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Late Cenozoic freshwater Mollusca of New Mexico: an annotated bibliography

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Preface

Fossil shells are common and locally conspicuous in stream and lake deposits throughout the arid and semi-arid Southwest. Most of them can be referred to living species and so provide important information about past environments. Topics of current geological concern to which these fossils are pertinent include the recognition of alluvial valleys, former perennial streams, the fluctuations of Pleistocene lakes, and stratigraphy in relation to environmental geology. Fossil mollusks have also been studied as a source of information about environment in archeological sites.

The rich sources of information represented by mollusk shells depend upon knowledge of the modern distributions of the species and the habitats in which they live, as well as details of their geological occurrences. Knowledge of the modern fauna of any state is thus an essential basis for study of its past. The present bibliography is the first phase of a program sponsored by the New Mexico Bureau of Mines and Mineral Resources on the freshwater mollusks of New Mexico. This summary of information in widely scattered sources brings together what is known of the late Cenozoic fossils, as well as the modern fauna, and provides a basis for future studies.

New Mexico is a transition area between the Great Plains and Southwest in its fossil molluscan faunas as well as present topography. The Pleistocene assemblages from the Llano Estacado are like those of the Plains from Texas to Nebraska. Westward, assemblages from the Pecos River, Rio Grande, and Plains of San Agustin show less regional and more individual character. Further

study may reveal details of seemingly distinct weather patterns in these regions.

Information on the modern fauna will be of interest to a variety of agencies and individuals--those concerned with resource management, environmental studies, and a variety of biological topics. Areas for future study will also be evident from lack of published data.

Acknowledgements--References that I might otherwise have overlooked were brought to my attention by John W. Hawley and Robert H. Weber, New Mexico Bureau of Mines and Mineral Resources; and Artie L. Metcalf, University of Texas (El Paso).

This bibliography includes references on the Miocene to modern fresh-water Mollusca of New Mexico. Additionally a few papers are cited that deal with the southernmost part of the Mimbres River drainage in adjacent Chihuahua, Mexico. Both published works and theses are cited. Preparation ended in May, 1980.

An asterisk (*) marks references mostly or entirely devoted to fossils or to shells from archeological sites.

*Andrews, Jean

1977 Shells and shores of Texas: Austin and London, Univ. Texas Press, 365 p., 4 color pls.

Pleistocene occurrences of the otherwise Gulf Coast brackish-water clam Rangia cuneata in gravels along the Pecos River in Eddy County are mentioned.

*Arnold, Ralph

1909 Paleontology of the Coalinga district, Fresno and Kings Counties, California: U.S. Geol. Survey, Bull. 396, 173 p., 30 pls.

Sphaerium magnum Sterki is cited as Pleistocene, Arroyo Pecos, Las Vegas, San Miguel County; presumably collected by T. D. A. Cockerell.

Ashmun, E.H.

1899 Collecting in Arizona and New Mexico: Nautilus, v. 13, p. 13-17

Ashmun found Physa mexicana in an artificial pond on the stage road between Albuquerque and White Oaks in 1899.

Athearn, H.D.

1962 (and Clarke, A.H., Jr.) The freshwater mussels of Nova Scotia: Nat. Museum Canada, Bull., no. 183, p. 11-41

Margaritifera margaritifera falcata is attributed to New Mexico, evidently following A.H. Clarke and C.O. Berg (1959).

Bachhuber, F.W.

*1971 Paleolimnology of Lake Estancia and the Quaternary history of the Estancia Valley, central New Mexico: Ph.D thesis, Univ. New Mexico, 238 p.

Six species of mollusks were found in Pleistocene and Holocene sediments.

*1977 (and McClellan, W.A.) Paleocology of marine Foraminifera in the pluvial Estancia Valley, central New Mexico: Quaternary Research, v. 7, p. 254-267

Late Pleistocene and early Holocene freshwater molluscs are cited, with identifications to genera only.

Baily, J.L., Jr. see Keep and Baily, 1935

Baker, F.C.

1907 Descriptions of new species of Lymnaea: Nautilus, v. 20, p. 125-127

Lymnaea dalli is reported from New Mexico, with no more precise locality.

1911 The Lymnaeidae of North and Middle America, recent and fossil: Chicago Acad. Sci., Spec. Pub. no. 3, 539 p., 58 pls.

Several species are cited from New Mexico: paper includes both old and new records.

1928 The fresh water Mollusca of Wisconsin, pt. I, Gastropoda: Wisconsin Geol. and Nat. Hist. Survey, Bull. 70, p. i-xx, 1-507, pls. 1-28

Species cited from New Mexico are Stagnicola palustris elodes, Fossaria parva, F. modicella rustica, Menetus exacuous Gyraulus umbilicatellus, and Physella lordi.

1945 The molluscan family Planorbidae: Urbana, Univ. Illinois, 530 p.

Helisoma tenue sinuosum from Albuquerque, Bernalillo Count is illustrated.

Bayne, J.M.

1963 High altitude shelling: Redlands, California, The Shelletter of Shells and their Neighbors, no. 16, p. 7-8 (Reprinted from Texas Shell News of San Antonio Shell Club; original not seen)

Physa gyrina and two other unidentified species are reported from Willow Creek, Catron County.

Beale, E.F.

1860 Report...relating to the construction of a wagon road fro Fort Smith to the Colorado River: U.S. 36th Congr., session 1, House Doc. 42, p. 1-91, map

Beale's journal for February 11, 1859, notes the abundanc of shells in the Conchas River, San Miguel County.

