
288, 345, 360, 407, 408,
409, 410, 414, 416, 422,

APPENDIX B - Arranged by County (cont')
Churchill County (cont')

423, 424, 465, 473, 520,
578, 599, 632, 636, 642,
669, 678, 679, 695, 696,
701, 705, 717, 721, 722,
727

Clark County:

184, 185, 186, 187, 280,
327, 328, 329, 364, 366,
374, 376, 428, 434, 435,
437, 440, 457, 458, 459,
475, 478, 479, 480, 483,
626, 627, 694, 763, 768

Douglas County:

308, 630

Elko County:

127, 145, 215, 216, 228,
229, 230, 231, 234, 252,
286, 333, 334, 335, 336,
337, 354, 363, 419, 441,
442, 467, 474, 506, 541,
552, 569, 572, 601, 606,
617, 635, 637, 661, 663,
671, 672, 673, 674, 710,
711, 765

Esmeralda County:

101, 109, 160, 188, 208,
311, 391, 392, 396, 400,
401, 419, 420, 461, 515,
518, 522, 564, 628, 656,
657, 658, 659, 660, 676,
681, 686, 770

Eureka County:

199, 200, 296, 347, 359,
387, 431, 443, 569, 677,
719, 720, 729, 736, 789

Humboldt County:

166, 167, 168, 191, 209,
211, 239, 244, 245, 246,
247, 254, 261, 262, 267,
272, 274, 290, 291, 292,
302, 303, 304, 305, 340,
348, 394, 406, 411, 412,

APPENDIX B - Arranged by County (cont')
Humboldt County (cont')

468, 529, 549, 570, 619,
620, 633, 634, 667, 723,
731, 773, 774, 775, 776,
777, 778, 779, 780, 781,
782, 783, 784, 785, 786

Lander County:

307, 354, 698, 766

Lincoln County:

294, 349, 350, 554, 555,
590, 700, 718, 724

Lyon County:

158, 181, 258, 289, 399,
419, 455, 472, 473, 516,
577, 646, 650, 652, 653,
654, 655, 683, 712, 713,
714, 715, 716, 735, 760,
761, 787, 790, 792, 793

Mineral County:

118, 145, 155, 161, 194,
198, 340, 393, 395, 399,
417, 421, 452, 453, 454,
462, 464, 473, 509, 510,
511, 512, 513, 514, 520,
523, 526, 594, 603, 628,
629, 644, 645, 647, 648,
649, 651, 684, 740, 741,
742, 743, 744, 745, 746,
747, 748, 749, 750, 751,
752, 753, 754, 755, 756,
757, 758, 791

Nye County:

190, 235, 275, 306, 307,
325, 393, 395, 426, 439,
444, 449, 517, 542, 543,
557, 565, 571, 666, 685,
699, 738, 767, 794

Pershing County:

163, 164, 212, 299, 418,
460, 546, 682, 693, 702,
734, 737, 759

APPENDIX B - Arranged by County (cont')

Storey County:
124, 134, 145, 154, 155,
415, 466, 640, 641, 732

Washoe County:
121, 145, 151, 155, 157,
213, 214, 221, 227, 258,
317, 318, 319, 320, 321,
339, 388, 397, 405, 419,
463, 526, 546, 621, 622,
623, 624, 668, 687, 688,
689, 690, 706, 708, 709,
728, 733, 762, 771, 772,
788

White Pine County:
169, 210, 257, 367, 525,
531, 535, 537, 556, 638,
662, 664, 707, 725, 730,
739

APPENDIX C
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