

Dorsal surface of arm steeply vaulted proximally, outline becoming more rounded near midline of arm. Proximalmost three or four dorsal arm plates exposed in reentrant between radial shields; proximal dorsal arm plates four to five times wider than long, with proximal, distal edges transverse, nearly parallel. Width of 15th dorsal plate about twice its length, with proximal and distal margins still parallel but flexed distally; distally, dorsal arm plates reduced in relative size, separated longitudinally but overlapped strongly by lateral arm plates.

Lateral arm plates not bowed but forming flat margin to arm; dorsally, reentrants bearing articulating ridge for arm spines well developed. Arm spines short, not overlapping next distal spine row; spines laterally compressed, base of spine thick, acutely narrowing to blunt tip. Four of five spines present on proximal laterals, at least to about 15th arm joint, dorsal-most quite long but second spine longest, probably extending in life to near base of spine of next-distal lateral plate; next two or three progressively shorter. Tentacle scales cover podial pores, with very small scales along distal edge of lateral arm plate on at least proximal segments.

Ventral arm plates about twice as wide as long; first four or five ventral plates (those beneath the disk) in contact but becoming disjunct distally. Shapes of proximalmost plates changing, the first shield-shaped with distal reentrant, the next quadrangular, then pentagonal, subsequent plates triangular with midarm plates about twice as wide as long, elliptical. Distally, ventral arm plates probably becoming reduced in relative size.

Remarks.—Specimens of more than fifty species assigned to *Ophiura* were studied, and others were reviewed from printed material, but adequate documentation of all named species was not available. From this survey, *Ophiura hendleri* is most similar to *O. acervata*, *O. sarsi*, *O. texturata*, and *O. luetkeni*. In *O. acervata* Lyman, the central plate and primary radials are better defined, and several lateral interradial scales are much larger, whereas dorsal radials are smaller. The oral shields of that species are shorter and more deeply indented by the genital burase. The lateral arm plates in *O. acervata* are comparatively large, and ventral arm plates are reduced to small elliptical structures beyond about the third plate. Dorsal arm plates are somewhat larger but also comparatively narrow after about the sixth plate. Arms again are distinctive in *O. sarsii* (Lutken), in which no more than the first two ventral arm plates are in contact and the lateral arm plates are comparatively broad and angular in cross section, with long spines on a well-developed spine ridge. The jaws are comparatively broad and divergent with pointed rather than blunt papillae, and the oral shield is comparatively short and wider proximally. *Ophiura hendleri* is very similar to *O. texturata* Lamarck, especially in the development of the dorsal surface; however, the ventral arm plates are disjunct in the latter, separated by a pit-like depressions; ventral and lateral interbranchial scales are comparatively large, and oral papillae pointed in *O. texturata*. In *O. luetkeni* (Lyman), ventral arm plates are again disjunct and laterals bear relatively long, delicate spines. The oral shield is distinctly shorter, comparatively small and equidimensional, and oral papillae are attenuated.

Ophiura hendleri can be distinguished from the nine living Antarctic species in overall appearance. The five arm spines serve to distinguish *O. hendleri* from *O. frigida*, *O. meridionalis*, *O. rouchi*, *O. serrata*, and *O. umitakamuruae*, all of which have three, and *O. mimaria*, which has seven or eight. *Ophiura crassa* and *O. flexibilis* have four or rarely five, and broad jaws, small, short radial shields, and relatively few large scales in the ventral interbranchii. *Ophiura migrans* has five to seven arm spines, broad jaws, oral shields wider than long, and relatively few large scales in the ventral interbranchii. *Ophiura hendleri* is also similar to the Texas Cretaceous species *O. texana*, although oral shields

are waisted in the latter species, and a number of small supernumerary plates occur where the arms join the disk; primary plates are more clearly differentiated in *O. texana*.

Etymology.—The species is named in honor of Gordon Hendler.

Material.—Hundreds of specimens, mostly of rather poor quality of preservation, see locality log. Holotype, USNM 490436, paratypes USNM 490437, 490438; unnumbered USNM paratypes; paratypes LACM 7183–7194.

