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Some Account of the Marine Botany of the Colony of Western Australia

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XX.—*Some Account of the Marine Botany of the Colony of Western Australia.*  
 By W. H. HARVEY, M. D., M. R. I. A., *Keeper of the Herbarium of the University of Dublin, and Professor of Botany to the Royal Dublin Society, &c.*

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Read December 11, 1854.

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THE land vegetation of Western Australia is now tolerably well known, chiefly through the labours of Mr. JAMES DRUMMOND and of Dr. L. PREISS, who have separately explored almost all the settled districts; and the former has also pushed his researches far to the northward and eastward, beyond the range of any colonist's settlement. Lesser collections of land plants have been made by Baron HÜGEL, Captain MANGLES, the late Mrs. MOLLOY, Mr. J. S. ROE, and other amateurs.

The vegetation of the seaboard of the colony is much less known. Our earliest acquaintance with West Australian *Algæ* is derived from small but interesting collections, made by some of the early French exploring expeditions; and by Dr. ROBERT BROWN, who accompanied FLINDERS. Many of the less common species of these collections are only known to botanists by description or figures. By far the largest series of *Algæ* brought from this coast is that procured during four years' exploration of the colony by Mr. L. PREISS, to whom great credit is due for having collected 141 species, as, from the nature of his engagements, but little time could be devoted to this branch of botany. We owe to Dr. SONDER, of Hamburgh, a very able analysis and description of PREISS's *Algæ*; and the Dublin University Herbarium is indebted to the liberality of Senator BINDER, of the same free city, for a tolerably perfect set of these *Algæ*. I have thus had the great advantage of examining authentic specimens of most of the new genera and species discovered by PREISS, and described by SONDER. A parcel containing between sixty and seventy species of Western Australian

Algæ, collected by Mr. MYLNE, was presented to me by the late Dr. CHARLES LEMANN, of London, and is now incorporated with the Dublin University Herbarium. This series, though small, contains several not ascertained by PREISS, and the specimens are generally more copiously collected, and in better order. I have received a few others from my friend J. BACKHOUSE, of York, who procured them at Fremantle, during his visit to the colony. Collections of Algæ, I am informed, have been repeatedly made in this colony by amateurs, chiefly ladies; but respecting their contents the botanical world is no wiser, as they have been dispersed hither and thither among friends at home.

This is all the information I possess respecting previous algological researches in Western Australia. My own observations were made between January and August, 1854, at a few widely separated points on this extensive coast; not, perhaps, at the best possible collecting stations, but at those which were most accessible. These were King George's Sound and Cape Riche, on the southern coast; and Fremantle, Garden Island, and Rottnest Island, all in the immediate vicinity of Swan River, on the western coast. I shall briefly describe the features of the coast of these places.

I landed at King George's Sound in January, and remained till the end of February; and I revisited this shore in August. My head-quarters were at the little town of Albany, situated on the shores of Princess Royal Harbour, an oval, land-locked, lake-like basin, with a very narrow entrance; and I made frequent excursions on foot to the coasts in the vicinity, chiefly to Middleton Bay, distant about three miles; and also dredged repeatedly in various parts of the Sound between Bald Head and the opposite shores. The vegetation of the enclosed harbour is, as might be expected, very different from that of the more exposed Sound. Its shores are generally sandy, shoaling to a considerable distance from the margin, leaving a very broad marginal belt of less than two fathoms in depth at high water, and in many places of less than one fathom. The tides rise and fall very irregularly, being much influenced by the wind. The rise varies from two to four feet; and there is generally but one tide in the twenty-four hours. Now and then, however, I have observed two tides. The depth of the central basin varies from five to seven fathoms. About the entrance the shores are rocky and rather steep, the rocks being coarse granites perhaps the least adapted of any to the growth of Algæ. In all the shallow water round

the northern and north-eastern beaches grows abundance of *Polyphysa peniculus*, a very remarkable little Alga, known only in this locality, where it was detected by Dr. R. BROWN. It is invariably found attached to dead shells, chiefly to the separated valves of a common *Venus* (like *V. aurea* ?), and is very frequently infested by a peculiar *Polysiphonia* (*P. infestans* H.), which I have found nowhere else. *Hormosira Labillardieri*, a fucoid plant, resembling strings of beads, and the only representative of the littoral fuci which I have met with, occurs on rocks near high-water mark, and extends to half-tide level. All the other fucoid plants of this coast commence at low-water mark, and are rarely left dry, even at the greatest recess of the tide. The deeper parts of the harbour appear to be occupied by immense strata of *Dictyota furcellata*, a slender, excessively branched species; and of *Stilophora Lyngbyæi*, with a liberal sprinkling of *Hypnææ*, and of a very luxuriant variety of *Spyridia filamentosa*. On the leaves of *Zostera*, and on the stems of *Caulinia antarctica*, both which form vast meadows in water from two to six feet deep, grows a profusion of small parasites, and on scattered stones, in the same zone of depth, *Laurencia Tasmanica*, and *Cystophyllum muricatum*, flourish abundantly.

At Middleton Bay is an extensive strand, some miles in length, reaching to the entrance of Oyster Harbour, and a narrow belt of rocky shore at the southern end, where, at the low-water of spring tides, many interesting species of the *Laminarian zone* may be gathered. *Ecklonia radiata*, the only laminarioid plant of this coast, fringes the whole of these rocks, and extends some distance within the heads of Princess Royal Harbour. Outside the heads, in the more open bay, the leaves are generally rough with prickles, and the whole plant grows stronger, being the state described by authors as *E. biruncinata* or *E. exasperata*; while in the tranquil water of the harbour the surface of the fronds is generally *smooth*, being the *E. radiata* of Agardh. From personal observations I conclude that these supposed species are not distinct, as originally stated by Turner. In summer time the rocks at Middleton Bay, between high and low water, are either completely bare, or produce a scanty vegetation of obscure *Calothrices*; or of a very minute *Polysiphonia*, with starved varieties of *Gelidium corneum*; the power of the sun being probably too great to admit of the growth of a fucoid vegetation, such as clothes rocks similarly exposed in colder climates. But in winter these same rocks are all densely covered with *Chorda lomentaria*

and *Ectocarpus siliculosus*, two plants of rapid growth, and both belonging to forms which are rare in the warmer, and abundant in the colder waters of the sea. Just above the laminarian belt, and extending into it, several social *Laurenciæ*, both here and on other parts of the coast, cover the rocks, often in very wide patches.

Nothing of any interest was collected in Oyster Harbour; nor was dredging in the Sound attended with any very remarkable result. Very little of the amount dredged had been detached by the dredge; the greater portion consisted of drifting plants, collected by currents and eddies on various parts of the sandy bottom. The deepest fucoid plant, observed *in situ*, was *Scaberia Agardhii*, which abounds on every part of the coast explored by me in 2–5 fathom water. Wherever *Caulinia antarctica* can find a footing, its wiry stems, but rarely its leaves, are generally found covered with parasites, many of which (such as *Thuretia*, *Halophlegma*, and various *Dasyæ*) are very curious and beautiful. The parasites on *Zostera*, on the contrary, usually grow on the leaves, not on the stem; and here are found *Chondriæ*, *Griffithsiæ*, *Callithamnia*, *Wrangelicæ*, *Crouanicæ*, &c.

I spent the month of March at Cape Riche, a bold promontory, about 60 miles by compass, and 70 or 80 by land, to the east of King George's Sound; and famous for the beauty and variety of flowering plants found on the hills in its neighbourhood. Here I was the guest of GEORGE CHEYNE, Esq., who has a farm and sheep-run at the Cape. The dry season had advanced too far to permit my seeing this beautiful district to the best advantage, or to allow of my making an extensive gathering of land plants; and the sea-shore proved to be singularly barren in Algæ. The ordinary *Fucoideæ* (*Sargassa* and *Cystophoræ*), with *Ecklonia radiata*, chiefly occupy the laminarian zone; and the smaller *Rhodospermeæ*, scattered among them, are few, and of little interest. Here, nevertheless, I collected a new Genus (*Lasiothalia*), and a remarkably fine *Liagora* (*L. Cheyniana*).

Early in April I started, overland, for Swan River, and on the 21st reached Fremantle, where I remained till the 21st of May; and returned again for the first fortnight in July. At this place the algologist must depend, either on the dredge, or on the western gales, which frequently throw drifted plants ashore. The coast at both sides of the town, which is built on a little calcareous pro-

montory, consists of long, sandy beaches that extend for many miles. On these, in stormy weather, many beautiful plants are cast up; but, owing to the fineness of the weather during nearly the whole of my stay, my success must have fallen far short of that of a collector in average seasons. I am convinced of this from the reports I heard from many persons at Fremantle; and also from the fact that thirty of the species found by PREISS were not ascertained by me. Nevertheless, I more than doubled my previous list, finding very many species not in PREISS'S collection. Some of these were dredged in the bay, in 5 or 6 fathoms water, but the greater number were picked up on the beach. Amongst the most remarkable of the Fremantle plants are *Claudea elegans* (found by GEORGE CLIFTON, Esq.), and *Kallymenia cribrosa*. *Halophlegma Preissii* is very common; so also is *Dasya tenera*, which, in a very few minutes after it has been removed from the water, melts into a rose-coloured, gelatinous mass. *Halosaccion firmum* and *H. Hydrophora*, apparently identical with the Kamtchatkan plants, are also very frequent; and *Eucheuma speciosum*, the jelly or blanc-mange weed of this colony, floats on shore in great abundance after winter gales.

Whilst residing at Fremantle, I made three excursions to Garden Island, distant about nine miles in a S. W. direction, landing each time on the northern and north-eastern beaches. On all these excursions I made very considerable collections of drifted plants, finding several species not seen or very rarely met with elsewhere. Among these the most remarkable were *Sarcomenia deserioides* and *S. hypnæoides*; and *Lenormandia spectabilis*, which is here extremely abundant, varying greatly in size, and in the breadth of the frond. I noticed that several species found at this island were much more luxuriant than individuals of the same kind collected at Rottnest Island, a few miles to the north. This is especially the case with *Griffithsia Binderiana*,—the specimens from Garden Island being four times the size of those from Rottnest. This I attribute to the fact, that at Rottnest this species always grows on *Zostera*; whilst at Garden Island it attaches itself to various Algæ; and the observation (coupled with other similar ones elsewhere made), seems to render it probable that Algæ really derive nourishment from the soil on which they grow.

From Fremantle I moved to Rottnest Island, about the end of May, and remained till the end of June, a period of six weeks. This little island is situated

about twelve miles W. by N. from Fremantle; and its land Flora is remarkable for the total absence of *Proteaceæ* and of grass trees (*Xanthorrhœa*), and for the paucity of *Myrtaceæ*, *Epacrideæ*, and *Leguminosæ* (with the exception of *Templetonia*, and two or three *Acacias*). It is seven miles long, and about three wide; it contains several large lakes of salt water, and is indented with many small bays, some of them with sandy beaches, and others rocky. Almost the whole island is surrounded by limestone reefs, at greater or less distances from the shore. The limestone seems of very recent formation, and is of similar character to that at Arthur's Head, and in other localities near Fremantle, already described by several geologists. It is remarkable for very fantastic and diversified forms. The reefs are generally flat-topped, but the surface is very rough, either thickly bristling with sharp points, a few inches high; or broken into miniature mountains and valleys,—strongly recalling to mind the *raised map* of Switzerland. Other reefs are ridged; the ridges parallel to each other, but variously directed towards the shore. The outer face of the bordering reef is generally very steep, often perpendicular or overhanging; and frequently it goes down, like a quay wall, into two or three fathoms water. At the N.E. angle of the island, a very remarkable quay-like reef, called the "Natural Jetty," runs out many hundred yards into the sea. Its surface is laid bare, at low-water, of spring tides, which rise and fall from 2 to 3½ feet. Many of the detached reefs are shaped like round tables, or mushrooms, being fixed on a slender central stalk, often only a few feet in diameter; the horizontal ledge, or table, spreading out to many yards on all sides. Sometimes two or three of these tables are joined together by narrow stone bridges; and sometimes large holes, through which you can look down two or three fathoms into the clearest water, are found in the table; and the swells rise through them, and flow over. I often wondered how these *filigree* reefs could so long withstand the beating of the waves in winter storms. Almost all of them offer good harvests to the algologist; and beautiful pictures to any one who can appreciate the loveliness of living vegetable forms. The surfaces of most are well clothed with the smaller *Rhodospermeæ* (*Laurenciæ*, *Hypnææ*, *Acanthophora*, &c.); and thickly studded with a *Caulerpa* (*C. lætevirens*, *Mont?*) with short stems, clothed with brilliant club-shaped leaves, resembling miniature clusters of grapes. At every few yards, deep basin-like hollows, of greater or lesser size, break the surface

of the reef, and afford well-sheltered nooks for a variety of beautiful Algæ. The water in these basins is always intensely transparent; the bottom frequently of white sand; and the steep and craggy sides clothed with Algæ vegetation, in which the brightest tints of green, purple, carmine, and olive, and the most graceful waving forms, are mingled in rich variety. Here is the favourite locality of some eight or ten species of *Caulerpa*, of several very distinct forms, and every one a beautiful object. All these are green; but the tints vary from the darkest bottle-green to the pale, fresh green of an opening *beech* leaf. Some resemble soft ostrich feathers; others, branches of the Norfolk Island pine; others, strings of beads; others, squirrels' or cats' tails; and *C. scalpelliformis* is like a double saw. Under the shelter of the *Caulerpæ* the smaller *Rhodosperms* (such as *Dasyæ* and *Callithamnia*) are often found. But these are most numerous on the perpendicular sides of the border reefs, where also rich meadows of *Caulerpæ* are seen waving in the clear water, from a foot beneath the surface to a considerable depth. Various *Fucoideæ* and *Ecklonia radiata* are scattered here and there through the deeper pools, and on the sides of the reef. None of these are ever left dry at low water. In many places a profusion of a *Bryopsis* (*B. Australis*) enlivens the rocks with its silky tufts of green, each tuft separate from its neighbour. Some of the shallower reefs, near high-water mark, are partially covered with sand: and this is the habitat of *Penicillus arbuscula*, a little green Alga, which may be compared either to a miniature tree, or to a shaving-brush. *Struvea plumosa* abounds on all the reefs, at about half-tide level, generally growing on the very edges of the rock-pools and border-reefs. I obtained from Mr. SANFORD, Colonial Secretary, a specimen of a new *Struvea*, sent by Mrs. DRUMMOND from Champion Bay, differing from *S. plumosa* in its vastly larger size, and more compound network. The specimen has been bleached white, and in this state strongly resembles a beautiful pattern of *old point-lace*, and might be made into ladies' collars, as it is of a tough substance.

I shall conclude this summary with a few remarks on the geographical distribution of the species collected.

The annexed descriptive catalogue contains 352 species: of which 277 are (so far as we yet know) peculiar to the Australasian Flora, and 75 belong either to *pelagic* species, or to more or less distant botanical regions. They are grouped as follows:—



	Whole number collected.	Australian.
Ser. 1. <i>Melanospermeæ</i> , . . . . .	42 . . . . .	26
„ 2. <i>Rhodospermeæ</i> , . . . . .	270 . . . . .	216
„ 3. <i>Chlorospermeæ</i> , . . . . .	40 . . . . .	35
	352	277

These numbers do not show the whole of the *Melanospermeæ* observed; some 15 or 20 species of *Sargassum* and *Cystophora* not having been examined, and having therefore been omitted from the list.

Still, the great preponderance of *Rhodospermeæ* is a remarkable feature. But the most singular fact is the proportion between the *Australian* and *pelagic* species of *Chlorospermeæ*, a group whose species are, generally speaking, much less local than those of either of the other divisions. The comparatively great number of *Siphoneæ* in Australia is one reason of this anomaly; another may be, that I have not yet minutely examined the species of *Cladophora* and *Calothrix*. Nevertheless, there is a marked deficiency in W. Australia of the common littoral *Chlorosperms*.

The *Pelagic* species, or those which inhabit many very distant places and dissimilar climates, are :—

<i>Chorda lomentaria.</i>	<i>Plocanium coccineum.</i>	<i>Gracilaria confervoides.</i>
<i>Dictyota dichotoma.</i>	<i>Spyridia filamentosa.</i>	<i>Codium tomentosum.</i>
<i>Asperococcus echinatus.</i>	<i>Centroceras clavulatum.</i>	<i>Ulva latissima.</i>
<i>Ectocarpus siliculosus.</i>	<i>Ceramium rubrum.</i>	<i>Enteromorpha compressa.</i>
<i>Gelidium corneum.</i>	————— <i>fastigiatum.</i>	

Species showing affinity with the vegetation of the Red Sea and Indian Ocean, are :—

<i>Turbinaria vulgaris.</i>	<i>Leveillia jungermanni-</i>	<i>Callithamnion thyrsig-</i>
<i>Cystoseira prolifera.</i>	<i>oides.</i>	<i>rum.</i>
<i>Dictyomenia fraxinifolia.</i>	<i>Dasya Lallemandi.</i>	

Connecting the W. Australian with the Flora of the South Pacific, are :—

*Dictyota Kunthii*; *Rhodymenia corallina*; *Ceramium miniatum*.

