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Queensland Faunistic Records
Part III.—Echinodermata (excluding Crinoidea)

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Queensland Faunistic Records

Part III.—Echinodermata (excluding Crinoidea)

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The material upon which this report is based was collected recently in sub-tropical Queensland. This region has been relatively neglected by collectors of echinoderms. Consequently, several species have been added to the Queensland fauna and the distributional ranges of many other species are extended. Seventy-two well authenticated species are recorded and existing specific descriptions of these are amplified by detailing the colours in life and relevant habitat data. Specimens have also been secured which cast doubt on the validity of established species. These, together with several apparently new species, will be discussed in a later paper. The new material has created interesting biogeographical problems and a brief discussion is appended.

Acknowledgment is made to the following for assistance in the collection of specimens:—Professor W. Stephenson, Misses H. Shields, P. Pennycook, P. Watkins, V. Biggs, M. Moffet, I. Day, and Messrs. E. Grant, W. Dall, D. J. Tranter, W. Dowd, F. Gnauck, and J. Davis.

CLASS ASTEROIDEA

Luidia australiae Döderlein, 1920, p. 266.

One, dredged from soft mud, 4½ fms. N.E. Woody Point, Moreton Bay (5/8/51). Abactinal surface yellowish marked with dark green. A new record for Moreton Bay.

Astropecten polyacanthus Müller & Troschel, 1842. Döderlein, 1917, p. 134, pl. 4, figs. 4, 5.

Five, sand flats, M.L.W.S., Stradbroke Is., Moreton Bay (9/6/51). Abactinal surface purplish; actinal surface orange. The first definite record from Moreton Bay.

A. vappa Müller & Troschel, 1843. Döderlein, 1917, p. 124, pl. 5, fig. 1.

Two, mud flat, M.L.W.S., Stradbroke Is. (9/12/49). A new record for Moreton Bay.

Goniodiscaster integèr Livingstone, 1931. Livingstone, 1931a, p. 135, pls. 17-19.

One, dredged 5 fms., shelly bottom, S.W. Peel Is., Moreton Bay (1/7/50). One, dredged 3 fms., Woody Point, Moreton Bay (4/7/51). Some of the superomarginal plates reddish-brown, others green. Abactinal plates sometimes dark red, sometimes orange. Actinal surface cream.

G. coppingeri (Bell, 1884, p. 128). Clark, 1921, pl. 23, figs. 1, 2.

Seven, dredged 7 fms., Barney Pt., Port Curtis (15/8/51). Abactinal plates greyish-brown; superomarginal plates fawn; actinal surface creamy white.

Anthenea acanthodes Clark, 1938, p. 124, pl. 18, fig. 2.

Two, amongst dead coral, Curtis Is. (14/8/51).

The larger specimen had $R = 100$ mm., $r = 53$ mm.; the smaller, $R = 97$ mm., $r = 51$ mm. Abactinal surface dark reddish-brown with the spines, distal tuberculated plates and the superomarginals black; actinal surface pale salmon pink with inferomarginals light brown. The only other known specimen of this species came from Port Curtis.

A. crassa Clark, 1938, p. 124, pl. 18, fig. 1.

Four, amongst coral boulders M.L.W.S., at Curtis Is. (14/8/51). Abactinal surface greenish with rust coloured patches interradially and with a rust coloured band across each arm about a third of the way from the tip. Actinal surface cream shading into salmon pink around the mouth. Inferomarginal plates cream splashed with mauve. Species known only from Port Curtis.

Pentaceraster australis (Lütken, 1871). Livingstone, 1932, p. 247, pl. 6, figs. 1-6; pl. 7, figs. 1-4; pl. 8, figs. 5-6; pl. 10, figs. 1-4.

Juveniles common in sandy channels near Dunwich, Stradbroke Is. (30/4/50). Primary radials prominent in all specimens and tubercles present on all superomarginal plates except two or three near tip of each ray. Ground colour biscuit; tubercles orange-red. Not previously recorded south of Double Is. Point (Clark, 1946).