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APPENDIX

LOCALITY DATA

Seymour Island (Figure 1) is approximately of a figure-eight shape, with the Eocene La Meseta Formation lying almost entirely on the smaller, northeastern portion of the island, and the Cretaceous and Paleocene rocks occurring to the southwest; the waist of the island is occupied by a broad lowland called "Cross Valley." The northeastern portion of the island is approximately 6 km (NE-SW) by 4 km (NW-

SE); it is an erosional remnant crowned by a comparatively small mesa that approximately parallels the long axis of that portion of the island and divides the La Meseta Formation outcrop area into "eastern" and "western" areas. Most locality descriptions below begin with either an "E" or "W" reflecting this distribution; a few begin with "CV" for the Cross Valley area and a few near Cape Wiman (Figure 1) begin with "CW." All localities containing stelleroids available to us are included below.

86-01.—W Float specimens scattered for about 20 m at the base of NW-facing slope below the drainage of 94-30 and 94-10, approx. 350 m NNE of 94-30 and between 1,000 and 1,050 m SE of the intersection of 56°40'W and 64°14'S and between 650 and 700 m SW of 56°38' and W 64°14'S. *Ctenophoraster* in unfossiliferous silty sands; some brachiopods.

86-02.—W On the slope approx. 100 m NE of 94-32 at approx. the same elevation; scattered *Zoroaster*, *Ctenophoraster*.

86-03.—W Approx. 6 m below the crest of Ruby nose on line between the tip of the nose and 94-2; two ophiuroid assemblages approx. 1 m in lateral extent and 1–3 cm thick separated by 0.1 m band of indurated gray sandstone with scattered, allochthonous brachiopods and ophiuroids. Float blocks of ophiuroid assemblages occur from several points on slope but it is unclear whether these represent a single horizon. *Ctenophoraster* in the debris slope.

86-04.—CV Specimens widely distributed along approx. 300 m of surface of dissected topography on the north side of primary Cross Valley drainage, centered about 900 m NW of the intersection of 56°40'W and 64°16'S and 1,050 m SW of the intersection of 40'W and 15'S; extending SE from below a high point approx. 350–400 m due west of 56°40'W. Localized patches of abundant *Zoroaster*, *Ctenophoraster*, *Paragonaster* in buff silts; few other fragmentary fossils.

86-05.—CV Specimens distributed along approx. 30 m of weakly dissected topography, below crest of rise on north side of primary Cross Valley drainage, centered about 750 m SE of the intersection of 56°42'W and 64°15'S and 1,700 m SE of the intersection of 41'W and 15'S. Fauna diverse, *Zoroaster*, *Ctenophoraster*, *Tessellaster*, *Sclerasterias*, corals, mollusks, in fine buff silts.

86-06.—CW On SE-facing slope of primary ridge extending NE from northern tip of plateau, centered approx. 1,200 m NE of intersection of 56°38'W and 64°14'S and 550 m NW of 56°36'W and 64°14'S. Scattered *Ctenophoraster* and *Zoroaster* fragments, *Metacrinus* crinoids, mollusks, in gray muddy siltstones.

86-07.—E Between 100 and 150 m NW of 94-11, on north-facing slope of central branch (of three) of the second principal drainage south of Larsen Cove. *Ctenophoraster* fragments.

86-08.—CW On N-facing slope below prominent hill, approx. 1,050 m SE of intersection of 56°38'W and 64°13'S and 1,250 m SW of 56°36'W and 64°13'S; few very small *Zoroaster* fragments, *Metacrinus* crinoid.

86-09.—CW NE-facing slopes at southeast end of EW-trending valley south of Cape Wiman; approx. 400 m east of the intersection of 56°38'W and 64°13'S; on 13', then fossils scattered in spurs to south of latitude line. *Ctenophoraster*, *Zoroaster* with molluscan-rich debris including oysters; both asteroids also found weathering out of relatively unfossiliferous horizons from about 10 m interval.

86-10.—W Approx. 400 m SW of intersection of 56°38'W and 64°14'S and 1,450 and 1,500 m SE of 56°40'W and 64°14'S; few very poorly preserved asteroids in sandy matrix on NNE-facing slope.

86-11.—W Approx. 300 m SW of intersection of 56°38'W and 64°14'S and approx. 1,550 m SE of 56°40'W and 64°14'S; flaggy float blocks containing abundant ophiuroids but not true assemblages, and mollusks, inarticulate brachiopods; on rubble-covered NNE-facing slope.

