

LIBRARY

FISHERIES RESEARCH BOARD OF CANADA,

BIOLOGICAL STATION,

ST. JOHN'S, NEWFOUNDLAND, CANADA.

This series includes unpublished preliminary reports and data records not intended for general distribution. They should not be referred to in publications without clearance from the issuing Board establishment and without clear indication of their manuscript status.

FISHERIES RESEARCH BOARD OF CANADA

MANUSCRIPT REPORT SERIES

No. 1122

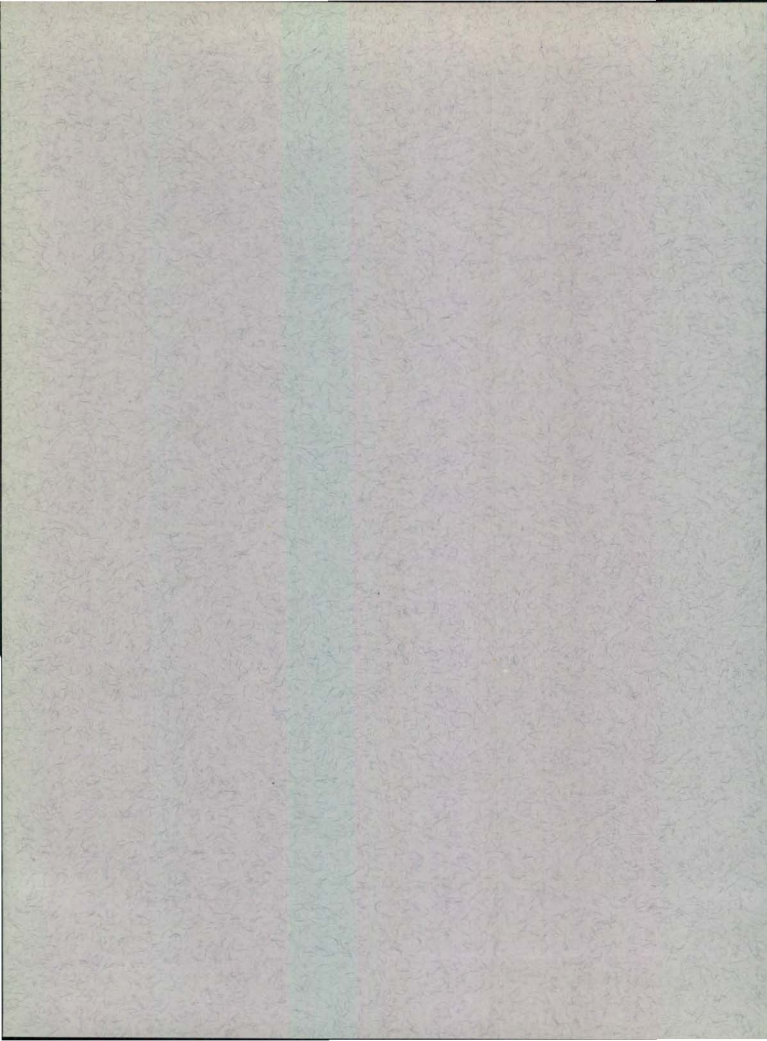
The Shore Fauna of Coffin Island, B.C.

by
D. B. Quayle

Biological Station, Nanaimo, B.C.

December 1970

JUL 27 1971



This series includes unpublished preliminary reports and data records not intended for general distribution. They should not be referred to in publications without clearance from the issuing Board establishment and without clear indication of their manuscript status.

**FISHERIES RESEARCH BOARD
OF CANADA**

MANUSCRIPT REPORT SERIES

No. 1122

The Shore Fauna of Coffin Island, B.C.

by
D. B. Quayle

Biological Station, Nanaimo, B.C.

December 1970

INTRODUCTION

"A knowledge of the fauna and flora of an area must form the basis of all lines of biological investigation, particularly in the fields of ecology, distribution, foods of organisms, food cycles and productivity. In oceanography, in the inclusive understanding of the term as embracing the physics, chemistry and biology of the ocean, the systematic collection and identification of the organisms inhabiting the sea must occupy a fundamental place."

The above excerpt from the introduction to "A Check List of the Marine Fauna and Flora of the Canadian Pacific Coast" by W. A. Clemens indicates the importance of taxonomic studies.

With this precept in mind, a collection of the shore fauna of Coffin Island in Stuart Channel was made during the summer of 1936. The collection was identified at the University of British Columbia.

The purpose of preparing this list as a manuscript report is to make it available as a baseline for any comparative studies of faunal changes either natural or pollution induced, that may have occurred since 1936.

The assistance of Dr. C. McLean Fraser and Mr. & Mrs. C. Berkeley was appreciated.

THE COLLECTION

Coffin Island (Lat. 48°59'07"N, Long. 123°45'08"W) is a small island near the entrance to Ladysmith Harbour about four miles from Ladysmith. On it is an unwatched rotating light. The island is one hundred forty yards long and seventy yards wide at low tide and forty yards long and forty yards wide at high tide. It is separated from the mainland (Mary Ann's Point) by a shallow passage about two hundred yards wide (Fig. 1).

The island is composed of sandstone with its long axis in an east-west direction and peculiarly enough it does not follow very closely the typical geological formation of the reefs in this district. The southern slope of the island is very gradual and its area exceeds that of the northern slope which is steeper though not nearly as precipitous as the typical local formation on the north side. The north side is badly broken up with large rocks whereas the southern slope is a comparatively level one with few large rocks. On both sides the rock formation gives way to a shelly bottom which recedes rapidly into deep water on the south side after a short area with laminarian growth. On the north side the shelly bottom gives way quickly to eel grass and the recedence to deep water is not so rapid as on the opposite side. On both sides of the island there is a relatively deep channel and then the bottom rises again about several hundred yards away from the island

to form two parallel reefs, both of which are barely covered at very low tides.

The western tip of the island is formed of two rocky points with a shelly beach about twelve yards wide between. Both rocky points disappear into sand but later rise to form a reef at low tide, in the middle of the channel. This extreme western tip is separated from the rest of the island at high tide. Between is a heavy layer of coarse shell which contains little life. To the south this coarse shell gives way to fine shell and sand, forming the chief clam-bearing area of the island.

The eastern tip is much broader than the western which is composed entirely of rock which slopes gradually into deep water. In summer this slope is profusely covered with algae below the half-tide mark.

The island borders on Stuart Channel where the set of the tide is northerly from Sansum Narrows to Dodd Narrows on a rising tide and southerly on a falling tide. Thus on the ebb tide the full force of the current strikes the long north side of the island. A strong current is set up in the shallow passage between the island and the mainland, so there is a fairly swift current brushing the western tip and consequently the eastern tip of the island, thus providing a good change of water. There is then a slower drift from west to east on the southern side of the island. The reverse is true on a flood tide.

Collections were made at various times during the summer from the latter part of April to the beginning of September. Only shore forms were collected.

One hundred and eighty five species were noted and 155 were named to genus or species.

LIST OF SPECIES

Protozoa

Foramenifera

Folliculina expansa

Porifera

Demospongia

Flat encrusting monactinellid sponges

Boring sponge - Cliona

Hexactinellida

Flat encrusting hexactinellid sponges

Coelenterata

Hydromedusae

Halistaura cellularia (Agassiz)
Polyorchis penicillata Agassiz
Aequorea aequorea (Forsk.)
Gonionemus vertens Agassiz

Hydroidea

Obelia longissima (Pallas)
Clytia edwardsi (Nutting)
3 species of F. Campanularidae

Actinozoa

Metridium senile var. dianthus (Ellis)
Epiactis prolifera Verrill
Haliplanella luciae (Verrill)

Scyphozoa

Aurelia aurita (Linnaeus)

Ctenophora

Cydippida

Pleurobrachia pileus Agassiz

Echinodermata

Asteroida

Solaster stimpsoni Verrill
Solaster dawsoni Verrill
Henricia leviuscula (Stimpson)
Evasterias troschellii (Stimpson)
Pisaster ochraceus (Brandt)
Pisaster brevispinus (Stimpson)
Pycnopodia helianthoides (Brandt)
Dermasterias imbricata (Grube)

Ophiuroida

Ophiopholis aculeata (Linnaeus)

Echinoida

Strongylocentrotus franciscanus Agassiz
Strongylocentrotus droebachiensis Agassiz

Holothuroida

Stichopus californicus (Stimpson)
Cucumaria miniata (Brandt) Ludwig
Cucumaria quinquesemita Selenka
Leptosynapta sp.

Platyhelminthes

Turbellaria

Planocera sp.
Leptoplana sp.
Species No. 1

Nemertinea

Carinella sp.
Cerebratulus sp. No. 1
Cerebratulus sp. No. 2
Species Nos. 3, 4, 5, 6 and 7

Nemathelminthes

Nematoda

Enoplus sp. Dujardin, probably E. brevis Bastian

Molluscoidea

Polyzoa

Tegella robertsoni O'Donoghue
formerly Membranipora occultata
Membranipora membranacea (Linnaeus) Blainville
Microporella ciliata (Pallas)
Schizoporella oligopus Robertson
Bugula pacifica Robertson
Alcyonidium mytili Dalyell
Species 1 and 2

Brachiopoda

Terebratalia transversa Sowerby

Annelida

Polychaeta

Polynoidae

Harmothoe imbricata Linne
Halosydna pulchra Johnson

Halosydna fragilis Baird
Halosydna imbricata Linne
Halosydna sp. Kinberg, probably H. insignis
Lepidonotus caeloris Moore

Nereidae

Nereis procera Ehlers
Nereis vexillosa Grube
Nereis pelagica Linne
Nereis agassizi Ehlers

Cirratulidae

Tharyx multifilis Moore var. nov.

