

(dupl.)

J.A. Norton

BOX 33

#A9295R

#11847

FLORA
~~Botany~~ of the Galapagos
Islands.

inc. Fallow - Algae

Section on algae from p. 89-99

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FUNGI.

By W. G. FARLOW.

FAVOLUS, Fries.

- F. CILIARIS**, Mont. Ann. Sci. Nat. Bot. ser. 2, xx. 364, t. 15, f. 2 (1843). — NARBOROUGH ISL.: southern part, alt. 615 m., Apr. 1899, *Snodgrass & Heller* (a single specimen). Further distrib. Madagascar and Japan.

FOMES, Fries.

F. LUCIDUS, Fries, Nov. Symb. 61 (1855). *Boletus lucidus*, Leysser, Fl. Hal. 300 (1783). — ALBEMARLE ISL.: Tagus Cove, Snodgrass & Heller. Further distrib. general.

SCHIZOPHYLLUM, Fries.

S. ALNEUM, Schroeter, Pilz. Schlesien, i. 553 (1889). *S. commune*, Hook. f. (3), 164; Anderss. (1), 123, & (2), 35. *Agaricus alneus*, L. Sp. 1176 (1753). — CHARLES ISL.: Darwin acc. to Hook. f., l. c. Further distrib. general.

Besides the *Favolus* and *Fomes* above mentioned, the collection of Messrs. Snodgrass & Heller contains a small dried *Polyporus* and a dried agaric, also alcoholic material of two *Agaricini* and a small tremelline fungus; none of these being in condition to determine.

LICHENES.

By W. G. FARLOW.

Judged by the collections of previous expeditions as well as those of Messrs. Snodgrass & Heller, the lichen flora of the Galapagos Islands must be striking in appearance and abundant. Naturally the collections include principally the larger and more showy species of foliose and fruticulose habit, which are in most cases identical with species found along the Pacific Coast of America from California to Chili. Hooker (3), 164, records three lichens collected by Darwin on James Island; Andersson secured nine species from James and Chatham Islands, and Baur six from Charles, Albemarle, Hood, and Chatham Islands. The lichens collected by Hill on the Hassler Expedition were determined by Tuckerman and included three new species, *Lecanora glaucovirens*, *Rinodina mamillana*, and *Pertusaria albinea*, the second species having been found previously in Hawaii. Willey in his Synopsis of the Genus *Arthonia*, 1890, described an *Arthonia nivea* from the Galapagos Islands (collected by Hill), and reported *A. platyspeilea* Nyl., as well as a third unnamed species. The last was sent to Nylander, but I am unable to ascertain whether it was ever named by him. Apparently a considerable number of lichens were collected by the Hassler Expedition, but no list of them was ever made so far as I am aware, and as the specimens are scattered through the Tuckerman Herbarium no enumeration could be made without a long search. In the following catalogue reference is made to such of these specimens as have come under my notice.

ARTHONIA, Ach.

A GREGARIA, Koerb. Syst. 291 (1855); Willey, Synop. of gen. Arthonia, 7. *Sphaeria gregaria*, Weig. Obs. Bot. 43, t. 2, f. 10 (1772). — DUNCAN ISL.: on twigs, May, 1899, *Snodgrass & Heller*. Cosmopolitan.

A. NIVEA, Willey, Synop. of gen. Arthonia, 5 (1890). — GALAPAGOS IDS.: Hassler Exped. [*Hill*]. Endemic.

A. PLATYSPEILEA, Nyl. Pr. N. Gr. 99 (1863); Willey, Synop. of gen. Arthonia, 16. — GALAPAGOS IDS.: Hassler Exped. [*Hill*] acc. to Willey, l. c. GARDNER ISL.: May, 1899, on twigs with *Pyrenula cerina*, *Snodgrass & Heller*. Also found in Florida.

A. sp. Willey, Synop. of gen. Arthonia, 41 (1890). — GALAPAGOS IDS.: Hassler Exped. [*Hill*] acc. to Willey, l. c.

BUELLIA, De Not.

B. *straminea*, Tuck. in herb. — ALBEMARLE ISL.: north of Pt. Christopher, 21 Jan. 1899, *Snodgrass & Heller*.

This small specimen of a crustaceous *Buellia* on a volcanic rock is identical with a large specimen in herb. Tuckerman, Galapagos Ids., Hassler Exped. [*Hill*] which is labelled *B. straminea*, Tuck., which, however, appears never to have been described. Why it was never published may perhaps be due to the fact that there is another specimen in herb. Tuckerman from the Galapagos Ids., Hassler Exped. [*Hill*], marked *B. flavo-areolata*, Nyl. and that Tuckerman was in doubt whether *B. straminea* was distinct from that species. There is, however, no note of Tuckerman stating his opinion. The *Snodgrass & Heller* lichen agrees perfectly with the specimen of *B. straminea*. In both the asci are obovate, 32–42 μ by 14–17 μ ; spores fuscous, 2-celled, 11 μ by 8–9 μ ; paraphyses hyaline, 2 μ in diam., branching only at the apex where they end in globose tips, 5 μ in diam., the upper half of which is dark colored. Iodine turns the hymenium blue. The specimen of *B. flavo-areolata* in herb. Tuckerman differs only in having spores rather larger and narrower, those of *B. straminea* being nearly globose, in which respect it corresponds better with the description of *Lecidea flavo-areolata*, Nyl., Ann. Sci. Nat. Bot. ser. 4, iii. 166 (1855). It seems to me probable that the two species are really the same, but in the absence of material to show the variations of the spores, it can only be said that our lichen is certainly *B. straminea* which differs from *B. flavo-areolata* in the shorter and comparatively broader spores.

B. sp. — BINDLOE ISL.: on rocks, 20 June, 1889, *Snodgrass & Heller*.

A single specimen agreeing with some of the specimens referred to *B. lactea* in herb. Tuckerman, but it is not certain how far these agree with the views of other lichenologists.

CHIODECTON, Ach.

C. SANGUINEUM, Wainio, Lichens du Brésil, ii. 143 (1890). *Byssus sanguinea*, Sw. Prodr. Fl. Ind. 148 (1783). *Hypochnus rubrocinctus*, Ehrh. Hor. Phys. Berol. 84 (1820). — ABINGDON ISL.: alt. 250 m., 25 June, 1899, *Snodgrass & Heller*. Widely distributed in the warmer parts of the world.

CLADONIA (Hill) Wainio emend.

C. PYCNOCLADA, Nyl. Jour. Linn. Soc. ix. 244 (1866). *Cenomyce pycnoclada*, Gaudichaud, Ann. Sci. Nat. Bot. v. 95 (1825). *Cladonia rungiferina*, var. auct. var. — ALBEMARLE ISL.: mountain east of Iguana Cove, alt. 925 m., Feb. 1899, *Snodgrass & Heller*; mountain east of Tagus Cove, alt. 770 m., Feb. 1899, *Snodgrass & Heller*. Further distrib. S. Am., Africa, Asia, Australia.