Culeita novaeguineae Müller & Troschel, 1842. Clark, 1921, p. 32, pl. 5, fig. 1.

Common, pools on reef flat, Heron Is. (10/8/51). Not previously recorded south of Low Is. (Livingstone, 1932). Juveniles were also collected and these will be discussed in a later paper.

Petricia vermicina (Lamarck, 1816). Fisher, 1908, p. 357.

One, under a small rock, Caloundra (11/10/51). $R = 35$ mm., $r = 18$ mm. Uniform grey; tube feet orange. A new Queensland record.

Nardoa pauciforis (von Martens, 1866). Clark, 1921, p. 51. Livingstone, 1932, p. 252, pl. 3, fig. 3; pl. 4, fig. 6.

Five, Heron Is. (8/8/50); two, Fairfax Is. (30/11/51); all near shore. Not previously recorded south of Mackay (Clark, 1938).

- N. novaecaledoniae* (Perrier, 1875). Livingstone, 1932, p. 253; pl. 4, fig. 1; pl. 5, fig. 3.
Three, Heron Is. (8/8/50); three, Fairfax Is. (30/11/51); all near shore. Previously recorded from the E. Australian coast only at Green Is. and Erub (Clark, 1921).
- Neoferdina ocellata* (Clark, 1921, p. 60; pl. 6, fig. 5; pl. 31, figs. 1, 2).
Two, outer reef edge, Heron Is. (12/9/50). Only three specimens of this species previously known. Clark originally secured two specimens from Mer. Livingstone (1931) described a *Neoferdina* from North-West Is. (Capricorn Group), which differed from Clark's holotype of *N. ocellata* in several respects. The present specimens appear intermediate between those described by Clark and Livingstone. They will be commented on in a later paper.
- Linchia laevigata* (Linné, 1758). Clark, 1921, p. 64, pl. 9, figs. 1-2; pl. 26, fig. 1.
Common, exposed on reef edge, Heron Is. (8/8/50); common, similar habitat, Lady Musgrave Is. (28/11/51). Not previously recorded south of 19° S. (McNeill & Livingstone, 1926).
- L. guildingii* Gray, 1840. Livingstone, 1932, p. 254.
Common, exposed on reef edge, Heron Is. (8/8/50). The larger specimens drab blue-green, specimens smaller than R = 65 mm. dull pink with purple blotches on the upper side of the arms.
- Ophidiaster confertus* Clark, 1916, p. 53, pl. 15, figs. 1, 2.
Common, pools, reef edge, Heron Is. (8/8/50). All were reddish-brown.
- Asterina burtonii* Gray, 1840. Clark, 1921, p. 96, pl. 6, fig. 2.
Five, under dead coral boulders, reef edge, Heron Is. (9/8/50); two, similar habitat, Lady Musgrave Is. (28/11/51). Disk bright red; rays mauve at the base and greenish distally; actinal surface greenish. Recorded previously only from Mer Is. on the northern tip of the Barrier Reef (Clark, 1921).
- Patiriella calcar* (Lamarck, 1816). Clark, 1946, p. 134.
Common, rocky headlands from the N.S.W. border to Point Lookout (5/7/51). A new Queensland record.
- P. exigua* (Lamarck, 1816). Clark, 1921, p. 97, pl. 7, figs. 6-7.
Common, under rocks, M.L.W.N., Garden Is., Port Curtis (16/8/51); common, similar habitat, Bargara (1/6/52). According to Clark (1946), *P. exigua* ranges along the whole eastern coast of Australia. However, we have not taken it as yet between the N.S.W. border and Bargara.
- Disasterina leptalacantha* (Clark, 1916). Livingstone, 1933, p. 8, pl. 3, figs. 5, 6; pl. 3, figs. 1, 4.
Two, under coral boulders, reef edge, Heron Is. (10/8/50); both white blotched with pale blue on abactinal and actinal surfaces. Species known only from Capricorn Group.
- Nepanthia brevis* (Perrier, 1876). Sladen, 1889, p. 387, pl. 63, figs. 3-5.
Common, under rocks, Curtis Is. (16/2/51).
- N. belchevi* (Perrier, 1876). Clark, 1909, p. 530, pl. 49, figs. 1-2.
Common, in mussel clumps, Stradbroke Is. (3/6/51); two, under stones, Bargara (1/6/52). The first record from sub-tropical Queensland.
- Echinaster luzonicus* (Gray, 1840). Clark, 1921, p. 98, pl. 10, figs. 2-4.
Abundant, crevices in coral boulders, reef edge, Heron Is. (8/8/50); common, similar habitat, Lady Musgrave Is. (29/11/51).
- Retaster insignis* Sladen, 1882. Sladen, 1889, p. 482, pl. 76, figs. 3, 4.
Two, 6 fms. on coral debris, S.E. of Peel Is., Moreton Bay (1/7/50); both bright red with black tips to spines. The first definite record from sub-tropical Queensland.

