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.

Read December 11, 1854.

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 Hugel, 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 Algae 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 Algae 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 Algae; 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 Algae. 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
Alga, 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 Algae, 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 Algae. In all the shallow water round
the Colony of Western Australia.

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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. infectans 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 Lyngbyei, with a liberal sprinkling of Hypnea, 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 Gelandium 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 *Lau-
rencea*, 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 *Dasys*) 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 *Chondria*, *Griffithsia*, *Callithamnia*, *Wrangelia*, *Crouania*, &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 Algae. The ordinary *Fucoidea* (*Sargassum* and *Cystophora*), with *Ecklonia radiata*, chiefly occupy the laminarian zone; and the smaller *Rhodospermae*, scattered among them, are few, and of little interest. Here, nevertheless, I collected a new Genus (*Lasiothalia*), and a remarkably fine *Liagora* (L. Cheymiana).

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. Halophleyna 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 Kam-tchatan 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 deles-serioides and S. hypnoides; 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 Algae; and the observation (coupled with other similar ones elsewhere made), seems to render it probable that Algae 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, Epaerideæ, and Leguminoseæ (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 (Laurencia, Hypnea, Acanthopora, &c.); and thickly studded with a Caulerpa (C. letevirens, 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 Algae. The water in these basins is always intensely transparent; the bottom frequently of white sand; and the steep and craggy sides clothed with Algae 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 Caulerpa the smaller Rhodosperms (such as Dasyae and Callithamnia) are often found. But these are most numerous on the perpendicular sides of the border reefs, where also rich meadows of Caulerpa 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:—
Dr. W. H. Harvey's Account of the Marine Botany of

Whole number collected. | Australian.
---|---
Ser. 1. *Melanospermae*, . . . 42 . . . . . . . 26
" 2. *Rhodospermae*, . . 270 . . . . . . . 216
" 3. *Chlorospermae*, . . 40 . . . . . . . 35

352 | 277

These numbers do not show the whole of the *Melanospermae* 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 *Rhodospermae* is a remarkable feature. But the most singular fact is the proportion between the *Australian* and *pelagic* species of *Chlorospermae*, a group whose species are, generally speaking, much less local than those of either of the other divisions. The comparatively great number of *Siphonae* 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 :

| *Chorda lomentaria*. | *Plocamium coccineum*. | *Gracilaria confervoides*. |
| *Dictyota dichotoma*. | *Spyridia filamentosa*. | *Codium tomentosum*. |
| *Asperococcus eckinatus*. | *Centroceras clavulatum*. | *Ulva latissima*. |
| *Ectocarpus siliculosus*. | *Ceramium rubrum*. | *Enteromorpha compressa*. |
| *Gelidium corneum*. | | *Gelidium fastigiatus*. |

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

| *Cystoseira prolifera*. | | |
| *Dictymenia fraxinifolia*. | *Dasya Lallemandi*. | |

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*. 

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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:—

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<td>Hydroclathrus cancellatus.</td>
<td>———— obscura.</td>
<td>———— riscida.</td>
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<td>Asperococcus sinuosus.</td>
<td>———— pennata.</td>
<td>Halymenia Floresia.</td>
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<td>Chondria sedifolia?</td>
<td>Dasya mollis.</td>
<td>Dudresnaia coccinea.</td>
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<td>Peyssonella rubra.</td>
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The following 27 are natives of the coasts of the British Islands, as well as of those of W. Australia:—

| Dicyota dichotoma.      | Laurencia obtusa.        | ———— gracillimum. |
| ———— echinatus.         | Helmintadora divaricata. | Callithamnion sparsum? |
| Chondria dasyphylla.    | Spyridia filamentosa.    | Enteronourpha compressa. |
| Polysiphonia obscura.   | Ceramium rubrum.         | Calothric caspitula? |

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 Algae, 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 examination, and are not now accessible.

1. Turbinaria vulgaris, J. Ag. Fragments on the beach, Fremantle (288).


3. Scytolithia dorycarpa β. 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).


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).


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.


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 radiciformis**, Ag. Fremantle and Cape Riche (156).

16. **Sporochnus scoparius**, n. sp.; fronde tereti rigidâ crassâ dendroidâ (2–3 pedali); caule strato velutino vestito; ramis creberrimis undique egredientibus decomposito-pinnatis angulatis glabris, minoribus erectis strictis sparsâ spinosis subalternis; receptaculis ovalibus v. oblongis pedicellum ipsis multiplo longius coronantis. At Cape Riche, and Garden and Rottnest 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 alternæ ramosâ, sinusobustissimus, segmentis erectis latis linearibus integerrimis sepæ alternæ 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, sinusobustissimus, segmentis patentibus linearibus integerrimis repetitâ furcatis subundulatis obtusis; laminâ tenui-membranaceâ enervi; soris dispositis in lineas recurvas é costâ ad marginem proficiscientibus. Fremantle, rare (155). A beautiful and distinct species, elegantly marked in dotted lines like a leopard's skin.


24. **Metachroma thuyoides**, n. sp.; Middleton Bay, King George's Sound; and Cape Riche at low-water mark (21). *Frond* 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 Kunthii, Ag. Key West and Rottnest (81 and 225).
27. Dictyota radicans, n. sp.; fronde estuposa stipitata basi fibris crassis sparsis est stipite et laminâ emissis radicante dichotomo-pinnatifidâ, segmentis cuneatis, lateralibus erectis, sinubus angustis, apicibus obtusissimis; sori 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 Lyngbyei, J. Ag. Princess Royal Harbour in summer, very common (25).
34. Asperococcus sinuosus, Ag. King George's Sound and Rottnest, &c. (27).
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 donata, basi et apice attenuata. King George's Sound (82).

Order VI.—ECTOCARPACEÆ.
40. Sphacelaria Nove Hollandiar, 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).
the Colony of Western Australia.

Series II.—Rhodosphermeæ.

Order I.—Rhodomelaceæ.

43. **Claudia elegans**, Ag. Fremantle, very rare, June, Geo. Clifton, Esq. (276).


45. **Martensia denticulata**, n. sp.; frondibus sessilibus cæspitosis tenui-membranaceis répetitè dichotomis, lacinias uncæatis ultimus non raro flabelliformibus; margine crispato denticulato; fenestro apice ciliato v. lobato, lobulis dumum elongatis fenestratisque. Species valēd 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, marginè hic illè minutissimè denticulato; fenestro apice angustissimè marginato denticulato. King George’s Sound, rare, February (88).

47. **Thuretia quercifolia**, Dne. King George’s Sound and Garden Island (65).


49. **Sarcomenia hypneoides**, n. sp.; fronde lineari angustissimâ compressâ distichë ramosissimâ, ramis ranulisque oppositís attenuatis acutis basi nee angustatibus; 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. **Lenormanda spectabilis**, Sond. Garden Island, abundant; rare at Rottnest (113). *L. lutifolia*, 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, costis infra medium laminae evanescente; fasciculis stichidiorum sparsis. Garden Island, rare (112). This plant is intermediate in character between *Jeannerettia* and *Pollexfenia*.

52. **Pollexfenia pedicellata**, Harv. Ner. Austr., t. 5. King George’s Sound, Garden Island, and Rottnest, common (33). *B. 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. **Polypnacum 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 Lemanriannum*, n. sp.; caule corneo crasso (pedali et ultrā) echinulato inferné teretī supernē alato Ramoso; ramis quoquoversum directis alatis phyllodiā proliferē fereentibus; phyllodiis furtiatis v. dichotomis costatis basi cuneatis apice obtusis, segmentīs laterálibus erectīs plus minus incisis. Fremantle, cast ashore in July (320). I first received this truly noble species in a collection of Western Australian Algae, 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 frazinifolia*. *Fucus frazinifolius*, Turn. Rottnest, rare (241). I abandon the genera *Epineuron* and *Spyromenia* as not being distinguishable from *Dictymenia*.