94-01.—W Near edge of crest of Ruby nose on the SW-facing side of a gradually sloping surface, N of north fork of principal drainage between Ruby and the next nose to the SW; approx. 900 m NE of intersection of 56°40'W and 64°15'S and 1,050 and 1,100 m SE of 56°40'W and 64°14'S. Small ophiuroid assemblage several m in diameter, specimens not abundant, associated with brachiopods.

94-02, 94-32.—W Steep, dissected NW-facing slope ESE across gully from flat surface of 94-33, and between two larger gullies (which digitate and converge toward crest of point), and 5 to 25 m above

floor of gully; 94-32 is to NE, 94-2 to SW; scattered *Ctenophoraster*, echinoids, mollusks, wood.

94-03.—W Head of an NS-trending gulch WSW of prominent, conical hill; Approx. 900 m NE of intersection of 56°41'W and 64°15'S and 850 m NW of the intersection of 40'W and 15'S; with diverse well-preserved, nearly autochthonous molluscan, coral, asteroid fauna in thin-bedded, indurated clastics to W, unconsolidated channel sands with large slump blocks, scattered, displaced asteroids and echinoids to E. *Zoroaster*, *Sclerasterias*, *Paragonaster*, *Ctenophoraster*, ophiuroid fragments.

94-06.—W On flats between 750 and 800 m NE of intersection of 56°40'W and 64°15'S and 1300 m NW of the intersection of 38'W and 15'S; ophiuroid associated with angular cobbles that might be Miocene in age (W. J. Zinsmeister, personal commun.).

94-07.—W On north-facing flank of Ruby nose in about middle of drainage that passes west of conical prominence at base of mesa, between 1,000 and 1,050 m NE of intersection of 56°40'W and 64°15'S and 1,000 m SE of 56°40'W and 64°14'S; and to the west 25 m, beyond the gully. Two very localized indurated ophiuroid assemblages in a rubble slope separated vertically about 3 m, in unconsolidated sands; beds under 10 cm thick, extending about 0.33–1.0 m along outcrop; other ophiuroids scattered through sands; poorly preserved *Ctenophoraster* with ophiuroid assemblage; *Metacrinus* crinoid; echinoids; brachiopods; burrow casts. (includes loc. 94-08).

94-09.—W Prominent NNE-WSW-trending spur approx. 500 m NE of Ruby nose elevation marker; locality is near edge of crest on SW-facing side of spur near its SE extremity between 1,300 and 1,350 m NE of intersection of 56°40'W and 64°15'S and between 1,000 and 1,050 m SE of 56°40'W and 64°14'S. Ophiuroid assemblage with abundant specimens approx. 20 cm thick exposed along approx. 4 m, on southwest to northwest side of a tiny knoll near to the crest of the knoll; *Ctenophoraster*? trace approx. 30 m to west.

94-10.—W Lag near the edge of flat nearly 100 SE of 30, between 1,200 and 1,250 m SE of intersection of 56°40'W and 64°14'S and between 850 and 900 m SW of 56°38'W and 64°14'S; crinoid, brachiopods.

94-11.—E Gradually sloping lag surface on NW-facing slope of low drainage entering most southerly of three main forks of second principal drainage south of Larson Cove between 700 and 750 m NW of the intersection of 56°36'W and 64°15'S and 1,150 and 1,200 m SW of the intersection of 36'W and 14'S, fossils collected over area approx. 50 m in length. Many *Metacrinus* crinoids, some tightly clustered, others scattered over broad, rather flat lag surface; bone fragments, ophiuroid? trace fossil, *Sclerasterias*.

94-12.—E A small saddle on the central branch (of three) of the second principal drainage south of Larsen Cove between 950 and 1,000 m NW of the intersection of 56°36'W and 64°15'S and 1350 m SW of the intersection of 36'W and 14'S. The saddle is floored by small distributary channels, and contains a diverse molluscan and brachiopod fauna; immature *Zoroaster*, *Ctenophoraster*, crinoids, scattered ophiuroids.

94-13.—E East-facing lag slope approx. 300 m southeast of 94-11, 550 m NW of the intersection of 56°36'W and 64°15'S and 1,450 m SW of the intersection of 36'W and 14'S. Few *Metacrinus* crinoids, few molluscan, brachiopod fragments.

94-17.—W Approx. 50 m NNW of 94-33 at the same stratigraphic horizon; abundant *Zoroaster*.