Beames, C.G., Jr.

1969 (and Lindeborg, R.G.) Temperature adaptation in the snail Physa anatina: Oklahoma Acad. Sci., Proc., v. 48, p. 12-14

The study locality is on the Gallinas River near Montezuma, San Miguel County.

Bequaert, J.C.

1973 (and Miller, W.B.) The mollusks of the arid Southwest, with an Arizona checklist: Tucson, Univ. Arizona Press, 271 p.

Many records are cited of both modern and fossil occurrences in New Mexico.

Berg, C.O., see Clarke and Berg, 1959

Blake, W.P.

1856 General report upon the geological collections: U.S. War Dept., Pacific Railroad Surveys, v. 3, pt. 4, p. 1-119, 3 pls.

Unio is listed from the Pecos River with no precise locality or collector.

Bonnet, A.

1864 Coquilles nouvelles ou peu connues: Revue et Magasin de Zoologie Pure et Appliquée, ser. 2, v. 16, p. 279-282, pl. 22

Planorbis sinuosus n. sp. is described and illustrated from "River-Grand dans le nouveau Mexique," with no precise locality or collector.

Bradbury, J.P.

*1967 Origin, paleolimnology, and limnology of Zuni Salt Lake maar, west central New Mexico. Ph.D thesis, Univ. New Mexico, 247 p.; Dissert. Abs., v. 28, p. 3748B-3749B

Three
~~These~~ aquatic mollusks are reported and illustrated from Pleistocene Zuni Salt Lake, Catron County.

Branson, B.A.

1966 (Sisk, M.E., and McCoy, C.J., Jr.) Observations on and distribution of some western and southwestern mollusks: Veliger, v. 9, p. 145-151

Physa virgata is reported from Rio Hondo at Sunset, Lincoln County.

Brues, C.T.

1928 Studies on the fauna of hot springs in the western United States and the biology of thermophilous animals: Am. Acad. Arts and Sci., Proc., v. 63, p. 139-228, pl. 1-6

Physa virginea was found at Hot Springs (now Truth or Consequences), Sierra County, by C.T. Brues, 1927.

Burch, J.B.

1973 Freshwater Unionacean clams (Mollusca: Pelecypoda) of North America: Biota of Freshwater Ecosystems Identification Manual 11, 176 p., U.S. Environ. Protect. Agency,

Margaritifera falcata is cited from New Mexico, probably following A.H. Clarke, Jr. and C.O. Berg (1959).

Call, R.E.

1885 A geographic catalogue of the Unionidae of the Mississippi Valley: Des Moines Acad. Sci., Bull., v. 1, p. 5-57

Unio satur is recorded from "Gaines' Creek, New Mexico," with no more precise locality or collector.

Clarke, A.H., Jr.

1973 The freshwater molluscs of the Canadian Interior Basin: Malacologia, v. 13, p. i-xvi, 1-509

Planorbula campestris is cited from New Mexico without precise locality.

1959 (and Berg, C.O.). The freshwater mussels of central New York, with an illustrated key to the species of northeaster North America: New York State College Agriculture (Ithaca), Mem. 367, 79 p.

Margaritana margaritifera falcata is said to range from "Alaska to New Mexico."

See Athearn and Clarke, 1962

*Clarke, W.T., Jr.

1938 The occurrence of flints and extinct animals in pluvial deposits near Clovis, New Mexico; Part VII--Pleistocene mollusks from the Clovis gravel pit and vicinity: Acad. Nat. Sci. Philadelphia, Proc., v. 90, p. 119-121

Clarke made collections during 1937 at four localities that yielded 10 species.

Clebsch, Alfred, Jr., see Nicholson and Clebsch, 1961

Clemons, R.E., see Seager and others, 1975

Clench, W.J.

1925 Notes on the genus Physa with descriptions of three new subspecies: Univ. Michigan, Museum of Zoology, Occasional Papers, no. 161, 10 p., 1 pl.

A series of specimens from New Mexico, locality and collector not cited, represents Physa lordi except for one specimen referred to Physa lordi utahensis.

Cockerell, T.D.A.

1896 Land Mollusca from the rejectamenta of the Rio Grande, New Mexico: Nautilus, v. 10, p. 41-43

Several species collected by Cockerell in 1896 are cited from drift of the Rio Grande at Mesilla and Rincon, Doña Ana County.

1902 Unio popeii, Lea, in New Mexico: Nautilus, v. 16, p. 69-70.

Found in North Spring River, Roswell, Chaves County. See Pilsbry and Cockerell, 1900

*Coleman, D.D.

1973 Illinois State Geological Survey radiocarbon dates IV: Radiocarbon, v. 15, p. 75-85

Two dated samples are from the Pecos River valley.

1974 Illinois State Geological Survey radiocarbon dates V: Radiocarbon, v. 16, p. 105-117

Mollusk shells (not identified) from the Pecos River valley are dated at various localities.

Crandall, O.A.

1901 The American Physae: Nautilus, v. 15, p. 25-30, 42-45, 54-58, 69-71, pl. 2, figs. 5-7

Physa rhomboidea collected by Crandall is cited from three localities near Las Vegas, San Miguel County.

*Cummins, W.F.

1892 Report on the geography, topography, and geology of the Llano Estacado or staked plains...: Texas Geol. Survey, Ann. Rept. 3, 1891, p. 127-200, pls. 3-4, 6-7

In Pleistocene deposits at Salt Lake, Eddy County, Cummins found Sphaerium (p. 163). From comparison with the list of identifications by Sterki (1892) it seems this is an error for Pisidium.