61. *Dictymenia pectinella*, n. sp.; fronde infernē valdé costā supernē sub-costā lineari distichē ramosā planā; ramis erecto-patentibus oppositis v. abortu alternis linearibus obtusi tenuissimē costatis ciliato-fimbriatis; ciliis oppositis argútō pectinato-pinnatifidis involutās; andlerrīliis magnī ovalibus ad apices ciliarum fasciculatīs. Garden Island, very rare (290). A very distinct and beautiful species.


63. *Kuttingia angusta*, n. sp.; fronde infernē costā cartilagineā percurssā decompositē pinnatā; ramis angustē-linearibus planis, superiōribus tenuissimē costatis v. ecostatis; ramulis oppositis erecto-patentibus obtusi apice involutis. Rottnest, rare (242). A very much smaller, narrower, and thinner plant than *K. canaliculata*, of which it has the structure.

64. *Kuttingia serrata*, n. sp.; fronde basi cartilagineā denudatā v. alato-marginatā bi-tripinnatifidă et costā primariā prolīferā; lacinīis membranaceīs planis tenuissimē costatīs, juniorībus, lacinulīque argútī serratīs. Rottnest, very rare (291).

65. *Rhytiphlebas Australisica*, Mont. King George’s Sound, common. Rare at Garden Island (31).

66. *Rhytiphlebas elata*. (*Rhodometra elata*, Sond. I) dendroidēca (1–2 pedalis); caule teretī crassissimō (2–3 lineas diametro) opaco Ramoso; ramis decomposito-ramosissimē di-tri-chotomis v. vagē divisiō, minoribus ramulisque patentibus transversim striatis; striis approximatis, axillis latisimīs; ceramidiis ovatis pedicellatīs; stichidiis ad latera ramulorum fasciculatīs; siphoniibis primāris 5–6 magnī, strato crasso cellularum minutarum corticatīs. Cast ashore at Fremantle (304). A gigantic species, quite unlike any known to me.


68. *Acanthophora dendroides*, n. sp.; caule increassato indiviso infernē nudō supernē ramis alternīs spirālīter evolutīs vestītō; ramis decompositis circumscriptiōne lanceolatīs; ramulis spinosis, spinulis solitariīs sparsīs. Rottnest on the reefs, near low-water mark (224). Much the largest and most robust of the genus.

69. *Alsidiun spinulosum*, n. sp.; fronde teretī crassā dendroidēca decompositē ramosissimā; ramis ramulisque erectīs quoquoversum sistentibus; ramulis spineformibus sparsīs; 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).
72. Chondria corynephora, n. sp.; fronde tereti succeosae succitata rosea robusta quoquoverum ramosisimae; ramulis indivisibus patentibus et latere bis terve ramosis; ramulis oppositis, fasciculatis, v. sparsis, sepulis incurvis cylindraceis 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 succeosae succitata radiis bis-terve umbellatim divisae; ramulis fasciculato-verticillatis saccatis oblongis obtusissimis basi constrictis; tetrasporis in ramulis nidulantibus. Garden Island, rare (273).
74. Chondria Umbellula, n. sp.; fronde pusillia (½–1 unciali) simplici sacco-clavati apice ramulis 5–10 conformibus umbellatim coronata; 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 pusillia (1–2 unciali) compressa cartilaginea alternè ramosis sub-distichà; ramis ramulisque alternis basi et apice attenuatis acutis; ceramidiis ovatis pedicellatis; tetrasporis sub apicibus ramulorum congestis. Rottnest, on Zostera leaves (191).
76. Leveillia jungermanniioides. L. Schimperi, and L. gracilis, Dnc. Abundant on a variety of Algae at Fremantle, Garden Island, and Rottnest (123).
78. Polyzonia flaccida, n. sp.; caule primario repente; ramis cretisim simplicibus ramosisve tenuissimis flaccidis oligosiphonias; foliis (v. ramulis) alternis pectiniformibus, pectinis laciniis 5–6 filiformibus articulatis monosiphonias acutis; stichidiis arcuatis rostratis. On Fucoideis, 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 laciniae (34).
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, succitata fuscescens; frondibus (2–3 uncialibus) cartilagineis chartæ acetæ adherentibus setaceis sursum attenuatis pellicidæ articulatis ramosissimis; ramis patentibus pluribus alternè v. vagè divisis ramulisque conspersis; ramulis capillaris simplicibus patentibus; axillis latis; articulis 4-siphonis subtorulosis, inferioribus diametro brevioribus, superioribus equalibus v. sublongioribus. Common on Polyphysa peniculæ, at Princess Royal Harbour, King George’s Sound. It has the habit of P. fibrillosa, but is more nearly allied to P. Harceyi and P. Binneyi than to any other that I remember (22).
85. **Polysiphonia mutabilis**, n. sp.; mollis, aère cito deliquescent, versicolor, siccate rosea, frondibus aggregatis (2-3 uncialibus) tenuissimè corticatis articulatis superrne eorticatis dichotomis ramosissimis; ramis minoribus subalternè divisis erecto-patentibus; ramulis sparsis basi et apice attenuatis acutis; articulis 6-siphoniis, ramorum diametro equalibus, 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 Rosea**, n. sp.; punicea; frondibus (3-6 uncialibus) cespitosis capillarisbus mollibus chartae ætæ adherentibus decompositè ramosissimis; ramis alternè compositis septè subsecundis plurics divisis; ramulis ultimis filiformibus elongatis sparsis omnibus eximì patentibus; axillis latissimis; articulis pellucidè 4-siphonis, 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.; siccate rosea; frondibus pusillis (vix uncialibus) densissimè intertextis arachnoïdes dichotomis ramosissimis suffastigiatis; ramis ramulisque patentissimis divaricato-squarrosis crispsique; axillis distantibus; articulis 4-siphonis 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 $\frac{1}{30}$ of an inch in diameter.

88. **Polysiphonia Scopularum**, n. sp.; badia; frondibus pusillis (vix uncialibus) cespitosis basi radicantibus rigidulis capillarisbus tetragonis erectis parce ramosis infrà simplicibus suprà ramis lateralisbus plus minùs onustis; ramis sepè secundis erectis simpliciusculis vel ramuliferis; ramulis paucis consimilibus; axillis angustissimis; articulis diametro subduplo-longioribus, superioribus aequalibus; ceramidis ovatis sessilibus. On littoral rocks, Rottnest, common (187). Allied to *P. rudis*, but smaller. It slightly adheres to paper in drying.

89. **Polysiphonia Implexa**, Hook. and Harv. Nov. Zel. Parasitical on Corallines and on *Caulinia* at King George's Sound (79).

90. **Polysiphonia prostrata**, n. sp.; parasitica, omnino prostrata, discis rameis preponentibus, rubra, siccate fuscescentes; frondibus pusillis (1-2 uncialibus) è centro radiantibus subparallelès secundè ramosis; ramis filiformibus simplicibus repentibus apice involutis; ramulis liberioris paucissimis brevissimis; articulis 4-siphonis diametro subduplo-brevioribus; ceramidibus ovatis longiusculis pedunculatis (ramos v. ramulus terminans). 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. eymosum*. 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, sicciata purpureo-nigrescens; frondibus subolitariis (2-3 uncialibus) crasis cartilagineis pellucide articulatis repetitiva dichotomis v. abortu scorpiodeo-secundis; ramulis ultimis bis terve furcatis spicis forcipatis articulis 6-siphoniis diametro brevioribus; ceramidii ovatis sessilibus. On *Zostera* at Rottnest and King George's Sound (186). A distinct species, looking like a *Ceramium* to the naked eye.