LECANORA, Ach.

L. GLAUCOVIRENS, Tuck. Proc. Am. Acad. xii. 172 (1874). — GALAPAGOS IDS.: Hassler Exp. [*Hill*]. Endemic.

PARMELIA, Ach.

P. PERLATA, Kremph. Flora, lii. 222 (1869); Anderss. (1), 124, & (2), 36. — ABINGDON ISL.: *Snodgrass & Heller*. ALBEMARLE ISL.: Iguana Cove, *Snodgrass & Heller*. CHARLES ISL.: *Andersson* (specimen not seen by the writer). The specimens of Messrs. *Snodgrass & Heller* are small and sterile but appear to belong to this common species.

P. sp. (*P. physodi*, Fries affinis) Andersson (1), 124, & (2), 36. — CHARLES ISL.: *Andersson*. Sterile and indeterminate, not seen by the writer.

PERTUSARIA, DC.

P. ALBINEA, Tuck. Proc. Am. Acad. xii. 177 (1877). — GALAPAGOS IDS.: on bark, Hassler Exp. [*Hill*]. Endemic.

PHYSICIA (DC.) Th. Fr.

P. LEUCOMELA (L.) Michx. Fl. Bor.-Am. ii. 306 (1803). *Lichen leucomelas*, L. Sp. ed. 3, 89 (1764). *Parmelia leucomela*, auct. var.

P. leucomela, var. *filiformis*, Anderss. (1), 124, & (2), 36. *Borrera leucomelas*, var. *filiformis*, Hook. f. (3), 164. — JAMES ISL.: Darwin, acc. to Hook. f., l. c. who states that "the same slender variety is common on the Peruvian Coast."

PSEUDOCYPHELLARIA, Wainio.

P. AURATA, Wainio, Lichens du Brésil, i. 183 (1890). *Sticta aurata*, Ach. Meth. Lich. 277 (1803); Hook. f. (3), 164; Anderss. (1), 124, & (2), 36. — ALBEMARLE ISL.: mountain east of Iguana Cove, alt. 925 m., Feb. 1899, *Snodgrass & Heller*. JAMES ISL.: Darwin. NARBOROUGH ISL.: southern part, alt. 615 m., March, 1899, *Snodgrass & Heller*. Further distrib. general.

PYRENULA, Fée.

P. CERINA, J. Muell, Flora, lxvii. 667 (1884). *Verrucaria cerina*, Eschw. Bras. 133 (1833). *Pyrenula aurantiaca*, Fée, Suppl. 82, t. 37, f. 1 (1837). — NARBOROUGH ISL.: southern part, alt. 615 m., 5 April, 1899, *Snodgrass & Heller*. On branches of the palo santo (*Bursera graveolens*) with spermatophytes and spores. The latter are obtusely elliptical, 28 μ by 14 μ , at first hyaline and multiguttulate but becoming dark and 4-celled. Further distrib. Bermuda, S. Am.

RAMALINA, Ach.

R. COMPLANATA, Ach. Lich. Univ. 599 (1810). *Lichen complanatus*, Sw. Fl. Ind. Occ. iii. 1911 (1806). — GALAPAGOS IDS.: Hassler Exp. [*Hill*]. CHARLES ISL.: Cuevas Bay, *Baur*. GARDNER ISL.: May, 1899, *Snodgrass & Heller*. HOOD ISL.: May, 1899, *Snodgrass & Heller*. TOWER ISL.: June, 1899, *Snodgrass & Heller*. Further distrib. warmer parts of America, East Indies, Australia.

R. INDICA, Fr. Kongl. Vet. Ak. Handl. 43 (1820); Anderss. (1), 123, & (2), 35. — CHARLES ISL.: on trunks of trees in the upper region, *Andersson*. Not seen by the writer. Further distrib. India.

R. USNEOIDES, Fr. Lich. Eur. 468 (1831). *Parmelia usneoides*, Ach. Meth. Lich. 270 (1803). — BINDLOE ISL.: 20 June, 1899, *Snodgrass & Heller*, a small form. A characteristic species of the warmer regions of America. A specimen in herb. Tuckerman collected on the Galapagos Ids. by the Hassler Exp. [*Hill*], and marked *Alectoria sarmentosa* appears to belong rather to this species.

RINODINA, Mass.

R. MAMILLANA, Tuck. Proc. Am. Acad. vii. 226 (1866), & xii. 174. — GALAPAGOS IDS.: Hassler Exp. [*Hill*]. Further distrib. Oahu, Hawaiian Ids.

ROCCELLA, DC.

The most striking feature of the maritime lichen flora of the Galapagos Islands as well as of the west coast of America from California southward is the abundance of species of *Roccella* of which very fine specimens were collected by Messrs. Snodgrass & Heller. In most herbaria the *Roccellae* of this region are somewhat vaguely placed under the species *R. fuciformis* and *R. tinctoria*, the complanate forms being referred to the former and the more or less terete forms to the latter. The excellent Monographia Roccelleorum of Darbishire, Stuttgart, 1898, affords the means of a more satisfactory determination. The separation of *Dendrographa* and *Roccellaria* from *Roccella* on the structure of the cortex is well founded. All the specimens of this group collected by Messrs. Snodgrass & Heller belong to the genus *Roccella* proper.

R. PERUENSIS, Darb. Bull. Herb. Boiss. v. 763 (1897), & Monogr. Rocc. 47, t. 18, 19, f. 83-88 (1898). *R. Montagnei*, var. *peruensis*. Kremph. Verh. Zoöl. Bot. Gesell. Wien, xxvi. 443 (1876). *R. fuciformis*, C. E. Cummings in Rob. & Greenm. (1), 149, not Ach. — ALBEMARLE ISL.: *Baur*. BARRINGTON ISL.: *Snodgrass & Heller*. CHARLES ISL.: *Baur*. CHATHAM ISL.: *Snodgrass & Heller*. DUNCAN ISL.: *Snodgrass & Heller*. GARDNER ISL.: *Snodgrass & Heller*. HOOD ISL.: *Baur*; *Snodgrass & Heller*. TOWER ISL.: *Snodgrass & Heller*. A considerable number of specimens were collected, none, however, with apothecia. The yellow basal filaments described by Darbishire are present in this species, which grows on shrubs. The specimens are larger and broader than the figures of this species in Darbishire and some resemble more closely his figure of *R. portentosa*, t. 8, f. 32. It may be questioned whether that figure really belongs to *R. portentosa*. In all specimens having this habit there were present the yellow base and lignicolous habitat which indicate *R. peruensis*.