1893 Notes on the geology of northwest Texas: Texas Geol. Survey, Ann. Rept. 4, 1892, pt. 1, p. 177-238

Planorbis parvus is cited from the salt lake in Eddy County, whence previously reported by Sterki (1892).

Dall, W.H.

1897 Report on the mollusks collected by the International Boundary Commission of the United States and Mexico, 1892-1894: U.S. Nat. Museum, Proc., v. 19, p. 333-379, pls. 31-33

Two species are cited from San Rafael, Valencia County, collected by E.H. Ashmun. The specimens cited as collected by Mearns in New Mexico are really from adjacent Sonora.

1905 Land and fresh water mollusks of Alaska and adjoining regions: Smithsonian Inst., Harriman Alaska Exped., 1899, Alaska series, v. 13, p. 1-171, pls. 1-2

Lymnaea columella, Planorbis umbilicatellus, Physa lordi, and Ancylus rivularis are cited from New Mexico.

Damon, P.E., see Haynes and others, 1966

*Dick, H.W.

1953 Two rock shelters near Tucumcari, New Mexico: Smithsonian Inst., Bureau of Am. Ethnology, Bull. 154, p. 267-284, pls. 48-54

Uniomerus tetralasmus was found in the Hodges archeological site, Quay County, dated late 14th or early 15th century to middle 16th century.

Drake, R.J.

1948 Mollusca of the eastern basin of the Chaco River, New Mexico: Nautilus, v. 62, p. 5-8; Nautilus, v. 62, p. 94-97

Four aquatic species were found in river drift from Chaco Canyon National Monument, San Juan County, collected by R.J. Drake, 1946-1947.

1953 Amnicola brandi, a new species of snail from northwestern Chihuahua: Washington Acad. Sci., Jour., v. 43, p. 26-28

The new species Amnicola brandi and others are reported from Las Palomas, Chihuahua.

1956 A new species of amnicolid snail from Chihuahua, Mexico: Southern California Acad. Sci., Bull., v. 55, p. 44-46

Lyrodes hertleini is described and illustrated from Las Palomas, Chihuahua.

*1975 Fossil nonmarine molluscs of the 1961-63 Llano Estacado paleoecology study, in Late Pleistocene environments of the southern High Plains, F. Wendorf and J.J. Hester, editors: Ft. Burgwin Research Center Pub., no. 9, p. 201-245.

Includes identification, interpretation, and illustrations of species from eastern New Mexico.

Dronen, N.O., Jr.

1975 The life cycle of Haematoloechus coloradensis Cort 1915 (Digenea: Plagiorchiidae), with emphasis on host susceptibilit to infection: Jour. Parasitology, v. 61, p. 657-660

Physa virgata is the normal snail host in vicinity of Las Cruces, Doña Ana County.

1978 Host-parasite population dynamics of Haematoloechus coloradensis Cort, 1915 (Digenea: Plagiorchiidae): Am. Midland Naturalist, v. 99, p. 330-349

Physa virgata and other hosts of the trematode were collected from 11 ponds in Sierra County.

Dundee, D.S.

1957 Aspects of the biology of Pomatiopsis lapidaria (Say) (Mollusca: Gastropoda: Prosobranchia): Univ. Michigan, Museum Zoology, Misc. Pub. 100, 37 p., 14 pls.

Pomatiopsis lapidaria is reported from Socorro County (no precise locality).

1974 Catalog of introduced molluscs of eastern North America (north of Mexico): Sterkiana, no. 55, p. 1-37

Lymnaea auricularia and Corbicula manilensis are cited from localities in New Mexico, from literature as well as original examination of specimens.

Ferriss, J.H., see Pilsbry and Ferriss, 1906, 1909, 1917

*Figgins, J.D.

1935 New World man: Colorado Museum Nat. History, Proc., v. 14, no. 1, p. 1-5, pls. 1-4

Sphaerium sp. cf S. striatinum was found fossil in association with human remains along the Cimarron River east of Folsom, Union County.

*Frye, J.C.

1978 (Leonard, A.B., and Glass, H.D.) Late Cenozoic sediments, molluscan faunas, and clay minerals in northeaster

New Mexico: New Mexico Bureau Mines Mineral Resources, Circ. 160, 32 p.

Pleistocene and Holocene molluscs are reported from 48 localities; 20 species are aquatic.

See Leonard and Frye, 1975, 1978; Leonard, Frye, and Glass, 197

Glass, H.D., see Leonard, Frye, and Glass, 1975

Grey, D.C., see Haynes and others, 1966

Haas, Fritz

1929 Bemerkungen über mittelamerikanische Najaden: Senckenbergiana, v. 11, p. 310-344

Lampsilis umbrosa is cited from "Neu-Mexico" with no specific locality.

Hall, S.A.

1977 Late Quaternary sedimentation and paleoecologic history of Chaco Canyon, New Mexico: Geol. Soc. America, Bull., v. 88, p. 1593-1618

Stagnicola cockerelli is found as a fossil throughout the Chaco alluvium.

1980 Snails from Quaternary valley fill at Chaco Canyon, New Mexico: Nautilus, v. 94, p. 60-63

Two aquatic species were found in prehistoric alluvium; those recorded by Drake (1948, 1949) may be from the same source.