Opheliidae

Armandia brevis
formerly Ammotrypane brevis Moore

Chaetopteridae

Telepsavus costarum Claparede

Glyceridae

Eulalia viridis Muller

Leodocidae (Eunicidae)

Lumbrinereis sp. Blainville

Terebellidae

Terebella robusta (Johnson)
Terebella sp. No. 1

Syllidae

Exogone gemmifera (Pagentecher)
Syllis pulchra Berkeley (in Ms)
Syllis armillaris (Muller)

Hesionidae

Podarke pugettensis Johnson
Castalia fusca Johnson

Sabellidae

Eudistylia gigantea Bush
Schizobranchia insignis Bush

Schizobranchia nobilis Bush
Myxicola aesthetica (Claparede)

Serpulidae

Serpula vermicularis Linnaeus
Spirorbis sp.

Arthropoda

Crustacea

Entomostraca

Cirripedia

Balanus cariosus (Pallas)
Balanus crenatus Bruguiere
Balanus nubilus Darwin
Peltogaster sp.
Sacculina sp.

Malacostraca

Decapoda

Macrura

Upogebia pugettensis Dana
Hippolyte californiensis Holmes
Spirontocaris washingtoniana Rathbun
Spirontocaris picta Stimpson
Spirontocaris sp. (brevirostris or palpator)
Spirontocaris paludicola (Holmes)

Anomura

Pagurus beringanus (Benedict)
Pagurus granosimanus (Stimpson)
Pagurus hirsutiusculus (Dana)
Petrolisthes eriomerus Stimpson
Haplogaster mertensii Brandt

Brachyura

Hemigrapsus oregonensis (Dana)
Hemigrapsus nudus Dana
Lophopanopeus bellus (Stimpson)
Telmessus cheiragonus (Tilesius)
Cancer productus Randall
Cancer oregonensis (Dana)

Pugettia gracilis Dana
Pugettia richii Dana
Oregonia gracilis Brandt (var.)
Oregonia gracilis Dana
Epialtus productus Randall
Fabia subquadrata Dana

Arthostraca

Caprella kennerlyi Stimpson
Caprella aequilibra Say
Amphithoe humeralis Stimpson
Amphithoe rubricata (Montagu)
Amphithoe lacertosa (Bate)
Exosphaeroma oregonensis Dana
Cirolana sphaeromiformis Hansen

Mollusca

Pelecypoda

Pododesmus (Monia) macroschisma (Deshayes)
Hinnites giganteus Gray
Pecten hericius Gould
Mytilus edulis Linnaeus
Saxidomus giganteus (Deshayes)
Schizothaerus nuttalli (Conrad)
Paphia staminea (Conrad)
Macoma nusata Conrad
Macoma secta Conrad
Macoma inquinata (Deshayes)
Mya arenaria Linnaeus
Cardium corbis Martyn
Ostrea gigas Thunberg
Ostrea lurida Carpenter
Saxicava arctica Linnaeus
Psammobia californica Conrad

Amphineura

Mopalia muscosa (Gould)
Mopalia ciliata (Sowerby)
Ischnochiton sp.
Ischnochiton mertensii (Middendorf)
Lepidochiton (Tonicella) lineata Wood

Gastropoda

Streptoneura

Thais lamellosa Gmelin
Thais emarginata Deshayes

Thais sp.
Alectrion mendicus Gould
Purpura foliata (Martyn)
Searlesia dira (Reeves)
Polinices lewisii Gould
Turbonilla sp. Several species
Littorina scutulata Gould
Tritonalia sp.
Calliostoma costatum (Martyn)
Diadora aspera Eschscholtz
Acmea scutum pintadina Gould
Acmea cassis olympica Dall
Acmea mitra Eschscholtz
Acmea personna Eschscholtz

Euthyneura

Nudibranchiata

Diaulula sandiegensis (Cooper)
Melibe leonina (Gould)
Dendronotus giganteus O'Donoghue
Aeolida papillosa (Linnaeus)
Hermisenda crassicornis (Eschscholtz)
Coryphella fusca O'Donoghue
10 other species

Tectibranchiata

Haminoea vesicula (Gould)

Chordata

Ascidia

Corella rugosa Huntsman
Chelyosoma productum Stimpson
Ascidopsis columbiana Hunt sman
Katatropa vancouverensis Huntsman
Pyura haustor (Stimpson)
Boltenia villosa (Stimpson)
Cnemidocarpa joannoe (Herdman)
Botrylloides sp.

SYSTEMATIC DISCUSSION

Protozoa

Foramenifera

Foramenifera of the Rotalia type were very numerous being lodged everywhere on all the animals examined. There were apparently a number of species.

Porifera

Sponges were not numerous. There were only those of the flat encrusting types, found chiefly under rocks at the lower tidal levels.

Demospongia

Several flat encrusting monactinellid sponges. These along with the other sponges were not classified due to the lack of literature for very little work has been done on the Pacific Coast on this group.

A small yellow sponge causing perforations in shells, found so far only in dead ones. The perforations vary from a pin point up to two mm in diameter. The animal may honeycomb the shell or project straight through from one side to the other. The spicules are short with a small knob at one end and pointed at the other.

A green sponge (likely Cliona) similar to the one above, was found on a large specimen of Balanus nubilis.

Coelenterata

This was not a large group though inexperience in collecting probably affected the number of species obtained, especially of hydroids.

The literature dealing with this group is for the most part extensive. The thorough and complete work of Dr. C. McLean Fraser on hydroids and Dr. E. Foerster on Medusae leaves little to be desired.

Hydromedusae

Halistaura cellularia (Agassiz)

Johnson and Snook. Seashore Animals of the Pacific Coast.
1935. p. 68, fig. 57.

Not at all common until later in the summer although till the end of August it was the most abundant species.

Polyorchis penicillata Agassiz

Johnson and Snook. 1935. p. 66, fig. 55.

Only one specimen.

Aequorea aequorea (Forsk.)

Johnson and Snook. 1935. p. 69, figs. 58, 59.

Found fairly consistently throughout the summer, though they were more numerous near the end.

Gonionemus vertens (Agassiz)

Johnson and Snook. 1935. p. 71, figs. 54, 60.

Several specimens floundering in shallow water. They swim by very noticeable quick violent contractions which seems to indicate a better muscular development than most medusae.

Hydroidea

Obelia longissima (Pallas)

Fraser, C. M. Some hydroids of the Vancouver Island Region. Trans. Roy. Soc. Can. Ser. 3, 8(5): 99-216. 1914. p. 153, pl. 16, fig. 55.

Numerous on Zostera below the zero tide mark.

Clytia edwardsi (Nutting)

Fraser, C. M. Some hydroids of the Vancouver Island Region. Trans. Roy. Soc. Can. Ser. 3, 8(5). 1914. p. 143, pl. 13, fig. 41.

Apparently not numerous.

Three species of E. Campanularidae. No reproductive structures were present so the classification could not be carried further.

Scyphozoa

Aurelia aurita (Linnaeus)

Johnson and Snook. Seashore Animals of the Pacific Coast. 1935. p. 82, fig. 62.

This species did not appear till late in August and even then it was not so numerous as in most years.

Actinozoa

Metridium senile var. dianthus (Ellis)

Johnson and Snook. Seashore Animals of the Pacific Coast.
1935. p. 104, figs. 81, 82.

Found in a group of a dozen or more, hanging from a low shelf of rock just above zero tide mark. They were hidden from much light and consequently were a sickly white colour. They were in close contact with the gelatinous sheaths of Myxicola aesthetica. This was the only place on the island where they were found.

Epiactis prolifera Verrill

Johnson and Snook. Seashore Animals of the Pacific Coast.
1935. p. 101, fig. 28.

Not at all numerous.

Haliplanella luciae (Verrill)

Johnson and Snook. Seashore Animals of the Pacific Coast.
1935. p. 101.

Fairly numerous at zero tide mark. One specimen was kept for several months in a quart jar, where its reproduction by segmentation was observed. Whenever the water in the jar became stale, when not changed for four or five days, the base of the animal would spread out and small segments would break off. After three weeks to a month these segments showed traces of adult characteristics. The animal was very voracious and ingested quite large pieces of mussel, crab, etc., which were fed to it. The colour was a beautiful olive-green with vertical orange stripes. The base was about one cm in diameter. The tentacles when fully extended were between fifteen and twenty mm in length.

Echinodermata

The littoral forms of this phylum are well represented on Coffin Island with members of four of the orders. It was interesting to notice they were quite rare on the northern side of the island, as were many other forms.

Echinoidea

Strongylocentrotus franciscanus Agassiz

Johnson and Snook. 1935. p. 234, fig. 195.

Only one specimen taken on shelly bottom two feet below low water mark. This was the only one observed. As a rule this species frequents only strong tidal water and it was rather extraordinary finding it in this location.

Strongylocentrotus droebachiensis Agassiz

Johnson and Snook. 1935. p. 234, fig. 193.

Numerous under rocks at zero tide mark. Typical green colour with a range of size up to two and one-half inches in diameter.

Ophiuroidea

Ophiopholis aculeata (Linnaeus)

Johnson and Snook. 1935. p. 221, fig. 187.

The members of this order were very scarce. Two single individuals were found at different places among the algae in the lower reaches of the tidal zone, and a group of ten were found together under a single small rock just below zero tide mark.

Holothuroidea

Stichopus californicus (Stimpson)

Johnson and Snook. 1935. pp. 247-248, fig. 205.

Only two large specimens and several small ones were obtained, all below the zero tide mark, mostly among algae.

Cucumaria minata (Brandt) Ludwig

Johnson and Snook. 1935. p. 244, fig. 202.