95. **Polysiphonia aurata**, n. sp.; fusco-rubra, madefacta aurea; frondibus craspiosis (2-3 uncialibus) capillariis cartilagineo-membranaceis articulatis decomposita ramosis; ramis dichotomis alternis vel erecto-patentibus; ramulis alternis v. secundis apice furcatis; articulis 10-18 siphoniis inferioribus diametro 2-3-plo-longioribus, superioribus equalibus; septis angustissimis; ceramidii 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.


98. **Polysiphonia pennata**, Ag. Sand-covered rocks, Middleton Bay, King George's Sound (12).

99. **Polysiphonia pecinella**, n. sp.; sicciata roseo-purpurea; frondibus purissimis (uncialibus) basi radicantis ramosis arachnoideis; ramis paucis alternis v. sparsis filiformibus simplicibus per totam longitudinem pecinatis; ramulis secundis patelliformibus simplicibus brevibus obtusis; articulis 8-siphoniis diametro equaliibus v. duplo-longioribus. On mud, near high-water mark, Princess Royal Harbour, King George's Sound. A larger variety at Rottnest (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.; minutula, dense crasptosa, rupestris, badia; surculo prostrato radicibus numerosissimis elongatis apice namilloso-squamosis radicante; ramis erectis secundis simplicissimis brevissimis approximatis subacutis; articulis 10-12 siphoniis, surculo diametro duplo-brevisobrius, ramorum adutorum sequiuliplo-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 segetorum*, 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.


103. **Polysiphonia cladostephus**, Mont. Garden Island and King George's Sound (271).

Dasya elongata, Sond. Abundant at Fremantle, and Rottnest, and King George's Sound (59).

Dasya Cliftoni, n. sp.; caule elongato (pedali et ultrade) tenui flexuoso v. scandente glabro omnino corticato subdistichio ramoso bi-tripinnato, pinnis patentibus glabras; pinnulis alternis remotiusculis rameolosae; ramellis multoties divaricato-dichotomis vix attenuatis obtusis monosiphoniiis, articulis cylindraceis, 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).

Dasya frutescens, n. sp.; caule (2-4 unciiali) vagh ramosissimo glabro corticato; ramis quaquaversalibus directis patentibus bis-terve divisis attenuatis, minoribus ramellis vestitis; ramellis pluripes dichotomis vix attenuatis obtusis, segmentis falcato-recursus v. incurvis, articulis diametro 2-3-plo-longioribus; ceramidiis sessiliis 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).

Dasya proxima, n. sp.; fronde crassâ corticata vagh ramosâ; ramis elongatis virgatis simplicibus vel ramos 2-3 consimiles lateraliis herentibus, ramis omnibus ramulos breves quo-quaversalibus emitentibus; ramulis corticatis simplicibus v. iterum ramosis, junioribus ramellis vestitis; ramellis subverticillatis dichotomis e basi laeâ conspicue 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).


Dasya Wrangelioidea, n. sp.; caule gracili (2-3 unciiali) pellucido articulato 10-12-siphonio distichio ramoso omnibus partibus ramellis vestito; ramis patentibus sursum curvatis simplicibus v. iterum alternâ ramosis; ramellis densissimis multoties divaricato-dichotomis acutis, articulis diametro sesquilongioribus; 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 Wrangelia velutina (272).

Dasya multicaps, n. sp.; caule subnullo (ferè bulbosum) mox in ramos numerosissimorum erecto diviso; ramis (2-3 unciiali) simplicibus pellucido articulatis, articulis diametro subbre-vioribus polysiphoniiis, pinnatis v. apice bipinnatis, ambitu lineariibus, v. lineari-spathulatis; pinnis oligosiphoniis alternis approximatis brevisissimis superioribus sensim longioribus rameolosae; ramellis alternis pluripes 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 ultrā) crasso villis stipato sub-dichotomo, segmentis ramiferis; ramis secundariis longissimis (1-2 pedalibus) caule multō tenueioribus glabris corticatis simplicibus infernē sepē denudatis superne pulcherrimē plumoso-pinnatis; pinnis alternis crebris horizontalibus plus minus ecorticatis polysiphonii iterum pinnulatis; pinnulis oligosiphonii brevissimis ramelliferis; ramellis dichotomis attenuatis obtusiis, 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).


116. *Dasya tenera*, n. sp.; cartilaginea, mox āère diliquescens, siccitate rosea; fronde tetrasiphoniā corticātā decompositī ramosissimā subdichotomā flexuosā; ramis irregulariter divisis, minoribus sepē secundis, ultimis attenuatīs acutīs, omnibus denudātīs v. ramellis tenuissimīs laxē vestitis; ramellis verticillātīs basi ramosī subsimplicibus strictīs cylindraceīs obtusiīs; ceramidiis ovatis pedicellatis; stichidiis sparsīs v. fasciculātīs lanceolatīs è ramullūs enatīs. 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 Lallemandii*, Mont.1 *D. gracilis*, Harv. MS. Perpendicular sides of the Jetty reef, at Rottnest, 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) vagē diviso corticato ramis articulatīs onusto; ramis (2-3 uncialibus) simplicibus glabris plus minus distinctī articularīs polysiphonii densissimē pinnatis ambitu linearibus; pinnis brevissimīs (2-3 lineas longīs) oligosiphonii dichotomo-multīfīdis, segmentis ultimīs solūm monosiphonii acutīs, articulis diametro aequālibus vel subbrevioribus; ceramidiis magnīs inflato-globosis pedicellatis. Rottnest, 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.


121. Asparagusis Sanforrdina, n. sp.; surculo valido ramosissimo repente caules plures emittente; caulibus erectis simplicibus à basi longè nudis suprâ ramellis thyrsóideo-penicillatis; penicillis ramellorum quoquoversum egredientibus extimè obtusis; pinnellis oppositis filiformibus crispato-incurvis; ceramidiiis globosis inferné 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 obtusi 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. Asparagus ps armata, n. sp.; surculo ultra-setaceo parum ramoso repente caules plures emittente; caulibus erectis ramosis usque ad basin ramellis obvisis v. brevissimè nudis; ramis secundariis consimilibus ad basin armatis ramulis subternis nudis retrorsum acutatis; penicillis ramellorum subdistichis ambitu ovatis acutis; pinnellis oppositis; ceramidiiis globosis; pedunculo cylindraceo. 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. 33, 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. ß. elata, Sond. A much larger and stronger form than the common one.

124. Laurencia obtusa, Lx. King George's Sound and Rottnest, on Algae (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).


128. Laurencia cruciata, n. sp.; livido-purpurea, caspitsa; fronde tereti rigidâ quoquoversum ramosâ; ramis ramulisque patentissimis oppositis verticillatisve rarò alternis, ramulis junioribus cylindricis truncatis, fructiferis verrucoso-glandulosi. 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 caspitsa, ò surculis repentibus orta; fronde livido-purpurea tereti rigidâ tenaci; juniori pluries secundù ramosâ, ramis ramulisque erecto-
appressis, axillis angustissimis; adulta spicule paniculata, ramis quuovoversum egredientibus
elongatis patentibus, ramulis alternis spiraliter insertis corymboso-multifidis; ceramidii 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).

Sound (125).