CLASS OPHIUROIDEA

- Ophiomyxa australis* Lütken, 1869. Clark, 1915, p. 168, pl. 1, figs. 1, 2.
One, under a coral boulder, reef edge, Lady Musgrave Is. (29/11/51). Disk brownish, spotted with red; arms grey, irregularly banded with reddish-brown. The only previous record from Queensland is that from Lizard Is.
- Euryale aspera* Lamarck, 1816, p. 535.
Two juveniles dredged 3 fms., Port Curtis (14/8/51).
- Ophiactis savignyi* (Müller and Troschel, 1842). Clark, 1946, p. 210.
Very common, cavities of sponges and dead coral, Dunwich (7/6/50); under stones Caloundra (20/5/50), under stones Port Curtis (16/8/51). Dominant colouration green and white.
- Ophiothrix exigua* Lyman, 1874, p. 236, pl. 4, figs. 24-26.
Common under stones and dead coral, M.L.W.N., Curtis Is. (14/8/51).
- O. aestra* Clark, 1909, p. 544, pl. 53, figs. 4, 5.
Five, dredged from 3 fms., Moreton Bay (29/9/51). An expected intermediate locality.
- O. caespitosa* Lyman, 1879. Lyman, 1882, p. 218, pl. 26, figs. 12-14.
Common under stones, Caloundra (23/9/50); amongst algae, Currumbin (30/9/51).
- Macrophiothrix longipeda* (Lamarck, 1816). Clark, 1921, p. 110, pl. 15, fig. 5; pl. 33, fig. 1.
Common under coral boulders, Heron Is. (8/8/50); similar habitat, Lady Musgrave Is. (28/11/51) and under stones, Curtis Is., Port Curtis (14/8/51).