This species was extremely numerous both on Coffin Island and on the point of the mainland. They were conspicuous when covered by the tide with their bright red branchial tentacles protruding from under dark coloured rocks. Their habitat is entirely under stones in the lower quarter of the tidal zone.

Cucumaria quinquesemita Selenka
formerly C. chronjhelmi Theel

Johnson and Snook. 1935. p. 244, fig. 203.

Not so numerous. Pale yellow-white with numerous fairly long tube feet. Largest sixty mm long. Often found with C. miniata under rocks in the lower quarter of tidal zone.

Leptosynapta sp.

Clark, H. L. The Apodous Holothurians. Smithsonian contributions to diffusion of knowledge among men. 1908. Vol. 35.

A number of these were found burrowing in the flat sandy beach at the western end of the island. This flat is at about the three foot tide mark.

Asteroidea

Solaster stimpsoni Verrill

Verrill, A. E. Monograph of the Shallow Water Starfishes of the North Pacific Coast from the Arctic Ocean to California. Smith, Inst., Harriman Alaska Exped. Ser. Vol. 14. 1914. p. 254, pl. 10, figs. 1, 2, pl. 11, figs. 1, 2 pl. 15, figs. 1, 2, pl. 26, fig. 1c, pl. 94, fig. 2, pl. 95.

A single specimen below low water mark on rough shell bottom at western tip of the island.

Solaster dawsoni Verrill

Verrill, A. E. p. 249, pl. 46, figs. 5-5b, pl. 90, fig. 1, pl. 91, figs. 1, 2, pl. 92, fig. 1.

Single specimen in tide pool in lower quarter of tidal zone at central southern part of the island.

Henricia leviuscula (Stimpson) Fisher

Verrill, A. E. p. 215, pl. 12, figs. 5, 6, pl. 13, figs. 1, 2, pl. 88, figs. 1, 1a, 2-2c.

Several small specimens at the very lowest tide levels. Not numerous.

Evasterias troschellii (Stimpson)

Verrill, A. E. p. 151, pl. 22, figs. 1, 2, pl. 25, figs. 1, 2, pl. 26, figs. 1, 2, pl. 62, fig. 1, pl. 106, figs. 1, 2.

This species with a number of varieties proved to be the most abundant starfish on the island. Found in almost all types of environment in the lower half of the tidal zone and down in to fairly deep water.

Pisaster ochraceus (Brandt) A. Agassiz

Verrill, A. E. p. 69, pl. 21, figs. 1, 2, pl. 49, figs. 3-3d, pl. 56, figs. 3-3a.

As a rule this is the commonest starfish in this vicinity often being found in large groups. However during the time the fauna was under observation this species was scattered and not abundant on Coffin Island. Found well up in the tidal zone, higher than any of the other species.

Pisaster brevispinus (Stimpson)

Verrill, A. E. p. 77, pl. 41, figs. 1, 2, pl. 44, figs. 1, 2, pl. 45, fig. 1, pl. 69, fig. 3, pl. 76, fig. 1-lb.

A single specimen was obtained from a large tidal pool whose inlet is at about the three foot tide level.

Pycnopodia helianthoides (Brandt) Stimpson

Verrill, A. E. p. 198. pl. 29, fig. 1, pl. 30, pl. 31, figs. 1, 2, pl. 23, fig. 1, pl. 24, fig. 1-3a, fig. 6, pl. 88, figs. 7-7d, text fig. No. 2.

This species was fairly common, especially in tide pools bordering the zero tide mark. This species is inclined to play havoc with the clam beds, being able to dig down after the molluscs. It is also cannibalistic.

Dermasterias imbricata (Grube) Perrier

Verrill, A. E. p. 306, pl. 6, figs. 3, 4, 5, pl. 29, fig. 2, pl. 50, figs. 1-lb, pl. 86, figs. 2-2d, pl. 97, figs. 2-2b.

Fairly common and often left stranded on bare rocks by fairly low tides. One specimen had six rays, formed by bifurcation of a tip of one of the normal rays.

Platyhelminthes

The members of this phylum obtained were all free living and belonged to the classes Turbellaria and Nemertinea. The Turbellarians did not show themselves as a numerous species but in regard to number they ranked high among the groups. The genus Leptoplana was numerous under rocks in the lower third of the tidal zone. The large Planocera species were much rarer. Only four specimens were obtained.

The literature on the Turbellarians is not extensive, and it is doubtful whether the B. C. Coast has been worked over. Heath and McGregor are the chief contributors to this literature.

The Nemertean were numerous but proved themselves very difficult to classify. None were taken down to species and only three were taken to genus. Five other species did not fit into the classification at all. The only work of any importance on the subject is by Coe and the majority of the species described by him were new and obtained almost exclusively from Alaska and California so there is much to be done on this group in British Columbia.

Turbellaria

Planocera sp.

Johnson and Snook. 1935. p. 116, 117.

Pratt, S. H. Manual of the Common Invertebrate Animals.
1935. p. 187, fig. 274.

Only two specimens were retained when preserved. The others disintegrated. The size of these was 2.5 cm by 1.25 cm. The colour on the back was a mottled chestnut brown.

Leptoplana sp.

Pratt, S. H. p. 189, fig. 226. 1935.

Species No. 3 -- small species narrow in proportion to its length. The average size was ten-fifteen mm by five mm. There were two definite large eyespots as well as diffuse pigment spots between and anterior to the eye spots.

Nemertinea

Carinella sp.

Coe, Wesley R. Nemerteans. Harriman Alaska Expedition.
Vol. 2. 1905. p. 910. p. 11.

Probably Carinella spesiosa or C. polymorpha. No detailed description of C. polymorpha was available. Coe describes C. spesiosa as being vermilion but my specimens were closer to a deep orange. The colour of C. polymorpha was not mentioned. The identification applies in all other respects. Five specimens were taken from the surface of the rocks in the lower quarter of the tidal zone. They were up to two metres in length but shrunk very much when preserved.

Cerebratulus sp. No. 1

Coe, Wesley R. 1910. p. 24.

Two specimens were obtained from the beach, digging in the sand. No constriction for neck. A blunt head. 200 mm by 12 mm broad at the widest part.

Cerebratulus sp. No. 2

Longer and thinner at the anterior end with a definite constriction in the neck region. Pointed flat head with deep grooves on the side reaching to a point opposite the middle of the mouth. 180 mm by 7 mm at the widest part. Dull dark brown in colour. Also found in sandy mud.

Species No. 3

This species was the commonest of the Nemerteans. Numerous, both under rocks and on barnacles throughout the lower third of the tidal zone. They were most abundant at the beginning of May but from then on the numbers receded till at the end of August none at all were found.

They are deep purple dorsally blending into a light yellow ventrally. The proboscis is colourless. The proboscis sheath extends through only one-third of the body length which is quite variable. The body is very firm when preserved and is quite slimy from a heavy mucous secretion. One specimen was observed engulfing a Nereid which was being devoured tail first. In this species of Nemertean the proboscis pore is coincident with the mouth but when the Nereid began to struggle the proboscis of the Nemertean was extruded and used to quell the struggles.

Species No. 4

Not very numerous. Red colour which remains when preserved. Ventral surface yellow. Not comparable to anything found in the literature.

Species No. 5

Long, thin, yellowish-white. 60 mm by 1.5 mm

Species No. 6 - Probably Paranemertes peregrina Coe

Dark brown when preserved with the pigment easily scraping off, leaving a transparent epidermal layer through which the internal organs could be seen. White transverse stripes. No lateral grooves and mouth coincides with the proboscis pore.

Species No. 7 - Probably Emplectonema gracile (Johnson)

Green in colour and darkest in the head region. Small lateral grooves. Light band running longitudinally along the back.

Nemathelminthes

Nematoda

Enoplus sp.

Pratt, S. H. 1935. p. 253.

This is a free living species and is very numerous occurring in the algae and on most animals which have any lodging surfaces. It is very small, the largest being only five mm in length.

Molluscoidea

It is difficult to say anything about the number of species of the group, especially the Bryozoans for most likely through inexperience in collecting a number were missed. However eight species of Bryozoans and one species of Brachiopoda were obtained. Membranipora membranacea, however, was exceedingly numerous on the fronds of Laminaria below the zero tide line.

Most of the work on Polyzoans in British Columbia was done by C. H. and E. O'Donoghue, T. Hincks and A. Robertson. The work of Hincks was not available but I believe it would have proved of much value.

Polyzoa

Tegella robertsoni O'Donoghue
formerly Membranipora occulta

O'Donoghue, C. H. and Elsie O'Donoghue. A second list of Bryozoa (Polyzoa) from the Vancouver Island Region. Contr. Canad. Biol. and Fish. New Ser. Vol. 3, No. 3. 1920. p. 5.

Robertson, A. The Incrusting Chilostomatous Bryozoa of the West Coast of North America. Univ. Calif. Pub. Zool. Vol. 4. No. 3, p. 262, pl. 14, figs. 6, 7, 8, 9. May, 1908.

Found encrusting barnacles.

Membranipora membranacea (Linnaeus) Blainville

Robertson, A. No. 5, p. 267, fig. 19, 1920.

Numerous in fairly large circular colonies on Phaeophyceyan fronds. Colonies were found up to 90 mm in diameter. Spines are blunter than figured in Johnson and Snook. p. 146.

Microporella ciliata (Pallas)

Osburn. Bull. Bur. Fish. Vol. 39. 1910. p. 234.

Found covering the whole upper face of Terebratalia transversa.

Schizoporella sp.

In areas where oecia occurred on this species they did so in great numbers, covering several square inches.

Species No. 1 and 2

Found on Anomia shell. They don't appear to fit into any of the classifications given by the available literature.