133. **Laurencia** Grevilleana, n. sp.; purpureo-cocinea; fronde complanata eximii disticha decom-
posito-pinnata; pinnis in rachide stricta 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 beauti-
ful 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 pusilla (1-2 unciali) paniculatim ramosa ambitu ovatâ;
caule basi inconficie articulato supra toruloso; ramis ramulisque patentibus suboppositis
v. verticillatis (nunc sparsi) obtusi articulato-constrictis, articulis diametro brevioribus
v. subequalibus; ceramidiis globosis sparis v. aggregatis. On Zostera at Rottnest (106).
The spores are allied to a very large placenta, nearly filling the cavity of the ceramidium.

136. **Champa parvula**. Lomentaria parvula, Ag. King George's Sound and Rottnest (37).

137. **Champa** aequis. Lomentaria aequis, Ag. King George's Sound, Rottnest, and Garden Island
(194).


**ORDER III.—WRANGELIACEÆ.**

139. **Wrangelia** penicillata, Ag. W. plumosa, Harv. Alg. Tasm. On Zostera leaves at Rott-
nest, 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 speci-
men now before me.

140. **Wrangelia?** Agardhiana, n. sp.; fronde cartilagineâ (6-8 unciali) corticata decompositè
ramosissimâ; ramis ramulisque dichotomo-alternis pluries divisis patentissimis ad gencica
verticillatim ramellosis; ramellis minutissimis dichotomo-multidis obtusis; articulis ramel-
lorum diametro sesquilongioribus. Dredged in 6-7 fathoms in King George's Sound (40).
It seems nearly allied to a plant from Cape Northumberland, distributed by me under the
MS. name of *Crowania insignis*, but which is perhaps also a *Wrangelia*.

141. *Wrangelia velutina*, H. *Dasya velutina*, Sond. I 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 myriophyloides*, n. sp.; fronde rigidiuscula è basi articulata é ecorticata é infernè
stuposa pinnatim ramosa; ramis patellibus simplicibus v. iterum pinnatis ad genicula verticillatim
ramellosis; ramellis pluries trichotomis segmentis patellibus spicæ trifurcis
acutissimis; fructu . . . Parasitical on the larger *Fucoids*, Rottnest (246). A very distinct
species.

143. *Wrangelia Nitella*, n. sp.; fronde membranacea flaccida è basi articulata (articulis diametro
4-6—plo-longioribus) é ecorticata decompositè pinnata; ramis ramulisque sempit oppositis
distichis ad genicula verticillatim ramellosis; ramellis di-tri-chotomo-multifidis segmentis
patellibus acutissimis; tetrasporis globosis ad ramellos sessilibus; cystocarpis . . . 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. squarrulosa* and *W. myriophyloides*. 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 prolóngations,
indicating that they come from deep water.

144. *Wrangelia Halurus*, n. sp.; rosea, gelatinosum-membranacea (aqua dulci citi deliquescent);
fronde è filo repente orta articulatâ é ecorticatâ vagè ramosa; ramis elongatis simplicibus
basi et apice attenuatis ad genicula verticillatim ramellosis; ramellis dichotomo-multifidis
patellibus obtusis; articulis ramorum diametro 2-3-plo, ramellorum multiplo-longioribus;
cystocarpis ramulos abbreviatus coronantibus. *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 cartilaginea crassâ elongatâ (6–10 uncias longâ)
cortiçatâ decompositè pinnata; pinnis pinnulisque alternis distichis subhorizontalibus, ultimis
subarticulatis tenuiter corticatis, ad genicula verticillatim ramellosis; ramellis dichotomis
incurvus obtusis; articulis diametro 3–4-plo-longioribus. Garden Island, rare (270).
Possibly a species of *Halurus*.

146. *Wrangelia? tenella*, n. sp.; pusilla (1½ uncialis), cespitosa; fronde tenuissimâ membranacea
è basi articulatâ é ecorticatâ vagè ramosa; ramis subsimplicibus nunc iterum ramosis elongatâ
virgatis per totam longitudinem bipinnatis; pinnis brevissimis (vix semilineam longis)
oppositis v. verticillatis, pinnulis 2-3-cellaribus obtusis; articulis ramorum diametro
4-plo, pinnarum 2-3-plo, pinnularum sesquilongioribus. 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
pineæ and ramellæ.
ORDER IV.—CORALLINACEÆ.

147. **Amphiroa charoides, Lx.** King George's Sound, Cape Riche, and Rottnest, on rocks (9).

148. **Amphiroa intermedia, n. sp.**; fronde gracilis (biuncialis) fastigiata sub-tetrachotoma, ramulis stellatim patentibus verticillatis; articulis cylindraceis basi et apice nodoso-incrementatis, superioribus diametro 8-plo-longioribus; geniculis angustissimis; ceramidibus 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, Dnn.** 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 equalibus; ceramidibus numerosissimis quoquoveris. 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-incrementatis, superioribus simplicibus diametro 6–8-plo-longioribus; geniculis diametro equalibus, inferioribus calcareae-granulosis, superioribus cartilagineis nudis; ceramidibus 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 sapê transversim rugulosis diametro sesquilateralibus, lobis brevibus acutis erectis; ceramidibus... At Rottnest, parasitical on *Alga* (250). A much smaller and more delicate plant than *C. sagittatum*, and differing from that and *C. culturatum*, 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 Alga, &c. (53).

158. **Jania affinis, n. sp.**; fronde pusillâ dichotomâ, ramis ramulisque erectis strictiussulis; axillis acutis; articulis omnibus cylindraceis diametro triplio-longioribus; ceramidibus parvis urceoliformibus. Rottnest ( ). The size of *J. micrarthrodia*, but with much longer joints and more erect growth. It may be *J. pacifica*, Aresch.

159. **Jania Cuvierii, Lx.** Many varieties of this species abundant (3).

160. **Mastophora plana, Sond.** Extremely common on rocks, Rottnest (50).

161. **Mastophora Lamourouxii, Dnn.** King George's Sound and Cape Riche ( ).

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ORDER V._—SPHÆROCOCCOIDEÆ.

171. Delesseria denticulata, n. sp.; frond costata dichotomâ rigidiusculâ; segmentis lato-lineari-bus crispato-undulatis marginæ denticulatis; costâ opaca cartilagineâ apicem versus evanes-cente; membrana cellulis parvis rotundato-hexagonis; venis nullis; soris in sporophyllis muricatis est costâ prorumpentibus. Parasite on Alga, Rottnest (235). Of a rigid substance, scarcely adhering to paper. 3-4 inches high, the branches ½ inch broad.

172. Delesseria crispatula, n. sp.; pusilla (1-2 uncialis); frond costata dichotomâ; segmentis linearibus integerrimis undulato-crispatis, costâ articulatâ 3-siphoniâ; venis nullis; soris in sporophyllis propriis est costâ enatis v. rarâ 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 Alga. 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; frond costata foliolis est 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 nudno carnosâ-cartilagineâ crassissimo (2-3 lines diametro) apice in frondem ramosissimam desinente; frond costata foliolis est costâ validâ prorumpentibus ramosâ; foliolis geminis exactè oppositis lineari-lanceolatis utrinque acutis, adultis costâ cartilagineâ opacâ, junioribus costâ articulatâ percursis; venis nullis; membrana 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.; frond costata foliolis a costâ validâ infra apicem revolutum prorumpentibus ramosâ; foliolis ovalibus latitudine sequi vel subduplo-longioribus tenuimembrannacis undulatis denticulatis apice obtusâ acuminatis revolutis; soris ???? On other Alga, King George's Sound, and Rottnest, rare. 2-3 inches high. Very unlike any previously described species (311).