The Cape of Good Hope is represented by,—

*Martensia elegans*; *Dasya pellucida*; and *Halophlegma*.

Of Antarctic species are *Callithamnion simile* and *Delisia pulchra*, both found by Dr. HOOKER at Kerguelin's Land.

Representing the North Pacific, from S. Francisco to Kamtchatka, are *Halosaccion firmum* and *H. hydrophora*, identical, so far as my judgment goes, with the specimens from high northern latitudes.

The characteristic vegetation of the Mediterranean Seas (of Europe and Mexico) is more largely developed, as shown by the following list :—

<i>Dictyota ciliata.</i>	<i>Polysiphonia Havanensis.</i>	<i>Liagora distenta.</i>
<i>Hydroclathrus cancellatus.</i>	————— <i>obscura.</i>	————— <i>viscida.</i>
<i>Asperococcus sinuosus.</i>	————— <i>pennata.</i>	<i>Halymenia Floresia.</i>
<i>Chondria sedifolia?</i>	<i>Dasya mollis.</i>	<i>Dudresnaia coccinea.</i>
<i>Polysiphonia breviarliculata.</i>	<i>Wrangelia penicillata.</i>	<i>Crouania attenuata.</i>
	<i>Peyssonelia rubra.</i>	<i>Halimeda macroloba.</i>
	<i>Helminthora divaricata.</i>	

The following 27 are natives of the coasts of the British Islands, as well as of those of W. Australia :—

<i>Chorda lomenteria.</i>	<i>Champia parvula.</i>	<i>Ceramium fastigiatum.</i>
<i>Dictyota dichotoma.</i>	<i>Laurencia obtusa.</i>	————— <i>gracillimum.</i>
<i>Stilophora Lyngbyæi.</i>	<i>Gracilaria confervoides.</i>	<i>Dudresnaia coccinea.</i>
<i>Asperococcus Turneri.</i>	<i>Gelidium corneum.</i>	<i>Crouania attenuata.</i>
————— <i>echinatus.</i>	<i>Helminthora divaricata.</i>	<i>Callithamnion sparsum?</i>
<i>Sphacelaria cirrhosa.</i>	<i>Plocamium coccineum.</i>	<i>Codium tomentosum.</i>
<i>Ectocarpus siliculosus.</i>	<i>Rhodophyllis bijida.</i>	<i>Ulva latissima.</i>
<i>Chondria dasyphylla.</i>	<i>Spyridia filamentosa.</i>	<i>Enteromorpha compressa.</i>
<i>Polysiphonia obscura.</i>	<i>Ceramium rubrum.</i>	<i>Calothrix cæspitula?</i>

I hope this outline may prove not uninteresting to botanists, and trust to be permitted, after my return to Europe, to lay before the Academy a more full memoir on this subject, accompanied by copious descriptions of the new species, and plates illustrative of the new genera, and some of the more remarkable species.

W. H. HARVEY.

MELBOURNE, September 11, 1854.

CATALOGUE of *Marine Algæ*, collected by Dr. W. H. HARVEY in *Western Australia*, from *January to August, 1854*; with *short Descriptions of the New Genera and Species*.

NOTE.—The *Numbers* between parentheses ( ) in this List are those under which the *Species* stand in a running Catalogue, kept by Dr. H., as the Collection proceeds.

SERIES I.—MELANOSPERMEÆ.

ORDER I.—FUCACEÆ.

SARGASSUM, } Several species of these genera have been collected and packed away without  
CYSTOPHORA, } examination, and are not now accessible.

1. TURBINARIA *vulgaris*, J. Ag. Fragments on the beach, Fremantle (288).
2. SCYTOThALIA *dorycarpa*, Grev. Rocks below low-water mark, common. King George's Sound, and Rottneſt (300).
3. SCYTOThALIA *dorycarpa*  $\beta$ . *xiphocarpa*; *S. xiphocarpa*, J. Ag. Thrown up from deep water at King George's Sound and Cape Riche. I consider that the characters which distinguish this plant from the preceding depend on depth of water, and exposure to currents (301).
4. SCABERIA *Agardhii*, Grev. Very common everywhere, in 2-3 fathoms (83).
5. CYSTOPHYLLUM *muricatum*, J. Ag. Common in Princess Royal Harbour, King George's Sound; and in the Swan River, from Perth to Fremantle (73).
6. CYSTOSEIRA *prolifera*, J. Ag. A single specimen on the beach, Fremantle, after a gale (287).
7. HORMOSIRA *Labillardieri*, Bory. Common near high-water mark, and at half-tide, in Princess Royal Harbour, King George's Sound. Rare at Cape Riche. Not seen elsewhere (76).
8. CARPOGLOSSUM *quercifolium*, Kütz. Rottneſt, on the reefs ( ).
9. CARPOGLOSSUM *angustifolium*, Sond. Cast ashore at Cape Riche and Fremantle ( ).
10. MYRIODESMA *serrulatum*, Dne. A few specimens picked up at Cape Riche and Fremantle, after storms (159).
11. MYRIODESMA *latifolium*, n. sp.; on the beach at Fremantle (278). My specimens not being at hand, I cannot at present further characterize this new species than by saying that it has the ramification of *M. serrulatum*, but the segments are an inch broad, densely dotted with innumerable scaphidia. It is quite different from *M. quercifolium*, Bory.
12. NOTHEIA *anomala*, Bail. and Harv. Harv. in Hook. Fl. Nov. Zel. cum icone. Parasitical on *Hormosira* in Princess Royal Harbour.

ORDER II.—SPOROCHNACEÆ.

13. SPOROCHNUS *comosus*, Ag. (?) King George's Sound and Fremantle, two or three feet long, and much stouter and more rigid than *S. pedunculatus* (13).

14. *SPOROCHNUS* sp. Fremantle (157). Being uncertain whether this or the preceding be Agardh's plant, I defer the description of either.
15. *SPOROCHNUS radiceformis*, Ag. Fremantle and Cape Riche (156).
16. *SPOROCHNUS scoparius*, n. sp.; fronde tereti rigidâ crassâ dendroideâ (2-3 pedali); caule strato velutino vestito; ramis creberrimis undique egredientibus decomposito-pinnatis angulatis glabris, minoribus erectis strictis sparsè spinosis subalternis; receptaculis ovalibus v. oblongis pedicellum ipsis multiplo longius coronantibus. At Cape Riche, and Garden and Rottneest Islands (248). I collected this at first as *Fucus inermis*, R. Br., or *F. caudatus*, Lab.; but my plant is a true *Sporochnus*, and not always unarmed.

## ORDER III.—LAMINARIACEÆ.

17. *ECKLONIA radiata*, Turn. *E. radiata* and *E. exasperata*, J. Ag. Lining most of the rocky shores at extreme low-water mark. Examination on the sea shore disposes me to unite these two supposed species. They vary extremely in roughness and smoothness, and in the comparative length of the rachis, all the forms imperceptibly running together (75).
18. *CHORDA lomentaria*, Lyngb. Clothing tidal rocks, in winter, at King George's Sound. My specimens are not fully grown, being in the state called *Asp. castaneus*, Carm. (323).

## ORDER IV.—DICTYOTACEÆ.

19. *HALISERIS Mulleri*, Sond.; stipite elongato ramoso; fronde dichotomâ v. suppressione ramorum alternè ramosâ, sinibus obtusiusculis, segmentis erectis latis linearibus integerrimis sæpè alternè divisis; laminâ crassiusculâ enervi; antheridiis sparsis. King George's Sound, Cape Riche, and Fremantle (102). Much larger and thicker in substance than *H. polypodioides* with rounded sinuses.
20. *HALISERIS pardalis*, n. sp.; stipite brevi; fronde dichotomâ, sinibus rotundatis, segmentis patentibus linearibus integerrimis repetitè furcatis subundulatis obtusis; laminâ tenui-membranaceâ enervi; soris dispositis in lineas recurvas è costâ ad marginem proficiscentibus. Fremantle, rare (155). A beautiful and distinct species, elegantly marked in dotted lines like a leopard's skin.
21. *PADINA Fraseri*, Grev. Fremantle and Rottneest, common (158).
22. *ZONARIA nigrescens*, Sond. Rocky shores, common (49). Very near *Z. variegata*, if distinct.
23. *ZONARIA interrupta*, Ag. var. *spiralis*; segmentis spiraliter tortis. Cape Riche and Rottneest (295).  
*METACHROMA*, nov. gen. *Caulis* basi radicans, cartilagineus, tereti-compressus, alternè ramosus. *Rami* infernè costati, lineares, pinnatifidi, lacinulis bicuspidatis. *Sporæ* (?) per superficiem laciniarum sparsæ, prominentes, intra perisporum hyalinum singulæ nidulantes. *Alga Australasica* radice ramoso-fibrillosâ, caule ramosissimo, ramis spiraliter tortis, laciniiis tortione spurie trifariis.
24. *METACHROMA thuyoides*, n. sp.; Middleton Bay, King George's Sound; and Cape Riche at low-water mark (21). *Fronde* 12-18 inches long, much branched. The generic name alludes to a remarkable change of colour, from olive to verdigris green, when thrown into fresh water.

25. *Dictyota Kuntzii*, Ag. Key West and Rottnest (81 and 225).  
 26. *Dictyota fastigiata*, Sond. Abundant at Cape Riche and Fremantle (167). A true *Dictyota*.  
 27. *Dictyota radicans*, n. sp.; fronde estuposâ stipitatâ basi fibris crassis sparsis è stipite et laminâ emissis radicante dichotomo-pinnatifidâ, segmentis cuneatis, lateralibus erectis, sinibus angustis, apicibus obtusissimis; soris effusis in medio parte frondis collectis. Rottnest and Garden Island (184). This species is readily marked by its rooting by a few rope-like filaments.  
 28. *Dictyota paniculata*, J. Ag. Common (14). If I rightly understand this plant it varies much in breadth and degree of ramification.  
 29. *Dictyota furcellata*, Ag.? *D. minor*, Sond. Excessively common in Princess Royal Harbour, King George's Sound, and elsewhere. In summer it comes ashore in vast banks, and is often the only plant raised from the bottom, by the dredge or hooks, in shallow water (24).  
 30. *Dictyota dichotoma*. King George's Sound and Rottnest (15).  
 31. *Dictyota ciliata*, J. Ag.? Carnac and Rottnest Islands, on shallow reefs, growing with *D. dichotoma*, from which its greener colour and ciliate margins best distinguish it (154).  
 32. *Stilophora Lyngbyæi*, J. Ag. Princess Royal Harbour in summer, very common (25).  
 33. *Hydroclathrus cancellatus*, Bory. Cape Riche, Fremantle, and Rottnest (183).  
 34. *Asperococcus sinuosus*, Ag. King George's Sound and Rottnest, &c. (27).  
 35. *Asperococcus Turneri*, Hook. *A. bullosus*, Auct. King George's Sound and Fremantle (26).  
 36. *Asperococcus echinatus*, Lx. King George's Sound ( ).

## ORDER V.—CHORDARIACEÆ.

37. *Cladosiphon?* sp. . . . King George's Sound (17). This has the habit of *Mesogloia virescens*, and I should so name it, but that the frond is certainly hollow, which character would put it in *Cladosiphon*. I am by no means, however, satisfied that this is a character of any generic importance in these plants.  
 38. *Mesogloia filum*, n. sp.; fronde simplici v. ramo uno v. altero donatâ, basi et apice attenuatâ. King George's Sound (82).

## ORDER VI.—ECTOCARPACEÆ.

39. *Sphacelaria paniculata*, Suhr. Cape Riche (297).  
 40. *Sphacelaria Novæ Hollandiæ*, Sond. Cape Riche, on rocks and shells in shallow water, common. Dredged at Fremantle (296).  
 41. *Sphacelaria cirrhosa*, Ag. On *Zostera* leaves, Fremantle, common (153).  
 42. *Ectocarpus siliculosus*, Lyngb. Very abundant at King George's Sound, in winter. Just commencing at Rottnest in June; and at Cape Riche in March (322).

## SERIES II.—RHODOSPERMEÆ.

## ORDER I.—RHODOMELACEÆ.

43. *CLAUDEA elegans*, Ag. Fremantle, very rare, June, *Geo. Clifton, Esq.* (276).
44. *MARTENSIA elegans*, Her. *M. Brunonis*, Harv. MS. Garden Island and Rottneſt, rare, May and June. My ſpecimens ſeem identical with the South African ones (170).
45. *MARTENSIA denticulata*, n. ſp.; frondibus ſeſſilibus cæſpitoſis tenui-membranaceis repetitè dichotomis, laciniis cuneatis ultimis non raro flabelliformibus; margine criſpato denticulato; fenestro apice ciliato v. lobato, lobulis demum elongatis fenestratiſque. Species valdè variabilis. Garden Island and Rottneſt, on reefs near low-water mark, June (171).
46. *MARTENSIA Australis*, n. ſp.; ſtipite cartilagineo brevi in frondem multilobatam membranaceam baſi incrassatam deſinente, margine hic illic minutiffimè denticulato; fenestro apice anguſtiſimè marginato denticulato. King George's Sound, rare, February (88).
47. *THURETIA quercifolia*, Dne. King George's Sound and Garden Island (65).
48. *SARCOMENIA deleſſerioides*, Sond. Garden Island and Fremantle (130). Three varieties occur together, viz.: *a. latifolia*, phyllodiis lato-lanceolatis; *β. lancifolia*, phyllodiis lineari-lanceolatis; *γ. cirrhosa*, phyllodiis anguſtiſſimis, ſupremis sæpiùs cirrhiferis. The plant deſcribed by me in *Ner. Austr.* as *S. deleſſerioides* is a *Deleſſeria*, namely, *D. corifolia*, H. I have now gathered Sonder's plant in abundance.
49. *SARCOMENIA hypneoides*, n. ſp.; fronde lineari anguſtiſſimâ compreſſâ diſtichè ramiſſimâ, ramis ramuliſque oppoſitiſ attenuatiſ acutiſ baſi nec anguſtatiſ; ſtichidiis lanceolatiſ ſparſiſ v. faſciculatiſ. Garden Island and Fremantle. Certainly a congener with the preceding, to which it bears preciſely the ſame relation that *Desmareſtia viridiſ* doeſ to *D. ligulata*. Both this and the preceding ſpecies are gray and irideſcent when living, but turn a brilliant roſy red after a few minuteſ expoſure to the air, and this colour is preſerved in drying (276).
50. *LENORMANDIA ſpectabilis*, Sond. Garden Island, abundant; rare at Rottneſt (113). *L. latifolia*, Harv. *Ner. Austr.* is only a broad-leaved variety. This plant varies extremely in ſize.
51. *JEANNERETTIA frondosa*, n. ſp.; caule dichotomo cartilagineo alato v. denudato; phyllodiis cuneatiſ dichotomiſ criſpatiſ, coſtâ infra medium laminæ evaneſcente; faſciculiſ ſtichidiorum ſparſiſ. Garden Island, rare (112). This plant is intermediate in character between *Jean-nerettia* and *Pollexfenia*.
52. *POLLEXFENIA pedicellata*, Harv. *Ner. Austr.*, t. 5. King George's Sound, Garden Island, and Rottneſt, common (33). *β. multipartita*; fronde anguſtiore, regulariter dichotomâ (100). *P. multipartita*, Harv. in *Herb. T. C. D.* Having collected both theſe forms in abundance, I am forced to unite them under one ſpecific name.
53. *POLYPHACUM proliferum*, Ag. King George's Sound and Fremantle (89).
54. *THAMNOCLONIUM proliferum*, Sond. King George's Sound, caſt aſhore (318).
55. *THAMNOCLONIUM flabelliforme*, Sond. Fremantle, in fragmentſ only (319).