- Placophiothrix lineocaeerulea* (Clark, 1928, p. 432, fig. 129).
Common under sponges and dead coral, Moreton Bay (3/7/50). The first record from the eastern Australian coast.
- Ophiothela hadra* Clark, 1915, p. 284, pl. 14, fig. 2.
Nine, from a *Peniacta tuberculosa*, dredged 3 fms., Moreton Bay (1/8/51). One had a disk diameter of 5 mm. and is the largest on record. Most specimens less than 1.5 mm. across the disk were bright orange. Specimens with disk diameters greater than 1.5 mm. were strikingly coloured with the aboral surface of the disk and upper surface of arms patched in white, orange, yellow and mauve, outlined by purplish-black streaks. Oral surface greyish; 3-6 arms present.
- Ophiocoma scolopendrina* (Lamarck, 1816). Clark, 1915, p. 293; pl. 14, figs. 10, 11.
Abundant, crevices in reef flat, Lady Musgrave Is. (28/11/51). Disks generally dark brown marked with yellow; arms, irregularly banded with dark brown or black and the uppermost arm-spines spotted and marked with dark colouring. Not previously recorded south of Low Is. (Clark, 1932).
- O. erinaceus* Müller and Troschel, 1842. Clark, 1915, p. 291, pl. 15, figs. 5, 6.
Two, under dead coral, reef edge, Heron Is. (8/8/50); one, similar habitat, Lady Musgrave Is. (28/11/51). Disk and arms uniformly black; tentacles reddish. Previously collected on the E. Australian coast only in the Murray Is. and Thursday Is. areas (Clark, 1921).
- O. brevipes* Peters, 1851. Clark, 1921, p. 129, pl. 13, fig. 7; pl. 34, figs. 3-4.
Five, under dead coral, reef edge, Lady Musgrave Is. (29/11/51). Disk dark green patterned with creamy-white, upper surface of arms light green irregularly banded with dark green; under arm plates creamy-fawn flecked with brown; each arm-spine encircled by a brown ring. Not recorded previously south of Green Is. near Cairns (Clark, 1921).
- O. insularia* Lyman, 1861, var. *variegata* Smith, 1876. Smith, 1879, p. 565, pl. 1, figs. 2-2d.
Abundant, under coral boulders, reef edge, Heron Is. (8/8/50); similar habitat Lady Musgrave Is. (28/11/51). Recorded previously on the east coast of Australia only from islands at the northern end of the Barrier Reef (Clark, 1921).
- Ophiarachna incrassata* (Lamarck, 1816). Clark, 1921, p. 140, pl. 34, figs. 1-2.
Common, under coral boulders, reef edge, Heron Is. (8/8/50). The Great Barrier Reef expedition took *O. incrassata* at Low Isles in 1929 and this appears to have been the most southerly record from the eastern Australian coast.
- Ophiarachmella gorgonia* (Müller and Troschel, 1842). Clark, 1921, p. 141; pl. 12, fig. 5; pl. 35, figs. 4, 5.
One, under a coral boulder, reef edge, Heron Is. (8/8/51); one juvenile, similar habitat, Lady Musgrave Is. (29/11/51). Both disk and arms of the Heron Is. specimen had a greenish ground colour. The arms were banded, the first two bands being reddish whilst the others were a greenish-grey. No previous records of the occurrence of *O. gorgonia* south of Low Isles (Clark, 1932).
- Ophiolepis superba* Clark, 1915. Clark, 1946, p. 272.
One, under a coral boulder, reef edge, Heron Is. (8/8/50). Ground colour light buff with five chocolate bands on the upper surface of each arm; aboral surface of the disk with a ring of chocolate colouring which gives off a short branch to each of the interradial areas. Three adjoining interradial areas on the oral surface of the disk were chocolate. A new record for the Capricorn Group. Low Isles most southerly of previous records (Clark, 1932).
- Ophioplocus imbricatus* (Müller and Troschel, 1842). Clark, 1921, p. 143, pl. 12, fig. 8; pl. 35, figs. 1-3.
Abundant, under coral boulders, reef edge, Heron Is. (10/8/50). Ground colour light cream, disk spotted with dark dots and the arms banded with dark colouring. Recorded previously on the eastern Australian coast only from Mer and Erub at the northern tip of the Great Barrier Reef (Clark, 1921).