Harbour, Jerry

*1958 Microstratigraphic and sedimentational studies of an

early man site near Lucy, New Mexico: M.S. thesis, Univ. New Mexico, 111 p.

Four species of aquatic molluska are reported from the Lucy site; modern snails are reported from Estancia spring and a reservoir 1½ miles northwest of the Lucy site.

Harrington, J.P., see Henderson and Harrington, 1914

Haskell, J.L.

*1977 (editor) Caprock water system archaeological project, Lea County, New Mexico: Eastern New Mexico Univ., Agency Conserv. Archaeology, 402 p.

Fragments of an unidentified mussel and an unidentified gastropod were found in the Laguna Plata site (p. 311), not precisely dated but post-ceramic.

Hawley, J.W., see Seager and others, 1975

*Haynes, C.V.

1975 Pleistocene and recent stratigraphy, in Late Pleistocene environments of the southern High Plains, F. Wendorf and J.J. Hester, ed.: Ft. Burgwin Research Center Pub. 9, p. 57-96.

Anodonta ("Anodasta") shells dated 10,600 B.P. ± 200 yrs are reported from Blackwater Draw, Roosevelt County.

1966 (Damon, P.E., and Grey, D.C.) Arizona radiocarbon dates VI: Radiocarbon, v. 8, p. 1-21 Anodonta shells are dated from Blackwater Draw, ~~New Mexico~~ Roosevelt County.

paragraph as annotation

Henderson, Junius

*1917 A new Pleistocene mollusk locality in New Mexico: Nautilus, v. 30, p. 134-135

A number of species were found fossil at Roswell, Chaves County, by M.M. Ellis in 1916.

*1933 Lampsilis at old New Mexican camp sites: Nautilus, v. 46, p. 107

Lampsilis ventricosus was found at ancient Indian sites "east of the Pecos" by H.P. Mera.

1936 Mollusca of Colorado, Utah, Montana, Idaho, and Wyoming--supplement: Univ. Colorado, Stud., v. 23, p. 81-145

Menetus exacuous is recorded from San Rafael, Valencia County.

1939 The Mollusca of New Mexico and Arizona, in So live the works of men, D.D. Brand and F.E. Harvey, editors: Univ. New Mexico, p. 187-194

Includes a bibliography and list of genera previously reported from Arizona ~~and~~ or New Mexico.

1914 (and Harrington, J.P.) Ethnozoology of the Tewa Indians: Smithsonian Inst., Bureau Am. Ethnology, Bull. 56, 76 p.

Several records from northern New Mexico are cited from a manuscript by E.H. Ashmun.

Herrington, H.B.

1962 A revision of the Sphaeriidae of North America (Mollusca: Pelecypoda): Univ. Michigan, Museum Zoology, Misc. Pub. 118, 74 p., 7 pls.

Sphaerium striatinum, Pisidium compressum, P. insigne, and P. nitidum are reported from New Mexico (no specific localities).

*Hester, J.J.

Mexico: Univ. Michigan, Museum Anthropology, Anthro. Pap. no. 31, 175 p., 16 pls.

Late Pleistocene Mollusca are listed from three localities in Blackdom terrace pond deposits.

*Jennings, J.D.

1940 A variation of southwestern Pueblo culture: Santa Fe, New Mexico Lab. Anthropology, Arch. Surv., Tech. Ser., Bull. No. 10, 11 p., 4 figs., 7 pls.

"Fragments of freshwater mussel shells" were found in sites at Peñasco Bend, Chaves County, dated at about 1150-1300 A.D.

*Judson, Sheldon

1950 Depressions of the northern portion of the southern High Plains of eastern New Mexico: Geol. Soc. America, Bull., v. 61, p. 253-273, pls. 1-3

Helisoma tenue sinuosum occurs in the Sand Canyon and San Jon Formations at the San Jon archeological site, Quay County, and is common living in the area.

1953 Geology of the San Jon site, eastern New Mexico: Smithsoni Misc. Colln. v. 121, no. 1, 70 p., 5 pls.

Helisoma tenue sinuosum is common in the San Jon and Sand Canyon Formations Holocene, at the San Jon archeological site, Quay County.

Keep, Josiah

1904 West American shells: San Francisco, Whitaker and Ray, 360 p.

Pisidium abditum and P. ashmuni are cited from New

1972 Blackwater locality No. 1--A stratified, early man site in eastern New Mexico: Ft. Burgwin Research Center, Pub. 8, 238 p.

Lists of molluscs are quoted from the papers by W.T. Clarke (1938) and Howard (1935). A shell artifact from Anodonta cf. grandis is reported.

Hibbard, C.W.

1960 (and Taylor, D.W.) Two late Pleistocene faunas from southwestern Kansas: Univ. Michigan, Museum Paleontology, Contrib., v. 16, p. 1-223, pls. 1-16

Stagnicola cockerelli and Promenetus exacuous are cited from various localities in New Mexico.

*Howard, E.B.

1935 The occurrence of flints and extinct animals in pluvial deposits near Clovis, New Mexico; Part 1--Introduction: Acad. Nat. Sci. Philadelphia, Proc., v. 87, p. 299-303.

Environmental interpretations of the molluscs by Pilsbry (1935) are quoted.

Hubendick, Bengt

1951 Recent Lymnaeidae; their variation, morphology, taxonomy, nomenclature, and distribution: Kgl. Svenska Vetenskapsakad. Handl., ser. 4, v. 3, no. 1, p. 1-223, pls. 1-5.