56. *THAMNOCLONIUM Lemannianum*, n. sp.; caule corneo crasso (pedali et ultra) echinulato infernè tereti supernè alato ramoso; ramis quoquoversum directis alatis phyllodia proliferè ferentibus; phyllodiis furcatis v. dichotomis costatis basi cuneatis apice obtusis, segmentis lateralibus erectis plus minus incis. Fremantle, cast ashore in July (320). I first received this truly noble species in a collection of Western Australian Algæ, made by *Mr. Mylore*, and presented to *Herb. T. C. D.* by my late lamented friend DR. CHARLES LEMANN, of London, to whose memory this plant is now consecrated.
57. *DICTYMENIA fraxinifolia*. *Fucus fraxinifolius*, Turn. Rottnest, rare (241). I abandon the genera *Epineuron* and *Spyrymenia* as not being distinguishable from *Dictymenia*.
58. *DICTYMENIA fimbriata*, Grev. Garden Island, rare (110).
59. *DICTYMENIA tridens*, Grev. Garden Island, Rottnest, and King George's Sound (111).
60. *DICTYMENIA spiralis*, Sond. Common everywhere (20).
61. *DICTYMENIA pectinella*, n. sp.; fronde infernè valdè costatâ supernè sub-costatâ lineari distichè ramosâ planâ; ramis erecto-patentibus oppositis v. abortu alternis linearibus obtusis tenuissimè costatis ciliato-fimbriatis; ciliis oppositis argutè pectinato-pinnatifidis involutis; antheridiis magnis ovalibus ad apices ciliarum fasciculatis. Garden Island, very rare (290). A very distinct and beautiful species.
62. *KUTZINGIA canaliculata*, Sond. Abundant everywhere. Often 2 or 3 feet in length (61).
63. *KUTZINGIA angusta*, n. sp.; fronde infernè costâ cartilagineâ percursâ decompositè pinnatâ; ramis angustè-linearibus planis, superioribus tenuissimè costatis v. ecostatis; ramulis oppositis erecto-patentibus obtusis apice involutis. Rottnest, rare (242). A very much smaller, narrower, and thinner plant than *K. canaliculata*, of which it has the structure.
64. *KUTZINGIA serrata*, n. sp.; fronde basi cartilagineâ denudatâ v. alato-marginatâ bi-tripinnatifidâ et è costâ primariâ proliferâ; laciniis membranaceis planis tenuissimè costatis, junioribus, lacinulisque argutè serratis. Rottnest, very rare (291).
65. *RYTIPHLÆA Australasica*, Mont. King George's Sound, common. Rare at Garden Island (31).
66. *RYTIPHLÆA elata*. (*Rhodomela elata*, Sond.) dendroidea (1-2 pedalis); caule tereti crassissimo (2-3 lineas diametro) opaco ramoso; ramis decomposito-ramosissimis di-tri-chotomis v. vagè divisis, minoribus ramulisque patentibus transversim striatis; striis approximatis; axillis latissimis; ceramidiis ovatis pedicellatis; stichidiis ad latera ramulorum fasciculatis; siphonibus primariis 5-6 magnis, strato crasso cellularum minutarum corticatis. Cast ashore at Fremantle (304). A gigantic species, quite unlike any known to me.
67. *TRIGENIA Australis*, Sond. Cast ashore in July, Fremantle (292).
68. *ACANTHOPHORA dendroides*, n. sp.; caule incrassato indiviso infernè nudo supernè ramis alternis spiraliter evolutis vestito; ramis decompositis circumscriptione lanceolatis; ramulis spinosis, spinulis solitariis sparsis. Rottnest on the reefs, near low-water mark (224). Much the largest and most robust of the genus.
69. *ALSIDIUM? spinulosum*, n. sp.; fronde tereti crassâ dendroideâ decompositè ramosissimâ; ramis ramulisque erectis quoquoversum sistentibus; ramulis spinæformibus sparsis; ceramidiis ramulos terminantibus. Garden Island, Rottnest, and Cape Riche (180). Primary tubes in the stem, 5, very large, and full of granular endochrome.

70. *CHONDRIA dasyphylla*, Ag. King George's Sound, August (293).
71. *CHONDRIA sedifolia*, Harv. Ner. Bor. Amer. *C. zostericola*, and *C. Curdicana*, Harv., MS. Common on *Zostera* leaves, King George's Sound, and Rottnest (29).
72. *CHONDRIA corynephora*, n. sp.; fronde tereti succosâ siccitate roseâ robustâ quoquoversum ramosissimâ; ramis indivisis patentibus è latere bis terve ramosis; ramulis oppositis, fasciculatis, v. sparsis, sæpius incurvis cylindræis basi constrictis obtusissimis. Cape Riche and Garden Island (114). Much more robust than *C. dasyphylla*. It soon breaks to pieces in fresh water, by which character and others it is readily known from the following.
73. *CHONDRIA verticillata*, n. sp.; fronde tereti succosâ siccitate badiâ bis-terve umbellatim divisâ; ramulis fasciculato-verticillatis saccatis oblongis obtusissimis basi constrictis; tetrasporis in ramulis nidulantibus. Garden Island, rare (273).
74. *CHONDRIA Umbellula*, n. sp.; fronde pusillâ ( $\frac{1}{2}$ -1 unciali) simplici saccato-clavatâ apice ramulis 5-10 conformibus umbellatim coronatâ; ramulis nunc apice umbellulatis; ceramidiis ovatis sessilibus; tetrasporis sparsis (190). Rottnest, on *Zostera* leaves. A very curious and pretty little species.
75. *CHONDRIA lanceolata*, n. sp.; fronde pusillâ (1-2 unciali) compressâ cartilagineâ alternè ramosâ sub-distichâ; ramis ramulisque alternis basi et apice attenuatis acutis; ceramidiis ovatis pedicellatis; tetrasporis sub apicibus ramulorum congestis. Rottnest, on *Zostera* leaves (191).
76. *LEVEILLIA jungermannioides*. *L. Schimperii*, and *L. gracilis*, Dne. Abundant on a variety of *Algae* at Fremantle, Garden Island, and Rottnest (123).
77. *POLYZONIA Sonderi*, Harv. Ner. Austr. Garden Island, on *Fucoids* (284).
78. *POLYZONIA flaccida*, n. sp.; caule primario repente; ramis erectis simplicibus ramosive tenuissimis flaccidis oligosiphoniis; foliis (v. ramulis) alternis pectiniformibus, pectinis lacinulis 5-6 filiformibus articulatis *monosiphoniis* acutis; stichidiis arcuatis rostratis. On *Fucoids*, King George's Sound, Garden Island, and Rottnest. Much more slender, and of softer texture than *P. Sonderi*, and readily known by its one-tubed lacinulæ (34).
79. *POLYSIPHONIA Hystrix*, Harv. Ner. Austr., t. 14. Cast ashore, Garden Island (121).
80. *POLYSIPHONIA Mallardiæ*, Harv. Ner. Austr., t. 13. With the preceding (117).
81. *POLYSIPHONIA breviarticulata*, Ag. Abundant on the reefs, near low water, Rottnest (188).
82. *POLYSIPHONIA Havanensis*, Mont. (?) With the preceding, profusely common. More robust than the American plant, but otherwise very similar (118).
83. *POLYSIPHONIA infestans*, n. sp.; pallida, siccitate fuscescens; frondibus (2-3 uncialibus) cartilagineis chartæ arctè adhærentibus setaccis sursum attenuatis pellucidè articulatis ramosissimis; ramis patentibus pluries alternè v. vagè divisis ramulisque conspersis; ramulis capillaribus simplicibus patentibus; axillis latis; articulis 4-siphoniis subtorulosis, inferioribus diametro brevioribus, superioribus æqualibus v. sublongioribus. Common on *Polyphysa peniculus*, at Princess Royal Harbour, King George's Sound. It has the habit of *P. fibrillosa*, but is more nearly allied to *P. Harveyi* and *P. Binneyi* than to any other that I remember (22).
84. *POLYSIPHONIA mollis*, Harv. Ner. Austr. On *Zostera*, at Fremantle (120).



85. *POLYSIPHONIA mutabilis*, n. sp.; mollis, aëre cito deliquescens, versicolor, siccitate rosea, frondibus aggregatis (2-3 uncialibus) tenuissimè corticatis articulatis supernè ecorticatis dichotomis ramosissimis; ramis minoribus subalternè divisis erecto-patentibus; ramulis sparsis basi et apice attenuatis acutis; articulis 6-siphoniis, ramorum diametro æqualibus, ramulorum brevioribus. On *Zostera*, at Fremantle (116). Pale brown when fresh, but almost instantly changing to rose red, and soon decomposing. I have neglected to make a section of the living stem, and it is impossible to cross-cut the dried frond, and very difficult to remove from the paper the smallest scrap for examination. Three primary tubes are seen in the front view of each articulation; and in most of the branches a series of external, shorter, secondary cells appear, being the commencement of a cortical layer, which is more evident in the lower parts of the frond.
86. *POLYSIPHONIA Roeana*, n. sp.; punicea; frondibus (3-6 uncialibus) cæspitosis capillaribus mollibus chartæ arcè adhærentibus decompositè ramosissimis; ramis alternè compositis sæpè subsecundis pluries divisis; ramulis ultimis filiformibus elongatis sparsis omnibus eximè patentibus; axillis latissimis; articulis pellucidè 4-siphoniis, inferioribus diametro 4-6-plo, superioribus duplo, ramulorum sesqui-longioribus. Dredged at Fremantle in 4-5 fathoms (119). A beautiful species, allied to *P. formosa*, but quite distinct. I name it in honour of J. S. ROE, Esq., Surveyor-General of the colony, from whom I received much kind attention during my stay at Perth, and who, though not a botanist, never neglects an opportunity of promoting the science.
87. *POLYSIPHONIA rufolanosa*, n. sp.; siccitate rosea; frondibus pusillis (vix uncialibus) densissimè intertextis arachnoideis dichotomis ramosissimis suffastigiatis; ramis ramulisque patentissimis divaricato-squarrosis crispisque; axillis distantibus; articulis 4-siphoniis diametro sesquilongioribus. On the stems of *Caulinia antarctica*, Princess Royal Harbour, King George's Sound (39). To the naked eye this little plant looks like a small *Callithamnion*, or like delicate flocks of fine crimson silk. The stems are about  $\frac{1}{800}$  of an inch in diameter.
88. *POLYSIPHONIA scopulorum*, n. sp.; badia; frondibus pusillis (vix uncialibus) cæspitosis basi radicanibus rigidulis capillaribus tetragonis erectis parcè ramosis infrà simplicibus suprâ ramis lateralibus plus minùs onustis; ramis sæpè secundis erectis simpliciusculis vel ramuliferis; ramulis paucis consimilibus; axillis angustissimis; articulis diametro subduplo-longioribus, superioribus æqualibus; ceramidiis ovatis sessilibus. On littoral rocks, Rottneest, common (187). Allied to *P. rudis*, but smaller. It slightly adheres to paper in drying.
89. *POLYSIPHONIA implexa*, Hook. and Harv. Nov. Zel. Parasitic on *Corallines* and on *Caulinia* at King George's Sound (79).
90. *POLYSIPHONIA prostrata*, n. sp.; parasitica, omnino prostrata, discis rameis prorepens, rubra, siccitate fuscescens; frondibus pusillis (1-2 uncialibus) è centro radiantibus subparallelis secundè ramosis; ramis filiformibus simplicibus repentibus apice involutis; ramulis liberis paucissimis brevissimis; articulis 4-siphoniis diametro subduplo-brevioribus; ceramidiis ovatis longiusculè pedunculatis (ramos v. ramulos terminantibus). Parasitical on the fronds of *Zonaria nigrescens*, which it sometimes completely covers over with cobweb-like threads, Fremantle, rare (305).

91. *POLYSIPHONIA neglecta*, MS. Sand-covered rocks, at Middleton Bay, King George's Sound, mixed with *P. pennata* and *Callith. cymosum*. I have not fully determined this species, which requires a careful comparison with some others of similar habit (11).
92. *POLYSIPHONIA forcipata*, n. sp.; pallida, siccitate purpureo-nigrescens; frondibus subsolitariis (2-3 uncialibus) crassis cartilagineis pellucidè articulatis repetitè dichotomis v. abortu scorpioideo-secundis; ramulis ultimis bis terve furcatis apice forcipatis! articulis 6-siphoniis diametro brevioribus; ceramidiis ovatis sessilibus. On *Zostera* at Rottneest and King George's Sound (186). A distinct species, looking like a *Ceramium* to the naked eye.
93. *POLYSIPHONIA cancellata*, Harv. Ner. Austr., t. 15. King George's Sound, common (35).
94. *POLYSIPHONIA nigrita*, Sond. Garden Island and Rottneest (122).
95. *POLYSIPHONIA aurata*, n. sp.; fusco-rubra, madefactâ aurea; frondibus cæspitosis (2-3 uncialibus) capillaribus cartilagineo-membranaceis articulatis decompositè ramosis; ramis dichotomis alternisve erecto-patentibus; ramulis alternis v. secundis apice furcellatis; articulis 10-siphoniis inferioribus diametro 2-3-plo-longioribus, superioribus æqualibus; septis angustissimis; ceramidiis ovatis sessilibus; tetrasporis magnis subsolitariis. King George's Sound, rare (307). Allied to *P. furcellata* in ramification, and to *P. versicolor* in substance and colour.
96. *POLYSIPHONIA versicolor*, Harv. Ner. Austr., t. 16. King George's Sound (36), var. *β. tenuior*. With the preceding (37).
97. *POLYSIPHONIA rostrata*, Sond. On *Caulinia*, &c. Rottneest and Fremantle (115).
98. *POLYSIPHONIA pennata*, Ag. Sand-covered rocks, Middleton Bay, King George's Sound (12).
99. *POLYSIPHONIA pectinella*, n. sp.; siccitate roseo-purpurea; frondibus pusillis (uncialibus) basi radicanibus ramosis arachnoideis; ramis paucis alternis v. sparsis filiformibus simplicibus per totam longitudinem pectinatis; ramulis secundis patentissimis simplicibus brevibus obtusis; articulis 8-siphoniis diametro æqualibus v. duplo-longioribus. On mud, near high-water mark, Princess Royal Harbour, King George's Sound. A larger variety at Rottneest (38). Certainly allied to *P. Pecten Veneris*, but a far more delicate and more brightly coloured species.
100. *POLYSIPHONIA obscura*, Ag. Sand-covered rocks at Middleton Bay, King George's Sound; mixed with *P. pennata* and *P. neglecta* (47).
101. *POLYSIPHONIA Calothrix*, n. sp.; minuta, densè cæspitosa, rupestris, badia; surculo prostrato radicibus numerosissimis elongatis apice mamilloso-squamosis radicante; ramis erectis secundis simplicissimis brevissimis approximatis subacutis; articulis 10-12-siphoniis, surculi diametro duplo-brevioribus, ramorum adultorum sesquiduplo-longioribus; tetrasporis paucis in ramis nidulantibus. On rocks at half-tide level, King George's Sound (337). This spreads in wide patches, like those of *Calothrix scopulorum*, which it so closely resembles in aspect, that I had actually dried and set it aside for that plant, nor did I discover my error till after I had applied the microscope. It is a larger plant than *P. prorepens*, and very much smaller than *P. obscura*, to which it is allied.
102. *POLYSIPHONIA prorepens*, Harv. Ner. Austr. Parasitical on *Dicranema Grevillii*, at King George's Sound (306).
103. *POLYSIPHONIA cladostephus*, Mont. Garden Island and King George's Sound (271).

104. *DASYA Gunniana*, Harv. Ner. Austr., t. 17. On the reef called "The Natural Jetty," Rott-  
nest (211).
105. *DASYA elongata*, Sond. Abundant at Fremantle, and Rottnest, and King George's Sound (59).
106. *DASYA Cliftoni*, n. sp.; caule elongato (pedali et ultrà) tenui flexuoso v. scandente glabro  
omnino corticato subdistichè ramoso bi-tripinnato, pinnis patentibus glabris; pinnulis alter-  
nis remotiusculis ramellosis; ramellis multoties divaricato-dichotomis vix attenuatis obtusis  
monosiphoniis, articulis cylindræis, diametro 3-4-plo-longioribus. Dredged in Fremantle  
Harbour, by G. CLIFTON, Esq., after whom this beautiful plant is deservedly named. I also  
collected it at Garden Island and Rottnest, and afterwards at King George's Sound (164).
107. *DASYA frutescens*, n. sp.; caule (2-4 unciali) vagè ramosissimo glabro corticato; ramis quo-  
quoversum directis patentibus bis-terve divisis attenuatis, minoribus ramellis vestitis; ra-  
mellis pluries dichotomis vix attenuatis obtusis, segmentis falcato-recurvis v. incurvis, ar-  
ticulis diametro 2-3-plo-longioribus; ceramidiis sessilibus urceolatis ore porrecto; stichidiis  
minutis sessilibus oblongis acutis. Rottnest, on *Zostera*. Something like a small form of  
*D. elongata*, but with much more slender and longer jointed ramelli. It is perhaps nearer  
to *D. arbuscula*, with which, however, it does not agree (303).
108. *DASYA proxima*, n. sp.; fronde crassâ corticatâ vagè ramosâ; ramis elongatis virgatis simpli-  
cibus vel ramos 2-3 consimiles lateraliter ferentibus, ramis omnibus ramulos breves quo-  
quoversum emittentibus; ramulis corticatis simplicibus v. iterum ramosis, junioribus  
ramellis vestitis; ramellis subverticillatis dichotomis è basi latâ conspicuè attenuatis, axillis  
patentibus, apicibus filiformibus obtusis, articulis diametro 3-4-plo-longioribus; ceramidiis  
ramulos primarios terminantibus urceolatis ore brevi prominulo. Cast ashore at Middleton  
Bay, King George's Sound, August. Nearly allied to *D. elongata*, but the ramelli are very  
different, quickly melting in fresh water. It is a much larger plant than *D. naccarioides*,  
with larger ramelli and longer joints (336).
109. *DASYA collabens*, Harv. Ner. Austr., t. 21. King George's Sound, rare (58).
110. *DASYA Wrangelioides*, n. sp.; caule gracili (2-3 unciali) pellucidè articulato 10-12-siphonio  
distichè ramoso omnibus partibus ramellis vestito; ramis patentibus sursum curvatis sim-  
plicibus v. iterum alternè ramosis; ramellis densissimis multoties divaricato-dichotomis  
acutis, articulis diametro sesquolongioribus; ceramidiis . . . . .; stichidiis minutissimis  
ovato-acuminatis. Parasitical on *Caulinia antarctica*. Fremantle, King George's Sound,  
and Cape Riche. A very distinct species, named from its external resemblance to *Wran-  
gelia velutina* (272).
111. *DASYA multiceps*, n. sp.; caule subnullo (ferè bulboso!) mox in ramos numerosissimos erectos  
diviso; ramis (2-3 uncialibus) simplicibus pellucidè articulatis, articulis diametro subbre-  
vioribus polysiphoniis, pinnatis v. apice bipinnatis, ambitu linearibus v. lineari-spathulatis;  
pinnis oligosiphoniis alternis approximatis brevissimis superioribus sensim longioribus ra-  
mellosis; ramellis alternis pluries dichotomis parum attenuatis obtusis. On sand-covered  
rocks, half buried in sand, on the Natural Jetty reef, Rottnest, June. The specimens are  
not in fruit, and probably but half grown. There is an evident tendency in the upper  
pinnæ to lengthen and become compound (251).