177. Delesseria corifolia, n. sp.; frond costata foliolis a costâ crassâ prorumpentibus ramosâ; foliolis cartilagineo-carnosis crassis opacis lanceolatis basi ovatis obtusis; membrane cellulis pluriserialibus, interioribus magnis, superficialibus minutiissimis; cystocarpiis sorisque in sporophyllis propriis est 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 delisserioides.
178. *Hemineura crispata*, n. sp.; fronde pinnatifido-decomposita, lobis oblongis basi et apice angustatis obtusis oppositis margine subintegerrimis undulato-crispatis demum crispiissimis; costæ immersæ supernæ evanescente, costulis obsoleteis; coccidiis in costâ loborum sessilibus ore protus crassâ dichotomâ; laciniis linearibus pluries divisis crispiato-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 uncialis) bisâ v. pluries furcatâ basi cuneâta stipticâ; stipite brevi in costâ max evanescente prolongato; laciniis rotundatis; margin processibus minutis ramosis densâ fimbriato; soris per totam laminam sparsis. Parasitical on *Pilota 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), tenuissimâ membranaceo-mucro. *crespitosum*; fronde sessili aveniâ dichotomâ fastigiata; laciniis lato-linearibus v. cuneatis undulato-crispatis patentibus obtusis; axillis rotundatis; soris ramosis 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).


183. *Nitophyllum ciliolatum*, n. sp.; fronde cespitosâ sessili angustâ-linearis dichotomâ ramosissimâ ciliolis marginalibus et superficialibus passim echinulata. *On Caulinia* s. 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.


186. *Phacelocarpus alatus*, n. sp.; fronde costata; costâ elevata bene definitâ utroque latere laminâ angustâ alata; 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 confused under the name *L. billardieri*.


191. *Dicranea pustulum*, n. sp.; fronde unciali subdichotomâ vagr 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 spines, those bearing tetraspores not swollen. The cystocarps are near the tips of the branchlets (80).


193. *Calliblepharis conspersa*, n. sp.; fronde stipitâta cartilagineâ simplici vel parciâ dichotomâ a margine pinnatâ; pinnis variâ lobatis et fimbriatis nunc multifidis margine dentato-acuteatis ciliatissive; disco aculeus 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 stipitâta rubro-sanguineâ v. purpurascence cartilagineo-corneâ rigidâ dichotomâ; lacinii linearibus è margine densissimè pinnato-fimbriatis; pinnis angustissimis patentibus simplicibus v. pinnatim compositis vaga dentatis v. ciliatis; coccidiis . . . . . . . Abundant on rocks near low-water mark, Middleton Bay, King George's Sound, and at Rottnest, cast 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, multiâfida, dupli â strato constituâta; stratum intius cribroso-spungiosum è cellulis brevibus anastomosanti bis et lacinii intercellularibus; exteri è cellulis minutis verticaliter seriatis constitutum. *Cystocarpia* marginâlia, elevata, hemisphærica, umbilicata; pericarpium cellulosum, crassum; spore minute in filis č placentâ centrali radiântibus seriâta. *Tetrasporae . . . . Alga* livido-rubra, sicciâte nigrescentis, ramosissima, subdichotoma; margine revoluto.

195. *Sarcocladia obesa*, n. sp.; abundant at King George's Sound and Rottnest (280).


198. *Thysanocladia costata*, n. sp.; fronde planâ costâ validâ percursi distichâ decomposito-pinnatâ ambitu ovatâ; pinnis patentibus approximatis suboppositis costatis; pinnulis argutâ serrâtâ subcostatis; coccidiis . . . Rottnest (250). A very handsome plant, 12-14 inches high, readily known by its strong midrib.


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. secundîs 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 verticalibus simplicibus, articulis diametro subduplo-longioribus, cystocarpiis 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 rumellosus* of Pl. Preiss. One or two specimens of a dichotomous *Gelidium*, resembling *G. variabile*, were gathered at Rottnest.

207. *Gelidium proliferum*, n. sp.; fronde infernâ semiterete crassissimâ, supernâ compresso-planâ v. applanatâ decompositâ pinnatâ et proliferâ, setis minutis demum foliaceis densissimâ-muricatâ; pinnis pinnulisque lato-linearius planis, pinnulis erecto-patentibus; cystocarpiis 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.

210. **Hypnea australis**, n. sp.; fronde dendroideâ (1–2 pedali) robustâ decomposito-ramosissimâ; ramis alternis sparsiâ approximâtis pluris alternè compositis; ramulis ultimis (1–2 unci-alibus) lineâribus acutis basi setaceo-attenuâtis; 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.—**CHÆTANGIEÆ.

**Hennedya,** nov. gen. *Caulis* tores, *ramosus*; *ramis* apice in frondem planam dichotomam stratis tribus contextam dilatatis; stratum *medullare* è filis tenuissimis anastomosantibus densissimê intertextis; *intermedium* cellulis magnis vacuis uniseriatis; *periphericum* cellulis minimis verticaliter ordinatis compositum. *Cystocarpia* hemisphaerica, elevata, umbilicata, demum poro pertusa, ad apices laciniarum sessilia, fasciculos sporarum secus parietes loculi dispositos foventia. *Tetraspora* ... *Alga* australis, fusco-rubra, rigide membranaeæ, multoties dichotoma; laciniiis crispatis lato-linearibus apice emarginatis.

217. **Hennedya crispa**, n. sp.; Garden Island and Rottnest, abundant (168). Readily known from *Chætangium* 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 Algae of the West of Scotland.

**Order IX.—**HELMINTHOCLADIEÆ.

218. **Helminthora dicaricata**, J. Ag. Rottnest and King George’s Sound in winter, common (234).

219. **Liagora viscidâ**, Ag. King George’s Sound and Cape Riche, common (8).

220. **Liagora distincta**, Ag. Cape Riche, rare (313).

221. **Liagora Cheyniana**, n. sp.; fronde gelatinosâ compressâ siccate subcanaliculâtâ dichotomâ ramosissimâ; *ramis* erecto-patentibus argenteis villo purpuroe tomentosis, apicibus divaricatis; *filis* periphericiis liberis cylindracciis furcatis. At Cape Riche (294). *Frond* 6–8
the Colony of Western Australia.

inches high, nearly a line in diameter, much branched, dichotomous, rarely with lateral branches. The peripheral 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, Dnc.? Galazaura 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, Dnc.? 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 flexed at the margin when dry, repeatedly dichotomous, and deep purple red.

ORDER X.—RHODYMENIACEÆ.

224. Hymenocladia? divaricata, n. sp.; fronde plana gelatinoso-membranacea decomposita; pinnatâ, rachide flexuosa basi et apice attenuata, pinnis pinnulisque lineari-lanceolatis attenuatis patentibus, pinnulis ultimis setacea minutis horizontali-divaricatis; cystocarpis ad discum vel marginem lamina insidentibus sparsis; tetrasporis magnis triangulo divisis 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 Laurenciaeæ. 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 placenta; if I mistake not, on the plan of those of a Rhodymeniacea, though the spores are of unusually large size in this order, and more resemble those of a Spherothecoid plant. The external habit is not unlike that of Gigartina Teedii.

225. Hymenocladia? Ramalina, n. sp.; fronde plana rosea membranacea ramosissimâ, ramis subpinnatim 2-3-divisit alternis oppositisque patentibus basi et apice attenuatis, pinnulis 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 rami.

226. Plocamium procerum, Ag. Very common everywhere (94).


228. Plocamium Preissianum, Sond. King George's Sound and Rottnest (86).


231. Rhodophyllis volans, n. sp.; cespitosa, è filis intertextis orta; fronde membranacea rosea subdichotomà vel vagè partitì, segmentis linearibus patentibus margine simplicibus vel sèpissimè pinnatis; pinnis ovalibus oblongisve obtusis basi attenuatis subpetiolatis; cysto-
carpiis per discum frondis sparsis; tetrasporis in pinnis nidulantiibus zonatim divis. King George's Sound (93) and Rottnest (142). A pretty little species, with the habit of Hemi-neura frondosa in miniature; and readily known by its scattered, not marginal, cystocarps.