R. PORTENTOSA, Darb. Ber. Deutsch. Bot. Gesell. xv. 4 (1897), & Monogr. Rocc. 29, t. 7-11, f. 27-41 (1898). *R. tinctoria*, var. *portentosa*, Mont. in Gay, Pl. Chili, viii. 841 (1852). — BARRINGTON ISL.: May, 1899, *Snodgrass & Heller*. GARDNER ISL.: May, 1899, *Snodgrass &*

Heller. JAMES ISL.: *Hill* of the Hassler Exp. (in hb. Tuckerman as *R. tinctoria*). SEYMOUR ISL.: south, May, 1899, *Snodgrass & Heller*. Further distrib. Peru (a specimen in hb. Farlow coll. by Gaudichaud and distrib. as *R. tinctoria*, f. *dichotoma*).

R. intricata, C. E. Cummings in Rob. & Greenm. (1), 149, coll. by Baur upon Charles Island, has the cortex of *Roccella* proper and therefore cannot be placed in *Roccellaria* where *R. intricata* properly belongs but is a narrow form of *R. peruensis*. The same may be said of some, but perhaps not all, of the *R. phycopsis*, Hassler Exp. [*Hill*] from the Galapagos Islands in herb. Tuckerman.

STICTA, Schreb.

S. WEIGELII, Wainio, Lichens du Brésil, i. 189 (1890). *S. damaecornis*, var. *Weigeli*, Ach. Lich. Meth. 446 (1810). — ALBEMARLE ISL.: Iguana Cove, 30 Dec. 1898, *Snodgrass & Heller*. This is the *S. quercizans*, common throughout the warmer parts of America.

TELOSCHISTES, Norm.

T. FLAVICANS, Norm. Gen. Lich., 17, 1852. *T. chrysophthalmus*, var. *flavicans*, Auct.; C. E. Cummings in Rob. & Greenm. (1), 149. *Lichen flavicans*, Sw. Prodr. 147 (1788). *Evernia flavicans*, var. *crocea*, Anders. (1), 123, & (2), 35. — ALBEMARLE ISL.: *Snodgrass & Heller*. CHARLES ISL.: *Andersson*; *Snodgrass & Heller*. CHATHAM ISL.: *Baur*, acc. to C. E. Cummings, l. c. DUNCAN ISL.: *Snodgrass & Heller*. Further distrib. general.

USNEA, Dill.

U. ARTHROCLADA, Fée, Ess. Crypt. Écorc. xvii. & ci. 3, f. 4, 5 (1824). — NARBOROUGH ISL.: southern part, alt. 615 m., 5 April, 1899, on *palo santo* trees (*Bursera graveolens*) with *Ramalina usneoides*, *Snodgrass & Heller*. Further distrib. Brazil.

This has a habit resembling *U. longissima* but stouter. With potash the medulla turns reddish brown, and this fact with the hard and polished cortex often breaking and forming articulations indicates *U. arthroclada*.

U. CERATINA, Ach. Lich. Univ. 619 (1810). *U. barbata*, Ach. f. *ceratina* Schaer, Spec. 505 (1840). — NARBOROUGH ISL.: *Snodgrass & Heller*. Cosmopolitan.

U. PPLICATA, Ach. Syn. Meth. 305 (1814); Hook. f. (3), 164; Anders.

(1), 124, & (2), 36 — CHARLES ISL.: *Andersson*. JAMES ISL.: *Darwin*. Further distrib. general.

ALGAE.

By W. G. FARLOW.

CYANOPHYCEAE.

SCYTONEMA, Agardh.

S. MYOCHROUS, Ag. Disp. Alg. Suec. 38 (1812). *Conferva*, Dillw. Brit. Conferv. t. 19 (1802). — ALBEMARLE ISL.: Mangrove Swamp, Turtle Pt., *Snodgrass & Heller*. Further distrib. general.

CHLOROPHYCEAE.

BRYOPSIS, Lamx.

B. RAMULOSA, Mont. Cuba, 16, t. 3, f. 2 (1838). *B. pennatula*, J. G. Agardh, Oefver. Kongl. Vet. Akad. Förh. iv. 6 (1847). — WENMAN ISL.: Dec. 1898, *Snodgrass & Heller*. Further Distrib. W. Ind., Fla.

CAULERPA, Lamx.

C. RACEMOSA, Weber van Bosse, Ann. Jard. Bot. Buitenzorg, xv. 357 (1898). *Fucus racemosus*, Forsk. Flor. Aegypt. 191 (1775). *Caulerpa clavifera*, Ag. Spec. Alg. 437 (1823). — ALBEMARLE ISL.: Jan. 11, 1899, *Snodgrass & Heller*. Further distrib. tropical seas.

ENTEROMORPHA, Link.

E. CLATHRATA, Kütz. Phyc. Germ., 247 (1845). *Conferva clathrata*, Roth. Cat., III, 175 (1806). — ALBEMARLE ISL.: Turtle Pt. in mangrove swamp, *Snodgrass & Heller*. Further distrib. cosmopolitan.

OEDOGONIUM, Link.

O. sp. — ALBEMARLE ISL.: Iguana Cove with *Najas*, *Snodgrass & Heller*. An entangled mass of a sterile *Oedogonium*.

RHIZOCLONIUM, Kütz.

R. HOOKERI, Kütz. Tab. Phyc., III, Pl. 67, f. 2 (1853). — ALBEMARLE ISL.: Tagus Cove, Jan. 11, 1899, *Snodgrass & Heller*. Further distrib. Nicobar Ids., Chiloe, etc.

Entangled masses with cells 120–140 μ in breadth and of the same length or a little longer. Cell-walls rather thick. The rhizoidal branches

seen were very scanty, but that is often the case in other species of the genus. This seems to be the same as the *R. Hookeri* of Grunow, Novara, 37, and his remarks on the Nicobar specimens apply equally to ours. Hohenacker, 477, Chiloe, has cells rather longer and thinner. In spite of the occasional rhizoid processes, it seems to me possible that this may be an old, prostrate form of *Chaetomorpha antennina* (Bory) corresponding to the similar form known in *C. aerea*.

ULVA (L.) Wittr.

U. FASCIATA, Delil. Egypt, 153, Pl. 158, f. 5 (1813). — ALBEMARLE ISL.: Tagus Cove, Feb. 1899, *Snodgrass & Heller*. Further distrib. warmer parts of Atlantic and Pacific Oceans, Ceylon.

PHAEOPHYCEAE.*

CARPOMITRA, Kütz.

C. CABRERAE, Kütz. Phyc. Gen. 343 (1843). *Fucus cabrera*, Clemente, Cat. 313; Turner, Hist. Fuc. Pl. 140 (1811); Piccone (1), 40. — CHATHAM ISL.: *Marcacci*, acc. to Piccone, l. c. Further distrib. southern Eu., Africa.

FUCODIUM, J. Ag.

F. GALAPAGENSE, Picc. & Grun. in Piccone (1), 40, t. 1, f. 1, t. 2, f. 3, & (2), 22. — CHARLES and CHATHAM IDS.: *Marcacci*, acc. to Piccone, ll. cc. Endemic.

