

cus at about a 45° angle, continuing posteriorly across sulcus onto disc nearly perpendicular to it. Posterior slope and disc sculptured by thin, sharply defined, moderately spaced concentric ridges. Umbo located near midline of shell. Umbonal reflection flaring, but narrow and elongate, not overturned (but missing over the umbo on the holotype), not sculptured with continuations of concentric ridges of the anterior slope.

Single specimen available is a juvenile valve that lacks callum and siphonoplax, both useful adult characters in species of *Netastoma* and *Pholadopsis*. Details of interior aspect of shell, including muscle insertion scars, pallial line and sinus, and umbonal region, are not discernible on external mold of holotype.

*Comparison.*—“*Jouannetia* sp.” of Clark and Woodford (1927, p. 102, Pl. 18, fig. 6), the generic allocation of which is uncertain, from the upper Paleocene or lower Eocene Meganos Formation in central California, has a proportionately larger anterior slope than combined disc and posterior slope, and appears to be sculptured by low, rounded concentric ridges anteriorly (Kennedy, 1974, figs. 91, 92) rather than with the sharp concentric ridges and pointed(?) projections of *Netastoma squiresi* n. sp. Another probable jouannetiine species, “*Zirphaea*” *plana* White (1889, p. 15, Pl. 4, fig. 22) from indeterminate Cretaceous, Paleocene, or Eocene strata of the “Chico–Tejon series” at Martinez, central California, is too poorly preserved for unequivocal generic assignment. The holotype (USNM 20129; Kennedy, 1974, fig. 101) and only known specimen appears to have a shorter umbonal reflection, more like species of *Pholadopsis* than *Netastoma*, and the raised and well-defined concentric ridges on the anterior slope do not appear to have a radial component with pointed(?) projections as does the holotype of *Netastoma squiresi* n. sp.

*Holotype.*—LACMIP 8405, external mold of juvenile left valve. Length, 10 mm (incomplete); height, 7 mm; projected dimensions without callum or siphonoplax, length 12 mm, height 8 mm.

*Type locality.*—LACMIP loc. 12648 (CSUN loc. 967), lower Eocene, uppermost “Meganos” Stage, uppermost Santa Susana Formation, approximately 1 km ENE of Marr Ranch, between Chivo Canyon and Las Lajas Canyon on south slope of Santa Susana Mountains, north side of Simi Valley, Ventura County, California.

*Distribution.*—Known only from the type locality.

*Discussion.*—The holotype of *Netastoma squiresi* was collected from the north side of the Simi Valley on the south slope of the Santa Susana Mountains in an area mapped as Santa Susana Formation by Squires (1983). Although that formation is predominantly Paleocene in age, the uppermost 100 m of the formation contains marine mollusks indicative of the lower Eocene part of the uppermost “Meganos” Stage (Saul, 1983; Squires, 1988). If correctly assigned to *Netastoma*, *N. squiresi* is the oldest known representative of the genus, which is unknown in rocks older than Pliocene (Kennedy, 1974). The sediment-filled borings erroneously attributed to *Netastomella* (= *Netastoma*) *rostrata* (Valenciennes, 1846) by Evans (1967) from the upper Miocene (“Margaritan”) Pismo Formation on the central California coast belong to an unidentified species of *Penitella* (Kennedy, 1974, p. 37, 67).

*Etymology.*—The species name honors Richard L. Squires, in recognition of his contributions to our understanding of Eocene invertebrate faunas of western North America.