Lymnaea bulimoides is illustrated as from "Gallup, northern Mexico" (McKinley County).

*Jelinek, A.J.

1967 A prehistoric sequence in the middle Pecos Valley, New

Mexico.

1935 (and Baily, J.L., Jr.) West coast shells: Stanford Univ., 350 p.

Valvata humerosa is cited from Valencia County, probably based on a record by Pilsbry (1906).

*Kidder, A.V.

1932 The artifacts of Pecos: Yale Univ., 314 p.

Unworked shells of Lampsilis purpurata and pendants of Unio sp., Lampsilis sp., and Ligumia recta latissima were found in excavations at Pecos, San Miguel County.

*Knowlton, F.H.

1902 Description of a new fossil species of Chara: Torreya, v. 2, p. 71-72

The new species is from Arroyo Pecos, Las Vegas, San Miguel County, where it was associated with fossil shells including Physa humosa [humerosa]and Sphaerium magnum.

Lambert, P.W.

*1968 Quaternary stratigraphy of the Albuquerque area, New Mexico: Ph.D. thesis, Univ. New Mexico, 329 p.

Freshwater mollusks are recorded from various localities in four stratigraphic units (table 8).

Leonard, A.B.

*1977 Three new pulmonate gastropods from the late Tertiary of New Mexico: Nautilus, v. 91, p. 143-145

Descriptions of new species and list of associated forms from Clayton South section, Ogallala Formation, Union County.

*1975 (and Frye, J.C.) Pliocene and Pleistocene deposits and molluscan faunas, east-central New Mexico: New Mexico Bureau Mines Mineral Resources, Mem. 30, 44 p.

Stratigraphy and fossil molluscs are described and illustrated; 24 aquatic species (both modern and fossil) are reported.

*1978 (and Frye, J.C.) Paleontology of Ogallala Formation, northeastern New Mexico: New Mexico Bureau Mines Mineral Resources, Circ. 161, 21 p.

Molluscs are described and illustrated from the Clayton South section, Ogallala Formation, Union County.

*1975 (Frye, J.C., and Glass, H.D.) Late Cenozoic mollusks and sediments, southeastern New Mexico: New Mexico Bureau Mines Mineral Resources, Circ. 145, 19 p.

Pleistocene molluscs are described, including 13 aquatic species.

Lindeborg, R.G., see Beames and Lindeborg, 1969

Louderbough, E.T.

1976 Macroinvertebrates and diatoms on submerged bottom substrates, Lake Powell: M.S. thesis, Univ. New Mexico, 47 p.

Physa and Gyraulus were found (p. 21), with data on depth distribution and abundance provided for Physa.

McClellan, W.A., see Bachhuber and McClellan, 1977

McCoy, C.J., Jr., see Branson and others, 1966

*McMullen, T.L.

1972 (and Zakrzewski, R.J.) A new late Pleistocene fauna from northeastern New Mexico: New Mexico Geol. Soc. Guidebook, 23rd field conference, p. 134-136

The new Casados Ranch local fauna in Harding County includes eight species of aquatic molluscs.

Marshall, W.B.

1895 Geographical distribution of New York Unionidae: New York State Museum, Ann. Rept. 48, p. 45-99

Unio luteolus is cited from New Mexico, from C.T. Simpson (1891).

*Mera, H.P.

1938 Reconnaissance and excavation in southeastern New Mexico: Am. Anthro. Assoc., Mem., no. 51, 70 p., 24 pls.

Clams illustrated but not identified from an archaeological site southwest of Carlsbad, Eddy County, are evidently Popenaias popei.

Metcalf, A.L.

1966 Corbicula manilensis in the Mesilla Valley of Texas and New Mexico: Nautilus, v. 80, p. 16-20

The "Asiatic clam" is established in the "West Drain", Doña Ana County, introduced not long before 1964.

*1967 Late Quaternary mollusks of the Rio Grande valley, Caballo Dam, New Mexico, to El Paso, Texas: Univ Texas (El Paso), Sci. Ser. 1, 62 p.

Pleistocene and Holocene molluscs are recorded as well as those living in the lower Rio Grande valley, New Mexico.

*1969 Quaternary surfaces, sediments, and mollusks--southern Mesilla Valley, New Mexico and Texas: New Mexico Geol. Soc. Guidebook, 20th field conference, p. 158-164.

Revised dates and correlations of fossil assemblages and comparison with modern fauna of Rio Grande valley, supplementary to study by Metcalf (1967).

1970a Field journal of Henry A. Pilsbry pertaining to New Mexico and trans-Pecos Texas: Sterkiana, no. 39, p. 23-37

Includes specific localities and dates of collection; the few aquatic species mentioned are listed only by genus.

1970b Late Pleistocene (Woodfordian) gastropods from Dry Cave, Eddy County, New Mexico: Texas Jour. Sci., v. 22, p. 41-46.

Stagnicola cockerelli is the only aquatic species reported.

*1974 Fossil and living freshwater mussels (Unionacea) from the Pecos River, New Mexico and Texas (abs): Am. Malacological Union, Bull., 1973, p. 47-48

Popenaias popeii may still live in southern New Mexico; other species of mussels are known only as fossils.

*1977 Some Quaternary molluscan faunas from the northern Chihuahuan Desert and their paleoecological implications: Sul Ross State Univ., Symp. on Biological Resources Chihuahuan Desert Region, Trans., p. 53-66; U.S. Dept. Interior, Natl. Park Serv., Trans. and Proc., Series 3, p. 53-66

Environmental interpretations of late Pleistocene and Holocene molluscs in southern New Mexico are reviewed, including new locality records and revision of ages.