112. *DASYA plumigera*, n. sp.; caule elato (pedali et ultrà) crasso villis stipato sub-dichotomo, segmentis ramiferis; ramis secundariis longissimis (1-2 pedilibus) caule multò tenuioribus glabris corticatis simplicibus infernè sæpè denudatis supernè pulcherrimè plumoso-pinnatis; pinnis alternis crebris horizontalibus plus minùs ecorticatis polysiphoniis iterum pinnulatis; pinnulis oligosiphoniis brevissimis ramelliferis; ramellis dichotomis attenuatis obtusis, articulis diametro 2-4-plo-longioribus; ceramidiis magnis pedicellatis inflato-ovatis ore prominulo; stichidiis minutis oblongis acutis. King George's Sound, and Cape Riche, and Garden Island; cast ashore and dredged. Also sent by *Dr. Curdie* from Cape Northumberland. A superb species, with branches like ostrich feathers (32).
113. *DASYA villosa*, Herv. Ner. Austr., t. 20. Garden Island, Rottneest, and King George's Sound (109). Very variable in size and ramification, putting on as many phases as *D. elegans*, its representative species.
114. *DASYA mollis*. Harv. Ner. Bor. Amer. King George's Sound, rare (64).
115. *DASYA Callithamnion*. *Polysiphonia Callithamnion*, Sond.! in Pl. Preiss. Abundant on the stems of *Caulinia antarctica*, &c. Rottneest and Fremantle (106).
116. *DASYA tenera*, n. sp.; cartilaginea, mox aère diliquescens, siccitate rosea; fronde tetrasiphoniâ corticatâ decompositè ramosissimâ subdichotomâ flexuosâ; ramis irregulariter divisis, minoribus sæpè secundis, ultimis attenuatis acutis, omnibus denudatis v. ramellis tenuissimis laxè vestitis; ramellis verticillatis basi ramosis subsimplicibus strictis cylindraceis obtusis; ceramidiis ovatis pedicellatis; stichidiis sparsis v. fasciculatis lanceolatis è ramulis enatis. Very common in May at Fremantle. Dredged in January and February at King George's Sound; and in March at Cape Riche. When growing it is a very pale brown, and is then crisp and brittle; but almost immediately it grows flaccid in the air, assumes a brilliant rosy red, and soon melts into a gelatinous mass (78).
117. *DASYA Lallemandi*, Mont.! *D. gracilis*, Harv. MS. Perpendicular sides of the Jetty reef, at Rottneest, and rarely on *Zostera* leaves, June. I have compared my specimens with one from the Red Sea, given me by *Dr. Montagne*, and find them to agree in all essential characters. The colour, when growing, is brownish red, becoming purple in drying. *Dr. Montagne's* specimen is faded (212).
118. *DASYA (Stichocarpus) crassipes*, n. sp.; caule incrassato hispido (3-4 unciali) vagè diviso corticato ramis articulatis onusto; ramis (2-3 uncialibus) simplicibus glabris plus minùs distinctè articulatis polysiphoniis densissimè pinnatis ambitu linearibus; pinnis brevissimis (2-3 lineas longis) oligosiphoniis dichotomo-multifidis, segmentis ultimis solùm monosiphoniis acutis, articulis diametro æqualibus vel subbrevioribus; ceramidiis magnis inflato-globosis pedicellatis. Rottneest, on the perpendicular sides of the Jetty reef, and cast ashore (189). It sometimes forms large tufts 6-8 inches in diameter, is very rigid, resists the action of fresh water; is carmine when fresh, but becomes brown in drying, and scarcely adheres to paper.
119. *DASYA pellucida*, Harv. Ner. Austr., t. 27. King George's Sound, very rare (308). More squarrose than the Cape of Good Hope plant, but otherwise the same.

## ORDER II.—LAURENCIACEÆ.

120. *DELISIA pulchra*, Grev. Rottnest Island, rare (239).
121. *ASPARAGOPSIS Sanfordiana*, n. sp.; surculo valido ramosissimo repente caules plures emittente; caulibus erectis simplicibus è basi longè nudis suprâ ramellis thyrsoideo-penicillatis; penicillis ramellorum quoquoersum egredientibus eximiè obtusis; pinnellis oppositis filiformibus crispato-incurvis; ceramidiis globosis infernè in pedunculo clavato attenuatis. Garden Island and Rottnest. A very distinct and noble species, much larger and more robust than *A. Delilei*, with which, however, I cannot at present further compare it. The much-branched surculi are as thick as crowquills; the stems, equally thick, are 3–8 inches long, or more, ending in a very dense, deep purple coma. The fasciculi of ramelli are remarkably *obtuse* in outline. I name it in honour of W. A. SANFORD, Esq., Colonial Secretary of Western Australia, with whom I had some pleasant sea-side walks, and to whom, during my stay in the colony, I am indebted for much kind attention and assistance (124).
122. *ASPARAGOPSIS armata*, n. sp.; surculo ultra-setaceo parum ramoso repente caules plures emittente; caulibus erectis ramosis usque ad basin ramellis obsitis v. brevissimè nudis; ramis secundariis consimilibus ad basin armatis ramulis subternis nudis retrorsum aculeatis; penicillis ramellorum subdistichis ambitu ovatis acutis; pinnellis oppositis; ceramidiis globosis; pedunculo cylindraco. Garden Island and King George's Sound (193). Also from Tasmania, *R. Gunn, Esq.* Whether this be what I have figured for *A. Delilei*, in *Ner. Austr.*, t. 35, I cannot at present say, not having the book at hand. If not, I at least confounded it with that species. It differs from the European plant in having branched stems, feathered with ramelli nearly to the base; and in having two or three naked branchlets armed with reflexed prickles issuing from the lower side of every main branch, near the base. The frond is from 6–10 inches long, twice as thick as hog's bristle, and of a pale red colour.
123. *LAURENCIA Forsteri*, Grev. On *Caulinia* stems, &c., very common (103 and 126). No. 126 is var. *β. elata*, Sond. A much larger and stronger form than the common one.
124. *LAURENCIA obtusa*, Lx. King George's Sound and Rottnest, on *Algæ* (67).
125. *LAURENCIA* sp. . . . On rocks, King George's Sound and Rottnest, near low-water (6). Either a larger form of *L. obtusa*, or a new species.
126. *LAURENCIA affinis*, Sond. Cape Riche (310).
127. *LAURENCIA arbuscula*, Sond. Cape Riche (309).
128. *LAURENCIA cruciata*, n. sp.; livido-purpurea, cæspitosa; fronde tereti rigidâ quoquoersum ramosâ; ramis ramulisque patentissimis oppositis verticillatisve rarè alternis, ramulis junioribus cylindricis truncatis, fructiferis verrucoso-glandulosis. This requires to be compared with *L. paniculata*, J. Ag., of which I have no specimen. My plant is extremely hard and rigid, scarcely adhering to paper after two days' maceration in fresh water. Agardh compares his plant with *L. obtusa*, with which mine cannot be confounded. On *Caulinia* stems, Rottnest (209).
129. *LAURENCIA heteroclada*, n. sp.; densissimè cæspitosa, è surculis repentibus orta; fronde livido-purpureâ tereti rigidâ tenaci; juniore pluries secundè ramosâ, ramis ramulisque erecto-

- apressis, axillis angustissimis; adultâ apice paniculatâ, ramis quoquoversum egredientibus elongatis patentibus, ramulis alternis spiraliter insertis corymboso-multifidis; ceramidiis ovatis sessilibus. Clothing the borders of reefs laid bare at low water, and covering wide spaces, Rottnest (210). Nothing can be more dissimilar in ramification than the young and the full-grown plant.
130. *LAURENCIA* sp. . . . On rocks near low-water mark, King George's Sound (7). I have not determined this species.
131. *LAURENCIA Tasmanica*, Hook. and Harv. Abundant on stones in shallow water in Princess Royal Harbour, King George's Sound (5).
132. *LAURENCIA elata*, Harv. Ner. Austr., t. 33. Garden Island, Rottnest, and King George's Sound (125).
133. *LAURENCIA Grevilleana*, n. sp.; purpureo-coccinea; fronde complanatâ eximie distichâ decomposito-pinnatâ; pinnis in rachide strictâ alternis erecto-patentibus; pinnulis oblongis inciso-crenatis v. pinnatifidis, inferioribus minutis glandula-formibus, fructiferis . . . Abundant on the under surface of flat-topped reefs, near low-water mark, Rottnest (196). Allied to *L. pinnatifida*, but of softer substance, and very different colour. When fresh it is a beautiful rosy carmine, partially preserved in drying. I name it in honour of Dr. GREVILLE, the first reformer of this genus.
134. *LAURENCIA* sp. . . . Rottnest (197). Near *L. distichophylla*, J. Ag.? It requires further examination. Besides these species of *Laurencia* here enumerated, I have collected two or three others in small quantity, which for the present I suppress.
135. *LOMENTARIA zostericola*, n. sp.; fronde pusillâ (1-2 unciali) paniculatim ramosâ ambitu ovatâ; caule basi inconspicue articulato supra toruloso; ramis ramulisque patentibus suboppositis v. verticillatis (nunc sparsis) obtusis articulato-constrictis, articulis diametro brevioribus v. subæqualibus; ceramidiis globosis sparsis v. aggregatis. On *Zostera* at Rottnest (195). The spores are affixed to a very large placenta, nearly filling the cavity of the ceramidium.
136. *CHAMPIA parvula*. *Lomentaria parvula*, Ag. King George's Sound and Rottnest (57).
137. *CHAMPIA affinis*. *Lomentaria affinis*, Ag. King George's Sound, Rottnest, and Garden Island (194).
138. *CHAMPIA compressa*, Harv. Rottnest, rare (245).

## ORDER III.—WRANGELIACEÆ.

139. *WRANGELIA penicillata*, Ag.! *W. plumosa*, Harv.! Alg. Tasm. On *Zostera* leaves at Rottnest, abundant (198). Much more robust than a Mediterranean specimen with which I have compared it, but very similar to one from Florida. My *W. plumosa* from Tasmania seems to differ solely in being more luxuriant, so far as I can judge from a very poor specimen now before me.
140. *WRANGELIA? Agardhiana*, n. sp.; fronde cartilagineâ (6-8 unciali) corticatâ decompositè ramosissimâ; ramis ramulisque dichotomo-alternis pluries divisus patentissimis ad genicula verticillatim ramellosis; ramellis minutissimis dichotomo-multifidis obtusis; articulis ramel-

- lorum diametro sesquolongioribus. Dredged in 6-7 fathoms in King George's Sound (40). I have seen no fruit, but have little hesitation in referring this fine species to *Wrangelia*. It seems nearly allied to a plant from Cape Northumberland, distributed by me under the MS. name of *Crouania insignis*, but which is perhaps also a *Wrangelia*.
141. *WRANGELIA velutina*, H. *Dasya velutina*, Sond.! Common at Rottneſt and Garden Island, rare at King George's Sound (108). I have found both the cystocarpic and tetrasporic fruits, which are exactly as in other species of *Wrangelia*.
142. *WRANGELIA myriophylloides*, n. sp.; fronde rigidiusculâ è basi articulatâ ecorticatâ infernè stuſoſâ pinnatim ramoſâ; ramis patentibus simplicibus v. iterum pinnatis ad genicula verticillatim ramelloſis; ramellis pluries trichotomis ſegmentis patentibus apice trifurcis acutiſſimis; fructu . . . Parasitical on the larger *Fucoids*, Rottneſt (246). A very diſtinct ſpecies.
143. *WRANGELIA Nitella*, n. sp.; fronde membranaceâ flaccidâ è basi articulatâ (articulis diametro 4-6-plo-longioribus) ecorticatâ decompoſitè pinnatâ; ramis ramuliſque ſæpiùſ oppoſitis diſtichis ad genicula verticillatim ramelloſis; ramellis di-tri-chotomo-multifidiſ ſegmentis patentibus acutiſſimis; tetrasporis globoiſ ad ramelloſ ſeſſilibus; cystocarpiis . . . Caſt aſhore at King George's Sound and Rottneſt, rare (213). Very ſimilar in external habit to *W. multifida*, but much more nearly allied to *W. squarroluſa* and *W. myriophylloides*. It iſ a much ſmaller and more flaccid plant than the latter, and cloſely adheres to paper in drying. Many of the branches, on my ſpecimens, end in nearly naked cirrhoſe prolongations, indicating that they come from deep water.
144. *WRANGELIA Haluruſ*, n. sp.; roſea, gelatiſo-membranacea (aquâ dulci cito deliquoſcens); fronde è filo repente ortâ articulatâ ecorticatâ vagè ramoſâ; ramis elongatiſ ſimplicibus baſi et apice attenuatiſ ad genicula verticillatim ramelloſis; ramelliſ dichotomo-multifidiſ patentibus obtuſiſ; articuliſ ramorum diametro 2-3-plo, ramelloſum multiplo-longioribus; cystocarpiis ramuloſ abbreviatoſ coronantiſ. On *Caulinia* ſtemſ at Fremantle and King George's Sound (127). Very ſimilar in aſpect to *Haluruſ equiſetifoliuſ*, but much ſofter, of paler colour, and ſoon decompoſing. The *cystocarps* are thoſe of a *Wrangelia*.
145. *WRANGELIA? abietina*, n. sp.; fronde cartilagineâ craſſâ elongatâ (6-10 unciſ longâ) corticatâ decompoſitè pinnatâ; pinnis pinnuliſque alterniſ diſtichis ſubhorizontalibuſ, ulimiſ ſubarticulatiſ tenuiter corticatiſ, ad genicula verticillatim ramelloſis; ramelliſ dichotomiſ incurviſ obtuſiſ; articuliſ diametro 3-4-plo-longioribus. Garden Island, rare (270). Poſſibly a ſpecies of *Haluruſ*.
146. *WRANGELIA? tenella*, n. sp.; puſilla (1½ uncialiſ), cæſpitoſa; fronde tenuiſſimâ membranaceâ è baſi articulatâ ecorticatâ vagè ramoſâ; ramis ſubſimplicibuſ nunc iterum ramoſiſ elongatiſ virgatiſ per totam longitudinem bipinnatiſ; pinnis breviffimiſ (vix ſemilineam longiſ) oppoſitiſ v. verticillatiſ, pinnuliſ 2-3-cellularibuſ obtuſiſ; articuliſ ramorum diametro 4-plo, pinnaruſ 2-3-plo, pinnularuſ ſeſquolongioribuſ. On the Jetty reef, Rottneſt, rare (285). I am doubtful whether to place this ſpecies in *Wrangelia* or *Callithamnion*; but place it provisionally in the former, on account of the tendency to verticillation in the pinnae and ramelli.