CLASS ECHINOIDEA

- Diadema setosum* (Leske, 1778). Mortenson, 1940, p. 256, pls. 50, 56.
Five adults, exposed on Myora coral patch, Stradbroke Is. (9/6/50); one, coral pool, reef flat, Heron Is. (9/8/50); juveniles common in crevices in rocks and dead coral, Stradbroke Is. (15/9/51). Adults had black spines, juveniles had white banded primary spines. Largest specimen with banded spines secured had R = 35 mm. New record for sub-tropical Queensland.
- Salmacis sphaeroides* (Linné, 1758). Clark, 1946, p. 312.
Common on *Zostera* at edge of mud flat, Stradbroke Is. (22/8/50). Ward (1937) recorded *S. sphaeroides* from the spit at Southport, but there appears to be no previous record of the occurrence of this species within Moreton Bay itself.
- S. virgulata* Agassiz & Desor, 1846, var. *alexandri* Bell, 1884. Clark, 1946, p. 311.
Commonest echinoid on *Zostera* flats, Moreton Bay (26/8/50). Usually most of the spines above the ambitus were wanting.
- Triplacustes gratilla* (Linné, 1758). Clark, 1921, p. 148, pl. 17, fig. 6.
Juveniles common amongst dead coral and sheltering at the base of the bivalve *Pinna menkei* at Myora, Stradbroke Is. (9/6/50); three, reef flat, Heron Is. (10/6/50). Dead tests of adults sometimes washed up on Stradbroke Is. and presumably adults occur in deeper water.

- Heliocidaris erythrogramma* (Valenciennes, 1846). Agassiz, 1873, p. 441, pl. 5a, figs. 2-4.
Common, rock crevices, Caloundra (23/9/51). All specimens examined had seven pore pairs and average specimens had h.d. = 70-75 mm., and v.d. = 32-36 mm. Two distinct colour varieties were present. One had short green primary spines (average length of primaries = 18 mm.) and the other longer purple spines (average length of primaries = 24 mm.). Apparently in South Australia there is a long green-spined variety and a short purple-spined variety. Cotton and Godfrey (1942) refer this long green-spined variety to the species *armigera*, but as evidenced by the present material there is great diversity in length and colour of spines. Clark (1946) gives Port Stephens, N.S.W., as the northern limit of the range of this species. Apparently he missed Harvey Johnston's (1917) record from Caloundra.
- Echinometra mathaei* (De Blainville, 1825). Agassiz, 1873, p. 431, pl. 4b, fig. 4.
Abundant, holes in coral boulders and on the reef flat, Heron Is. (8/8/50); common, reef flat, Lady Musgrave Is. (27/11/51); common, rock crevices, Caloundra (23/9/51); common in holes in dead coral, Myora, Stradbroke Is. (3/6/50). Most specimens had a blackish test and reddish-brown spines, but some specimens had grey spines and some grey tipped with white. New record for Moreton Bay.
- Heterocentrotus mammillatus* (Linné, 1758). Clark, 1912, p. 378, pl. 115-7.
Two, reef flat, Heron Is. (8/8/50). Primary spines dark brown with three to four bands of cream colour on the distal half. Blunt secondaries dark reddish-brown. Previously recorded only from the Murray Is. (Clark, 1921). However, the species is by no means rare in Queensland waters. There are photographs of it in many popular accounts of the Barrier Reef and the characteristic spines are frequently found wedged under rocks on ocean headlands.
- Avachnoides placenta* (Linné, 1758). Agassiz, 1873, p. 530, pl. 136, figs. 1-4.
One, 45 mm. in diameter, washed up on the rocks at Caloundra (23/8/50).
- Rhynobrissus hemiasteroides* Agassiz, 1879. Agassiz, 1881, p. 186, pl. 35b, figs. 12-15.
Two, under sand near Eribie Is., Moreton Bay (26/4/48).—Clark (1938) records *R. hemiasteroides* from Coolangatta. This appears to have been the only previous Queensland record.
- Echinoneus cyclostomus* Leske, 1778. Westergren, 1911, pp. 35-68, pls. 1-5.
One, 39 mm. long, 28 mm. broad and 18 mm. high, from a sand-filled crevice in a pool on the reef flat, Lady Musgrave Is. (29/11/51). Colour reddish-brown, spines on the oral surface longer than those on the aboral surface. A new record for the Bunker Group.