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## APPENDIX

## LOCALITY DESCRIPTIONS

- CAS loc. 1841. Middle Miocene, "Temblor" Stage, Temblor Formation. [Pholadid] boring into Cretaceous shales, base of Temblor Reef, Jasper Canyon, western Fresno County, California. Collected by G. D. Hanna, September 1929.
- CAS loc. 28485. Miocene, Temblor(?) Formation. "One mile" (1-2 km) southeast of Oil City, north of Coalinga, Fresno County, California. Collected by Joe Knowles, 1915-1935. "(Possibly the Temblor and Santa Margarita fossils were slightly mixed in locs. 28485 . . .)" (V. A. Zullo, personal commun.).
- CAS loc. 66602 (SU loc. N. P. 129). Upper Oligocene, Juanian Stage, Sooke Formation. Sandstone and conglomerate in sea cliffs between the mouths of Kirby (formerly Coal) and Muir Creeks, Orveas Bay between Otter Point and Sheringham Point, west of Sooke, Renfrew District, southern end of Vancouver Island, British Columbia, Canada. Probably collected by Ralph Arnold or Harold Hannibal, early 1900s.
- LACMIP loc. 5824. Middle Miocene, "Temblor" Stage, Topanga(?) Group. Pholads and other burrowing clams in top 0.3 m of dark-gray shale and overlying buff shaley sandstone below conglomerate unit, in freshly excavated areas for Upper Oso Reservoir on east side of Oso Creek valley, northeast of El Toro, northern Santa Ana Mountains, Orange County, California. NE¼, SW¼, SW¼, sec. 9, T6S, R7W, SBBM (USGS 7.5 min Santiago Peak, California quadrangle, 1954, scale 1:24,000). 33°39'37.3"N, 117°37'16.5"W. Collected by L. G. Barnes (LGB-1900), 12 April 1979; E. C. Wilson (OD-2), P. G. Owen, and B. J. Welton, 29 May and 19 June 1979.
- LACMIP loc. 10788 (CIT loc. 1008). Upper Cretaceous, Santonian Stage, Redding Formation, lower part of member V of Popenoe (1943). Southwest end of ridge forming divide between Basin Hollow Creek and Clover Creek, approximately 8 km ENE of Millville, east of Redding, Shasta County, California. SE¼, NW¼, sec. 33, T32N, R2W, MDBM (USGS 15 min Millville, California quadrangle, 1953, scale 1:62,500). 40°35'25.3"N, 122°05'57.3"W. Sandstone slabs cropping out at head of small southwest-trending ravine, and overlying massive cliff-forming conglomerate cropping out on north face of ridge. Collected by W. P. Popenoe (P30-31) and D. W. Scharf, 11 April 1931.
- LACMIP loc. 10816 (CIT loc. 1007). Upper Cretaceous, lower Coniacian Stage, Redding Formation, member IV of Popenoe (1943). Hard limey sandstones cropping out on lower slope of hills north of Oak Run and about 0.6 km (0.4 mi) due north of Hathaway Brothers ranch house, approximately 11 km northeast of Millville, east of Redding, Shasta County, California. Approximately 0.55 km southeast of NW cor. sec. 16, T32N, R2W, MDBM (USGS 15 min Millville, California quadrangle, 1953, scale 1:62,500). 40°38'01.3"N, 122°06'04.5"W. Collected by W. P. Popenoe (P29-31) and D. W. Scharf, 9 August 1931.
- LACMIP loc. 12648 (CSUN loc. 967). Lower Eocene, uppermost "Meganos" Stage, uppermost Santa Susana Formation. Limey concretionary lense (20 m long, 30-40 cm thick) exposed 47-61 m below top of formation on south side of unmaintained dirt road on eastern spur of ridge crest between Chivo Canyon and Las Lajas Canyon approximately 1 km ENE of Marr Ranch, south slope of Santa Susana Mountains on north side of Simi Valley, Ventura County, California. SE¼, SE¼, SW¼, sec. 29, T3N, R17W, SBBM (USGS 7.5 min Santa Susana, California quadrangle, 1951 (PR 1969), scale 1:24,000). 34°18'34.4"N, 118°40'56.1"W. Elevation 1,725 ft. Collected by R. L. Squires, 28 February 1986.
- UCR loc. 1446. Lower Pliocene, "Etchegoin" Stage, Etchegoin Formation. [? Shell Oil Company oil well] E. C. 31, San Emigdio Mountain, Kern County, California. Collection of Shell Oil Company of California.
- USGS loc. M1542. Upper Miocene, Wishkahan Stage, Montesano For-

mation, basal contact. In bed of Canyon River, Grays Harbor County, Washington. 214 m (700 ft) west of SE cor. sec. 35, T21N, R7W, WBM (USGS 15 min Grisdale, Washington quadrangle, 1955, scale 1:62,500). Large bivalves boring into underlying Astoria Formation. Collected by W. O. Addicott.

USGS loc. M3073. Upper Miocene, Wishkahan Stage, Montesano For-

mation, basal formational contact. Road cut just south of bridge over the Middle Fork of the Satsop River, southwest corner of Mason County, Washington. 61 m (200 ft) west and 275 m (900 ft) north of SE cor. sec. 36, T19N, R7W, WBM (USGS 15 min Wynoochee Valley, Washington quadrangle, 1955, scale 1:62,500). Collected by G. A. Fowler, early 1960's.