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 costā validā evanescente donatas dichotomo-multifidas abeuntibus; segmentis linearibus cuneatissimis, margine incrassato plano; soris maculam depressam infra apicem frondis formantibus. *Hab*. Rottnest (238). Frond 1–2 feet high, much branched; segments \(\frac{3}{4}–\frac{3}{4}\) 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** *data*, n. sp.; caulescens; stipite plano-compresso subcanaliculato ramoso, ramis in frondes pergamenas infernè subcostatas pinnato-dichotomias abeuntibus; rachide flexuosa, segmentis alternis linearibus angustissimis dichotomias 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** ? *obtusa*, 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 max ampliato, fronde basi cuneatā tenui-membranacea flaccidā rosā subpalmatifidā, segmentis lato-cuneatis variō 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 cells.


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.

ORDER XI.—CRYPTONEMIACEÆ.

241. MYCHODEA carnosa, 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 frond, 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 cocinea, 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.


246. GIGARTINA disticha, Sond. Fremantle (262). A solitary specimen only.

GATTYA, nov. gen. Frons membranacea, compressa, disticha, pinnatifida, è filo centrali verticillatim ramellosa composta. Filum centrale articulatum, callithamnoidenum, ad gencilia filis verticillatae dichotoma emittens, ramellorum apicibus in stratum periphericum membranaceum arcte coherentibus. Cystocarpia et Tetraspora ignotae. Alga tenella, parasitica; structurâ fere Endocladiâ; habitu diversissimo; affinitate magis ad Catenelâm accedens. The generic name is given in honour of Mrs. MARGARET GATTY, of Ecclesfield, Yorkshire, a diligent explorer of British Alge and Marine animals.

247. GATTYA pinnella, n. sp.; parasite on Sarcocladia, and on Corallines, Rottnest (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 carnosomembranacea, plano-compressa, è stratis tribus cellularum composta; stratum medullare è cellulis maximis inanibus demum sepè ruptis; intermedium cellulis pluriseriatis minoribus coloratis; corticale filis moniliformibus verticalibus dichotomis mucro cohíbitis formatum. Faversella intra pericarpium proprium spicis coronatum, poro pertusum, ad placemant basalem allxe; filis arachnoidea laxæ circumdate, sporas conglobatas angularis foventes. Tetraspora sparse, cruciatim divisa. Alge Australiscae, rosea, distichè decomposito-pinnata v. dichotoma, charte arcte adherentes. 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 Alge of Plymouth Sound, &c., to whom I am indebted for large numbers of beautifully preserved specimens of rare British Alge.

248. HOREA halymenioides, n. sp.; fronde subdichotomă, 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 subfastigiatâ dichotomă, laciniis dichotomo-
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multifidis margine integris v. parce 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 opuntioides, n. sp.; fronde (6–10 uncias alta) innerv cartilaginea solidescense obsoletè strictitè dichotomæ, supernetè di-tri-chotomæ articulato-constrictæ membranaceæ succo aquoso repletæ, ramulis ad genticula verticillatis articulatis; articulis ramorum puncto affixis (citò in aqua dulci sejunctis) ovali-oblongis basi et apice obtusissimis; cystocarpiis . . . 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 longæ) tenui membranaceæ succo gelatinoso repletæ roseæ è basi articulato-constrictæ trichotomæ v. umbellatim ramosæ; ramis ternis ferè ad singula genticula ogroidentibus; ramulis sepè numerosis; articulis inferioribus clavatis diametro 4–5-plo-longioribus, superioribus obovatis, ultimis ellipsoideis utrinque obtusis. Fremantle, G. Clifton, Esq. (263). 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. Müllerii, 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, b). These are very similar in form to the Kwantchatkan plants to which I refer them; but they closely adhere to paper, and are filled, when recent, with very slimy mucus. Both produce cystocarps. 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 Kallymenoides, n. sp.; fronde planæ gelatinoso-membranaceæ foliaceæ informi variæ lobata et sinuata, margine glandulosæ, lacinis acutis, cystocarps sparsis. Cast ashore at Fremantle, rare (174). This has the habit of Kallymenia, but exactly the structure of Halymenia.

258. Gelinaria uttoides, 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 peripheral 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.

260. *Nemastoma? gelinaroides*, n. sp.; fronde gelatinoso-carnosa rosea plana decomposito-pinnata, pinnis approximatis erecto-patentibus pinnatis v. bipinnatis, segmentis basi parum attenuatis sublancescatis acuti, ultimis lato-subulatis acuti nulis. 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* damascornis, n. sp.; fronde gelatinoso-carnosa exterata compresso-planar dichotomomultifida subfastigiatâ; segmentis patentibus cuneatis, terminalibus filiformibus obtusis; axillis omnibus eximiis rotundatis; tetrasporis sparsis cruciatim divisus. 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.—Spyridiaceae.**

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

**Order XIII.—Ceramiaceae.**


263. *Ceramium rubrum*, Ag. Rottnest and King George's Sound, in winter (258).


265. *Ceramium isegnon*, n. sp.; fronde pusillâ (1–2 unciai) subsetacea dichotoma fastigiatâ, segmentis erecto-patentibus terminalibus forcipatis; articulis corticatis omnibus diametro equalibus lineâ hyalinâ centrali notatis medio parumque constrictis; favellis subterminalibus bilobis ramellis 1–2-falcatis; tetrasporis. . . . . On *Alga*, 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 distichê subpinnata, pinnis dichotomo-fastigiatis, segmentis terminalibus brevissimis dentiformibus, articulis diametro brevioribus sacculo roseo coloratis, omnibus nisi supremis interstitiis nudis, tetrasporis secus marginem segmentorum utriusque 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.


271. **Halophlema Preissii**, Sond.1 Very abundant on the reefs at Rottnest; also on Caulinía, &c. (63).

272. **Hanowia australis**, Sond.1 Fremantle, rare (66).

273. **Hanowia robusta**, n. sp.; fronde (vix evoluta) compressa latâ; filis setaceis, articulis primariis ovoideo-cylindraceis ad gencula 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 compressa latâ furcatâ v. dichotomâ, filis arachnoideis, articulis primariis cylindraceis diametro 6–8-plo-longioribus. King George's Sound, very rare (52). *Frond* 1–2 inches high, the segments ½ to ⅔ inch broad, compressed. Filaments much more slender than in H. australis, with much longer joints.

275. **Lasiothalia**, nov. gen. *Frons* filiformis, membranaceae, ramosa, hirsuta, è filis longitudinaleibus intertextis anastomosantibus, filoque centrali majori contexta; filis periphericis externè fila callithamnoides subsimplicia horizontalis libera emittentibus. *Fructus*?

276. **Dudresnaia coccinea**, Bonn.1 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 decompositâ ramosissimâ membranacê (vix gelatinoseâ), ramis ramulisque patentibus, omnibus ramellis densissimis velatis, ramellis dvaricato-multifidis; favellis solitariis reniformibus in ramulis minoribus inter ramellos immersis; tetrasporis sphericis triangulè divisis. Rottnest and King George's Sound, on Zostera, &c. (338). Much more robust than C. attenuata, much less gelatinous, and not moniliform in any part of the frond.

279. **Dasysthila Preissii**, Sond.1 On the stems of Fucoidae, Garden Island, common (149).


281. **Ptilota** sp. King George's Sound (92). Possibly only a variety of the last, with articulatè ramellì.