GLOSSOPHORA, J. Ag.

G. galapagensis, nov. sp.

Frons usque 18 cm. longit., .6 cm. latit. linearis-elongata, saepe dichotoma, axillis apicibusque obtusis, margine distincte spinosa; undique

* *DIATOMEAE*. Many species of this order from the Galapagos Islands are enumerated by Ehrenberg (2), and the following are recorded by Cleve in his paper On some new and little known Diatoms, Kongl. Svenska Vetensk. Akad. Handl. xviii. no. 5, pp. 26, Pl. I-VI, 1881. *Mastogloia panduriformis*, Cl.; *M. submarginata*, Cl. & Grun.; *Navicula Eugeniae*, Cl.; *N. Henedyi*, var. *undulata*, Cl.; *N. Henedyi*, var. *minuta*, Cl.; *N. Platessa*, Cl.; *N. Anderssonii*, Cl.; *N. gallapagensis*, Cl.; *N. jugata*, Cl.; *Surirella degenerans*, Cl.; *S. formosa*, Cl.; *Campylodiscus peramplus*, Cl.; *Plagiogramma spinosum*, Cl.; *Rutilaria recens*, Cl.; *Melosira tuberculosa*, Cl.; *Auliscus insignis*, Cl.; *Biddulphia gallapagensis*, Cl.; *Triceratium Triplos*, Cl.; *T. Anderssonii*, Cl.; *T. laeve*, Cl.; *T. gallapagense*, Cl.; *T. Margariferum*, Cl.

praecipue in parte inferiore phylliculis vestita quae basem versus deorsum ad instar radicum prolongantur. Sori oosporiferi minuti irregulariter supra frondem sparsi. — ALBEMARLE ISL.: Turtle Pt., March, 1899, *Snodgrass & Heller*.

In all the specimens there are leaflets on both surfaces of the fronds except near the tips. They arise from the cortical cells, and have no connection with the fructification which is found on the frond itself. Near the base the leaflets grow downward, become somewhat thicker and twisted and bear on their lower surface the proper rhizoids so that the fronds are attached by what is generally called a fibrous base. In spite of the leaflets which would lead one to refer this alga to the genus *Glossophora*, it seems to me to be less closely related to *G. Kunthii*, J. Ag. of Peru, the type of the genus, than to *Dictyota crenulata*, J. Ag. of the Pacific Coast of Mexico. As originally described from Mexico that species has no leaflets and the base is described as stuposc. In 1884 Grunow described a variety from the Canary Islands with leaflets, but its relation to that species is uncertain. The Galapagos species differs so much from *D. crenulata* as originally described, and from the var. *canariensis* that it must be kept distinct. If material hereafter collected should show that the two species are really forms of a single species, a new description will be needed. The following notes on the microscopic structure of the Galapagos alga will be of interest.

In the upper part the frond is about $100\ \mu$ thick, becoming $200\ \mu$ thick below. Above, there is a single medullary layer of large cells $70\ \mu \times 70\ \mu \times 168\ \mu$ and a single layer of colored cortical cells $14\ \mu \times 14\ \mu$ in section. Below, the cortical cells become rather deeper, $22\ \mu \times 14\ \mu$ in section, and the medullary cells thicker-walled and comparatively narrower, $112\ \mu \times 56\ \mu$ in section, and between the medullary and cortical cells is a single layer of flattened colorless cells, $28\ \mu \times 28\ \mu \times 90\ \mu$. The tangential walls of the medullary cells are pitted to an extent seldom seen in algae of this order. The oogonia are $80\ \mu$ or more in diameter and found in small numbers in scattered sori on the frond. The spines are sharper and more solid than in most of the ciliate species, 24–32 mm. long, the tips deeper colored than the base.

PADINA, Adams.

P. DURVILLAEI, Bory, Coquille, 147, t. 21, f. 1 (1829). — ALBEMARLE ISL.: Tagus Cove, and Turtle Pt., Feb. & Mar. 1899, *Snodgrass & Heller*. CHATHAM ISL.: north, Aug. 1891, *Baur* as *Zonaria lobata*. Further distrib. W. Ind., west coast of Am.

Typical specimens of this fine species were collected, some more than 12 cm. long. The species has a characteristic rusty-brown color and is coarser than *P. Paronia*. In the median portion the frond has usually ten layers of cells, $80 \times 40 \mu$ in section, and a single layer of cortical cells, $14 \times 9 \mu$. The very large oosporangia vary from $110-125 \mu \times 70-84 \mu$.

SARGASSUM, Ag.

S. CYMOSUM, Ag. Spec. i. 20 (1821); J. Ag. Sp. Sarg. Austr. 109 (1889). — ALBEMARLE ISL.: Tagus Cove and Turtle Pt., March, 1899, *Snodgrass & Heller*. WENMAN ISL.: Dec. 1898, *Snodgrass & Heller*. Further distrib. warmer Atlantic coasts of Asia and Africa.

In the determination of this species I have followed J. Ag. l. c. (1889) and the Albemarle and Wenman Island specimens seem to me to belong to *S. cymosum* as that species is limited by J. Agardh. The species has, however, been variously interpreted by different writers.

S. GALAPAGENSE, Grunow in Piccone (1), 48, t. 1. — CHATHAM ISL.: *Marcacci*, acc. to Piccone, l. c. Endemic.

S. GALAPAGENSE, var. *SETIFOLIA*, Grunow in Piccone (1), 48, t. 2, f. 1, 2 (1886). — ALBEMARLE ISL.: Tagus Cove and Turtle Pt., Feb. 1899, *Snodgrass & Heller*. CHATHAM ISL.: March, 1884, *Marcacci*, acc. to Piccone, l. c. Endemic.

As is remarked by J. Agardh, l. c., 122, this variety is closely related to *S. piluliferum* (Turn.) Ag., of California and Japan, but not to *S. acinaria* (Turn.) J. Ag., as suggested by Grunow.

? *S. GRAMINIFOLIUM*, J. Ag. Spec. i. 103 (1848). *Fucus graminifolius*, Turn. Hist. Fuc. Pl. 210 (1819). — WENMAN ISL.: *Snodgrass & Heller*. Further distrib. China Sea.

To this species is referred with much doubt a single specimen of a *Sargassum* with the upper fructiferous portion only. The receptacles are racemose, the conceptacles contain antheridia and oogonia, and the leaves are long, narrow, serrate, with but few cryptostomata.

S. LENDIGERUM, var. *FOLIOSA*, Grunow in Piccone (1), 49. — CHATHAM ISL.: March, 1884, *Marcacci*, acc. to Piccone, l. c.

S. LENDIGERUM, var. *FURCIFOLIA*, Grunow, l. c. 50. — CHATHAM ISL.: March, 1884, *Marcacci*, acc. to Piccone, l. c.

Of the var. *foliosa*, Grunow described two forms, *subdelicatula* and *rigidiuscula* and of var. *furcifolia* a forma *denticulata*. J. Agardh, l. c.