CLASS HOLOTHURIOIDEA

- Pentacta quadrangularis* (Troschel, 1846). Clark, 1938, p. 449, pl. 16, fig. 4.
Twenty-nine, trawled 2½ fms., Moreton Bay (10/9/51). All specimens were grey on the back and sides and had three longitudinal red stripes ventrally. A new record for sub-tropical Queensland.
- P. tuberculosa* (Quoy and Gaimard, 1833). Clark, 1938, p. 452, pl. 16, fig. 2.
Three, dredged 3 fms., Moreton Bay (5/6/51). The first definite record from the Bay.
- Discucumaria africana* (Semper, 1868, p. 53). Clark, 1946, p. 404.
Common, under rocks, tidal pools, Caloundra (1/4/50); under dead coral, near shore, Lady Musgrave Is. (29/11/51); under stones, Bargara (1/6/52). Numerous individuals occur together under the one stone or piece of coral. All a dull purplish colour. New records for sub-tropical Queensland. Previous records from E. Australia: Murray Is. (Clark, 1921) and Low Is. (Clark, 1932).
- Stichopus chloronotus* Brandt, 1835. Clark, 1921, p. 186, pl. 18, fig. 2.
Common, near reef edge, Heron Is. (9/8/50); also common, reef flat, Lady Musgrave Is. (28/11/51). New records for sub-tropical Queensland.
- S. variegatus* Semper, 1868. Théel, 1886, p. 162, pl. 7, fig. 7.
Common along the edges of the channels skirting the sand flats near Stradbroke Is. (4/3/50). New record for Moreton Bay.
- Holothuria argus* (Jaeger, 1833). Semper, 1868, p. 80, pl. 30, fig. 11.
One, reef edge, Lady Musgrave Is. (28/11/51). New record for sub-tropical Queensland. Clark (1946) believed that this species entered the Australian region only at the northern end of the Barrier Reef.
- H. marmorata* (Jaeger, 1833). Semper, 1868, p. 79, pl. 30, fig. 10.
Common throughout the year, Myora, Moreton Bay. Usually found below the surface of the sand, its position being indicated by a rounded elevation in the sand. Not recorded previously south of Low Is. (Clark, 1932).
- H. atra* Jaeger, 1833. Théel, 1886, p. 181, pl. 7, fig. 4.
Abundant, reef flat, Heron Is. (14/8/50); common, reef flat, Lady Musgrave Is. (27/11/51); common, rocky pools, Caloundra (23/8/50).
- H. edulis* Lesson, 1830. Clark, 1921, p. 177, pl. 19, fig. 4.
Common, reef flat, near shore, Heron Is. (10/8/50); two, reef flat, Lady Musgrave Is. (29/11/51).