282. **Ptilota striata**, n. sp.; fronde ancipiti siccitate transversim ruguloso-striatê decompositê ramosissimâ, ramis majoribus sparsis alternè divisis vix pinnatis, minoribus linearibus pectinato-pinnatis, pinnulis subulatis alternè simplicissimis; favellis minimis ad latus superius pinnularum pedicellatis involucratis, involucro è filis callithamnoides multiseriatis compostò; tetrasporis ad processos proprios ramosos è lateribus pinnularum emissis. Rottnest, not uncommon (240). A most distinct and beautiful species with the habit of Phaceolocarpus Labillardieri. It most resembles P. Rhodocallis, H. (Rhodocallis elegans, Kütz.), but differs essentially from that species in the position and nature of the involucres, &c.
283. **Ptilota siliculosa**, n. sp.; fronde complanată costatà decomposità ramosissimà, ramis majoribus alternis sparsisve, minoribus linearibus pectinato-pinnatifidis, pinnulis è basi lato subulatis alternis simplicissimis; tetrасospis in glomerula siliculiformis è pinnularum latere superiore enata congestis, ad fila callithamnoides brevissima circum axim verticillatis affinis. 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 erectà (sub-bi-unciali) di-tri-chotomà subfastigiatà crassissimà, segmentis erecto-patentibus, articulis diametro 3-4-plo-longioribus, inferioribus clavatis, mediis superioribusque obovatis inflatis ad genicula maximè constrictis; fertileibus conformibus; involucris tetrасosporum circa genicula involucratis è ramellis minimis confatis. Parasitical on Zostera, King George’s Sound (41). Also sent by Dr. Curdie, from Cape Northumberland. Very much more robust than G. corrallina, with nodes contracted like those of an Opuntia. It is as robust as Chylocladia articulata.

286. **Griffithsia monilis**, n. sp.; fronde basi radicante cespitosà (1-2 unciali) dichotomà fastigiatà crassissimà, segmentis erecto-patentibus; articulis diametro sesquio-longioribus globosoinflatis siccitate sub-collapsis et ovalibus ad genicula maximè constrictis; fertileibus conformibus, involucris tetrасosporum circa genicula verticillatis. Parasitical on Algae at Garden Island, and on Zostera at Rottnest (252). When fresh it resembles beautiful strings of ruby-coloured beads, but fades much in drying.

287. **Griffithsia Binderiana**, Sonn.1 Garden Island on Algae, Rottnest on Zostera (199).

288. **Griffithsia Teges**, 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 (bi-unciali) setacea gelatinoso-membranacea dichotomodecomposità et alternè ramosà, ramulis pluribus dichotomis, articulis longissimis ad genicula nec contractis, ramellis superioribus tenuissimis dichotomis, apicibus longè filiformibus arachnoidis; tetrасospis ad genicula ramorum majorum oblongis nucleis indiviso. Rottnest, in June, very rare (344). Fremantle, July, G. Clifton, Esq. A very distinct species, readily known by its attenuated spicis.

290. **Corynospora gracilis**, n. sp.; fronde pusillà (unciali) tenui alternè ramosà v. subdichotomì, ramulis quoqueversum egredientibus inferioribus furcatis superioribus bis-terve dichotomis, apicibus subattenuatis obtusiusculis; tetrасospis . . . ? Garden Island, rare, July (266). The habit and substance of the plant are those of Corynospora.

291. **Callithamnion thysigerum**, Thw. MS.; filo primario repente, secundariis erectis cespitosis capillaris (1-1½ unciali) vagè ramosis, ramis minoribus sepsisimè secundis filiformibus simplicissimis acuminatis; articulis diametro 3-5-plo-longioribus cylindraceis; tetrасospis circa genicula suprae ramorum verticillatis pedicellatis, pedicellis ramosulis thyrsoideo-paniculatis; favellis in ramulo terminalibus involucratis. On Algae 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.; densissimæ caespitum; filis primariis repente praæcisis, secundariis erectis arachnoideis (uncialibus) vagæ ramosis, ramis subdichotomis v. alternis minoribus filiformibus erectis longè simplicibus obtusis, articulis diametro multoties (8–12-plo) longioribus cylindraceis; tetrasporis in cymis veris aequalibus 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 ramosis è quoque geniculo plumulatis, plurimis oppositis per paria decussatis infra spicem articuli egredientibus tenuibus laxè pinnatis, pinnulis inferioribus sepulcris oppositis reliquis alternis è rachide flexuosâ emissis omnibus attenuatis simplicibus v. ramulo uno alterve 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 linea ault); filo primario repente caesso ramos suboppositos liberos emittente; ramis filo primario quadruplo-angustioribus pinnatis, pinnis oppositis patentibus simplicibus v. latere inferiori subramulosis subattenuatis obtusisculis; articulis fili primarii diametro sesqui v. subduplo, ramorum 4–5-plo, ramulorum sesquihongioribus. Parasite on Fucoids, Rottnest, rare (327). Apparently nearly allied to C. leptocladium, Mont.; but scarcely the same?

295. Callithamnion aculeatum, n. sp.; filo primario repente; secundariis erectis (sub-uncialibus) capillaribus subdichotomis v. alternè ramosis corymboso-fastigiatis; ramis omnium seriium quoquoversum egredientibus, minoribus caule duplo-angustioribus, ramulis ad genicula ferè omnia verticillatis spinaeformibus patentissimis brevissimis simplicibus subacutis; tetrasporis solitariis ad ramulos lateralis; articulis ramorum diametro 2–3-plo-longioribus. On Zostera, at King George's Sound, rare (343).

296. Callithamnion spinosum, Kütz. Cal. tomentellum, Harv. MS. Very common, everywhere on Algae, &c. This species is so common that it can hardly have escaped Press, and therefore I suppose it the C. spinosum 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 horizontalis, n. sp.; filis erectis (uncialibus) capillaribus solitariis parum ramosis, ramis 3–4-lateribus simplicibus patentibus cum filo primario è quoque articulo opposito plurumatis; plurimis è medio articuli egredientibus subdistichis horizontaliter patentibus (latiss planum sursum vertentibus) ambitu ovatis pinnatis; pinnà insimil simplici, ceteris fucatis; articulis omnibus diametro aequalibus v. sesquihongioribus; apicibus acuti; 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 minus furcatis; articulis diametro equalibus v. sesquilongioribus; epicicis acutis; tetrasporis solitariis ramulum pusillum pinnarum terminantibus. *Parasite* on *Algae* 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 formatis. *Parasite* on various *Algae*; especially on *Areschougia australis*. Rottnest and Cape Riche (230). At first I supposed this beautiful little plant to be *C. australis*, 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 similis*, Hook. and Harv. *On Fucoidae* at King George’s Sound and Rottnest (90). I have compared the specimens with one from Kerguelin's Land, and find them to agree.

301. *Callithamnion Wollastonii*, n. sp.; fronde ultra-setaceâ elatâ (4 unciali) basi tenuiter corticata sursum longâ pilis squarrosis stuposo-hirsuta subdistributâ ramosissimâ; ramis alternis decomposito-pinnatis, penultimis distichis pellucidè articulatis alternè plumulatis; plumulis patentibus longissimis ambitu linearibus; pinnis tenuibus erectiusculis brevibus, inferioribus simplicibus, superioribus sempitè 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 *Archeacon 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 Browniani*, n. sp.; fronde ultra-setaceâ elatâ (4 unciali) subcorticata sursum longâ pilis squarrosis stuposo-hirsuta quoquoverum ramosissimâ; ramis pluries alternè decompositis, penultimis quoquoveris pellucidè articulatis nodosis (parietibus cellularum crassis gelatinoïdè), alternè plumulatis; plumulis quoquoveris brevibus crispis pinnatis, pinnis capillaribus longissimis maximè curvati infléxi; articulis pinnularum diametro 4-plo-longioribus; tetrasporis brevissimè pedicellatis solitariis v. geminis ad latera pinnularum enatis. *On Zostera* at Rottnest, 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 Alge, from whom and her estimable husband I received much kind attention during my stay in their neighbourhood.