122, remarks that the var. *furcifolia* is hardly different from *S. galapagense*. *S. lendigerum* is a species known mainly from the figure in Turner, Hist. Fuc. Pl. 48 (1808), with which agree the specimens from Bermuda referred to *S. lendigerum* by J. Agardh, l. c. 110, and the species appears to be limited to the Atlantic. None of the specimens of Snodgrass & Heller can be referred to *S. lendigerum*, but it is probable that some of the forms of Grunow's var. *foliosa* may be the same as specimens which I have included under *S. cymosum*.

SPATOGLOSSUM (KUETZ.), J. Ag. Emend.

S. SCHROEDERI, KUETZ. Tab. Phyc. ix. 21, t. 51, f. 1 (1859); Piccone (2), 17. *Zonaria*, Ag. Syst. 265 (1824). — CHARLES ISL.: *Marcacci*, acc. to Piccone, l. c. Further distrib. Brazil, W. Ind.

ZONARIA, J. G. Agardh.

Z. LOBATA, Ag. Syst. 265 (1824); Piccone (1), 89, & (2), 40. — CHARLES and CHATHAM IDS.: March, 1884, *Marcacci*. Further distrib. trop. Atlantic coast of America, Teneriffe, Cape of Good Hope.

RHODOPHYCEAE.

AMPHIROA, Lamx.

A. DILATATA, Lamx. Hist. Polyp. Flex. 299 (1816); Piccone (1), 66, & (2), 46. — ALBEMARLE ISL.: Elizabeth Bay, *Snodgrass & Heller*. CHARLES ISL.: *Snodgrass & Heller*. Further distrib. Australia.

A. ORBIGNIANA, Decaisne, Ann. Sci. Nat. Bot. ser. 2, xviii. 124 (1842). — ALBEMARLE ISL.: Turtle Pt., March, 1899, *Snodgrass & Heller*. Further distrib. Pacific Coast of Am.

The specimens are covered with parasites and not in typical condition, but they appear to belong to this species.

A. PERUANA, Aresch. Phyc. Extraeur. 41 (1854). — WENMAN ISL.: Dec. 1898, *Snodgrass & Heller*. Further distrib. Florida, Peru.

CALLOPHYLLIS, Kütz.

C. sp. — ALBEMARLE ISL.: Iguana Cove, *Snodgrass & Heller*.

Two small specimens with cystocarps which are of large size, some of them with marked papillae around the carpostome. The species is apparently near *C. furcata*, Farl. but the specimens are incomplete and cannot be referred with certainty to that species.

CHONDRUS, Stack.

C. CANALICULATUS, Grev., Alg. Brit., lv. (1830). *Sphaerococcus canaliculatus* C. Ag. Spec. I, 260 (1822). — ALBEMARLE ISL.: Iguana Cove, *Snodgrass & Heller*. Further distr. West coast of S. Am.

A single specimen which can be referred to this species. There are a few specimens which may perhaps belong to this species but they certainly are not normal. They have the structure of the frond and the sporidia of *Chondrus*, but, in the absence of cystocarps, there is a possibility that they may belong to the genus *Iridaea*. Their habit, however, is that of *Chondrus*, but the fronds are occasionally perforate, which may however be accidental rather than normal.

CORALLINA, Lamx.

? C. BERTERII, Mont. in Harvey, Ner. Austr. ii. 103 (1858), & Fl. Chili. viii. 318. — ALBEMARLE ISL.: Elizabeth Bay, *Snodgrass & Heller*. Further distrib. Chili.

Much covered with parasites and not in favorable condition to be determined.

DASYA, C. Ag.

x- D. *Stanfordiana*, nov. sp.

Frons cylindrica, ad 15 cm. longit., basem versus 1.25 mm. latit., irregulariter composito-pinnata, usque apicem dense corticata, ramis superne elongatis, ramellis subaequalibus, brevibus, circa 32 mm. longit., vestitis. Ramelli monosiphonii, spiraliter inserti, unilateraliter cymosi, cellulis $56 \mu \times 28 \mu$, cellula terminali conica, inter ramificationes bicellulis. Stichidia primum ovato-lanceolata demum cylindrico-apiculata, $168 \mu \times 28 \mu$ bene evoluta, sporidiis 20-seriebus et ultra ordinatis, cellulis pericentralibus 5-8. Color roseo-purpureus, substantia gelatinosa. Chartae arcte adhaeret. — WENMAN ISL.: Dec. 21, 1898, *Snodgrass & Heller*. ALBEMARLE ISL.: Turtle Pt., March, 1899, *Snodgrass & Heller*.

A species resembling *D. pacifica*, Harv. in its long stichidia but differing in its long slender habit quite unlike that of *D. arbuscula* J. Ag. to which *D. pacifica* bears a strong resemblance and in its branches densely corticated to the apex. In the authentic specimen of *D. pacifica* which I have examined the pericentral cells were easily seen at some distance from the apex, whereas in *D. Stanfordiana* they can be seen only at the extreme tip on account of the thick cortex. The monosiphonous ramelli and the exposed sporangia agree with those of *Dasya*

as defined by Falkenberg, but there is a free cell between those from which the divisions of the ramelli arise. With this exception, the plan of ramification follows the type shown in Falkenberg, fig. 10, A. The divisions of the ramelli are not divergent but penicillate with a tendency to be slightly convergent. The older stichidia are very long and the consecutive series of sporidia are often as many as 20 and sometimes more, showing 3-4 sporangia on side view. The branches are radial and not dorsiventral, although in drying they have the appearance of being flattened in the upper part. In section of the larger branches it was not possible to recognize any definite axial or pericentral cells in the material examined, but they had probably collapsed in the preparation.

DILSEA, Stack.

D. sp. — ALBEMARLE ISL.: Iguana Cove, Dec. 30, 1898, *Snodgrass & Heller*.

A single imperfect specimen with sporangia; the material insufficient for specific determination.

GALAXAURA, Lamx.

G. MARGINATA, Lamx. Hist. Polyp. Flex. 264 (1816). *Corallina marginata*, Ell. & Sol. 122, t. 22, f. 6 (1786). *Brachycladia*, Sonder et Auct. — ALBEMARLE ISL.: Iguana Cove, *Snodgrass & Heller*. Further distrib. tropical seas.

GELIDIUM, Lamx.

G. CRINALE, J. Ag. Epicr. 546 (1876). *Fucus crinalis*, Turn. Hist. Fuc. Pl. 198 (1819). *Gelidium corneum*, var. *crinale*, Auct.; Piccone (2) 39. — CHARLES ISL.: *Marcacci*, acc. to Piccone, l. c. Further distrib. general.