*1980 Fossil Rangia cuneata (Mactridae) in Eddy County, New Mexico: Nautilus, v. 94, p. 2-3

Pleistocene occurrence of this brackish-water species in New Mexico is most likely due to transport by waterfowl.

1972 (and Smartt, Richard) Records of introduced mollusks--New Mexico and western Texas: Nautilus, v. 85, p. 144-145

Radix auricularia has been introduced into New Mexico; Corbicula has extended its range.

Miller, W.B., see Bequaert and Miller, 1973

Morrison, J.P.E.

1980 Recent Corbicula in North America (abs): Am. Malacological Union, Bull., 1979, p. 67

The Chinese species Corbicula fluminalis has been found in the upper Rio Grande.

Nicholson, Alexander, Jr.

*1961 (and Clebsch, Alfred, Jr.) Geology and groundwater conditions in southern Lea County, New Mexico: New

Mexico Bureau Mines Mineral Resources, Ground Water Rep. 6, 123 p., 2 pls.

The older alluvium "is characterized by a profusion of gastropods shells, which are found at almost every locality where it is exposed" (p. 41).

Noel, M.S.

1954 Animal ecology of a New Mexico springbrook: Hydrobiologia, v. 6, p. 120-135

Seasonal distribution of Amnicola neomexicana and Physa integra is recorded in Lander Springbrook near Roswell, Chaves County. Other species were represented by empty shells only.

Phelps, Austin

1963 Some like it hot: Redlands, California, The Shelletter of Shells and their Neighbors, no. 19, p. 7

Minute snails are mentioned as living in the thermal outflow of Mimbres Hot Spring, Grant County; no identification

Pilsbry, H.A.

1895 A new Mexican Bythinella: Nautilus, v. 9, p. 68-69

Bythinella palomasensis is described from Lake Palomas, Chihuahua, collected by E.A. Mearns, International Boundary Commission.

1896 Limnaea bulimoides Lea resisting drought: Nautilus, v. 10, p. 96

Specimens collected by G.H. Pepper in a seasonal pond near Farmington, San Juan County, in 1896, survived out of water for 45 days.

1899 Note on some New Mexican shells: Nautilus, v. 13, p. 79

Eight species are cited from drift of South Spring River, Roswell, Chaves County, collected by J.D. Tinsley, 1899.

1900a Land shells from rejectamenta of the Rio Grande at

Mesilla, New Mexico, and of the Gallinas River at Las Vegas, New Mexico: Nautilus, v 14, p. 9-10

Four species are cited from drift of the Rio Grande at Mesilla, Doña Ana County, collected by T.D.A. Cockerell.

1900b Shells of Las Vegas, New Mexico: Nautilus, v. 14, p. 47

Planorbis deflectus and Pisidium compressum were found (whether fossil or living not clear) by Mary Cooper at Las Vegas, San Miguel County.

1906 Shells of Grant, Valencia County, New Mexico: Nautilus, v. 19, p. 130

Four species were found (whether drift or living not clear) at Grants by Albert and J.L. Baily, Jr.

1916-17 New species of Amnicola from New Mexico and Utah: Nautilus, v. 29, p. 111-112; v. 30, pl. 5, figs. 4, 8, 9

Amnicola neomexicana n. sp. is described from warm springs at Socorro, Socorro County; the collector not recorded.

*1935 Report on shells collected by E.B. Howard from lake bed southwest of Clovis, Roosevelt County, New Mexico, in Evidence of early man in North America, E.B. Howard, editor: U. Pennsylvania Museum, Museum Jour., v. 24, p. 89-90

Seven species were found at the Clovis early man site.

1900 (and Cockerell, T.D.A.) Records of Mollusca from New Mexico: Nautilus, v. 14, p. 85-86

Three species are cited from stream drift at Las Vegas, San Miguel County, collected by Cockerell.

1906 (and Ferriss, J.H.) Mollusca of the southwestern states--II: Acad. Nat. Sci. Philadelphia, Proc., v. 58, p. 123-175, pls. 5-9

Lymnaea bulimoides cockerelli, L. bulimoides techella, and Paludestrina seemanni (fossil only) are recorded from New Mexico, all from other collectors.

1909 (and Ferriss, J.H.) Mollusks from around Albuquerque, New Mexico: Nautilus, v. 22, p. 103-104

Four species were found in drift of the Rio Grande at Albuquerque, Bernalillo County, collected by Pilsbry and Ferriss in 1906.

1917 (and Ferriss, J.H.) Mollusca of the southwestern states--VIII, The Black Range, New Mexico: Acad. Nat. Sci. Philadelphia, Proc., v. 69, p. 83-107, pls. 7-10

Physa sp. was collected by Pilsbry and Ferriss in 1915 at two localities in the eastern foothills of the Black Range, Sierra County.

* Reeves, C.C., Jr.

1976 Quaternary stratigraphy and geologic history of southern High Plains, Texas and New Mexico, in Quaternary stratigraphy of North America, W.C. Mahaney, editor: Stroudsburg, Pennsylvania, Dowden, Hutchison and Ross, Inc., p. 213-234

Includes a correlation chart of stratigraphic and

climatic units and significant gastropod assemblages of the region (p. 218).

* Renaud, E.B.