Brachiopoda

Terebratalia transversa Sowerby

Oldroyd, Ida S. Marine Shells of Puget Sound and Vicinity. Pub. Puget Sd. Biol. Sta. of the Univ. of Wash. Vol. 4, 1924, p. 204, pl. 29, figs. 1-2.

Several specimens up to three cm in width were found at the zero tide mark under rocks. Not numerous.

Annelida

The only group of this phylum obtained were the Polychaetes of which 31 species in 13 families were found. This collection is indicative of the wealth of fauna to be found in a small area. The literature of this group is quite extensive in the way of lists of species, but there is a decided lack of keys and descriptions. Mrs. Berkeley of the Pacific Biological Station at Nanaimo is the authority on British Columbia Polychaete Annelids and she very kindly provided excerpts from her key without which the work would have been very difficult. She also kindly identified a number of the more difficult species. Other authors found to be useful were J. K. Bush, J. P. Moore and A. L. Treadwell.

Polychaeta

Polynoidae

Halosydna pulchra Johnson

Berkeley, Edith. Polychaetous annelids from the Nanaimo district. Part 1. Syllidae to Segalionidae. Contr. Canad. Biol. New Ser., Vol. 1, Nos. 10-18, p. 10.

Commensal with Stichopus californica. Two specimens were found on the single Stichopus. The colour of the polynoids was similar to that of the holothuroidian.

Halosydna fragilis Baird

Berkeley, Edith. p. 10.

Commensal with Evasterias troschellii in the ambulacral groove near the disk.

Lepidonotus caeloris Moore

Berkeley, Edith. p. 11.

One small specimen.

Halosydna sp., probably H. insignis

Numerous specimens. Largest 50 mm by 14 mm. Free living under stones.

Harmothoe imbricata Linne

Berkeley, Edith. p. 13.

Several examples were collected among the algae and under the rocks at the lower tide levels.

Nereidae

Nereis procera Ehlers

Berkeley, Edith. Polychaetous Annelids from the Nanaimo District. Part 2. Phyllodocidae to Nereidae. Contr. to Can. Biol., N. S. Vol. 2, 1924. p. 7.

Very long in comparison to its width 115 mm by 6 mm. It was apparently divided into three parts, the two posterior segments containing eggs. The last segment contained more numerous and better developed eggs than the middle segment.

Nereis vexillosa Grube

Berkeley, Edith. Part 2. Phyllodocidae to Nereidae. Vol. 2. p. 6.

Numerous in all sizes. The basal lobe of the dorsal cirri on the posterior segments were markedly large (broad), resembling quite closely F. Phyllodocidae. Found in almost any environment, but more particularly in the mussel beds.

Nereis pelagica Linnaeus

McIntosh, Pub. Ray Soc., Vol. 2, Part 2, p. 267.

Classified from the anterior portion. Checks with Mrs. Berkeley's description in that there are heavy pointed homogomph dorsal notopodial setae in the region of the 35th segment similar to those found in N. vexillosa. Found among algae in the lower tidal region.

Nereis agassizi Ehlers

Treadwell, Polychaetous Annelids of the Pacific Coast. Univ. Calif. Pub. Zool. 1914-1916, Vol. 13, p. 189.

Classified from a portion of a single specimen.

Cirratulidae

Tharyx multifilis Moore, var. parvus, var. nov.

Berkeley, Edith. Polychaetous Annelids of the Nanaimo District, Part 4, Chaetopteridae to Maldanidae, Contr. to Can. Biol., N. Ser. Vol. 4, No. 22, 1929. p. 301.

Chaetopteridae

Telepsavus costarum Claparede

Berkeley, Edith. Part 4. Chaetopteridae to Maldanidae. p. 307.

Only the ribbed parchment-like tube of this species was collected.

Opheliidae

Armandia brevis Moore

Berkeley, Edith. Part 4, Chaetopteridae to Maldanidae.
p. 313.

A single specimen. This species is quite common at Brockton Point near Vancouver, B. C.

Glyceridae

Hemipodia borealis Johnson

Berkeley, Edith. Part 3. Leodocidae to Spionidae. p. 411.

In one specimen the prostomium was completely retracted. The somites were bi-annulate.

Anterior-dorsal cirri ovate. Posterior dorsal cirri tapering and decidedly pointed at the tip. The single aciculum is centrally placed with a small bundle of acicular setae ventrally placed. All the rest are pointed homogomph setae. Found burrowing in the sand.

Glycera rugosa Johnson

Berkeley, Edith. Part 3. Leodocidae to Spionidae. p. 411.

This species has a powerful four-toothed proboscis. Two acicula and two acicular bundles of setae. Tiny prostomium with four tentacles. Retractable branchiae between the parapodia.

Phyllodocidae

Eulalia viridis Muller

Berkeley, Edith. Part 2. Phyllodocidae to Nereidae.

Found in tide-pools among the algae.

Leodocidae (Eunicidae)

Lumbrinereis sp.

A single specimen in the heteronereid condition. Found among the algae.

Terebellidae

Terebella robusta (Johnson)

Amphitrite robusta Johnson (1907), p. 425, Moore (1908) p. 350

Berkeley, Edith. Part 4. Chaetopteridae to Maldanidae, p. 308.

A single specimen 80 mm long, thus belonging to the shorter of the two races indicated by Mrs. Berkeley. No eyespots were discernable. This specimen was in spawn and contained a tremendous number of eggs. The worm was fawn coloured when preserved. Collected from a mud tube beneath a rock at the zero tide mark.

Terebella sp.

The type of uncini was different from those of T. robusta. The branchiae showed indications of redness, especially the anterior pair. Body green when preserved. Obtained July 6 in full spawn from mud tube beneath a rock at the zero tide mark.

Syllidae

Exogone gemmifera (Pagentecher)

Classified by Mrs. Berkeley. No reference to this species was found anywhere in the literature.

Syllis pulchra Berkeley

Mrs. Berkeley in Ms. Found among the algae.

Syllis armillaris (Muller) Oersted

Berkeley, Edith. Part 1. Syllidae to Sigalionidae. p. 206.

Found among the algae growing on a specimen of Pyura haustor near the low tide mark.

Hesionidae

Podarke pugettensis Johnson

Berkeley, Edith. Part 1., Syllidae to Sigalionidae. p. 211.

Castalia fusca Johnston

Berkeley, Edith. Part 1. Syllidae to Sigalionidae. p. 211.

Sabellidae

Eudistylea gigantea Bush

Bush, J. K. Tubicolous Annelids. Harriman Alaska Series. Vol. 12 of the Smithsonian Institution. 1910. p. 210, pl. 21, figs. 1, 2, pl. 22, figs. 4, a, c, d.

Collected from a crevice between rocks some distance, peculiarly enough, above the zero tide mark. Not numerous.

Schizobranchia insignis Bush

Bush (1910) p. 206.

Not numerous. Found in the lower quarter of the tidal zone in rock crevice.

Schizobranchia nobilis Bush

Bush (1904) p. 207. pl. 35, fig. 20.

This specimen agrees with Mrs. Berkeley's description of the uncini in that the breasts are more prominent and rounded than Bush figures in pl. 35, fig. 20.

Myxicola aesthetica Claparede

Berkeley, Edith. Part 5. Annocharidae to Myzostomidae. p. 73.

A number of these specimens were found in a jelly-like mass on the under side of an overhanging ledge of rock in close proximity to a group of Metridium. They could only be reached at a zero tide, and then with some difficulty. According to Mrs. Berkeley (in Ms) it has been found only once before on the West Coast of this continent, though Bush records something very similar from Alaska.

Serpulidae

Serpula vermicularis Linnaeus

Bush (1904) p. 73.

Fairly common and in spots were found well above low water mark.

Spirorbis sp.

Very difficult to classify to species. Numerous on all types of material such as shells, Zostera, algae, etc.

Arthropoda

This group produced the most species, thirty-six in number, and in many cases were quite numerous. Others, however, were rare.

The group showed a tendency towards definite group movements, whether they were migrations or not is difficult to determine. In one case at least, that of Petrolisthes eriomerus, it seemed there was a definite migration for spawning purposes. Epialtus productus also showed a similar movement to a very specific spawning environment.

The Crustacea has the most complete and extensive literature of any of the classes treated in this report. The works of Rathbun, Schmitt, Richardson, Stebbing, and others were readily accessible and they give a complete account of the taxonomy of British Columbia Crustaceans.

The list of Crustacea could have been increased materially by the addition of more groups of the Entomostraca, but time limitations both in collecting and classifying prevented this.

Crustacea

Entomostraca

Cirripedia

Balanus glandula (Darwin)

Johnson and Snook. p. 268

Cornwall, I. E. A Review of the Cirripedia of the Coast of British Columbia, with Glossary and Key to Genus and Species. Contr. to Can. Biol. N. Ser. Vol. 2, No. 18. p. 4, pl. 1, pl. 2 A, B, pl. 3, E-H, fig. 1, A-F.

Commonest barnacle. Forms a continuous band around the island in approximately the middle third of the tidal zone and a little higher.

Balanus crenatus Brugiere

Cornwall, I. E. pl. 8, pl. 4, A-H and fig. 2.

Found in varied locations, chiefly on dead shells.

Balanus nubilis Darwin

Cornwall, I. E. p. 11, pl. 2, C-G, fig. 3.

This was a single specimen almost at the zero tide mark, and far under a low overhanging ledge. It was found to be attacked by a green boring sponge.

Sacculina sp.

Parasitic Cirripede found on Haplogaster mertensii.

Peltogaster sp.

Parasitic Cirripede found on Pagurus hirsutiusculus.

Malacostraca

Decapoda

Macrura

Upogebia pugettensis (Dana)

Schmitt. The Marine Decapod Crustacea of California.
Univ. of Calif. Pub. in Zool., Vol. 23, 1921. p.
115, fig. 77.