G. SERRULATUM, J. Ag. Oefv. Kongl. Vet. Akad. Förh. iv. 11 (1847). — WENMAN ISL.: Dec. 1898, *Snodgrass & Heller*. Further distrib. Venezuela.

Several specimens of a *Gelidium* were collected at Wenman Isl. with well-developed bilateral conceptacles characteristic of the genus. One would have expected from this locality rather *G. filicinum*, Bory, Coquille, 162 (1829), than *G. serrulatum* since the former species was first described from Chili, whereas the latter is an Atlantic species. I have been able to compare the Wenman Isl. specimens with an authentic specimen of *G. filicinum* from herb. Bory through the kindness of

Dr. E. Bornet and with an authentic specimen of *G. serrulatum* from herb. Agardh. It seems to me that there can be no doubt that they agree perfectly with *G. serrulatum* and differ from *G. filicinum* although the two species are certainly closely related.

G. FILICINUM, Bory, Coquille, 162 (1829).—ALBEMARLE ISL.: Iguana Cove, Dec. 30, 1898, *Snodgrass & Heller*. Further distrib. west coast of South America.

But a single specimen was found which may be referred to this species.

GIGARTINA, Stackh.

G. LESSONII, J. Ag. Spec. Alg. ii. 268 (1851). *Sphaerococcus Lessonii*, Bory, Coquille, 171 (1829), excl. syn.—ALBEMARLE ISL.: Elizabeth Bay and Iguana Cove, Feb. 1899, *Snodgrass & Heller*. Further distrib. Peru, Chili.

Most of the specimens were small and sterile, but one had conceptacles which in this species are borne at the base of small branchlets rather than in well-marked papillae as in most species of the genus.

GRACILARIA, Grev.

? *G. RUGULOSA*, Mont. Pole Sud, 155, Pl. 13, fig. 1 (1845) sub *Hypnea*.—ALBEMARLE ISL.: Iguana Cove. *Snodgrass & Heller*. Further distrib. Australia.

Two specimens with cruciate sporidia which agree well with the description and figure of the habit of this species. Montagne's figure shows sporidia which certainly are not zonate as in *Hypnea*, but may be tripartite, although the figure is not quite clear on that point. The Galapagos alga has cruciate sporidia and hence, in spite of its habit, can be referred only with doubt to Montagne's species.

GYMNONGRUS, Mart.

G. GRIFFITHSIAE, var. *GALAPAGENSIS*, Picc. & Grun. in Piccone (1), 60, & (2), 31.—CHARLES and CHATHAM IDS.: *Marcacci*, acc. to Piccone, ll. cc. Endemic.

G. MELANOTHRIX, Grunow in Piccone (1), 60, & (2), 31. *Gigartina melanothrix*, Bory, Coquille, 152, t. 19, f. 3 (1829).—CHARLES and CHATHAM IDS.: *Marcacci*, acc. to Piccone, ll. cc. Further distrib. Chili.

G. VERMICULARIS, J. Ag. Spec. Alg. ii. 323 (1851.) *Fucus vermicularis*, Turn. Hist. Fuc. Pl. 221 (1819); Piccone (1), 61.—

CHATHAM ISL.: March, 1884, *Marcacci*, acc. to Piccone, l. c. Further distrib. western So. Am.

HERPOPHYLLON, gen. prov.

Frons membranacea, prostrata, subcircularis vel vague expansa, centro radicibus adfixa. Structura interne cellulis oblongis vel radiatim elongatis, parietibus distincte colloideis cellulis superficiem versus rotundatis in stratum unicum corticale transformatis constituta. Sporangia cruciatim divisa, in soris verrucaeformibus supra frondem sparsa. Cystocarpia ignota.

H. coalescens, spec. prov.

Frondes circa 40 mm. diametro, aggregatae, a marginibus coalescentes, thallum indefinite expansum formantes. Sporangia in soris verrucaeformibus ad superficiem superiorem frondis inter paraphyses allata, anguste ovaes, $56 \mu \times 15-20 \mu$. ALBEMARLE ISL.: Tagus Cove, March, 1899, *Snodgrass & Heller*.

The provisional name given above is adopted to designate a curious alga the cystocarpic fruit of which is unknown and which in other respects does not agree with any genus known to me. When removed from the fluid in which it was preserved it appeared like an irregular, rather cartilaginous pellicle adherent to the substratum by groups of coarse rhizoids. On a closer examination the surface was seen to be ridged, or veined, and apparently the larger specimens are composed of smaller individual fronds which have united, each tuft of rhizoids being in the centre of a frond. The smaller specimens were like the larger, but none seen was so small as to be composed of a single frond. The microscopic structure of the ridges show that they are the lines of union of two different fronds, or, if the whole is to be regarded as a single plant, of its different lobes. The internal structure consists of a compact tissue of large cells about 56μ in transverse section but more or less elongated in radial sections, some being 140μ long. They cannot, however, be called filaments. Near the upper and lower surfaces and near the margin the cells become more nearly spherical. The cell-walls are markedly colloidal and near the margin seem to be imbedded in a solid colloidal matrix. The cortical cells are small and arranged in a single layer, especially on the lower surface, those on the upper surface more frequently dividing anticlinically, especially where the sporidia are forming. The latter are in spots on the upper surface, which are sometimes not much raised but at other times form well-marked warts. The sporangia are borne between paraphyses about 60μ long and 3μ broad, formed by the out-

growth of cortical cells. It is to be regretted that more is not known as to the mode of growth of the frond. As it is, this alga, although at first sight it suggested *Peyssonnelia rugosa* Harv. in its habit, cannot be referred to that genus, for the frond in section is seen to be symmetrical except that the cortical cells on the under side are more uniformly in a single layer than above, but quite different from the well-defined base of *Peyssonnelia*. Nor can it be considered a prostrate form of *Kallymenia* or *Constantinea*, to which it appears to be more nearly related. It might be suggested that the specimens were abnormal developments of some species with erect fronds, but the abundance of sporidia appear to indicate that the growth was normal.

HYPNEA, Lamx.

H. PANNOSA, J. Ag. Oefv. Kongl. Vet. Akad. Förh. iv. 14 (1847).
— ALBEMARLE ISL.: Tagus Cove, Feb. 1889, *Snodgrass & Heller*.
Further distrib. tropical seas.

LAURENCIA, Lamx.

L. OBTUSA (Huds.) Lamx., var. GRACILIS, Harv. Ceyl. Alg. 26;
Piccone (1), 80. — CHATHAM ISL.: March, 1884, *Marcacci*, acc. to
Piccone, l. c. Further distrib. general.

LITHOPHYLLUM, Phil.

* L. FARLOWII, Heydrich in Engler, Bot. Jahrb. xxviii. 532, t. 1, f. 6
(1901). — CHARLES ISL.: *Hassler Exped.* Endemic.

LITHOTHAMNIUM, Phil.