303. Callithamnion laricinum, n. sp.; fronde cartilaginea setacea (1-3 unciales) ferè ad apices ramorum corticalè glabrè quoquoversum ramosà ambitù pyramidalì; ramis alternis patentibus supernè sensim brevioribus ramulis dichotomo-multifidis undique obsessis; ramulis pluries dichotomis, segmentis patentibus, ultimis brevissimis spiniformibus; favellis geminis oblongis! simplicibus v. furcatis; tetraspóris 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 erectà crassiusculà alternè decomposito-ramosà omnìnè eccentricà; ramis ramulisque quoquoversum egredientibus, terminalibus corymboso-flabellatis, ramulis dichotomo-multifidis fastigiatis; apicibus obtusis patentibus; favellis geminis rotundatis ramulis stipatis (quasi involucratis). On Zostera at Rottnest, and at Garden Island on Alge (201). Nearly allied to C. corymboseum, but a more robust, though smaller plant; with cells more like those of a Griffithsia than of a Callithamnion.

305. Callithamnion multifilium, n. sp.; fronde pusillà (uncialù) arachnoidè eccentricà densè cespitosà alternè ramosà; ramis simplicibus ramosisve, ramulis alternis quoquoversis dichotomo-multifidis; segmentis patentibus obtusis; articulis ramorum basi incrassatis diametro 4-plo, ramulorum cylindraceis 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 pusillà (1-½ uncialù) capillari eccentricà cespitosà inferiorì quoquoversum, supernè distichè ramosà; ramis superioribus è rachide flexuosà alternè plunulatis; plunulis brevissimis alternè pinnatis, pinnis 3-4 simplicissimis filiformibus elongatis obtusis eximiè arcuato-inflexis; articulis omnibus diametro sesquilongioribus; favellis geminis; tetraspóris . . . . . In shady crevices of rocks, at half-tide level, Rottnest. Near C. Borriëri, but a much smaller plant, and sufficiently characterized as above (228 α).

307. Callithamnion pusillum, n. sp.; fronde pusillà (vix uncialù) capillari eccentricà cespitosà inferiorì simpliciusculà supernè quoquoversum ramosà; ramis inferne plunulatis, supernè alternè ramosis, ramis minoribus è rachide strictiusculà quoquaversum plunulatis; plunulis brevissimis vix pinnatis; pinnis 2-3 alternis v. secundis elongatis obtusis arcuato-inflexis; articulis omnibus nisi basilaribus diametro 3-plo-longioribus; favellis geminis; tetraspóris globosis ad latera pinnarum solitariis. Crevices of rocks, at half-tide, Rottnest (228 β). 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 pusillà (uncialù) capillari eccentricà quoquoversum ramosà, ramis paucis cum ramulis ambitù clavatis quoquoversum plunulatis; plunulis inferiòribus brevibus, superioribus elongatis pinnatis; pinnis simplicibus filiformibus longis-
simis arcuato-incurvis obtusis; articulia 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 pusilla (vix unciali) tenuissimâ eoarticulâ cespitosâ inferne quoquoversum superne distichâ ramosâ; ramis paucis alternâ divisis, ramis minoribus distichchè ramulosis, ramulis patentissimis inferioribus simplicibus spineformibus 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 starred form of _C. polyspermum_, but of a very fragile substance and pale colour.

310. **Callithamnion radicans**, n. sp.; nanum, parasiticum, volutino-cespitosum; fronde minutâ (2 lineas altâ) basi fibrillissi 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 sparsius 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 rootiing filaments and longer articulations.

311. **Callithamnion botryocarpum**, n. sp.; nanum, penicillato-cespitosum; fronde minutâ (1-1½ lineas altâ) è basi ramosissimâ, ramis alternis secundis patentibus flexuosius nunc sub-squareos; articulis diametro 4-plo-longioribus; tetrasporis magnis triangulè divisis in glo-merula ad axiles ramorum densissimè aggregatis; antheridiis, botryoideis è quoque forè articulo ramorum sepè 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 _Sporochtus_, 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 simplicisscula**, 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 lateviensis**, 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).


318. **Caulerpa Mulleri**, Sond. I surculo crasso squamulis cylindraceis dichotomis densè muricato; fronde erecta stipitata oblongâ obtusâ pinnatâ; stipite pinnisque foliis undique densissimè obtectis, foliis geminis basi unitis cylindraceis 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 obscuroa**, Sond. I 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 scapelliformis**, R. Br. King George’s Sound, and on border reefs, Rottnest (206).

324. **Struva plumosa**, Sond. Abundant on all the shallow reefs at Rottnest, but scarcely in season in June, when I visited the island (216).

325. **Struva macrophylla**, n. sp.; fronde oblongo-ovali maximum (4–5 uncias longa, 3 uncias latà) crenata, 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.


327. **Pennicillus Arbusculus**, 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 Montague’s plant.

328. **Halimeda macroloba**, Dnc. Cape Riche and Rottnest, on the reefs (226).

329. **Codium tomentosum**, Ag. Abundant everywhere (45).
the Colony of Western Australia.

330. Codium laminarioides, n. sp.; stipe brevi cuneato mox in frondem amplissimam (2–3 peda-
lem) planam subsimplicum v. parce 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 mollis polymorphā variè lobatā et spongioideā; filis
interioribus laxiusculis in gelatinā immersis, periphericis cylindraceis v. pyriformibus
obtusis; spermatiis 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 mamillatum, n. sp.; fronde globosā vel reniformi puncto affixa solidā; filis interioribus
densissimē intertextis arachnoideis gelatinā subsolidā obvallatis, periphericis maximis in-
flato-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 externally, radiating branches, 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).


336. Dictyosphaeria sericea, n. sp.; fronde umbilicatā medifixa variè lacerā (nunquam vesicatā)
sericeā; 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. anastomosans, MS. Cast ashore at Fremantle (163).


341. Cladophora sp. Fremantle (177).


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. Phycosera Ulva, Sond. Garden Island.

345. Phycosera latissima. Ulva latissima, Auct. I cannot say to which of Kützing’s species
Dr. W. H. Harvey's Account of the Marine Botany, &c.

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


**ORDER IV.—OSCILLATORIACEÆ.**

347. *Rivularia australis,* n. sp.; fronde maximâ (fronde 1–1½ uncias diametro) solitariâ hemisphaerica solidâ lubricâ olivaceo-viridi. On rocks near low-water mark, Cape Riche (298). I suppose this belongs to Kütsing's genus *Euactis,* but I have not minutely examined it. It is the largest of the genus known to me.


349. *Calothrix cespitula,* Harv.? Parasitical on *Algae,* 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.


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.
DIURNAL VARIATION OF MAGNETIC DECLINATION.

Winter Half-Year Scale

Parity Ordinate and Sine Extented.

\[ \sin (\phi) = \frac{h}{d} \]

\[ d = \sqrt{h^2 + a^2} \]

\[ h = \frac{d - a}{\cos (\phi)} \]

\[ a = \frac{d \sin (\phi)}{\cos (\phi)} \]

\[ \phi = \arctan \left( \frac{h}{d} \right) \]

A.M. P.M.
ANNUAL VARIATION or THE MAGNETIC DECLINATION.

M.1.VY.V1.

Scale 0'2TnAk 1mrrrute.

Ordina Corrsqo,id to XsrPef{ec?z-orf?Yonk e u1 of?7 rnet.

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