Very rare on Coffin Island while in other localities near by, especially in the inner harbour they are quite numerous. Only one dead specimen was found.

Hippolyte californiensis Holmes

Schmitt. 1921. p. 48, fig. 26.

Two specimens were obtained from tide pools.

Spirontocaris washingtoniana Rathbun

Schmitt. 1921. p. 55, fig. 33.

One specimen from a tide pool.

Spirontocaris picta Stimpson

Schmitt. 1921. p. 68, fig. 46.

Single specimen from tidepool.

Spirontocaris sp.

Probably S. brevirostris or S. palpator. It is apparently an intermediate form. One small tide pool specimen.

Spirontocaris paludicola (Holmes)

Schmitt. 1921. p. 64, fig. 42.

Very numerous. Definite red stripes on the antero-dorsal and postero-lateral sides of the carapace. All were tide pool specimens.

Anomura

Petrolisthes eriomerus Stimpson

Schmitt. (1921). p. 180, fig. 114, pl. 32, fig. 2

Numerous specimens of this species were observed for the first time on June 20, so they must have appeared between June 11, the time of the previous collecting trip and June 20. Females were carrying eggs so apparently it was a spawning migration. The next two collections were widely spread, so that sometime between July 17 and August 30 all the adults disappeared, leaving only the tiny young which by this time were quite well developed.

The habitat of this quaint but beautiful creature is exclusively under rocks at the levels of the lowest tides. It is able to live under very flat rocks due to its excessively flat carapace, whence its common name "flat-topped crab". Its method of swimming by flapping the abdomen is also very interesting. The carapace of the largest specimen taken was 14 mm by 13 mm and the carpus of the cheliped 5 mm by 9 mm.

Haplogater mertensii Brandt

Johnson and Snook. p. 337, fig. 285.

Light brown carapace with darker spots. Chelipeds and walking legs reddish; white in patches with dark red spots. Very spiny legs with the whole body covered with numerous setae. The carapace of the single specimens measured 16 mm by 15 mm. Several small Amphipods and Tharyx multifilis were taken from among the setae. Attached to the abdomen was a parasitic Cirripede, Sacculina. I have not discovered a report of it being found on this species before. The common host is apparently Lophapanopeus bellus. Collected from tide pool at zero tide mark.

Pagurus beringanus (Benedict)

Schmitt. p. 135, fig. 87.

Stevens. Hermit Crabs of Friday Harbour
Washington, Pub. Puget Sd. Biol. Sta., Vol. 1,
No. 68, p. 285.

Several specimens. Largest specimen with carapace length of 23 mm and length at large cheliped 45 mm. Carapace banded and splotched with crimson red, deeper in colour than the chelipeds. Chelae dark red proximally and fades to a much lighter shade distally.

Pagurus granosimanus (Stimpson)

Schmitt. p. 141, fig. 91

Stevens. p. 282.

Colour of this preserved specimen differed from Rathbun's description as did the specimen examined by J. L. Hart, Can. Field Nat. Vol. 44, No. 3, May 1930. p. 104. Length of carapace 13 mm.

Pagurus hirsutiusculus (Dana)

Schmitt, p. 137, fig. 89, pl. 16, fig. 4.

Prominent red streak on both sides of the dactyl of second and third legs. Brownish red body when preserved. Whole carapace measured 16 mm, with the front carapace measuring 9.5 mm by 8 mm.

Parasitized by Peltogaster sp. measuring 11 mm long and 5 mm wide. It was attached to the middle of the second abdominal segment.

Brochyura

Hemigrapsus oregonensis (Dana)

Schmitt. p. 274, fig. 162, pl. 48.

Very common in all areas of the tidal zone, with a tendency to follow the progress of the tide.

Hemigrapsus nudus (Dana)

Schmitt. p. 272, fig. 161, pl. 47.

Along with Hemigrapsus oregonensis the commonest shore crab.

Fabia subquadrata Dana

Rathbun. The Grapsoid Crabs of America. Bull. of the U. S. Nat. Mus. No. 97. 1918. p. 102, figs. 53, 54.

Female specimen, 11 mm by 8.5 mm. Taken from the mantle cavity of Schizothaerus nuttalli.

Lophopanopeus bellus (Stimpson)

Schmitt. p. 241, fig. 143, pl. 37, fig. 4.

Carapace 23 mm by 16 mm a specimen laden with eggs. Not common.

Cancer productus Randall

Schmitt. p. 122, fig. 136.

Not numerous as the bottom is not suitable.

Cancer oregonensis (Dana)

Schmitt. p. 234, pl. 36, figs. 3, 4.

Carapace 21 mm by 17 mm. Not common.

Telmessus cheiragonus (Tilesius)

Schmitt. pl. 51, figs. 3, 4.

Only a carapace was found.

Epialtus productus Randall

Schmitt. p. 201, fig. 124.

Two double rows of curved setae, one double row, one each side of the rostrum and forward part of the carapace.

The rows are curved towards each other to form an arch.

Various growths were found on the carapace, Ulva and colonies of Membranipora were prominent. The carapace was beautifully marked with dark brown markings on a lighter brown background.

Of June 11, 1936, this species was found spawning on Mary Ann's Point on a steep ledge. They were observed at half tide and the great majority were females. Only a single small female was found on Coffin Island after a careful search.

On March 27, 1937 they were again observed spawning, this time a short distance from the former location. Again however, they were placed on a perpendicular ledge, just along the edge of the water. This time they were in great numbers with several hundred in a smaller area. None was found on Coffin Island or in other areas nearby so the indications are that they prefer a perpendicular ledge for spawning purposes. The indications are, then, that they spawn more than once a year and probably several times.

Oregonia gracilis

Schmitt. p. 198, fig. 122.

Dactyl of cheliped was found to be only slightly more than one-third the total length of the palm whereas Schmitt says one-half.

Heavily coated with varied growths. Numerous curved setae especially on the rostrum. They act like vices to hold down algae filaments.

One specimen had two large filaments of red algae which were so held, one on each part of the rostrum and projecting past the ends thus appearing to make the rostrum twice as long. The carapace was covered with numerous diatoms and many Pelecypods that had recently settled. Bugula, small portions of a Campanularian hydroid, Enoplus and many Foramenifera.

Several specimens were obtained from tide pools at the zero tide mark, but they were not numerous.

Oregonia gracilis variety

The legs and rostrum were shorter than in O. gracilis Dana. Also very hirsute and covered with a dense foliage of coralline algae, diatoms, Phaeophyceae, Foramenifera, several ribbons of Gastropod eggs, Spirorbis and many particles of shell.

A single specimen taken from the algae just below zero tide mark.

Pugettia gracilis Dana

Schmitt. p. 206, fig. 128, pl. 73, fig. 17.

Two female specimens and one small male. A variety of colouring was noticeable in these specimens. They were covered with many forms of life. Among those taken from one specimen were:

Phaeophyceae
Corallines
Diatoms
Nematodes
Ostracods
Chelifera
Pelecypoda

Arthrostraca

Amphithoe humeralis Stimpson

Stebbing, Das Tierreich, Amphipoda, Gammaridea, 1906, p. 631.

Not numerous. Taken from a tide pool.

Amphithoe rubricata (Montagu)

Stebbing. (1906). p. 639.

Not numerous. Taken from a tide pool.

Amphithoe lacertosa (Bate)

Stebbing. (1906). p. 633.

Taken from a tide pool in the lower quarter of the tidal zone.

Caprella kenneerlyi Stimpson

Johnson and Snook. p. 282, fig. 237.

A single male specimen taken from hydroids on *Zostera* below zero tide mark.

Caprella aequilibra Say

Johnson and Snook. p. 280, fig. 235.

Very numerous. Found in all tide pools below half tide mark among the algae. Very numerous among hydroids on *Zostera* below zero tide mark.

Cirolana sphaeromiformis Hansen

Richardson. Monograph of the Isopods of North America.
Bull. of U. S. Nat. Mus. No. 54, 1905. p. 85, fig. 65.

Exasphaeroma oregonensis Dana

Richardson. (1905). p. 296.

Quite numerous. Found just below the half tide mark under rocks. First antennae had only 12 articles instead of 13 described by Richardson. Females were in spawn with rather large yellow kidney-shaped eggs.

Mollusca

The island proved to be rich in this type of fauna. However no examples of the classes Scaphopoda or Cephalopoda were found. While none of the latter class were taken they are known to be fairly common in the immediate vicinity.

The Amphineura were all Placophorans.

Nudibranchs were quite numerous but difficulty in classification coupled with lack of time prevented all the species being named.

The Streptoneurans were abundant both in species and in specimens.

Not many Pelecypods were found living but the valves of a number of others were found. The habitat of this group is rather restricted on the island.

There has been much done upon the Mollusca, or rather on their shells, but classification is rendered difficult due to lack of keys. In the valved forms only the superficial characteristics of the shells are used for identification and there is a considerable amount of environmental variation. It seems to be the concensus of opinion that morphological characteristics as a basis of classification would be more valuable.

The works of McFarland and O'Donoghue are outstanding in the Opisthobranchiate field, while those of Dall, Bartsch and Oldroyd are the standards on valved Gastropoda and Pelecypoda.

Pelecypoda

Pododesmus (Monia) macroschisma (Deshayes)

Oldroyd, I. S. Marine Shells of Puget Sound and Vicinity, Pub. Puget Sd. Biol. Sta. at the Univ. of Wash. Vol. 4, 1924, p. 23, pl. 35, figs. 1a, 1b.

Fairly numerous in the lower quarter of the littoral zone. Larvae had set a short time before August 30. The underside of stones forms a very definite setting surface. This species exhibits the peculiarity in setting noticed in other Pelecypoda with like larval forms. That is, they tend to set in groups. Under one rock a number will set all within a comparatively small area, while under a neighbouring rock in a like position to allow setting, not one may be found.