- H. ocellata* (Jaeger, 1833). Théel, 1886, p. 178, pl. 7, fig. 11; pl. 16, fig. 1.
Four, dredged 4½ fms. Moreton Bay (5/6/51). Papillae white and encircled by a dark brown ring. Ground colour a greyish white flecked with light and dark brown. On the dorsal surface, particularly near the mid-line, the flecks were so close together that the greyish ground colour was almost hidden. This species has only been taken twice in Australian waters previously; at Torres Strait by the "Challenger" and off Howick Is. by the Great Barrier Reef expedition.
- H. scabra* Jaeger, 1833. Semper, 1868, p. 79, pl. 19.
Commonest holothurian on *Zostera* flats at Stradbroke Is., Moreton Bay, and at Port Curtis. Occurs throughout the year. New record for Moreton Bay.
- H. impatiens* (Forskäl, 1775). Clark, 1921, p. 178, pl. 19, figs. 3, 5.
Common in crevices in coral clumps, reef flat, Heron Is. (14/8/50); three, under boulders, Lady Musgrave Is. (29/11/51). Variegated colouring in which dark and light brown, yellow and purplish-black predominated.
- H. difficilis* Semper, 1868, p. 92, pl. 30, fig. 21.
Occurs commonly in clusters, under-surface of stones, rock pools, Caloundra (1/4/50). Previously recorded as far south as the Capricorn Group on the Queensland coast (Clark, 1938).
- H. monacaria* Lesson, 1830. Théel, 1886, p. 172, pl. 8, fig. 10.
Two, under coral boulders, reef edge, Lady Musgrave Is. (29/11/51). Both were dark brown with yellowish papillae dorsally and greyish papillae ventrally. New record for sub-tropical Queensland.
- H. pardalis* Selenka, 1867. Théel, 1886, p. 224.
Common under rocks and dead coral at Heron Is., Port Curtis and under mussel clumps, Moreton Bay (4/2/50) and under stones, Bargara (1/6/52).
- H. leucospilota* (Brandt, 1835). Semper, 1868, p. 81, pl. 21.
Very common on reef flat, Heron Is. (10/8/50); abundant, Lady Musgrave Is. (27/11/51); common in pools at Caloundra (23/8/50).
- H. arenicola* Semper, 1868, p. 81, pl. 20; pl. 30, figs. a, b.
Three, under coral boulders, reef edge, Heron Is. (8/8/50); three, similar habitat, Lady Musgrave Is. (29/11/51). All were brownish tinged with a rusty red and had two dorsal series of dark reddish blotches.
- H. pervicax* Selenka, 1867. Fisher, 1907, p. 655, pl. 68, figs. 2, 2a-c.
Two, under coral boulders, reef edge, Lady Musgrave Is. (29/11/51). Both had a greyish ground colour liberally flecked with brown. Dorsally there were splashes of dark olive brown and the papillae were chestnut brown. A new record for sub-tropical Queensland. Lizard Is. most southerly of previous records (Clark, 1932).
- Actinopyga mauritiana* (Quoy and Gaimard, 1833). Fisher, 1907, p. 648, pl. 67, figs. 1-1d.
Three, reef edge, Lady Musgrave Is. (29/11/51). All were light brown with the papillae near the anal end surrounded by white rings. Not previously recorded from sub-tropical Queensland and Clark (1946) believed that it was confined to the northern end of the Great Barrier Reef.
- Chondroclaea recta* (Semper, 1868, p. 14, pl. 4, figs. 2, 3).
Common, buried in mud in certain restricted areas of the *Zostera* flats near Stradbroke Is., Moreton Bay (11/6/50). Some were brown, others were black with white speckling. One measured 410 mm., and must be one of the largest on record. A new record for sub-tropical Queensland.
- Chiridota rigida* Semper, 1868, p. 18, pl. 3; pl. 5, figs. 3, 13.
Abundant, just below surface of the coral sand, near shore, Heron Is. (9/8/50). Abundant also at Myora, Moreton Bay, where it occurred buried in the sand and also in the interstices of mussel clumps. Specimens from both localities had twelve tentacles and ranged up to 120 mm. in length. The species has been recorded once previously. Clark (1921) secured a single specimen from Mer at the northern end of the Barrier Reef.

BIOGEOGRAPHY OF THE SOUTHERN QUEENSLAND ECHINODERMS

The present list of echinoderms, whilst incomplete, includes most of the dominant littoral forms and a short discussion of their biogeographical relationships is of interest.

Hedley (1904) recognized two faunistic provinces on the E. coast of Australia. He first delineated the more northern of these two provinces—the Solanderian—as the area extending from Torres Strait to Moreton Bay. Subsequently (1926), he placed the southern limit of the Solanderian province at Wide Bay (about 26° S.) and defined the more southern province—the Peronian—as extending from Wide Bay to E. Victoria. Whitley (1932) restricted the term "Solanderian" to the Great Barrier Reef fauna and gave the name "Banksian" to the fauna of the Queensland coast proper. Clark (1946), after a study of Australian echinoderms, followed Hedley in placing the northern limit of the Solanderian province at Wide Bay and in including the mainland fauna in this province.