L. CRASSUM, Phil. Weigm. Arch. 1837, 2, p. 388; Piccone (2), 45.
— CHARLES ISL.: *Marcacci*, acc. to Piccone, l. c.

No specimens of this species have been seen, and I am unable to say whether the alga collected by *Marcacci* on the *Pisani Exp.* is the same as the *L. crassum*, originally described from the Mediterranean, as that species is now understood.

MELOBESIA, Lamx.

M. CORTICIFORMIS, Kütz. Spec. Alg. 696 (1849). — WENMAN ISL.:
on *Gelidium serrulatum*, Dec. 1888, *Snodgrass & Heller*. Further
distrib. general.

M. PUSTULATA, Lamx. Hist. Polyp. Flex. 315, t. 12, f. 2 (1816);
Piccone (1), 65. — CHATHAM ISL.: (on *Zonaria lobata*) *Marcacci*,
acc. to Piccone, l. c. Further distrib. general.

* Name changed to *L. claudescens*, Heydrich, Ber. deutsch. bot. Ges. xix, 440,
as it is antedated by *L. Farlowii*, *Eoster*. *Toche* 2

OCHTODES, J. Ag.

O. FILIFORMIS J. Ag. Bid. Flor. Syst., 5 (1871), Flor. Morph. Pl. 31, p. 1-8 (1879); *Sphaerococcus filiformis* J. Ag. Spec. Alg. ii, 664 (1851). — WENMAN ISL.: Dec. 1898, *Snodgrass & Heller*. Further distrib. West Indies.

The occurrence of this characteristic but not common West Indian species at the Galapagos is interesting. The few specimens collected have an abundance of cystocarps whose structure together with the peculiar axial structure of the fronds leaves no doubt as to the genus, nor am I able, even in their habit, to recognize any specific distinction between West Indian and Pacific specimens.

PEYSSONNELIA, Decaisne.

P. RUBRA J. Ag. Spec. Alg. ii. 502 (1851). *Zonaria rubra* Grev. Trans. Linn. Soc. xv. 340, Pl. III. f. 3 (1827). — ALBEMARLE ISL.: Elizabeth Bay, *Snodgrass & Heller*. Further distrib. Mediterranean, Pacific Islands.

Specimens with sporangia, the color altered by the preserving fluid.

PLOCAMIUM, Lyngb.

P. COCCINEUM Lyngb. Tent. Hydr. 39, Pl. 9, B. (1819). *Fucus coccineus* Huds. Fl. Angl. ed. 2, 586 (1778). — WENMAN ISL., Dec. 1898, *Snodgrass & Heller*. Distribution, general.

RHODYMENIA (Grev.) J. Ag. Emend.

R. FLABELLIFOLIA, Mont. Bonite, 105 (1844). *Sphaerococcus flabellifolius*, Bory, Coquille, 174, t. 17 (1829). — ALBEMARLE ISL.: Elizabeth Bay and Iguana Cove, Dec. 30, 1898, *Snodgrass & Heller*. Further distrib. Peru, Chili.

All the specimens from Elizabeth Bay and some of those from Iguana Cove have the typical habit of this species. Some of the specimens from the latter locality are more branched than the type but appear to belong to the same species.

HEPATICAE.

By A. W. EVANS.

BRYOPTERIS, Lindenb.

B. FILICINA (Sw.) Nees, Syn. Hep. 284 (1845). *Jungermannia filicina*, Wilson in Hook. f. (3), 165. — JAMES ISL.: *Darwin*. Widely distributed in tropical America.

B. GALAPAGANA, Gottsche, Ann. Sci. Nat. ser. 4, viii. 341 (1857). Listed by Wilson in Hook. f. (3), 165, as *Jungermannia filicina*, var. *tenuis*. — CHARLES and JAMES IDS.: *Darwin*. Also collected by *Andersson*. The species is endemic but is very close to the following.

B. TENUICAULIS, Tayl. Syn. Hep. 285 (1845). — ABINGDON ISL.: *Snodgrass & Heller*. CHATHAM ISL.: *Baur*. Known also from the Andes.

FRULLANIA, Raddi.

F. ACULEATA, Tayl. Lond. Jour. Bot. v. 407 (1846). — GALAPAGOS IDS.: *Darwin*. Also found in the Andes. *Jungermannia pungens*, Wils. in Hook. f. (3), 165, collected on CHARLES ISL. by *Darwin*, is apparently a synonym of this species.

F. ATRATA (Sw.) Nees, Syn. Hep. 463 (1845). — CHARLES ISL.: *Darwin*; 8 Apr. 1888, *Lee*. DUNCAN ISL.: *Baur*. Widely distributed in tropical America.

F. GALAPAGONA, Ångstr. Oefversigt Kongl. Vetensk.-Akad. Förhandl. xxx. no. 5, 116 (1873). — GALAPAGOS IDS.: *Andersson*. Endemic.

F. TAMARISCI (L.) Dum. Recueil d'Obs. 13 (1835). — This widely distributed species of Europe and North America is quoted by Wilson from CHARLES ISL.: *Darwin*. The species would hardly be expected from the Galapagos Islands.

F. VAGINATA (Sw.) Dum. l. c. — CHARLES and JAMES IDS.: *Darwin*. A Javan species. Its occurrence on the Galapagos Ids. is considered doubtful by *Schiffner* (cf. Conspect. Hepat. Arch. Ind. 348).

LOPHOLEJEUNEA (Sprence) Schiffn.

L. ANDERSSONII, Steph. Hedwigia, xxxv. 108 (1896). — GALAPAGOS IDS.: *Andersson*. Endemic.

MARCHESINIA, S. F. Gray.

M. BRACHIATA (Sw.) Schiffn. in Engl. & Prantl. Nat. Pflanzenf. i. Abt. 3, 128 (1893). — DUNCAN ISL.: *Baur*. Widely distributed in tropical America. *Phragmicoma galapagana*, Ångstr. l. c. 114, and *P. nigrescens*, Ångstr. l. c. 115, are very close to this extremely variable species. Both were collected by Andersson.

NOTOTHYLAS, Sull.

N. ORBICULARIS (Schwein.) Sull. Mem. Am. Acad. new ser. iii. 64, t. 4 (1846). — ALBEMARLE ISL.: Tagus Cove, *Snodgrass & Heller*. Widely distributed in eastern N. Am.; also European.

OMPHALANTHUS, Lindenb. & Nees.

O. FILIFORMIS (Sw.) Nees, Syn. Hep. 304 (1845). — CHARLES and JAMES IDS.: *Darwin*. Widely distributed in tropical America, especially in mountainous regions.

PELTOLEJEUNEA (Spruce) Schiffn.

P. GALAPAGONA, Steph. Hedwigia, xxxv. 123 (1896). — CHARLES ISL.: *Andersson*. Endemic.

PLAGIOCHASMA, Lehm. & Lindenb.