Both clams and oysters will set in this way. An instance is cited in the case of the large 1932 spawn of Japanese oysters in Ladysmith Harbour. The set spread as far south as Maple Bay. At this distant point even the oysters had set in small groups, so where one specimen was found there would be nearly always several others near by. Theories are put forward that the clustering may be due to a number of larvae being caught together in a surface tension membrane; or that the cilia of the trochal discs become entangled so they are unable to free themselves. However, whatever the cause it is an interesting phenomenon.

Hinnites giganteus Gray

Oldroyd. p. 21, pl. 30, figs. 1a, 1b.

Only two living specimens and several small valves were found on the whole island. Both the living specimens were attached firmly to the rocks at eastern tip of the island in a most exposed position. They were just below the lowest tide mark and were very close together. The valves were extremely thick and heavy and measured 160 mm by 130 mm on the specimen taken. It is strange that there were only two living specimens, at least of a discernable size, on the island, and in this way it is comparable to the case of the single specimen of Strongylocentrotus franciscanus. In both these cases it was not likely that others had been overlooked.

Pecten hericius Gould

Oldroyd (1924) p. 16, pl. 23, figs. 1, 2.

Several small specimens of this were taken from under rocks near the zero tide mark. The largest specimen was not more than 12 mm in length. Several of the specimens had a number of the protozoan *Folliculina expansa* growing on them. It is probable that these specimens are the results of spawning from the Dodd Narrows beds to the North or the Tent Island beds to the South-east.

Mytilus edulis Linnaeus

Oldroyd (1924) p. 23, pl. 46, fig. 1.

Very numerous and along with the barnacles for the major portion of life in the middle littoral zone.

Saxidomus giganteus (Deshayes)

Johnson and Snook. p. 443, fig. 423.

The common "butter" clam as it is called is common in the two small areas of sand and shell on the Western tip of the island.

Schizothaerus nuttalli (Conrad)

Johnson and Snook. p. 461, fig. 464.

The largest and commonest pelecypod on the island; also the most numerous. One pair of valves taken measured 18 cm long by 15 cm wide and 10 cm deep.

Habitat similar to that of *Saxidomus*, though it's range may extend deeper into the sand and lower down the beach. This species forms the major part of the Pelecypod prey of *Pycnopodia helianthoides*.

Paphia staminea (Conrad)

Packard, E. L. Molluscan Fauna from San Francisco Bay.
Univ. Calif. Pub. Zool. Vol. 14, p. 270, pl. 21, fig. 1a,
1b, pl. 45. 1914-1918.

Similar habitat as *Saxidomus* and quite as numerous.

Macoma nusata Conrad

Oldroyd. p. 53, pl. 32, figs. 1a, 1d. (1924).

Similar habitat as *Saxidomus* but not quite so numerous.

Macoma secta Conrad

Oldroyd. p. 55. pl. 4, fig. 8. (1924).

Similar in habitat and numbers as M. nusata.

Macoma inquinata (Deshayes)

Oldroyd. p. 54, pl. 32, figs. 2a, 2b, 3a, 3b. (1924).

Same habitat as M. nusata and M. secta, but rarer.

Mya arenaria Linnaeus

Oldroyd. 0. 62, pl. 47, fig. 4. (1924).

Only a few shells of this species were found.

Caadium corbis Martyn

Oldroyd. p. 42, figs. 1a, 1b. (1924).

In same habitat as Saxidomus but very rare here. Only two specimens were taken.

Ostrea gigas Thunberg

There were about three to four dozen specimens, mostly small, not measuring more than three and one-half inches, scattered over the island in the mid-tidal zone. They were all four years old. Examination of culch indicated that the set for that summer (1936) was much heavier, a considerable number being found on the north side of the island, on which side there were none of the 1932 set. The area showed the peculiarity of setting in groups as mentioned above.

Ostrea lurida Carpenter

Johnson and Snook. p. 42, fig. 376.

Only a few shells were found. The island is in no way a suitable habitat for this species.

Saxicava arctica Linnaeus

Oldroyd. (1924). p. 64, pl. 49, fig. 4.

Several small specimens, not more than 11 mm in length were found attached by byssus threads to the under side of rocks in the lower quarter of the tidal zone.

Gari californica Conrad

Oldroyd. (1924). p. 57, pl. 46, fig. 3.

Only a few shells of this species were found.

Amphineura

Mopalia muscosa (Gould)

Johnson and Snook. p. 565, figs. 666, 673.

A single specimen of this species was obtained, measuring 22.5 mm by 35 mm. Heavy valves. This, along with all the Amphineurans, with the occasional exception, were not found higher than the four foot tide mark.

Mopalia ciliata (Sowerby)

Johnson and Snook. p. 565, fig. 672.

This species was the most numerous of the Amphineurans and many varieties of shell colours, patterns, and striations were found. One specimen had two smaller slits along with the two normal ones close to and on either side of the sinus of the posterior valve.

Ischnochiton mertensii (Middendorf)

Johnson and Snook. p. 504, fig. 659.

A single specimen measuring 32 mm by 17 mm.

Ischnochiton sp.

Both the anterior and posterior valves contained 11 slits. The number of slits is very constant, so that combination does not fit into the classification at any point.

Lepidochitona (Tonicella) lineata Wood

Johnson and Snook. p. 501, fig. 567.

Quite numerous and produced a variety of colour schemes and designs.

Gastropoda

Streptoneura

Thais lamellosa Gmelin

Oldroyd. (1924). p. 104, pl. 64, figs. 1, 2, 4, pl. 43.

Very numerous in the lower quarter of the tidal zone. Numerous variations in the shells.

Thais emarginata Deshayes

Oldroyd. (1924). p. 182, pl. 2, fig. 1.

Similar in distribution to T. lamellosa.

Purpura foliata (Martyn)

Johnson and Snook. p. 516, fig. 549.

Fairly numerous and is found just above the zero tide mark.

Searlesia dira (Reeves)

Oldroyd. (1924). p. 93, pl. 44, fig. 10.

Not numerous. Found in the lower quarter of the tidal zone.

Alectrion mendicus Gould

Oldroyd. (1924). p. 95, pl. 22, fig. 6.

Quite numerous under rocks and is found just below the half tide mark.

Polinices lewisii Gould

Oldroyd. (1924). p. 162, pl. 36, fig. 1.

Not numerous. All several feet below the low tide mark. The egg "collars" were more numerous than the animals.

Crepidula nummaria (Gould)

Oldroyd. (1924). p. 160, pl. 19, figs. 7-9.

Not common. A definite search was made for them before they were found attached to rocks, mostly the upper surface at just above the zero tide mark. At the head of Ladysmith Harbour Calyptraea fastigiata Gould occurs in great numbers on the oysters and it is remarkable they have not spread from the small area in the region of the oyster beds. Very likely this is an example of the necessity of a specific environment.

Genus Turbonilla

Several species found over most of the littoral zone.

Littorina scutulata Gould

The small black gastropod found high up in the tidal zone, the only creature living above the barnacle zone.

Tritonalia sp.

A single specimen.

Calliostoma costatum (Martyn)

Johnson and Snook. p. 550, fig. 639.

Not numerous. Found under rocks and in crevices in the lower quarter of the tidal zone. Empty shells often inhabited by Pagurus.

Diadora aspera Eschscholtz

Oldroyd. (1924). p. 182, pl. 29, figs. 1-3.

Two specimens taken just below the barnacle zone.

Acmea scutum pintadina Gould

Oldroyd. (1924). p. 167, pl. 21, fig. 14.

Along with A. cassis olympica this species was the commonest limpet on the island. Both species were found over the whole range of the lower two-thirds of the tidal zone. They are almost as widely distributed as barnacles.

Acmea cassis olympica Dall

Oldroyd. (1924). p. 166, pl. 21, figs. 12, 13.

Distribution similar to A. scutum pintadina.

Acmea mitra Eschscholtz

Johnston and Snook. p. 542, fig. 608.

Fairly numerous with a wide distribution. Often covered with barnacles.

Acmea personna Eschscholtz

Johnson and Snook. p. 544, fig. 614.

A single specimen measuring 39 mm by 33 mm by 19 mm. Found in a tide-pool just below half tide mark.

Opisthobranchiata

Nudibranchiata

Diaulula sandiegensis (Cooper)

McFarland. Opisthobranchiate Molluscs from Monterey Bay, California and Vicinity. Bull. Bur. Fish. Vol. 25. p. 122, pl. 23, fig. 5, pl. 18, figs. 22-24.

Not numerous. Found under rock in the lower quarter of the tidal zone.

Melibe leonina (Gould)

Johnson and Snook. p. 501, fig. 509.

Only a single adult and two tiny ones which were left stranded in the tide-pools.

In the inner harbour along the northern shore vast numbers of them spawned in the eel-grass. The spawning period lasted from the beginning of May to shortly after June 1.

Dendronotus giganteus O'Donoghue

Johnson and Snook. p. 499, p. 509 a, b.

Not common. A single specimen taken from shelly bottom about two feet below low water mark.

Aeolida papillosa (Linnaeus)

O'Donoghue, C. H. Nudibranchiate Mollusca from the Vancouver Island Region. Trans. Roy. Can. Inst. 1921. Vol. 13, No. 1, p. 199.

Several specimens were obtained from crevices and in small streams of water that appear after the tide has fallen. Usually in the lower third of the tidal zone.

Hermisenda crassicornis (Eschscholtz)

Not numerous. Similar distribution to A. papillosa.

Coryphella fusca O'Donoghue

O'Donoghue. p. 195.

Similar in number and distribution to A. papillosa.