## ORDER IV.—CORALLINACEÆ.

147. *AMPHIROA charoides*, Lx. King George's Sound, Cape Riche, and Rottnest, on rocks (9).
148. *AMPHIROA intermedia*, n. sp.; fronde gracili (biunciali) fastigiata sub-tetrachotomâ, ramulis stellatim patentibus verticillatis; articulis cylindraceis basi et apice nodoso-incrassatis, superioribus diametro 8-plo-longioribus; geniculis angustissimis; ceramidiis ad ramulos secundis. On *Caulinia* stems, Rottnest (282). A much smaller plant than *A. charoides*; and differing from *A. stelligera* in the shorter nodes, &c.
149. *AMPHIROA stelligera*, Dne. On *Caulinia*, King George's Sound, and Rottnest, common (4).
150. *AMPHIROA gracilis*, n. sp.; fronde lapidescente di-tri-chotomâ fastigiata; articulis cylindraceis basi et apice truncatis diametro multoties (10-14-plo) longioribus; geniculis diametro æqualibus; ceramidiis numerosissimis quoquoersis. King George's Sound and Rottnest, common (218).
151. *AMPHIROA granifera*, n. sp.; fronde lapidescente di-tri-chotomâ fastigiata; articulis cylindraceis, inferioribus basi et apice nodoso-incrassatis, superioribus simplicibus diametro 6-8-plo-longioribus; geniculis diametro æqualibus, inferioribus calcareo-granulosis, superioribus cartilagineis nudis; ceramidiis ad ramulos secundis. On *Caulinia* at King George's Sound and Rottnest, common (283).
152. *AMPHIROA Ephedra*, Lx. Fremantle, *G. Clifton*, Esq. (289).
153. *AMPHIROA anceps*, Lx. Rottnest, not common (281).
154. *AMPHIROA australis*, Sond. In dark hollows of the reefs, Rottnest (217).
155. *AMPHIROA* sp. . . . Rottnest, growing with *A. australis*, to which it is allied (219). The specimen retained for description has become broken in travelling, and I therefore leave this plant undescribed for the present.
156. *CHEILOSPORUM pulchellum*, n. sp.; fronde pusillâ brevi stipitata dichotomâ flabelliformi fastigiata; articulis sagittatis medio costatis sæpè transversim rugulosis diametro sesquilongioribus, lobis brevibus acutis erectis; ceramidiis . . . . At Rottnest, parasitical on *Alger* (250). A much smaller and more delicate plant than *C. sagittatum*, and differing from that and *C. cultratum*, to which it is more nearly allied, in the erect, not patent, and shorter lobes of the articulations.
157. *JANIA micrarthrodia*, Lx. Common on *Caulinia* and *Algae*, &c. (53).
158. *JANIA affinis*, n. sp.; fronde pusillâ dichotomâ, ramis ramulisque erectis strictiusculis; axillis acutis; articulis omnibus cylindraceis diametro triplo-longioribus; ceramidiis parvis urnæformibus. Rottnest ( ). The size of *J. micrarthrodia*, but with much longer joints and more erect growth. It may be *J. pacifica*, Aresch.
159. *JANIA Cuvieri*, Lx. Many varieties of this species abundant (3).
169. *MASTOPHORA plana*, Sond. Extremely common on rocks, Rottnest (50).
170. *MASTOPHORA Lamourouzii*, Dn. King George's Sound and Cape Riche ( ).



## ORDER V.—SPHÆROCOCCHOIDEÆ.

171. *DELESSERIA denticulata*, n. sp.; fronde costatâ dichotomâ rigidiusculâ; segmentis lato-linearibus crispato-undulatis margine denticulatis; costâ opacâ cartilagineâ apicem versus evanescente; membranæ cellulis parvis rotundato-hexagonis; venis nullis; soris in sporophyllis muricatis è costâ prorumpentibus. Parasitic on *Algæ*, Rottnest (235). Of a rigid substance, scarcely adhering to paper. 3-4 inches high, the branches  $\frac{1}{4}$  inch broad.
172. *DELESSERIA crispatula*, n. sp.; pusilla (1-2 uncials); fronde costatâ dichotomâ; segmentis linearibus integerrimis undulato-crispatis, costâ articulatâ 3-siphoniâ; venis nullis; soris in sporophyllis propriis è costâ enatis v. rarò in segmentis terminalibus. Fremantle, on *Caulinia*, rare (129). Analogous to *D. alata*, but differing in the articulated midrib and absence of lateral veins.
173. *DELESSERIA spathulata*, Sond.? On *Zostera*, *Caulinia*, and various *Algæ*. Rottnest and King George's Sound. I am not quite sure that my plant and Sonder's are the same. Mine is analogous to *D. ruscifolia*, as the following is to *D. Hypoglossum* (203).
174. *DELESSERIA hypoglossoides*, n. sp.; pusilla, decumbens; fronde costatâ foliolis è costâ tenui articulatâ trisiphoniâ prorumpentibus ramosâ; foliolis lineari-lanceolatis planis utrinque acutis, venis nullis. In crevices of rocks at Garden Island and Rottnest (172). So like *D. Hypoglossum* as not to be known without microscopic examination. Then indeed the articulated midrib at once characterizes it.
175. *DELESSERIA dendroides*, n. sp.; caule elongato nudo carnosò-cartilagineo crassissimo (2-3 lineas diametro) apice in frondem ramosissimam desinente; fronde costatâ foliolis è costâ validâ prorumpentibus ramosâ; foliolis geminis exactè oppositis lineari-lanceolatis utrinque acutis, adultis costâ cartilagineâ opacâ, junioribus costâ articulatâ percursis; venis nullis; membranæ cellulis strato unico dispositis magnis oblongis. Fremantle, rare, *G. Clifton, Esq.* (269). A superb species of the *Hypoglossum* section, resembling a beautiful tree, a foot or 18 inches high, with a trunk-like stem 6-8 inches long, supporting a large head of branches. The ramification is similar to that of *D. oppositifolia*, but the substance of the leaf is of a very different structure. It closely adheres to paper.
176. *DELESSERIA revoluta*, n. sp.; fronde costatâ foliolis a costâ validâ infra apicem revolutum prorumpentibus ramosâ; foliolis ovalibus latitudine sesqui vel subduplo-longioribus tenui-membranaccis undulatis denticulatis apice obtusè acuminatis revolutis; soris? —. On other *Algæ*, King George's Sound, and Rottnest, rare. 2-3 inches high. Very unlike any previously described species (311).
177. *DELESSERIA corifolia*, n. sp.; fronde costatâ foliolis a costâ crassâ prorumpentibus ramosâ; foliolis cartilagineo-carnosis crassis opacis lanceolatis basi ovatis obtusis; membranæ cellulis pluriserialibus, interioribus magnis, superficialibus minutissimis; cystocarpis sorisque in sporophyllis propriis è costâ enatis. Garden Island and Rottnest, rare (279). My specimens are few and far from complete, but sufficient to establish a very distinct species, with remarkably thick and densely cellular leaves. It most resembles *D. nereifolia*, but has a very different structure. It was small scraps of this plant which I described in *Ner. Austr.* under *Sarcomenia delesserioides*.

178. *HEMINEURA crispata*, n. sp.; fronde pinnatifido-decompositâ, lobis oblongis basi et apice angustatis obtusis oppositis margine subintegerrimis undulato-crispatis demum crispatissimis; costâ immersâ supernè evanescente, costulis obsolete; coccidiis in costâ loborum sessilibus ore producto rostratis; soris rotundato-hemisphæricis convexis secus marginem seriatis. Rottnest and King George's Sound. Sent also by *Dr. Curdie* from Cape Northumberland (312). A smaller plant than *H. frondosa*.
179. *NITOPHYLLUM cartilagineum*, n. sp.; fronde sessili aveniâ cartilagineo-membranaceâ rigidâ crassâ dichotomâ; laciniis linearibus pluries divisis crispato-undulatis obtusis patentibus; axillis rotundatis; soris minutis impressis per totam frondem sparsis. Garden Island, not uncommon (131). Remarkably thick in substance, shrinking in drying, and imperfectly adhering to paper. Colour, brownish red.
180. *NITOPHYLLUM fimbriatum*, n. sp.; fronde pusillâ (1-2 unciali) bifidâ v. pluries furcatâ basi cuneatâ stipitatâ; stipite brevi in costâ mox evanescente prolongato; laciniis rotundatis; margine processibus minutis ramosis densè fimbriato; soris per totam laminam sparsis. Parasitical on *Ptilota coralloidea*, at Garden Island, rare (268). I suspect my specimens are not fully grown, though one of them is in fruit. The elegantly fringed margin at once marks the species.
181. *NITOPHYLLUM pulchellum*, n. sp.; pusillum (sub-biunciale), tenuissimè membranaceum, roseum. cæspitosum; fronde sessili aveniâ dichotomâ fastigiâtâ; laciniis lato-linearibus v. cuneatis undulato-crispatis patentibus obtusis; axillis rotundatis; soris rotundatis majusculis per totam frondem sparsis. King George's Sound and Rottnest, on various *Alga*. Like a miniature *N. punctatum*, to which species it is perhaps too nearly allied (60).
182. *NITOPHYLLUM minus*, Sond. Garden Island and Rottnest (181).
183. *NITOPHYLLUM ciliolatum*, n. sp.; fronde cæspitosâ sessili angustè-lineari dichotomâ ramosissimâ ciliolis marginalibus et superficialibus passim echinulatâ. On *Caulinia*, &c., King George's Sound (30). Very similar to *N. minus*, except in the presence of the ciliæ, which I find constant in very numerous specimens examined.
184. *Nov. Gen.?* My number (141) from Garden Island appears to belong to a new genus, allied to *Nitophyllum*; but without the cystocarpic fruit it is impossible to determine it.
185. *PHACELOCARPUS Labillardieri*, Endl. Common at Rottnest and Garden Island (134).
186. *PHACELOCARPUS alatus*, n. sp.; fronde costatâ; costâ elevatâ benè definitâ utroque latere laminâ angustâ alatâ; ciliis subulatis distichis. Rottnest (261). Half the breadth of *P. Labillardieri*, with a more strongly defined midrib and less deeply pinnatifid lamina. I suspect that several species are confounded under the name *L. billardieri*.
187. *HERINGIA?* *filiformis*, n. sp.; fronde cæspitosâ, è surculis repentibus ortâ setaceâ filiformi v. apice compressâ vagè ramosâ subdichotomâ rigidiusculâ. Garden Island, rare (182). Similar to *H. mirabilis* in structure, but the fruit is unknown.
188. *DICRANEMA filiforme*, Sond. Garden Island (133).
189. *DICRANEMA Grevillii*, Sond. King George's Sound, Cape Riche, Garden Island, and Rottnest (97).
190. *DICRANEMA revolutum*, Ag. On *Caulinia*, in shallow water. Cape Riche (128).

191. *DICRANEMA pusillum*, n. sp.; fronde unciali subdichotomâ v. vagè ramosâ, apicibus fructiferis strictis; tetrasporis in ramulis immutatis sparsis. Dredged near Emu Point, King George's Sound, on *Caulinia* stems. About the size of *D. revolutum*, but readily known by its straight apices, those bearing tetraspores not swollen. The cystocarps are near the tips of the branchlets (80).
192. *CALLIBLEPHARIS? Preissii*, Ag. Garden Island and Fremantle (138). I have not satisfactorily ascertained the genus of this plant.
193. *CALLIBLEPHARIS conspersa*, n. sp.; fronde stipitatâ cartilagineâ simplici vel parcè dichotomâ a margine pinnatâ; pinnis variè lobatis et fimbriatis nunc multifidis margine dentato-aculeatis ciliatisve; disco aculeis v. lobulis ramosis consperso; coccidiis per totam laminam sparsis. Garden Island (132). Like *C. ciliata* in habit, and very variable in form, and readily known by its scattered cystocarps.
194. *CALLIBLEPHARIS? pannosa*, n. sp.; fronde stipitatâ rubro-sanguineâ v. purpurascente cartilagineo-corneâ rigidâ dichotomâ; laciniis linearibus è margine densissimè pinnato-fimbriatis; pinnis angustissimis patentibus simplicibus v. pinnatim compositis vagè dentatis v. ciliatis; coccidiis . . . . . Abundant on rocks near low-water mark, Middleton Bay, King George's Sound, and at Rottnest, east ashore (98). I have seen no fruit, but the habit and structure agree with those of *Calliblepharis*.
- SARCOCLADIA*, nov. gen. *Frons* plana, cartilagineo-carnosa, crassa, multifida, duplici strato constituta; stratum interius cribroso-spongiosum è cellulis brevibus anastomosantibus et lacunis intercellularibus; exterius è cellulis minutis verticaliter seriatis constitutum. *Cystocarpia* marginalia, elevata, hemisphærica, umbilicata; pericarpium cellulosum, crassum; sporæ minutæ in filis è placentâ centrali radiantibus seriatae. *Tetrasporæ* . . . . *Alga* livido-rubra, siccitate nigrescens, ramosissima, subdichotoma; margine revoluta.
195. *SARCOCLADIA obesa*, n. sp.; abundant at King George's Sound and Rottnest (280).
196. *THYSANOCLADIA oppositifolia*, Ag. *T. pectinata*, Harv.! Ner. Austr. Common at Garden Island and Rottnest. Sometimes two feet long (165).
197. *THYSANOCLADIA laxa*, Sond.; fronde livido-purpureâ siccitate fuscescente planâ, infernè medio-incrassatâ v. subcostatâ, supernè ecostatâ, distichè decomposito-pinnatâ; pinnis lato-linearibus approximatis patentibus suboppositis; pinnulis erectiusculis lato-linearibus planis basi angustatis simplicibus vel trifurcis; axillis pinnularum eximiè rotundatis; soris tetrasporarum in apicibus dilatatis immersis. Rottnest, rather rare (237). Livid purple, with a slight bloom when fresh. Very distinct from *T. oppositifolia*.
198. *THYSANOCLADIA costata*, n. sp.; fronde planâ costâ validâ percursâ distichè decomposito-pinnatâ ambitu ovatâ; pinnis patentibus approximatis suboppositis costatis; pinnulis argutè serratis subcostatis; coccidiis . . . Rottnest (260). A very handsome plant, 12-14 inches high, readily known by its strong midrib.
199. *THYSANOCLADIA coriacea*, Harv. Ner. Austr., t. 36. Rottnest and Garden Island, common (105). The cystocarps are crowded near the ends of the ramuli exactly as in *T. dorsifera*.
200. *GRACILARIA confervoides*, Grev. Abundant at Fremantle (166).
201. *GRACILARIA dactyloides*, Sond. Garden Island and Rottnest, not uncommon (178). My plant

is a true *Gracilaria*, but requires to be compared with Sonder's, which is said to be *terete*, while mine is strongly compressed.

202. *GRACILARIA fruticosa*, n. sp.; fronde rubro-coccineâ siccitate fuscescente compressâ quoquo-versum ramosâ; ramis crebris patentissimis bis terve divisis; ramulis alternis v. secundis vagè spinoso-armatis acutis; coccidiis . . . Fremantle, rare (179). Nearly allied to *G. armata*, but of softer substance, and compressed. The peripheric cells are in a single row.
203. *GRACILARIA* sp. . . King George's Sound (95). Not in fruit. I have not been able to determine this species satisfactorily.

## ORDER VI.—SQUAMARIEÆ.

204. *PEYSSONELIA rubra*, Grev.? Rottnest, a solitary specimen (316). If not the same as the Mediterranean plant, it is very nearly allied to it.
205. *CRUORIA? australis*, n. sp.; fronde pusillâ ovali roseâ, filis verticallibus simplicibus, articulis diametro subduplo-longioribus, cystocarpis è basi frondis erectis magnis oblongis. Parasitical on *Amphiroa australis*, at Rottnest (317). I am doubtful of the genus, not having found tetraspores on many specimens examined. The filaments most resemble those of a *Cruoria* or *Petrocelis*; but the habit is that of an *Actinococcus*. The cystocarps in my plant are oblong, consisting of dichotomous strings of spores, either whorled round a vertical axis, or proceeding from a central point.

## ORDER VII.—GELIDIACEÆ.

206. *GELIDIUM corneum*, Lx. King George's Sound, not common (43). Some of the very dwarf varieties are frequent, near high-water mark, on all the rocky shores. Near Arthur's Head, Fremantle, grows abundance of what I suppose to be *Acrocarpus ramellosus* of Pl. Preiss. One or two specimens of a dichotomous *Gelidium*, resembling *G. variable*, were gathered at Rottnest.
207. *GELIDIUM proliferum*, n. sp.; fronde infernè semiterete crassissimâ, supernè compresso-planâ v. applanatâ decompositè pinnatâ et proliferâ, setis minutis demum foliaceis densissimè muricatâ; pinnis pinnulisque lato-linearibus planis, pinnulis erecto-patentibus; cystocarpis bilocularibus in processis filiformibus simplicibus v. pinnatis è pinnulis emissis immersis. Fremantle, thrown up after storms (244). A very distinct species, much the largest of the genus. I have long possessed imperfect specimens collected by *Messrs. Mylne* and *Backhouse*.
208. *PTEROCLADIA lucida*, J. Ag. King George's Sound and Rottnest (44). The King George's Sound specimens agree closely with those from New Zealand. The Rottnest plant may possibly belong to a new species, but requires very careful examination.
209. *EUCHEUMA speciosum*, J. Ag. Fremantle and Rottnest (232). The *Jelly* or Blanc-mange weed of the colonists.

210. *SOLIERIA australis*, n. sp.; fronde dendroideâ (1-2 pedali) robustâ decomposito-ramosissimâ; ramis alternis sparsive approximatis pluries alternè compositis; ramulis ultimis (1-2 uncialibus) linearibus acutis basi setaceo-attenuatis; cystocarpis in ramulis semi-immersis. Fremantle and King George's Sound (150). A noble species, much more robust and branching than *S. chordalis*, and readily known, even in fragments, by the *acute*, but not *acuminate* apices.
211. *HYPNEA musciformis*, Ag. King George's Sound and Rottnest, common (16).
212. *HYPNEA episcopalis*, Hook. and Harv. Rottnest, rare (252). My specimens have fruit of both kinds, further establishing this species, whose crosier-like tendrils and scarlet colour are truly episcopal.
213. *HYPNEA seticulosa*, J. Ag. Rottnest and King George's Sound (70).
214. *HYPNEA divaricata*, J. Ag. King George's Sound (69).
215. *HYPNEA* sp. . . . Rottnest, on the reefs (253). } Not ascertained.
216. *HYPNEA* sp. . . . Rottnest, on the reefs (222). }

## ORDER VIII.—CHÆTANGIÆ.

*HENNEDYA*, nov. gen. *Caulis* teres, ramosus; ramis apice in frondem planam dichotomam stratis tribus contextam dilatatis; stratum *medullare* è filis tenuissimis anastomosantibus densissimè intertextis; *intermedium* cellulis magnis vacuis uniseriatis; *periphericum* cellulis minimis verticaliter ordinatis compositum. *Cystocarpia* hemisphærica, elevata, umbilicata, demum poro pertusa, ad apices laciniarum sessilia, fasciculos sporarum secus parietes loculi dispositos foventia. *Tetrasporæ* . . . *Alga* australis, fusco-rubra, rigidè membranacea, multoties dichotoma; laciniis crispatis lato-linearibus apice emarginatis.