In the present investigation it was found that the echinoderm fauna of Port Curtis differs markedly from that of Heron and Lady Musgrave Is. although both faunas have a northern origin. However, Port Curtis provides habitats vastly different from those afforded by the coral islands. Further investigation of

mainland coastal localities north of Port Curtis, particularly in the region where the Barrier Reef approaches more closely to the mainland is required before it can be ascertained whether such a longitudinal division of the fauna into Solanderian and Banksian elements, as proposed by Whitley, is warranted.

It will be noted that, in the present investigation, no typical Peronian echinoderms were secured north of Caloundra. In fact, no echinoderms at all were found on the coast between Caloundra and Wide Bay, although the rocky platforms at Noosa Heads, in particular, should provide suitable habitats. (See D. England, 1947). Between Pt. Lookout on the ocean side of Stradbroke Is. and the N.S.W. border no Solanderian forms have been encountered, but two Peronian species, *Patiriella calcar* and *Helicodidaris erythrogramma*, are common. It seems, then, that as far as the echinoderm fauna is concerned, the southern limit of the Solanderian province should be placed at Wide Bay and the northern limit of the Peronian at about the latitude of Cape Moreton. There appears to be no intermingling of the respective echinoderm faunas of these two provinces, and indeed there appears to be a virtual buffer zone between them.

The Caloundra-Moreton Bay area has an interesting echinoderm fauna. At Caloundra, situated on the mainland side of the entrance to Moreton Bay, the following echinoderms are common: *Holothuria atra*, *H. leucospilota*, *H. difficilis*, *Discucumaria africana*, *Echinometra mathaei* and *Helicodidaris erythrogramma*. With the exception of *H. erythrogramma* all are Barrier Reef forms. Excluding the Crinoidea, 28 species of echinoderms have now been recorded from Moreton Bay itself. None of these is a typical Peronian form. Most are widely-ranging Indo-Pacific species. Some common forms such as *Chiridota rigida*, *Holothuria ocellata*, *Placophiothrix limeocerulea* and *Ophiothela hadra* have rarely been encountered elsewhere on the Queensland coast. It would appear, then, that the Moreton Bay echinoderm fauna is a rich, yet isolated one. Port Curtis, on the coast, over 200 miles to the north, is the nearest locality with a fauna somewhat akin to it. Hedley (1915) put forward the view that, in relatively recent times, the eastern coast of Australia had a much warmer climate than at present. Possibly the present Moreton Bay echinoderm fauna is a remnant of a former influx of tropical echinoderms.

Another fact that emerges from the present study is that there is a marked resemblance between the echinoderm fauna of Southern Queensland and that of Lord Howe Island (Lat. 31° 33' S., Long. 159° 5' E.). Of the 48 species at Lord Howe Island which are non-endemic (Clark, 1938), 37 have now been recorded from S. Queensland and possibly more can be expected. In addition, many of the species common in S. Queensland are common at Lord Howe Island (e.g., *Nepanthia belchevi*, *Ophidiaster confertus*, *Ophiocoma insularia* var. *variegata*, *Echinometra mathaei*, *Holothuria atra*, *H. difficilis*, *H. pardalis*, *Chiridota rigida*). It should be noted that there are representatives of both Great Barrier Reef and Queensland mainland forms at Lord Howe Island.

As regards the origin of the Lord Howe fauna, it is beyond the scope of this paper to comment upon Hedley's (1909) and Iredale and Allan's (1940) concepts of former land connections between Queensland and the New Caledonia area. A fact worthy of mention in this regard, however, is that a branch of the South Pacific Equatorial current, known as the Notonectian current, impinges on the Queensland coast just south of the Tropic of Capricorn. It then bends sharply to the south (see Halligan, 1921). This current may provide a pathway for echinoderm larvae between S. Queensland and Lord Howe Island. A study of the duration of the planktonic larval stages of echinoderms common to S. Queensland and Lord Howe Island would throw some useful light on this.

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