Tectibranchiata

Haminoea vesicula (Gould)

Very like H. vesicula except that it is much darker. Not common.

Chordata

Ascidia

This group occurs in considerable numbers, especially certain species, usually close to the zero tide mark and on steep or overhanging walls of rock.

The literature on the group is not extensive but what there is is quite comprehensive, especially the work of Huntsman of the Holostomatous Ascidians of British Columbia. Ritter has also done considerable work on the group.

The classification is based on the arrangement of the internal organs and the wall of the branchial chamber, so dissection is necessary.

Corella rugosa Huntsman

Huntsman. The Holostomatous Ascidians from the Coast of Western Canada. Contrib. to Can. Biol. 1906-1910. p. 120, pl. 10. fig. 7, pl. 15, figs. 5, 6.

Quite abundant; attached to rocks near the zero tide mark. Quite transparent with no foreign growths. The largest specimen was 30 mm by 20 mm.

Chelyosoma productum Stimpson

Huntsman. (1910). p. 120, pl. 10, fig. 7, pl. 15, fig. 5, 6.

S single specimen 20 mm by 15 mm. Not very different externally from Corella rugosa.

Ascidiopsis columbiana Huntsman

Huntsman. (1910). p. 110, pl. 10, fig. 5, pl. 14, figs. 5, 6, 7.

A single specimen 22 mm by 22 mm. Transparent.

Katatropa vancouverensis Huntsman

Huntsman. (1910). p. 144, pl. 11, fig. 10, pl. 12, fig. 1, pl. 19, figs. 1, 2, 6.

Two small specimens yellow-orange in colour. Bright red around the oral and atrial openings. 15 mm long and 4 mm in diameter.

Boltenia villosa (Stimpson)

Huntsman. (1910). p. 166, pl. 13, figs. 2, 3, 4,
pl. 20, figs. 4, 5, 6.

Quite numerous. Dark red spiny individuals on a definite stalk. Largest specimen 40 mm by 20 mm.

Cnemidocarpa joannoe (Herdman)

Huntsman. (1910). p. 159, pl. 12, fig. 6, pl. 20,
figs. 2, 3.

Quite numerous. Brilliant orange or red in colour. A smooth or wrinkled test but with little or no foreign growths. Largest specimen 30 mm long by 15 mm wide by 1.5 mm high.

Pyura haustor (Stimpson)

Huntsman. (1910). p. 169, pl. 13, fig. 6, pl. 21,
fig. 1, 2.

The largest and most numerous of the Ascidians. They are extremely corrugated and all carry a wealth of fauna and flora. The largest specimen taken was 50 mm by 40 mm by 30 mm. As an example of the variety of material found in association with this species, a specimen 32 mm by 20 mm by 15 mm had the following list of forms growing or living upon it:

- 5 specimens of Tanaoidea (Chelifera)
- a monactinellid sponge
- a specimen of Mytilus edulis
- 8 specimens of Spirorbis
- numerous specimens of several species of Foramenifera
- 11 Nematode worms (Enoplus)
- several larval clams and mussels
- a specimen of Caprella aequilibra
- a number of small Amphipods
- 2 specimens of Exogone gemmifera
- a number of barnacles (Balanus)

Compound Ascidian. Probably Botrylloides sp. These are quite numerous and cover fairly large areas under rocks and on the walls of crevices in the lower quarter of the tidal zone.

CONCLUSION

While this list does not by any means form a complete list of all the species inhabiting Coffin Island, it does give an indication of the wealth and variety of fauna to be found on the British Columbia Coast, particularly in a limited area.

More specific results in connection with Coffin Island are:

1. Most of the invertebrate groups were represented in varying numbers.
2. The southern shore of the island proved to have the most abundant fauna.
3. The greatest variety of fauna is found below the three foot tide mark and more particularly at the zero tide mark.
4. The most favoured habitat is beneath rocks.
5. Many of the forms are gregarious.
6. The associations between different species were varied and numerous.
7. Migrations and movements for various reasons were very much in evidence.

BIBLIOGRAPHY

General

Hegner. Invertebrate Zoology.

Johnson and Snook. Seashore Animals of the Pacific Coast. 1935.

Pratt, S. H. Manual of the Common Invertebrate Animals. 1935.
Cambridge Natural History.

Porifera

- * Lambe, L. M. 1900. Catalogue of the recent sponges of Canada and Alaska. Ottawa Nat. 14(9): 153-172.
- * 1892. Sponges from the Pacific Coast of Canada and the Behring Sea. Trans. Roy. Soc. Can. 10: 67-68.
- * 1894. Sponges from the Western coast of North America. Trans. Roy. Soc. Can. 12: 113-138.

- * 1893. Sponges from the Pacific Coast of Canada. Trans. Roy. Soc. Can. 11: 25-43.

Coelenterata

- Foerster, R. E. 1923. The Hydromedusae of the west coast of North America, with special reference to those of the Vancouver Island regional Contr. Canad. Biol. 1(12): 219-277.
- * Fraser, C. M. 1911. The hydroids of the west coast of North America. Bull. Lab. Nat. Hist., State Univ. Iowa, 1-91.
- * 1913. Hydroids from Vancouver Island. Bul. Lab. Nat. Hist., State Univ. Iowa, 147-155.
- * 1914. Some hydroisid of the Vancouver Island region. Trans. Roy. Soc. Can. Ser. 3, 8(5): 99-216.

Platyhelminthes

- Coe, Wesley, R. 1905. Nemerteans. Harriman Alaska Expedition. Vol. 11, pp. 1-220.
1905. Nemerteans of the West and North-West Coast of America. Bull. Mus. Comp. Zool. Harvard. Vol. 47.

Johnson and Snook. 1935. Seashore Animals of the Pacific Coast.

Pratt, S. H. 1935. Manual of the Common Invertebrate Animals.

Nemathelminthes

Pratt, S. H. 1935. Manual of the Common Invertebrate Animals.

Echinodermata

- Bush, Mildred. Revised Key to the Echinoderms of Friday Harbour. Pub. Puget Sd. Biol. Sta. Vol. 3 pp. 65-77.
- * Clark, H. L. North Pacific Ophiurans in the Collection of the U. S. Nat. Mus. Bull., U. S. Nat. Mus. No. 75.
- * 1901. The Holothurians of the Pacific Coast of North America. Zool. Anz., Bd. 24, pp. 162-171.
1908. The Apodous Holothurians. Smithsonian contributions to diffusion of knowledge among men. 35(1723): 1-231, pls. 1-13.
1924. Some Holothurians from British Columbia. Canad. Field-Nat. 38(3): 54-57.

Fisher, W. K. 1911. Asteroidea of the North Pacific and adjacent waters.
Part 1. Phanerozonia and Spinulosa. Smith. Inst. U. S. Nat. Mus. Bull.
76: 1-406.

1928. Asteroidea of the North Pacific and adjacent waters. Part 2.
Forcepulata (Part). Smith. Inst. U. S. Nat. Mus. Bull. 76: 1-161.

McBride, E. W. 1906. Echinodermata. Cambridge Natural History.

* Nielsen, Eigil. Ophiurans from the Gulf of Panama, California, and the
Strait of Georgia. Papers from Dr. Thos. Mortensen's Pacific Expedition.
1914-16. 59. Vidensk. Medd. fra Dansk. Nat. Foren. 21: 241-346.

Verrill, A. E. 1914. Monograph of the shallow water starfishes of the north
Pacific coast from the Arctic Ocean to California. Smith. Inst.,
Harriman Alaska Exped. Ser. 14: 1-408.

Molluscoidea

* Davidson, Thos. Monograph of recent Brachiopoda. Trans. Linn. Soc. London,
Second Ser., Vol. 4, Zoology.

Hincks, T. Polyzoa of the Queen Charlotte Islands.
1882 -- Ann. Nat. Hist. (5) Vol. X. pp. 348-256.
1884 -- Ann. Nat. Hist. (5) Vol. XII. pp. 203-215.

O'Donoghue, C. H. and Elsie O'Donoghue. 1923. A preliminary list of Polyzoa
(Bryozoa) from the Vancouver Island Region. Contr. Canad. Biol. and Fish.
New Ser. Vol. 1. Nos. 10 to 18.

A second list of Bryozoa (Polyzoa) from the Vancouver Island Region.
Contr. Canad. Biol. and Fish. New Ser. Vol. III. Nos. 1 to 8.

Robertson, A. 1910. The Cyclostomatous Bryozoa of the West Coast of North
America. Univ. California. Pub. Zool. Vol. 6.

Non-incrusting Chilostomatous Bryozoa of the West Coast of North
America. Univ. California. Pub. Zool. Vol. 2, No. 5, pp. 235-322,
pls. 4-16.

1900. Studies in Pacific Coast Entoprocta. Proc. Calif. Acad.
Sci. Vol. 11, Oct.

1900. Papers from the Harriman Expedition, VI. The Bryozoa.
Proc. Washington Acad. Sci. Vol. II, Oct.

Annelida

Benham, W. Blaxland. Worms, Rotifers, and Polyzoa. Archianellida,
Polychaeta, and Myzostomaria. p. 241. The Cambridge Natural History.

Berkeley, Edith. 1923. Polychaetous annelids from the Nanaimo district. I. Syllidae to Segalionidae. Contr. Canad. Biol. 1(11): 203-218.

1924. Polychaetous annelids from the Nanaimo district. II. Phyllodocidae to Nereidae. Contr. Canad. Biol. 2(12): 285-293.

1927. Polychaetous annelids from the Nanaimo district. III. Leodicidae to Spionidae. Contr. Canad. Biol. 3(17): 405-422.

* 1929. Polychaetous annelids from the Nanaimo district. IV. Chaetopteridae to Maldanidae. Contr. Canad. Biol. 4(22): 305-316.