217. *HENNEDYA crista*, n. sp.; Garden Island and Rottnest, abundant (168). Readily known from *Chaetangium* by the single row of large cells forming the intermediate stratum of the frond, and by the completely external fruit. It grows in large tufts, often a foot in diameter. The frond is deep red when growing, and remarkably crisped and curled. The cystocarps are formed in a little notch at the extreme end of the lacinia. The generic name is given in honour of Mr. ROGER HENNEDY, of Glasgow, a most able and indefatigable investigator of the Algæ of the West of Scotland.

## ORDER IX.—HELMINTHOCLADIÆ.

218. *HELMINTHORA divaricata*, J. Ag. Rottnest and King George's Sound in winter, common (234).
219. *LIAGORA viscida*, Ag. King George's Sound and Cape Riche, common (8).
220. *LIAGORA distenta*, Ag. Cape Riche, rare (313).
221. *LIAGORA Cheyniana*, n. sp.; fronde gelatinosâ compressâ siccitate subcanaliculatâ dichotomâ ramosissimâ; ramis erecto-patentibus argenteis villo purpureo tomentosis, apicibus divaricatis; filis periphericis liberis cylindraccis furcatis. At Cape Riche (294). *Frond* 6-8

inches high, nearly a line in diameter, much branched, dichotomous, rarely with lateral branches. The peripheric threads extend beyond the calcareous portion, and form a purple tomentum to the branches, as in *Microthoe*. This fine plant is named in compliment to GEORGE CHEYNE, Esq., of Cape Riche, at whose hospitable house I resided during my residence on that part of the coast.

222. *MICROTHOE lapidescens*, Dne.? *Galaxaura lapidescens*, Lx.? Reefs at Rottnest (221). This is certainly a *RhodospERM*, and nearly related to *Liagora*. When living it is clothed with dense, dark purple villosity, composed of *Callithamnoid* filaments.
223. *MICROTHOE marginata*, Dne.? On the reefs, at Rottnest, and cast ashore at King George's Sound (96). I have no authentic specimen at hand to compare with. Mine spring from short, dichotomous, cylindrical, woolly stems, which, had they been found disconnected, would pass for a separate species. The upper frond is flat, slightly inflexed at the margin when dry, repeatedly dichotomous, and deep purple red.

## ORDER X.—RHODYMENIACEÆ.

224. *HYMENOCLADIA?* *divaricata*, n. sp.; fronde planâ roseâ gelatinoso-membranaceâ decompositè pinnatâ, rachide flexuosâ basi et apice attenuatâ, pinnis pinnulisque lineari-lanceolatis attenuatis patentibus, pinnulis ultimis setaceis minutis horizontali-divaricatis; cystocarpis ad discum vel marginem laminæ insidentibus sparsis; tetrasporis magnis triangulè divisus per ramos majores distributis. King George's Sound (68). I venture to refer this plant to *Hymenocladia*, J. Ag., a genus founded on *Fucus Usnea*, R. Br., whose cystocarps are unknown, and which is temporarily placed by J. Agardh in *Laurenciaceæ*. My plant has a similar habit and internal structure, and similar tetraspores; but the nucleus of its cystocarp is formed of strings of cells radiating from a basal placentia; if I mistake not, on the plan of those of a *Rhodymeniaceæ*, though the spores are of unusually large size in this order, and more resemble those of a *Sphaerococcoid* plant. The external habit is not unlike that of *Gigartina Teedii*.
225. *HYMENOCLADIA?* *Ramalina*, n. sp.; fronde planâ roseâ membranaceâ ramosissimâ, ramis subpinnatim 2-3-divisus alternis oppositisque patentibus basi et apice attenuatis, ramulis ultimis subulatis v. filiformibus elongatis horizontaliter patentibus; fructu. . . . King George's Sound, rare (87). A less gelatinous plant than the last, imperfectly adhering to paper, more irregularly branched, less compounded, and with much longer ramuli.
226. *PLOCAMIUM procerum*, Ag. Very common everywhere (94).
227. *PLOCAMIUM Mertensii*, Grev. Rottnest (140 and 259).
228. *PLOCAMIUM Preissianum*, Sond. King George's Sound and Rottnest (86).
229. *PLOCAMIUM coccineum*, Lyngb. King George's Sound and Rottnest (72).
230. *RHODOPHYLLIS bifida*, Kütz. Garden Island, rare (145).
231. *RHODOPHYLLIS volans*, n. sp.; cæspitosa, è filis intertextis orta; fronde membranaceâ roseâ subdichotomâ vel vagè partitâ, segmentis linearibus patentibus margine simplicibus vel sæpissimè pinnatis; pinnis ovalibus oblongisve obtusis basi attenuatis subpetiolatis; cysto-

- carpiis per discum frondis sparsis; tetrasporis in pinnis nidulantibus zonatim divisis. King George's Sound (93) and Rottnest (142). A pretty little species, with the habit of *Hemineura frondosa* in miniature; and readily known by its scattered, not marginal, cystocarps.
232. RHODYMENIA *corallina*, Grev. King George's Sound and Rottnest (85).
233. RHODYMENIA (*Acropeltis*) *australis*, Sond. Abundant at Rottnest (144). I have gathered both kinds of fruit. The *cystocarps* are in every respect similar to those of *Rhodymenia*.
234. RHODYMENIA (*Acropeltis*) *phyllophora*, n. sp.; caulescens; stipite alato ramoso, ramis in frondes pergamenas crassas infernè costâ validâ evanescente donatas dichotomo-multifidas abeuntibus; segmentis linearibus cuneatisve, margine incrassato plano; soris maculam depressam infra apicem frondis formantibus. *Hab.* Rottnest (238). Frond 1-2 feet high, much branched; segments  $\frac{1}{4}$ - $\frac{1}{2}$  inch broad. This is probably the same as *Acropeltis phyllophora*, H. and H., but I have not had the opportunity of comparing it with that plant.
235. RHODYMENIA *elata*, n. sp.; caulescens; stipite plano-compresso subcanaliculato ramoso, ramis in frondes pergamenas infernè subcostatas pinnato-dichotomas abeuntibus; rachide flexuosâ, segmentis alternis linearibus angustis dichotomis erecto-patentibus obtusis, axillis rotundatis. Rottnest, rare (233). A noble species, two feet high, and much branched, very distinct from *R. flabellifolia*, with which alone it can be confounded.
236. RHODYMENIA? *obtusata*, Sond. Rottnest and Garden Island, common (143). I have not examined the cystocarps minutely, and my specimens are not now accessible. I think it scarcely of this genus.
237. RHODYMENIA? *rosea*, n. sp.; stipite brevi compresso mox ampliato, fronde basi cuneatâ tenuimembranacâ flaccidâ roseâ subpalmatifidâ, segmentis lato-cuneatis variè lobatis, lobis acutis. Fremantle, *G. Clifton*, Esq. I have seen only a single immature specimen, sufficient to establish a distinct species, but not to fix the genus. It may possibly be a *Rhodophyllis*. A transverse section shows a double row of large empty cells in the medullary layer, and a thin cortical layer of minute cellules.
- ARESCHOUGIA, nov. gen. (*Harv. MS. Herb. T. C. D.*) *Frons* linearis, compressa, immersè costata, distichè ramosissima, è filo centrali articulado et stratis tribus cellularum constituta; stratum *medullare* è filis articulatis longitudinalibus anastomosantibus laxè intertextis, *intermedium* è cellulis rotundis majusculis pluriseriatis, *corticale* è cellulis minimis verticalibus formatum. *Cystocarpia* fronde immersa, inter fila strati intermedii suspensa, reticulo filorum velata, carpostomio demum aperta, fila sporifera a placentâ centrali emissa continentia; sporæ subrotundæ, seriatae. Genus *Rhabdonia* proximum; differt filo centrali articulado, et habitu. Dixi in honorem Prof. J. E. ARESCHOUG, Upsaliensis, Algologi eximii.
238. ARESCHOUGIA *australis*. *Halymenia australis*, Sond. *Pl. Preiss. Phacelocarpus australis*, Sond. *Bot. Zeit.* 1845, p. 55. *Areschougia ligulata*, *Harv. MS. olim in Herb. T. C. D.* Common at Rottnest (173). The structure of the frond is very similar to that of *Phacelocarpus*; that of the cystocarp to *Rhabdonia*.
239. ARESCHOUGIA *Laurencia*, *Harv. in Herb. T. C. D. Thamnocarpus? Laurencia*, H. and H. *olim.* Rottnest, rare (236). I have seen no fruit; but the structure of the frond nearly agrees with that of *A. australis*, and the habit is not dissimilar.
240. RHABDONIA? *Sonderi*, J. Ag. Cast ashore at Fremantle (139). I have not seen fruit.

## ORDER XI.—CRYPTONEMIACEÆ.

241. *MYCHODEA carnososa*, Hook. and Harv. Cape Riche and King George's Sound (99). The cystocarps in this and in the following species are external, hemispherical, sessile on the sides of the ramuli, by which character, and the very large size of the intermedial cells of the frond, this genus differs from *Cystoclonium*; to which, however, it is closely allied.
242. *MYCHODEA membranacea*, H. and H. King George's Sound (42).
243. *CALLOPHYLLIS coccinea*, H. Garden Island (137). My (263) is probably only a very narrow variety of this variable plant.
244. *CALLOPHYLLIS* sp. . . . King George's Sound (151). Delicately membranous, with marginal fruit.
245. *KALLYMENIA cribrosa*, n. sp.; stipite brevi in frondem maximam simplicem v. bipartitam rotundato-reniformem ampliato, laminâ basi cordatâ gelatinoso-membranaceâ foraminibus circularibus crebris pertusâ; cystocarpiis sparsis. Fremantle and King George's Sound, rare. June (274). A very remarkable species, elegantly perforated, like an *Agarum*.
246. *GIGARTINA disticha*, Sond. Fremantle (262). A solitary specimen only.
- GATTYA*, nov. gen. *Frons* membranacea, compressa, disticha, pinnatifida, è filo centrali verticillatim ramelloso composita. *Filum* centrale articulatum, callithamnoideum, ad genicula fila verticillata dichotoma emittens, ramellorum apicibus in stratum periphericum membranaceum arcuè coherentibus. *Cystocarpia* et *Tetrasporæ* ignotæ. *Alga* tenella, parasitica; structurâ ferè *Endocladia*; habitu diversissimo; affinitate magis ad *Catenellam* accedens. The generic name is given in honour of MRS. MARGARET GATTY, of Ecclesfield, Yorkshire, a diligent explorer of British Algæ and Marine animals.
247. *GATTYA pinnella*, n. sp.; parasite on *Sarcocladia*, and on *Corallines*, Rottneest (223). A beautiful little plant, fit to bear a lady's name, and of a very curious structure. Though the fruit is unknown, I have no hesitation in proposing the genus.
- HOREA*, nov. gen. *Frons* carnososo-membranacea, plano-compressa, è stratis tribus cellularum composita; stratum *medullare* è cellulis maximis inanibus demum sæpè ruptis; *intermedium* cellulis pluriseriatis minoribus coloratis; *corticale* filis moniliformibus verticalibus dichotomis muco cohibitis formatum. *Favella* intra pericarpium proprium apice spinis coronatum, poro pertusum, ad placentam basalem affixæ; filis arachnoideis laxè circumdatæ, sporas conglobatas angulares foventes. *Tetrasporæ* sparsæ, cruciatim divisæ. *Algæ* Australasiæ, roseæ, distichè decomposito-pinnatæ v. dichotomæ, chartæ arcuè adhærentes. The name is given in honour of REV. W. S. HORE, of St Clement's, Oxford, an excellent algologist, and ardent and successful explorer of the Algæ of Plymouth Sound, &c., to whom I am indebted for large numbers of beautifully preserved specimens of rare British Algæ.
248. *HOREA halymenioides*, n. sp.; fronde subdichotomâ, segmentis decomposito-pinnatis ambitu ovatis, pinnis pinnulisque divaricato-patentibus nunc spurie anastomosantibus attenuatis acutis, pinnulis setaceis. Fremantle, common (152).
249. *HOREA flabelliformis*, n. sp.; fronde flabelliformi subfastigiata dichotomâ, laciniis dichotomo-



- multifidis margine integris v. parcè lobatis, lobulis deltoideo-subulatis acutis. King George's Sound, rare (341). Frond broader and more dichotomous than in the preceding, spreading from a central point like a fan.
250. *CHRYSYMENIA obovata*, Sond.! King George's Sound and Rottneſt (104). I have ſeen no fruit, and can throw no light upon the genus. But J. Agardh muſt have got hold of ſomething very different, or he would not refer this plant to *Rhabdonia*, to which it bears neither internal nor external reſemblance.
251. *CHYLOCLADIA ſecunda*, Hook. and Harv.! King George's Sound (340). I have not compared with New Zealand ſpecimens; but refer this plant from memory and deſcription.
252. *CHYLOCLADIA opuntioiſdes*, n. ſp.; fronde (6–10 uncias altâ) infernè cartilagineâ ſolidescente obſoletè conſtrictâ dichotomâ, ſupernè di-tri-chotomâ articulato-conſtrictâ membranaceâ ſucco aquoſo repletâ, ramulis ad genicula verticillatis articulatis; articulis ramorum puncto affixis (citò in aquâ dulci ſejunctis) ovali-oblongis baſi et apice obtuſiſſimis; cystalcarpiis . . . Rottneſt, Fremantle, and King George's Sound (192). Either this or the following appears to be the "*Ch. articulata*" of Australian botaniſts, but both differ eſſentially from each other, and from the European ſpecies ſo called. The preſent is remarkable for the rapidity with which its branches and ramuli fall to pieces, without diſſolving, when thrown into freſh water. An hour or two is ſufficient to denude a large ſpecimen, leaving nothing behind but the cartilaginous main ſtem. The colour is a beautiful roſy purple.
253. *CHYLOCLADIA Cliftoni*, n. ſp.; fronde (6–8 uncias longâ) tenui membranaceâ ſucco gelatiſoſo repletâ roſeâ è baſi articulato-conſtrictâ trichotomâ v. umbellatim ramoſâ; ramis ternis ferè ad ſingula genicula egredientibus; ramulis ſæpè numeroſis; articulis inferioribus clavatis diametro 4–5-plo-longioribus, ſuperioribus obovatis, ultimis ellipſoideis utrinque obtuſis. Fremantle, *G. Clifton, Eſq.* (265). A much more delicately membranous plant than *Ch. articulata*, of larger ſize, cloſely adhering to paper in drying, and ſoon diſſolving in freſh water. It is nearly allied to *Ch. Mülleri*, Sond.! but quite diſtinct.
254. *HALOSACCION firmum*, Poſt. and Rup.? Fremantle, common (135, a).
255. *HALOSACCION hydrophora*, Poſt. and Rup.? With the preceding; alſo at King George's Sound (135, β). Theſe are very ſimilar in form to the Kamtchatkan plants to which I refer them; but they cloſely adhere to paper, and are filled, when recent, with very ſlimy mucus. Both produce cystalcarps. I am doubtful, whether as ſpecies they are ſufficiently diſtinct one from another.
256. *HALYMENIA Floresia*, Ag. Fremantle (314); alſo found by *G. Clifton, Eſq.*
257. *HALYMENIA Kallymenioides*, n. ſp.; fronde planâ gelatiſoſo-membranaceâ foliaceâ informi variè lobatâ et ſinuatâ, margine glanduloſo, laciniis acutis, cystalcarpiis ſparſis. Caſt aſhore at Fremantle, rare (174). This has the habit of *Kallymenia*, but exactly the ſtructure of *Halymenia*.
258. *GELINARIA ulvoidea*, Sond. Fremantle and King George's Sound (136). The ſtructure, as already ſtated by Kützing, is very ſimilar to that of *Halymenia*. The only difference is, that in *Gelinaria* the peripheric membrane is very thick and fleſhy, compoſed of two or three rows of ſmall polygonal cells, protected externally by a thick ſtratum of vertical, moniliform

filaments, formed of very minute oblong, cells. The colour, when fresh, is a bright, but very fugacious, rosy pink. I have seen no fruit.