1930 Prehistoric cultures of the Cimarron Valley, northeastern New Mexico and western Oklahoma: Colorado Sci. Soc., Proc., v. 12, p. 113-150

"Two or three fresh water mussel shells" were found in a rock shelter at one of the "fumaroles" in the extreme northeast corner of New Mexico. No more precise identification of species.

* Richards, H.G.

1936 Mollusks associated with early man in the Southwest: Am. Naturalist, v. 70, p. 369-371

A second collection from the Clovis site, Roosevelt County, made by J.R. Whiteman, is recorded.

Roberts, F.H.H.

*1942 Archeological and geological investigations in the San Jon district, eastern New Mexico: Smithsonian Misc. Colln., v. 103, no. 4, 30 p., 9 pls.

Helisoma tenue sinuosum was found in the San Jon archeological site and living in seasonal lakes in the vicinity, Quay County.

Roosa, W.B.

*1968 Data on early sites in central New Mexico and Michigan: Ph.D thesis, Univ. Michigan, 420 p.

Four aquatic species are listed from the Lucy site, Torrance County, quoted from Harbour (1958).

Roueche, W.L., see Webb and Roueche, 1971

Samson, K.S., see Wilson and Samson, 1967

Seager, W.R.

*1975 (Clemons, R.E., and Hawley, J.W.) Geology of Sierra Alta quadrangle, Doña Ana County, New Mexico: ~~New Mexico~~ New Mexico Bureau Mines Mineral Resources, Bull. 102, 56 p., map

Biomphalaria sp. is listed from the older valley alluvium.

Simpson, C.T.

1891 Notes on Unionidae: Nautilus, v. 5, p. 86-88

Unio luteolus is cited from New Mexico, without precise locality or collector.

Sisk, M.E., see Brannon and others, 1966

Smartt, Richard, see Metcalf and Smartt, 1972

Sowerby, G.B.

1873-74 Monograph of the genus Physa, in Conchologia iconica, L.A. Reeve, editor: London, L. Reeve, v. 19, 12 sheets of text, 12 color pls, 2 p. index.

Physa humerosa is described and illustrated from New Mexico, with no more precise locality.

Springer, Ada

1902 On some living and fossil snails of the genus Physa, found at Las Vegas, New Mexico: Acad. Nat. Sci. Philadelphia, Proc., v. 54, p. 513-516, pl. 26

Several genera are found fossil at Las Vegas, San Miguel County. Brief observations on the radula of several species of Physa indicate useful taxonomic

characters.

Sterki, Victor

*1892 Shells collected in the sand of a dry salt lake near Eddy, New Mexico: Texas Geol. Survey, Ann. Rept. 3, 1891, p. 261-265

Four aquatic species are cited from Salt Lake, Eddy County, collected by W.F. Cummins, 1891.

1896 Small land Mollusca from New Mexico: Nautilus, v. 9, p. 116

Limnaea and Planorbis were found in drift of the Rio Grande at San Marcial, Socorro County, collected by T.D.A. Cockerell.

1903 New North American Pisidia: Nautilus, v. 17, p. 42-43

Pisidium ashmuni is described from San Rafael, Valencia County, collected by Rev. E.H. Ashmun.

1906 New species of Pisidium: Nautilus, v. 20, p. 17-20

Pisidium friersoni is reported from the Gallinas River, Las Vegas, San Miguel County, collected by T.D.A. Cockerell.

1916 A preliminary catalog of the North American Sphaeriidae: Carnegie Museum, Annals, v. 10, p. 429-477

Pisidium ashmuni and P. compressum are cited from New Mexico, with no specific localities.

Stunkard, H.W.

1946 Possible snail hosts of human schistosomes in the United States: Jour. Parasitology, v. 32, p. 539-552

Physa anatina from an unspecified locality in New

Mexico was exposed to schistosome infection.

Sublette, J.E.

1967 (and Sublette, M.S.) The limnology of playa lakes on the Llano Estacado, New Mexico and Texas: Southwestern Naturalist, v. 12, p. 369-406

Lymnaea bulimoides and Helisoma trivolvis were found in some of the ponds studied in Roosevelt County.

Sublette, M.S., see Sublette, J.E., and Sublette, 1967

Taylor, D.W.

1967 Freshwater mollusks collected by the United States and Mexican boundary surveys: Veliger, v. 10, p. 152-158

Revised identifications and locality data are provided for collections along the boundary by E.A. Mearns, 1892-93.

1970 American Malacological Union symposium--Rare and endangered mollusks; 4, Western freshwater mollusks (editor's summary): Malacologia, v. 10, p. 33

Physa humerosa of the upper Gila River, Arizona-New Mexico, is listed as a rare or endangered species. See Hibbard and Taylor, 1960

x Separate line

Te, G.A.

1973 A brief review of the systematics of the family Physidae (abs.): Malacological Review, v. 6, p. 61

Physa virgata is cited from New Mexico, without more precise locality.

Theis, C.V.

*1932 Report on the ground water in Curry and Roosevelt Counties, New Mexico: New Mexico State Engineer, Bienn. Rep. 10, p. 98-161

x

Fossil mollusks are mentioned but not identified from the upper part of the Portales Valley fill (p. 110) and from Big and Little Salt Lakes (p. 112).

Tryon, G.W.