94-20.—E North-facing slope of east-west hill approx. on 64°15'S and 650 m W of the intersection with 56°36'W. *Metacrinus* crinoids on deflation surface.

94-21.—E On east-facing side of gulch approx. 900 m SW of the intersection of 56°36'W and 64°15'S and between 900 and 950 m SE of the intersection of 38'W and 15'S; approx. 150 m from the sea cliffs on a line perpendicular to the cliffs and just below and SE of a small L-shaped summit. Isolated *Ctenophoraster* in unconsolidated sands approx. 2 m above gulch floor.

94-24.—E A small knoll several m across capped by indurated fossiliferous sandstone slabs overlying unfossiliferous sands; knoll is about 2 m above the floor of a steep gulch, on the south-facing side of the gulch; locality is on the main drainage extending to the center of curvature of the mesa, between 250 and 300 m ENE of 94-26, 300 to 350 m SE of the intersection of 56°38'W and 64°15'S and 1,350 m SW of the intersection of 36'W and 15'S. Diverse mollusks, as-

O. hendleri,
type loc.

LACMIP 17106

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teroids, ophiuroids, crinoid fragments, brachiopods extending along outcrop.

94-25.—E Fossiliferous float below and east of crest of spur of meseta, between 600 and 650 m NE of the intersection of 56°38'W and 64°15'S and 1,200 m NW of the intersection of 36'W and 15'S; one small *Zoroaster*, brachiopods, numerous mollusks.

94-26.—E Hummocky, low relief topography in gray silts, sands, some indurated, between 200 and 250 m SSE of the intersection of 56°38'W 64°15'S and 1,600 m NNE of the intersection of 38'W and 16'S. Most of area with few fossils, but one *Ophiura* assemblage and several horizons with abundant bivalves (*Eurhomalea* sp.).

94-30.—W Prominent NNE-WSW-trending nose 200–250 m east of that of 94-9; locality is on the east-facing slope of the major drainage extending to the west of the SW end of the airstrip, below the crest of the spur, but still on a fairly gradual slope, nearly 1,450 m NW of intersection of 56°38'W 64°15'S and approx. 900 m SW of 56°38'W and 64°14'S. Very locally derived slump blocks, exposure about 3–4 m by 1–2 m, about 1 m in thickness; dark, indurated silty shales, numerous comatulid crinoids (*Notocrinus rasmussenii*), numerous scattered ophiuroids, brachiopods, scattered mollusks.

94-31.—*Zoroaster*, *Ctenophoraster*; see 94-02.

94-33.—W Very steep SW-facing slope a few m west of 56°40'W nearly 800 m south of the intersection of 56°40'W and 64°14'S; a distinctive, sloping, NW-SE-trending flat surface is at the top of the

slope and immediately E of 56°40'W; abundant *Zoroaster* collected from several m of evenly bedded sands, approx. 5 m above floor of gulch.

94-34.—W NW-facing slope approx. 2 m above gulch floor approx. 800 to 850 m SE of intersection of 56°41'W and 64°14'S and 600 m SW of the intersection of 40'W and 14'S; few *Zoroaster* collected from Eocene slump blocks in channel sands.

94-35.—Two float blocks, Ruby Hill; ophiuroid assemblages.

94-36.—E Near base of steep, N-facing, freshly slumping slope, immediately above main gully floor, approx. 90 m SW of 94-12. Approx. 3.5 m of sand below 0.5 m burrowed, indurated interval *Ctenophoraster*, crinoid fragments, bone fragments, brachiopods.

94-38.—E Unconsolidated, sandy, steep, northeast-facing slope approx. 2–4 m above bottom of steep secondary gulch, approx. 500 m southwest of entrance to second principal drainage south of Larsen Cove and 400 m northeast of third principal drainage, 50–100 m northwest of foot of seacliff face, between 600 and 650 m NE of 56°36'W and 64°15'S; scattered crinoids, brachiopods, fish vertebrae.

94-39.—E A sharp ridge less than 50 m east of the intersection of 56°38'W and the sea cliffs immediately N of the sea cliff face; one *Zoroaster*.

94-40.—W SW-facing slope of Ruby nose between 900 and 950 m NE of intersection of 56°40'W and 64°15'S and 950 and 1,000 m SE of 56°40'W and 64°14'S. Rubble slope with indurated coquina horizons dominated by a very small, undescribed; traces of *Zoroaster*?

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