1930. Polychaetous annelids from the Nanaimo district. B. Ammonocharidae to Myzostomidae: with an appendix on some pelagic forms from the Strait of Georgia and the west coast of Vancouver Island. Contr. Canad. Biol. 6(5): 65-77.

Berkeley, E. and C. 1932. On a collection of littoral Polychaeta from the west coast of Vancouver Island. Contr. Canad. Biol. Fish. 7(24): 310-318.

Bush, Katherine J. 1910. Tubiculous Annelids. Harriman Alaska Series. Vol. XII. of the Smithsonian Institution.

McIntosh, W. C. 1877. The British Annelids. The Ray Society, London.

Vol. I	Part II
Vol. II	Parts I and II
Vol. III	Part II
Vol. IV	Parts I and II

Moore, J. P. Poly. Annelid dredged by the U. S. S. Albatros of the Coast of Southern California. 1904. Proc. Acad. Nat. Sci. Phil. Vol. 25, pp. 179-259.

1911. The Polychaetous Annelids Dredged by the U. S. S. "Albatross" off the Coast of Southern California in 1904. III. Euphosynidae to Goniadidae. p. 234. Acad. of Nat. Sci. (Phil., U. S. A.).

Treadwell, Aaron L. Polychaetous Annelids of the Pacific Coast in Collections of the Museum of the University of California. Univ. of Calif. Pub. in Zool. Vol. 13 1914-1916, p. 175-234.

Arthropoda

Cornwall, Ira E. A review of the Cirripedia of the coast of British Columbia, with Glossary and Key to Genera and Species. Contrib. Canad. Biol. and Fish. New Series. Vol. II. Nos. 15 to 22.

* 1927. Some North Pacific Whale Barnacles. Contrib. Canad. Biol. and Fish. New Series. Vol. III. Nos. 12 to 23.

- * Darwin, C. A. 1854. A Monograph of the Subclass Cirripedia.
- * Fraser, C. M. 1919. Copepods parasitic on fish from the Vancouver Island Region. Trans. Roy. Soc. Can., Series III, Vol. XIII.
- Hart, J. F. L. 1930. Some Decapods from the South-Eastern shores of Vancouver Island. Can. Field Nat., Vol. XLIV. No. 5. 101-109.
- Holmes, J. S. 1904. The Amphipods of Southern New England. Bull. U. S. Fish. Com. Vol. 24, p. 457.
- Rathbun, M. J. 1904. Decapod crustacea of the North-West Coast of North America. Harriman Alaska Expedition, 10: 1-210.
1918. The Grapsoid Crabs of America. Bull. U. S. Nat. Mus., 97: 1-461.
1925. The Spider Crabs of America. Bull. U. S. Nat. Mus. 129.
1930. The Cancroid crabs of America of the families Euryalidae, Portunidae, Atelecyclidae, Cancridae and Xanthidae. Bull. U. S. Nat. Mus., 152: 1-609.
- Richardson, H. 1905. A Monograph on the Isopods of North America. Bull. U. S. Nat. Mus., 54: 1-727.
- Schmitt, W. L. 1921. The Marine Decapod Crustacea of California. Univ. Cal. Press., Berkeley, California.
- Stebbing, T. R. R. 1906. The Amphipoda I. Gammaridea. Das Tierreich.
- Smith, Gertrude M. 1928. Notes on the Distribution of some Decapod Crustacea collected near Sidney, B. C. The Can. Field. Nat., Vol. XLII, No. 7, 163-165.
- Smith, G. and W. F. R. Welden. Cambridge Natural History. 4. 1-217.
- Stebbing, T. R. R. Amphipoda from the Copenhagen Museum and other sources. Trans. Linn. Soc. London, second series, Zoology. Vol. VII. p. 395.
- Stevens, Belle A. 1925. Hermit Crabs of Friday Harbour, Washington. Publ. Puget Sd. Biol. Sta. Vol. 3, No. 68, 273-709, Fig. 1-24. pl. 34-36.
- * 1928. Callianassidae from the West Coast of North America. Publ. Puget Sd. Biol. Sta., Vol. 6. 315-369. Fig. 1-71.
- Taylor, George W. 1906-1909. Preliminary List of One Hundred and Twenty-Nine Species of B. C. Decapod Crustaceans. Contrib. Can. Biol., 187-214.

- Wailes, G. H. 1931. Amphipoda from British Columbia. Vanc. Mus. Art. Notes. 6(1): 40-41.
- Way, Evelyn. 1917. Brachyura and Crab-like Anomura of Friday Harbour, Washington. Puget Sd. Marine Sta. Publ. Vol. I, No. 30, 349-382, pl. 80-82.
- * Wilson, C. B. Parasitic Copepods from Nanaimo, B. C., including eight species new to science. Contr. Can. Biol., 1906-1910. No. IX. 85-102.
- * 1935. Parasitic Copepods from the Pacific Coast. Amer. Midl. Nat., 16: 776-797.
- * Wells, Wayne, W. 1928. Pinnotheridae of Puget Sound. Publ. Puget Sd. Biol. Sta., Vol. 6, 283-314, Fig. 1-78.

Mollusca

- * Bartsch, Paul. 1922. Monograph of the North American Shipworms. U. S. N. M. Bulletin. No. 122.
- Berry, S. Stillman. Notes on West American Chitons I. Proc. Calif. Acad. Sci. 4th series. Zool., Vol. 7, pp. 229-248.
- * A review of the Cephalopoda of Western North America. Bull. Bur. Fish. Vol. 30. pp. 229-248.
- * Review of Cephalopoda of Western North America. Bull. U. S. Bur. Fish. 1910(1912) 31: 269-336.
- * Dall, Wm. H. Synopsis of the Family Cardiidae and of the North American Species. Proc. U. S. N. M. Vol. 23, p. 381-1900.
1921. Summary of the Marine Shellbearing Mollusks of the North-West Coast of America, etc. Bull. 112, U. S. Nat. Mus.
- Dall, Wm. H. and P. Bartsch. 1907. A Monograph of the West American pyramidellid mollusks. Bull. U. S. Nat. Mus. 68: 1-258. pls. 1-30.
- Keep, Joshiah. 1904(1935). West American Shells.
- * Kofoid, C. A. 1921. The Marine Borers of the San Francisco Bay Region. Report on the San Francisco Bay Marine Piling Survey. pp. 23-61.
- McFarland, F. M. 1905. The Opisthobranchiate Mollusca of Monterey Bay. Bull. Bur. Fish. Vol. XXV. pp. 109-151.

Oldroyd, Ida S. 1924-1927. Marine Shells of the West Coast of North America. Stan. Univ. Pub. Univ. Series. Geol. Sci. Vol. I. No. I. and Vol. II, pls. 1, 2, 9, 3.

Packard, E. L. 1918. Molluscan Fauna from San Francisco Bay. Univ. Calif. Pub. Zool. Vol. 14, pp. 199-452.

- * Sigerfoos, C. P. Natural History, Organization, and Late Development of the Teredinidae, or Shipworms. Bull. U. S. Bur. Fish. Vol. 27. pp. 191-231.

Chordata

Huntsman, A. G. 1906-1910. Holostomatous Ascidiens from the Coast of Western Canada. Contrib. to Can. Biol.

- * Ritter, W. E. 1856. Ascidiens. Univ. Calif. Pub. Zool. Vol. 4, No. I.

- * 1900. Some Ascidiens from Puget Sound, Collections of 1896. Ann. N. Y. Acad. Sci. Vol. 12, pp. 589-616.

Ritter, W. E. and R. A. Forsyth. Ascidiens of the Littoral Zone of Southern Calif. Univ. Calif. Pub. Zool. Vol. 16 pp. 439-512.

- * Indicates literature that was inaccessible or not used in the work but is standard for the subject.

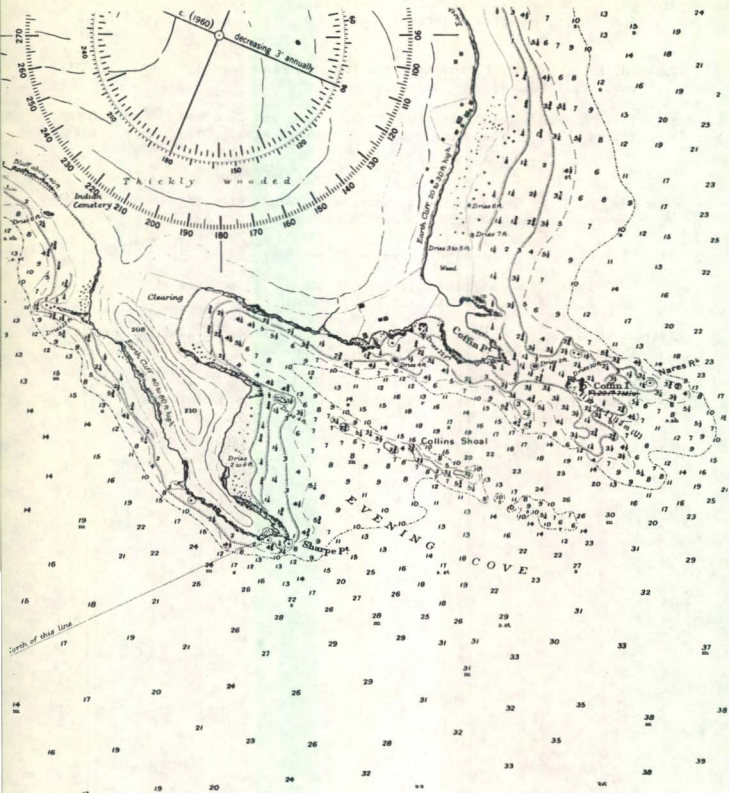


Fig. 1. Coffin Island Area.