1865 Catalogue of the species of Limnaea inhabiting the United States: Am. Jour. Conchology, v. 1, p. 247-258

Limnophysa palustris is cited from "Laguna de los Cavallos, New Mexico," now Horse Lake, Rio Arriba County (collected by J.S. Newberry, VII-1859). means July, 1859 July

1870-71 A monograph of the fresh-water univalve Mollusca of the United States: Philadelphia Acad. Nat. Sci., 238 p., 17 pls.

Limnaea palustris is cited from New Mexico with no precise locality or collector, but presumably the "Laguna de los Cavallos" of Tryon (1865).

U.S. Fish and Wildlife Service

1976 Proposed endangered or threatened status for 32 U.S. snails: Fed. Register, v. 41, p. 17742-17747

Endangered status is proposed for Amnicola neomexicana "formerly known from the Sedillo and Socorro Springs in Socorro County", probably now extinct, but "found as recently as 1971".

Walker, Bryant

1904 Notes on eastern American Ancyli, II: Nautilus, v. 18, p. 16-17, 25-30, pls. 1-2

Ancylus rivularis is cited from New Mexico, without precise locality, presumably based on the record by Pilsbry (1899).

1909 Notes on Planorbis, II--P. bicarinatus: Nautilus, v. 23, p. 1-10, 21-32, pls. 1-3

Several localities in New Mexico are cited for the species, but no distinction is drawn between fossil and living occurrences. On present knowledge all could be fossil.

1915 A list of shells collected in Arizona, New Mexico, Texas, and Oklahoma by Dr. E.C. Case: Univ. Michigan, Museum Zoology, Occas. Papers, no. 15, 11 p.

A few species are listed from stream drift at two localities, in Mora and San Miguel Counties.

Webb, R.G.

1971 (and Roueche, W.L.) Life history aspects of the tiger salamander (Ambystoma tigrinum mavortium) in the Chihuahuan desert: The Great Basin Naturalist, v. 31, p. 193-212

Physa virgata and Planorbella tenuis are cited from Taylor well, Doña Ana County.

Wilson, G.I.

1967 (and Samson, K.S.) The identity of snail vectors of Fasciola hepatica in the Southwest (abs.): ~~Abs. 4 Papers, 43rd Ann. Mtg.,~~ Am. Assoc. Adv. Sci., Southwest Rocky Mtn. Div., 43rd Ann. Mtg., Abs. Papers, p. 46-47 ~~and Southwest and Rocky Mtn. Div., Am. Assoc. Adv. Sci., p. 46-47~~

Lymnaea bulimoides techella is the normal host of Fasciola in northern New Mexico, southern Colorado, and

eastern Arizona.

1971 The incidence of fascioliasis of sheep and cattle in the Southwest with observations on the snail vectors: Helminthological Soc. Washington, Proc., v. 38, p. 52-56

Stagnicola palustris and Fossaria modicella are vectors of Fasciola in the vicinity of Aztec, San Juan County, and Chama, Rio Arriba County.

Yarrow, H.C.

1875 Report upon the collections of terrestrial and fluviatile Mollusca made in portions of Colorado, Utah, New Mexico, and Arizona, during the years 1872, 1873, and 1874: U.S. War Dept., Geogr. Surveys west of the 100th Meridian, Rept., v. 5, p. 923-954

Several aquatic species are reported from New Mexico.

Zakrzewski, R.J., see McMullen and Zakrzewski, 1972

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Leonard, and Glass (1978), p. 16; Hall (1980), p. 61; Jelinek (1967), p. 11; Leonard (1977), p. 145; Leonard and Frye (1975), p. 23 (I); (1978), p. 11 (I); Leonard, Frye, and Glass (1975), p. 6, 13; McMullen and Zakrzewski (1972), p. 134; Metcalf (1967), p. 37; (1969), p. 159

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Bachhuber (1971), p. 181, 185, 186

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Bequaert and Miller (1973), p. 218; Drake (1975), p. 239 (I); Frye, Leonard, and Glass (1978), p. 16; Herrington (1962), p. 35 (I); Jelinek (1967), p. 11; Leonard and Frye (1975), p. 25 (I); Leonard, Frye, and Glass (1975), p. 6, 15; Pilsbry (1899), p. 79; (1900b), p. 47; Sterki (1916), p. 447; Taylor (1967), p. 155

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exacuous, Promenetus (Menetus, Planorbis)

Baker (1928), p. 363 (I); W.T. Clarke (1938), p. 120; Drake (1975), p. 237 (I); Frye, Leonard, and Glass (1978), p. 16; Henderson (1936), p. 136; Hibbard and Taylor (1960), p. 108; Jelinek (1967), p. 11; Pilsbry (1899), p. 79

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Leonard and Frye (1975), p. 22 (I); Leonard, Frye, and Glass (1975), p. 6, 13

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Morrison (1980), p. 67

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Jelinek (1967), p. 11; Lambert (1968), p. 238

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parva, Fossaria (Galba, Lymnaea)

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Cockerell (1896), p. 42; Drake (1953), p. 27; Harbour (1958), p. 72; Henderson (1917), p. 135; Henderson and Harrington (1914), p. 63, 65; Jelinek (1967), p. 11; Louderbough (1976), p. 21, 27-29; Metcalf (1970a), p. 26; Pilsbry (1900a), p. 10; (1906), p. 130; (1935), p. 89; Pilsbry and Cockerell (1900), p. 86; Pilsbry and Ferriss (1917), p. 105; Richards (1936), p. 370; Walker (1915), p. 4

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Drake (1975), p. 235 (I)

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Yarrow (1875), p. 941

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tenuis, Planorbella (Helisoma)

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