259. *NEMASTOMA? gelinarioides*, n. sp.; fronde gelatinoso-carnosâ roseâ planâ decomposito-pinnatâ, pinnis approximatis erecto-patentibus pinnatis v. bipinnatis, segmentis basi parum attenuatis sublanceolatis acutis, ultimis lato-subulatis acutiusculis. King George's Sound, rare (84). Very like some of the more branching forms of *Gelinaria ulvoidea*, but of much denser and different structure. The structure is as dense as in *Schizymenia*.
260. *NEMASTOMA damacornis*, n. sp.; fronde gelatinoso-carnosâ exeteri compresso-planâ dichotomo-multifidâ subfastigiâtâ; segmentis patentibus cuneatis, terminalibus filiformibus obtusis; axillis omnibus eximiè rotundatis; tetrasporis sparsis cruciatim divisis. At Fremantle and Rottnest, rare (315). It requires to be compared with the Mediterranean *N. dichotoma*, which it closely resembles, and from which it may not be sufficiently distinct.

## ORDER XII.—SPYRIDIACEÆ.

261. *SPYRIDIA filamentosa*, H. Abundant all along the coast (18).

## ORDER XIII.—CERAMIACEÆ.

262. *CENTROCERAS clavulatum*, Ag. Common on littoral rocks and on *Zostera*, &c. (2).
263. *CERAMIUM rubrum*, Ag. Rottnest and King George's Sound, in winter (258).
264. *CERAMIUM puberulum*, Sond.! *C. monile*, H. and H.! On *Zostera*, Rottnest, and King George's Sound (66).
265. *CERAMIUM isogonum*, n. sp.; fronde pusillâ (1-2 unciali) subsetaceâ dichotomâ fastigiâtâ, segmentis erecto-patentibus terminalibus forcipatis; articulis corticatis omnibus diametro æqualibus lineâ hyalinâ centrali notatis medio parumque constrictis; favellis subterminalibus bilobis ramellis 1-2-fulcratis; tetrasporis . . . . On *Algæ*, Garden Island (286). Quite distinct from any of the *rubrum* section.
266. *CERAMIUM miniatum*, Suhr.? *C. Filicula*, Harv. M. S.; filo primario repente frondes minutas (semiunciales) sparsas erectas emittente; fronde compressâ distichè subpinnatâ, pinnis dichotomo-fastigiatis, segmentis terminalibus brevissimis dentiformibus, articulis diametro brevioribus sacculo roseo coloratis, omnibus nisi supremis interstitiis nudis, tetrasporis secus marginem segmentorum utrinque longitudinaliter seriatis. Parasitical on *Dictyota Kunthii* at Rottnest (220). I have little hesitation in referring this to *C. miniatum*, Suhr. (first found on the Peruvian Coast), although Agardh makes no mention of the primary creeping filament, and there are some other slight differences in the description.
267. *CERAMIUM australe*, Sond.! Garden Island, rare (285). Near *C. Deslongchampsii*.
268. *CERAMIUM fastigiatum*, Harv. Parasitical on *Zostera*, Rottnest, rare (257).
269. *CERAMIUM gracillimum*, Kütz. Parasite on *Algæ*, on mud-banks, King George's Sound, January (23).
270. *PTILOCLADIA pulchra*, Sond.! Garden Island, rare (147 and 148).

271. *HALOPHLEGMA Preissii*, Sond.! Very abundant on the reefs at Rottneſt; alſo on *Caulinia*, &c. (63).
272. *HANOWIA australis*, Sond.! Fremantle, rare (56).
273. *HANOWIA robusta*, n. ſp.; fronde (vix evolutâ) compreſſâ latâ; filis ſetaceis, articulis primariis ovoideo-cylindraceis ad genicula contractis diametro 2-3-plo-longioribus, endochromate amplâ. Fremantle, very rare ( ). My ſpecimens are immature. The filaments are much more robust and more laxly woven than in *H. australis*.
274. *HANOWIA arachnoidea*, n. ſp.; fronde compreſſâ latâ furcatâ v. dichotomâ, filis arachnoideis, articulis primariis cylindraceis diametro 6-8-plo-longioribus. King George's Sound, very rare (52). *Fronde* 1-2 inches high, the ſegments  $\frac{1}{4}$  to  $\frac{1}{2}$  inch broad, compressed. Filaments much more ſlender than in *H. australis*, with much longer joints.
- LASIOThALIA*, nov. gen. *Frons* filiformis, membranacea, ramosa, hirsuta, è filis longitudinalibus intertextis anastomosantibus, filoque centrali majori contexta; filis periphericis externè fila callithamnoidea ſubſimplicia horizontalia libera emittentibus. *Fructus?*
275. *LASIOThALIA hirsuta*, n. ſp.; Cape Riche, very rare (321). I found only two or three ſpecimens. The laſteſt is about 6 inches long, irregularly divided, with lateral branches and ſlender filiform ramuli. Every part of the plant is clothed with ſhort, ſimple, or ſlightly branched, horizontal, jointed hairs. There is no trace of gelatine, and the plant but ſlightly adheres to paper.
276. *DUDRESNAIA coccinea*, Bonn.! King George's Sound, very rare (325).
277. *CROUANIA attenuata*, *β. australis*. On *Zostera*, &c., King George's Sound (62). Much larger and leſs gelatinous than the Britiſh plant uſually is, but ſcarcely otherwiſe different.
278. *CROUANIA veſtita*, n. ſp.; fronde ultra-ſetaceâ decompoſitè ramiſſiſſimâ membranaceâ (vix gelatinosâ), ramis ramuliſque patentibus, omnibus ramelliſque denſiſſimè velatis, ramelliſque divaricato-multifidiſque; favelliſque ſolitariis reniformibus in ramuliſque minoribus inter ramelloſque immerſiſque; tetraſporiſque ſphæriciſque triangulè diviſiſque. Rottneſt and King George's Sound, on *Zostera*, &c. (338). Much more robust than *C. attenuata*, much leſs gelatinous, and not moniliſque in any part of the fronde.
279. *DASYPHILA Preissii*, Sond.! On the ſtemſ of *Fucoideæ*, Garden Iſland, common (149).
280. *PTILOTA coralloidea*, J. Ag. Garden Iſland, Rottneſt, and King George's Sound, common (91).
281. *PTILOTA* ſp. King George's Sound (92). Poſſibly only a variety of the laſt, with articulated ramelliſque.
282. *PTILOTA striata*, n. ſp.; fronde ancipiti ſiccitate tranſverſim ruguloſo-striatâ decompoſitè ramiſſiſſimâ, ramis majoribus ſparſiſque alternè diviſiſque vix pinnatiſque, minoribus linearibus pectinato-pinnatiſque, pinnuliſque ſubulatiſque alterniſque ſimpliciſſimiſque; favelliſque minimiſque ad latera ſuperius pinnularum pedicellatiſque involucriſque, involucriſque è filis callithamnoideiſque multiſeriatiſque compoſitiſque; tetraſporiſque ad proceſſoſ proprioſ ramiſque è lateribus pinnularum emiſſiſque. Rottneſt, not uncommon (240). A moſt diſtinct and beautiful ſpecies with the habit of *Phacelocarpus Labillardieri*. It moſt reſembles *P. Rhodocallis*, H. (*Rhodocallis elegans*, Kütz.), but differs eſſentially from that ſpecies in the poſition and nature of the involucriſque, &c.

283. *PTILOTA siliculosa*, n. sp.; fronde complanată costată decompositè ramosissimâ, ramis majoribus alternis sparsisve, minoribus linearibus pectinato-pinnatifidis, pinnulis è basi lato subulatis alternis simplicissimis; tetrasporis in glomerula siliculiformia è pinnularum latere superiore enata congestis, ad fila callithamnoidea brevissima circum axim verticillata affixis. Rottnest, rare (243). Very like the preceding in habit; but evidently ribbed, and rather inciso-pinnatifid than pinnate, and not obviously transversely striate; and abundantly characterized by the strangely metamorphosed fructification.
284. *THAMNOCARPUS Gunnianus*, Harv. Common at Garden Island and Rottnest; but not in fruit (169).
285. *GRIFFITHSIA ovalis*, n. sp.; fronde erectâ (sub-bi-unciali) di-tri-chotomâ subfastigiata crassissimâ, segmentis erecto-patentibus, articulis diametro 3-4-plo-longioribus, inferioribus clavatis, mediis superioribusque obovatis inflatis ad genicula maximè constrictis; fertilibus conformibus; involucris tetrasporarum circa genicula involucratis è ramellis minimis conflatis. Parasitical on *Zostera*, King George's Sound (41). Also sent by *Dr. Curdie*, from Cape Northumberland. Very much more robust than *G. corallina*, with nodes contracted like those of an *Opuntia*. It is as robust as *Chylocladia articulata*.
286. *GRIFFITHSIA monilis*, n. sp.; fronde basi radicante cæspitosâ (1-2 unciali) dichotomâ fastigiata crassissimâ, segmentis erecto-patentibus; articulis diametro sesquilongioribus globoso-inflatis siccitate sub-collapsis et ovalibus ad genicula maximè constrictis; fertilibus conformibus, involucris tetrasporarum circa genicula verticillatis. Parasitical on *Algæ* at Garden Island, and on *Zostera* at Rottnest (326). When fresh it resembles beautiful strings of ruby-coloured beads, but fades much in drying.
287. *GRIFFITHSIA Binderiana*, Sond.! Garden Island on *Algæ*, Rottnest on *Zostera* (199).
288. *GRIFFITHSIA Tegea*, MS. Cast ashore at Fremantle (146). I do not describe this species, as the fruit is unknown. It forms enormous, coarse, mat-like strata, one or two feet in breadth, composed of filaments resembling those of *G. secundiflora*, but very irregularly branched.
289. *CORYNOSPORA australis*, n. sp.; fronde (biunciali) setaceâ gelatinoso-membranaceâ dichotomodecompositâ et alternè ramosâ, ramulis pluries dichotomis, articulis longissimis ad genicula nec contractis, ramellis superioribus tenuissimis dichotomis, apicibus longè filiformibus arachnoideis; tetrasporis ad genicula ramorum majorum subsessilibus oblongis nucleo indiviso. Rottnest, in June, very rare (344). Fremantle, July, *G. Clifton, Esq.* A very distinct species, readily known by its attenuated apices.
290. *CORYNOSPORA gracilis*, n. sp.; fronde pusillâ (unciali) tenui alternè ramosâ v. subdichotomâ, ramulis quoquoersum egredientibus inferioribus furcatis superioribus bis-terve dichotomis, apicibus subattenuatis obtusiusculis; tetrasporis . . . ? Garden Island, rare, July (266). The habit and substance of the plant are those of *Corynospora*.
291. *CALLITHAMNION thyrsigerum*, Thw. MS.; filo primario repente, secundariis erectis cæspitosis capillaribus (1-1½ uncialibus) vagè ramosis, ramis minoribus sæpissimè secundis filiformibus simplicissimis acuminatis; articulis diametro 3-5-plo-longioribus cylindraceis; tetrasporis circa genicula suprema ramorum verticillatis pedicellatis, pedicellis ramosulis thyrsoido-paniculatis; favellis in ramulo terminalibus involucratis. On *Algæ* and *Zostera*

- King George's Sound and Rottneſt (51). A beautiful and very diſtinctly characterized ſpecies of the *C. Turneri* ſection, which I firſt gathered at Belligam Bay, Ceylon, in company with my friend *G. H. K. Thwaites, Eſq.*, of Peradenia Botanical Gardens.
292. *CALLITHAMNION cymosum*, n. ſp.; denſiſſimè cæſpitoſum; filis primariis repentibus intricatis, ſecundariis erectis arachnoideis (uncialibus) vagè ramiſis, ramis ſubdichotomis v. alternis minoribus filiformibus erectis longè ſimplicibus obtuſis, articulis diametro multoties (8–12-plo) longioribus cylindraceis; tetraſporis in cymis veris æqualibus v. ſcirpoideis ſecus ramos evolutis diſpoſitis; favellis . . . . ? On ſand-covered rocks, Middleton Bay, King George's Sound and Rottneſt; often half buried in ſand (10). The cymoid inflorescence is very peculiar, and beautifully accurate to the typical cyme.
293. *CALLITHAMNION delicatulum*, n. ſp.; puſillum, arachnoideum, filo primario repente; ſecundariis erectis (vix uncialibus) parum ramiſis è quoque geniculo plumulatis, plumulis oppoſitis per paria decuſſatis infra apicem articuli egredientibus tenuibus laxè pinnatis, pinnulis inferioribus ſæpiùs oppoſitis reliquis alternis è rachide flexuoſâ emiſſis omnibus attenuatis ſimplicibus v. ramulo uno alterove auctis; fructu . . . . Parasite on *Solieria australis*, at King George's Sound. A very delicate and beautiful little plant (339).
294. *CALLITHAMNION gracilentum*, n. ſp.; minutum (1–2 lineas altum); filo primario repente crasso ramos ſuboppoſitos liberos emittente; ramis filo primario quadruplo-angustiſſimis pinnatis, pinnis oppoſitis patentibus ſimplicibus v. latere inferiori ſubramelloſis ſubattenuatis obtuſiſculis; articulis fili primarii diametro ſeſqui v. ſubduplo, ramorum 4–5-plo, ramulorum ſeſquilongioribus. Parasite on *Furoids*, Rottneſt, rare (327). Apparently nearly allied to *C. leptocladum*, Mont.; but ſcarcely the ſame?
295. *CALLITHAMNION aculeatum*, n. ſp.; filo primario repente; ſecundariis erectis (ſub-uncialibus) capillaribus ſubdichotomis v. alternè ramiſis corymboso-ſtaſigatis; ramis omnium ſerierum quoquoſum egredientibus, minoribus caule duplo-angustiſſimis, ramulis ad genicula ferè omnia verticillatis ſpinæformibus patentiſſimis breviffimis ſimplicibus ſubacutis; tetraſporis ſolitariis ad ramulos laterales; articulis ramorum diametro 2–3-plo-longioribus. On *Zostera*, at King George's Sound, rare (343).
296. *CALLITHAMNION ſpinescens*, Kütz.? *Cal. tomentellum, Harv. MS.* Very common, everywhere on *Alga*, &c. This ſpecies is ſo common that it can hardly have eſcaped PREISS, and therefore I ſuppoſe it the *C. ſpinescens* of Sonder's liſt. But the ramuli are not *whorled*; but *oppoſite* and *decuſſated*; one pair ſpreading one way, the next at right angles to them. In all my ſpecimens the articulations of the ſtem are very ſhort. In habit, it has much reſemblance to *Jungermannia tomentella* (48).
297. *CALLITHAMNION horizontale*, n. ſp.; filis erectis (uncialibus) capillaribus ſolitariis parum ramiſis, ramis 3–4-lateralibus ſimplicibus patentibus cum filo primario è quoque articulo oppoſitè plumulatis; plumulis è medio articuli egredientibus ſubdiſtichis *horizontaliter* patentibus (latus planum ſurſum vertentibus) ambitu ovatis pinnatis; pinnâ infimâ ſimplici, cæteris furcatis; articulis omnibus diametro æqualibus v. ſeſquilongioribus; apicibus acutis; tetraſporis ſolitariis ramulum puſillum pinnarum terminantibus. Parasitic on *Griff. Binderiana* at Rottneſt; and on *Pol. nigrita* at Garden Iſland (254).

298. *CALLITHAMNION verticale*, n. sp.; filis erectis (uncialibus) capillaribus subsolitariis parum ramosis, ramis 1-2-lateralibus brevibus cum filo primario è quoque articulo oppositè plumulatis; plumulis è medio articuli egredientibus distichis *verticaliter* patentibus (latus planum ad latera vertentibus) ambitu ovatis pinnatis; pinnis omnibus plus minùs furcatis; articulis diametro æqualibus v. sesquolongioribus; apicibus acutis; tetrasporis solitariis ramulum pusillum pinnarum terminantibus. Parasite on *Algæ* at Garden Island (267). Very nearly allied to the preceding; but having a different aspect, from the different direction of the flat surface of the plumules.
299. *CALLITHAMNION pulchellum*, n. sp.; pusillum (semi-unciale); filo primario ramisque primariis prostratis repentibus demum ramos secundarios erectos simplices v. parum ramosos emittentibus; ramis omnibus è quoque articulo oppositè v. cruciatim plumulatis; plumulis 2-4 infra apicem articuli egredientibus patentibus ambitu ovatis pinnatis; pinnis simplicissimis approximatis obtusis; articulis ramorum diametro 2-4-plo-longioribus, pinnarum et pinnellarum diametro brevioribus; favellis simplicibus rachidem plumuli terminantibus; tetrasporis à pinnellis abbreviatis formati. Parasitic on various *Algæ*; especially on *Areschougia australis*. Rottneest and Cape Riche (230). At first I supposed this beautiful little plant to be *C. australe*, J. Ag., but on comparison with his description, my plant must be different. The plumules on the younger part of the frond are always *opposite* and *vertical*; those on the older erect branches are frequently in fours, *cruciate* and *horizontal*. Can this be *C. Preissii*, Sond.? The specimens with cruciate plumules would be near Sonder's description.
300. *CALLITHAMNION simile*, Hook. and Harv. On *Fucoides* at King George's Sound and Rottneest (90). I have compared the specimens with one from Kerguelin's Land, and find them to agree.
301. *CALLITHAMNION Wollastonianum*, n. sp.; fronde ultra-setaceâ elatâ (4 unciali) basi tenuiter corticatâ sursum longè pilis squarrosis stuposo-hirsutâ subdistichè ramosissimâ; ramis alternis decomposito-pinnatis, penultimis distichis pellucidè articulatis alternè plumulatis; plumulis patentibus longissimis ambitu linearibus; pinnis tenuibus erectiusculis brevibus, inferioribus simplicibus, superioribus sæpiùs furcatis v. pinnulatis; tetrasporis solitariis ad ramulos brevissimè pedicellatis; articulis diametro 2-4-plo-longioribus. Middleton Bay, King George's Sound, rare in August (329). A very beautiful species, which I name in affectionate regard to the family of ARCHDEACON WOLLASTON, from whom I received unvarying kindness during the whole of my stay at King George's Sound. It is nearly allied to *C. latissimum*, but differs in several respects.
302. *CALLITHAMNION Brownianum*, n. sp.; fronde ultra-setaceâ elatâ (4 unciali) subcorticatâ sursum longè pilis squarrosis stuposo-hirsutâ quoquoversum ramosissimâ; ramis pluries alternè decompositis, penultimis quoquoversis pellucidè articulatis nodosis (parietibus cellularum crassis gelatinosis), alternè plumulatis; plumulis quoquoversis brevibus crispis pinnatis, pinnis capillaribus longissimis maximè curvatis inflexis; articulis pinnularum diametro 4-plo-longioribus; tetrasporis brevissimè pedicellatis solitariis v. geminis ad latera pinnularum enatis. On *Zostera* at Rottneest, Fremantle, and King George's Sound

- (264). Much resembling the last in aspect, but not distichous in any part; and with remarkably curled pinnules. I name it in compliment to Mrs. RICHARD BROWN of Fremantle, an amateur collector of Algæ, from whom and her estimable husband I received much kind attention during my stay in their neighbourhood.
303. *CALLITHAMNION laricinum*, n. sp.; fronde cartilagineâ setaceâ (1-3 unciali) ferè ad apices ramorum corticatâ glabrâ quoquoversum ramosâ ambitu pyramidali; ramis alternis patentibus supernè sensim brevioribus ramulis dichotomo-multifidis undique obsessis; ramulis pluries dichotomis, segmentis patentibus, ultimis brevissimis spinæformibus; favellis geminis oblongis! simplicibus v. furcatis; tetrasporis globosis ad latera ramulorum sparsis. On *Zostera* at Rottnest, common (200). This has the aspect and substance of *C. tetragonum*; but is more nearly related to *C. granulatum* or *C. grande*.
304. *CALLITHAMNION flabelligerum*, n. sp.; fronde erectâ crassiusculâ alternè decomposito-ramosâ omninò ecorticatâ; ramis ramulisque quoquoversum egredientibus, terminalibus corymboso-flabellatis, ramulis dichotomo-multifidis fastigiatis; apicibus obtusis patentibus; favellis geminis rotundatis ramulis stipatis (quasi involucretis). On *Zostera* at Rottnest, and at Garden Island on *Algæ* (201). Nearly allied to *C. corymbosum*, but a more robust, though smaller plant; with cells more like those of a *Griffithsia* than of a *Callithamnion*.
305. *CALLITHAMNION multifidum*, n. sp.; fronde pusillâ (unciali) arachnoideâ ecorticatâ densè cæspitosâ alternè ramosâ; ramis simplicibus ramosisve, ramulis alternis quoquoversis dichotomo-multifidis; segmentis patentibus obtusis; articulis ramorum basi incrassatis diametro 4-plo, ramulorum cylindræcis diametro 2-3-plo-longioribus. On sand-covered rocks, half-tide level, generally buried in the sand, the grains of which adhere closely to the filaments. Reefs at Rottnest, May and June (229).
306. *CALLITHAMNION crispulum*, n. sp.; fronde pusillâ ( $\frac{1}{2}$ - $\frac{3}{4}$  unciali) capillari ecorticatâ cæspitosâ infernè quoquoversum, supernè distichè ramosâ; ramis superioribus è rachide flexuosâ alternè plumulatis; plumulis brevissimis alternè pinnatis, pinnis 3-4 simplicissimis filiformibus elongatis obtusis eximiè arcuato-inflexis; articulis omnibus diametro sesquolongioribus; favellis geminis; tetrasporis . . . . In shady crevices of rocks, at half-tide level, Rottnest. Near *C. Borreri*, but a much smaller plant, and sufficiently characterized as above (228  $\alpha$ ).
307. *CALLITHAMNION pusillum*, n. sp.; fronde pusillâ (vix unciali) capillari ecorticatâ cæspitosâ infernè simpliciusculâ supernè quoquoversum ramosâ; ramis infernè plumulatis, supernè alternè ramosis, ramis minoribus è rachide strictiusculâ quoquoversum plumulatis; plumulis brevissimis vix pinnatis; pinnis 2-3 alternis v. secundis elongatis obtusis arcuatis inflexis; articulis omnibus nisi basilaribus diametro 3-plo-longioribus; favellis geminis; tetrasporis globosis ad latera pinnarum solitariis. Crevices of rocks, at half-tide, Rottnest (228  $\beta$ ). At first I had this for a variety of *C. crispulum*, but it differs in not being in any part distichous, and in the longer articulations.
308. *CALLITHAMNION Scopula*, n. sp.; fronde pusillâ (unciali) capillari ecorticatâ quoquoversum ramosâ, ramis paucis cum ramulis ambitu clavatis quoquoversum plumulatis; plumulis inferioribus brevibus, superioribus elongatis pinnatis; pinnis simplicibus filiformibus longis-

- simis arcuato-incurvis obtusis; articulis omnibus diametro 2-3-plo-longioribus; tetrasporis ellipsoideis numerosis secus pinnas sessilibus. Crevices of rocks, at half-tide, Rottnest (328). This is certainly near *C. roseum* in miniature. To the naked eye it looks very like *Dasya ocellata*, or like a bunch of little bottle brushes.
309. *CALLITHAMNION debile*, n. sp.; fronde pusillâ (vix unciali) tenuissimâ ecorticatâ cæspitosâ infernè quoquoersum supernè distichè ramosâ; ramis paucis alternè divisis, ramis minoribus distichè ramulosis, ramulis patentissimis inferioribus simplicibus spinæformibus superioribus furcatis v. subpinnulatis; articulis inferioribus diametro 5-8-plo, ramulorum 3-4-plo-longioribus; tetrasporis solitariis ad ramulos sessilibus. Rottnest, rare (330). Unlike any Australian species; and most like some starved form of *C. polyspermum*, but of a very fragile substance and pale colour.
310. *CALLITHAMNION radicans*, n. sp.; nanum, parasiticum, velutino-cæspitosum; fronde minutâ (2 lineas altâ) basi fibrillis crispatis radicante, è basi ramosissimâ; ramis primariis alternis secundisve 2-3-ties decompositis, minoribus ramulisque secundis strictis; articulis cylindraceis diametro 4-5-plo-longioribus; ramulis fructiferis prope basin ramorum sparsis simplicibus v. parum ramosis; tetrasporis ellipsoideis terminalibus. On *Zostera* leaves, Fremantle (331). This resembles *C. luxurians*, J. Ag., externally, but seems sufficiently marked by its rooting filaments and longer articulations.
311. *CALLITHAMNION botryocarpum*, n. sp.; nanum, penicillato-cæspitosum; fronde minutâ (1-1½ lineas altâ) è basi ramosissimâ, ramis alternis v. secundis patentibus flexuosis nunc subsquarrosis; articulis diametro 4-plo-longioribus; tetrasporis magnis triangulè divisis in glomerula ad axiles ramorum densissimè aggregatis; antheridiis, botryoideis è quoque ferè articulo ramorum sæpè evolutis. Abundant on *Chorda lomentaria*, at King George's Sound, in August (324). Externally very like *C. Daviesii*, but I suppose distinctly characterized by its fruit. The tetraspores are very large for this section of the genus. The antheridia resemble little clusters of grapes, ranged along the upper branches of fertile specimens.
312. *CALLITHAMNION sparsum*, Harv. (?) Parasite on *Sporochnus*, at Garden Island. This requires to be compared with British specimens; and also with Kützing's *C. humile* from the Cape of Good Hope. It is quite different from either of the preceding, very sparingly branched, of a deep purple colour, and rather rigid texture, with very short articulations.

## SERIES III.—CHLOROSPERMEÆ.

## ORDER I.—SIPHONACEÆ.

313. *CAULERPA simpliciuscula*, Ag.? On the reefs, Rottnest. A much dwarfer, and more branching form than that figured by Turner, if the same. Possibly my plant may be rather akin to *C. lentifera*, J. Ag. (207).
314. *CAULERPA lætevirens*, Mont.? Extremely abundant on the surface of shallow reefs, exposed at low water, Rottnest. I have not compared with Montagne's plant (208).
315. *CAULERPA cylindracea*, Sond. King George's Sound, rare (54).



316. *CAULERPA tenella*, n. sp.; surculo setaceo glabro; frondibus filiformibus simplicibus v. parè ramosis, ramis vagis, foliis spiraliter laxè insertis subtristichis erecto-patentibus subulatis brevibus mucronatis læteviridibus. On the Natural Jetty at Rottnest, very rare (215). A slender species, 1–2 inches high.
317. *CAULERPA hypnoides*, R. Br. Abundant in tide-pools and borders of reefs, at Rottnest and Garden Island (185).
318. *CAULERPA Mulleri*, Sond.! surculo crasso squamulis cylindræis dichotomis densè muricato; fronde erectâ stipitatâ oblongâ obtusâ pinnatâ; stipite pinnisque foliolis undique densissimè oblectis, foliolis geminis basi unitis cylindræis obtusis apice bi-mucronulatis erectis imbricatis intensè viridibus. On border reefs and sides of deep tide-pools at Rottnest (205). Nearly related to *C. hypnoides*, but a much stronger and coarser plant, readily known at a glance, when the two are seen together, though difficult to characterize. In *C. hypnoides* the surculus and base of stem are clothed with far more densely set and muricated squamæ, and the folioli are much smaller, softer, more patent, more laxly set, and more acute.
319. *CAULERPA obscura*, Sond.! Abundant at King George's Sound; and in tide-pools, &c., Rottnest (77). The fronds are often 12–18 inches long.
320. *CAULERPA furcifolia*, Hook. and Harv. A few fragments cast ashore at King George's Sound, February ( ).
321. *CAULERPA geminata*, n. sp.; surculo glabro; frondibus erectis simplicibus (brevibus) articulato-constrictis glabris, foliis parvis oppositis ovoideis distichis v. tortione caulis quoquo-versum directis. On very shady rocks, usually on the under surface of table-reefs, Rottnest. The distichous form is readily distinguishable; but that with leaves turned to all sides resembles *C. sedoides* in miniature; but is readily known by its articulate stem and opposite leaves (214). I suspect that it is *S. sedoides*, of Sonder in Pl. Preiss.
322. *CAULERPA corynephora*, Mont. King George's Sound, and in deep tide-pools, Rottnest (101).
323. *CAULERPA scalpelliformis*, R. Br. King George's Sound, and on border reefs, Rottnest (206).
324. *STRUVEA plumosa*, Sond. Abundant on all the shallow reefs at Rottnest, but scarcely in season in June, when I visited the island (216).
325. *STRUVEA macrophylla*, n. sp.; fronde oblongo-ovali maximâ (4–5 uncias longâ, 3 uncias latâ) crenatâ, tubulis anastomosantibus pluries pinnatis. Champion Bay, *Mrs. Drummond*, Jun. A single specimen, bleached white, was sent by *Mrs. Drummond* to *Mr. Sanford*, who kindly presented it to me. The frond closely resembles a beautiful structure of "old point-lace," and as it is very tough and strong, it might be manufactured into ladies' *natural-lace collars*, by merely tacking on a border of net.
326. *POLYPHYSA Peniculus*, Ag. *Fucus Peniculus*, R. Br. Extremely abundant, at all seasons, in Princess Royal Harbour, King George's Sound, growing on old shells. Not seen elsewhere (1).
327. *PENICILLUS Arbuscula*, Mont.? Abundant, on shallow, sand-covered reefs at Rottnest (204). It varies much in size. The stem is sometimes scarcely twice as thick as a hog's bristle; sometimes as thick as a goose-quill. I have not compared with Montagne's plant.
328. *HALIMEDA macroloba*, Dne. Cape Riche and Rottnest, on the reefs (226).
329. *CODIUM tomentosum*, Ag. Abundant everywhere (45).

330. *Codium laminarioides*, n. sp.; stipite brevi cuneato mox in frondem amplissimam (2-3 pedalem) planam subsimplicem v. parcè lobatam expanso. At Rottneſt and King George's Sound, on the under ſurface of table-shaped rocks. If this be only a form of *C. elongatum* it is indeed an extraordinary one. The undivided frond is often three feet wide by two feet long, reſembling a piece of green cloth (227).
331. *Codium ſpongioſum*, n. sp.; fronde ſeſſili molli polymorphâ variè lobatâ et ſpongioideâ; filiſ interioribuſ laxiuſculiſ in gelatinâ immerſiſ, periphericis cylindraceiſ v. pyriformibuſ obtuſiſ; ſpermatiſiſ fuſiformibuſ baſi et apice acutiſ. On ſhells and ſtones, &c., about low-water mark, common ( ). I do not wonder that this has not been brought to Europe. as it is almoſt impoſſible to prevent the ſpongy maſſ decompoſing (with a very unſavoury ſmell) during the proceſſ of drying.
332. *Codium mamilloſum*, n. sp.; fronde globoſâ vel reniformi puncto affixâ ſolidâ; filiſ interioribuſ denſiſſimè intertextiſ arachnoideiſ gelatinâ ſubſolidâ obvallatiſ, periphericis maximis inflato-cylindraceiſ, eorum apicibuſ ad ſuperficiem frondiſ quaſi mamilliſ directiſ, ſiccitate ſericeo-nitentibuſ. Fremantle and King George's Sound, caſt aſhore (162). It formſ a very ſolid, green, mammillated ball, compoſed internally of very ſlender, denſely packed threadſ, throwing off to all ſideſ externallſ, radiating branchſ, whoſe apiceſ, cloſely ſet together, give the mammillated appearance to the ſurface.
333. *Bryopſiſ australiſ*, Sond.? Very common on rockſ, at Rottneſt and Carnac (161).
334. *Bryopſiſ* ſp. On *Zoſtera*, Rottneſt (175).
335. *Bryopſiſ* ſp. Perhaps *B. folioſa*, Sond. On ſand-covered rockſ, Rottneſt (249).
336. *Dictyopſheria ſericea*, n. sp.; fronde umbilicatâ medifixâ variè lacerâ (nunquam veſicatâ) ſericeâ; veſiculiſ minimiſ globoſo-polyhedriſ. On rockſ near low-water mark, King George's Sound, Cape Riche, and Rottneſt (160). Very diſtinct from *D. favuloſa* at all ageſ.

## ORDER II.—CONFERVACEÆ.

337. *Cladophora valonioides*, Sond. Common on rockſ and in ſhallow water (55).
338. *Cladophora* ſp. Sand-covered rockſ, King George's Sound (46).
339. *Cladophora* ſp. *C. anastoſoſans*, MS. Caſt aſhore at Fremantle (163).
340. *Cladophora* ſp. Fremantle (176).
341. *Cladophora* ſp. Fremantle (177).
342. *Cladophora* ſp. Near *C. pellucida*. Rottneſt, on reefſ (275).
343. *Cladophora* ſp. Allied to *C. glauceſcens* (333). I have neither bookſ nor ſpecimenſ at hand ſufficient to determine whether theſe ſpecieſ have been previously deſcribed.

## ORDER III.—ULVACEÆ.

344. *Phycoſeriſ Ulva*, Sond. Garden Iſland.
345. *Phycoſeriſ latiffima*. *Ulva latiffima*, Auct. I cannot ſay to which of Kützing's ſpecieſ

these specimens should be referred, but I fear that author has needlessly multiplied the names in this genus.

346. *ENTEROMORPHA compressa*. Submerged rocks and woodwork, everywhere.

ORDER IV.—OSCILLATORIACEÆ.

347. *RIVULARIA australis*, n. sp.; fronde maximâ (fronde 1-1½ uncias diametro) solitariâ hemisphæricâ solidâ lubricâ olivaceo-viridi. On rocks near low-water mark, Cape Riche (298). I suppose this belongs to Kützing's genus *Euactis*, but I have not minutely examined it. It is the largest of the genus known to me.
348. *RIVULARIA* sp. Near *R. plicata*, Carm. Upper end of Princess Royal Harbour, on stones and wood in shallow water (19).
349. *CALOTHRIX cœspitula*, Harv.? Parasitical on *Algæ*, in tide-pools at Cape Riche (299). This requires to be compared with the European plant, to which, if not the same, it is closely related.
350. *CALOTHRIX limbata*, MS. Littoral rocks, Rottneſt (277).
351. *CALOTHRIX* sp. Cape Riche (334).
352. *CALOTHRIX* sp. Cape Riche (335). I cannot at present identify these species; and have besides two others, collected in smaller quantity.

AT SEA, September 4, 1854.

