P. ? — ALBEMARLE ISL.: Iguana Cove, Tagus Cove, and mountain east of Tagus Cove, *Snodgrass & Heller*. CHARLES ISL.: *Baur*, no. 380 (hb. Harvard Univ.). NARBOROUGH ISL.: south side, 615 m. alt., *Snodgrass & Heller*. The specimens are all sterile and indeterminate but seem referable to a single species.

PLAGIOCHILA, Dum.

P. ANDERSSONII, Ångstr. l. c. 114; Rose (1), 138. — GALAPAGOS IDS.: *Andersson*. CHATHAM ISL.: *A. Agassiz*. Further distrib. Cocos Island of the Pacific.

P. SPINIFERA, Ångstr. l. c. — GALAPAGOS IDS.: *Andersson*. Endemic.

RADULA, Dum.

R. RETROFLEXA, Tayl. Lond. Jour. Bot. v. 378 (1846). — GALAPAGOS IDS.: *Andersson*. Also known from the "Pacific Islands," *Nightingale*.

RICCIA, Mich.

R. ? Sterile and indeterminate. — ALBEMARLE ISL.: Iguana Cove, *Snodgrass & Heller*.

MUSCI.

By W. G. FARLOW.

CALYMPERES, Sw.

C. SPRUCEI, Bescherelle, Ann. Sci. Nat. Bot. ser. 8, i. 304 (1895). — BINDLOE ISL.: *Snodgrass & Heller*. Several specimens of this species were collected. There are no capsules but an abundance of septate gemmae borne on the long club-shaped prolongation of the ribs. As there appeared to be a slight difference between the cell-structure of these specimens and Spruce's no. 20, on which Bescherelle founded his *C. Sprucei*, material of the Galapagos plant was submitted to M. Bescherelle, the learned author of the *Essai sur le genre Calymperes*, who has been so kind as to verify the identification.

CAMPYLOPUS, Brid.

C. ANDERSSONII, Jaeg. Adumb. i. 140 (1870). *C. sp.* Anderss. (1), 125. *Dicranum Anderssonii*, C. Muell. Bot. Zeit. xiv. 169 (1856); Anderss. (2), 37. — CHARLES ISL.: *Andersson*. Endemic. To judge from the description this must be quite different from the following species.

C. LAMELLATUS, Mont. Ann. Sci. Nat. Bot. ser. 2, ix. 52 (1838) *Dicranum lamellatum*, C. Muell. Syn. Musc. i. 411 (1849). — ALBEMARLE ISL.: mountain east of Tagus Cove, alt. 770 m., 1 Feb., and June, 1899, *Snodgrass & Heller*. Further distrib. Bolivia. To this species may be referred a moss collected in small quantity with a marked polytrichoid habit suggesting *C. polytrichoides*, De Not.; Renault & Cardot, Musci. Eur. no. 114, and *C. leucotrichus*, Sull. & Lesq. Musc. Am. Bor. no. 73 (1856). The stems are from $1\frac{1}{3}$ to 4 cm. high, nearly simple, but in a few cases with lateral innovations just below the tips, which are gemmiferous but without traces of antheridia or archeogonia. The erect infolded leaves terminate in long hyaline papilliferous hairs. The ribs which occupy the greater part of the leaves have a large number, about 30, of dorsal laminae composed of three or four cells seen in section, the terminal cell being obtuse. In well-developed leaves there is in the costal region a single internal layer of squarish colorless cells, $16-18\ \mu$ by $14\ \mu$ in section, but in older leaves there is developed inside these colorless cells a layer of very narrow small cells. The union by Mitten, Musci. Austro-Americani, of *C. lamellatus*, *C. polytrichoides*, *C. leucotrichus* and a number of other species into a single

species (*C. introflexus* (Hedw.) Mitt.) is incorrect so far as *C. introflexus*, at least, is concerned, as was shown by Duby and C. Mueller, but probably Mitten was justified in uniting some of the species referred to. I am unable to ascertain whether *C. lamellatus* or *C. polytrichoides* was first published since both species were described in 1838. The present species may be referred to *C. lamellatus*, Mont., to which it is at least very closely related, but the scanty and sterile material prevents an accurate determination. The specimens in their leaf structure agree well with the *C. lamellatus* of the Wilkes Expedition in herb. Sullivant.

DALTONIA, Hook. & Tayl.

D. ROBUSTA, Ångstr. Oefv. 1873, no. 5, p. 117. — GALAPAGOS IDS.: *Andersson*. Endemic.

MACROMITRIUM, Brid.

M. SCABRISSETUM, Wils. in Hook. f. (3), 165; *Anderss.* (1), 125, & (2), 37. Reduced by Mitten, Jour. Linn. Soc. xii. 210, to *M. longifolium*, Brid. Bryol. Univ. i. 309, 738 (1826), which is *Orthotrichum longifolium*, Hook. Musc. Exot. t. 44 (1818). — ABINGDON ISL.: alt. 250 m., 25 June, 1899, *Snodgrass & Heller*. CHARLES ISL.: *Darwin*. The material secured by Messrs. Snodgrass & Heller consists of a single small specimen with lower leaf cells papillose and rather transparent. The specimen was sterile and the absence of the seta made accurate determination impossible, and furthermore the leaves themselves were not in very good condition, being old and more or less torn.

PAPILLARIA, C. Muell.

P. NIGRESCENS, Jaeg. Adumb. vii. 265 (1876). *Neckera nigrescens*, Schw. Suppl. 3, i. t. 244 (1828); *Anderss.* (1), 125, & (2), 37. — CHARLES ISL.: *Andersson*. ? JAMES ISL.: *Darwin* ("Neckera vel Pilotrichum sp.?" Hook. f. (3), 165). Neither seen by the writer. Further distrib. general in North and South America.

PILOTRICHELLA, C. Muell.

P. ANDERSSONII, Jaeg. Adumb. vii. 262 (1876). *Neckera Anderssonii*, C. Muell. Bot. Zeit. xiv. 170 (1856); *Anderss.* (2), 37. — CHARLES ISL.: *Andersson*. Endemic. Not seen by the writer.

P. NIGRICANS, Besch. Prodr. Bry. Mex. 79. *Hypnum nigrescens*, Hook. in Kunth, Syn. Pl. Equin. i. 64 (1822). — GALAPAGOS IDS.:

Andersson, vid. Ångström in Oefv. k. Vet. Akad. Förh. xxx. 118 (1873).

SCHLOTHEIMIA, Brid.

S. JAMESONI, Brid. Bryol. Univ. i. 742 (1826). *Orthotrichum Jamesoni*, Arn. Trans. Wern. Soc. v. 201 (1824). — ALBEMARLE ISL.: Iguana Cove, 30 Dec. 1898, *Snodgrass & Heller*. Further distrib. Brazil. The specimens referred to this species were sterile. The leaf structure agrees so well with that of *S. Jamesoni* in herb. Taylor that the name may be retained here. The relations of *S. Jamesoni* to *S. nitida*, *Schwaeg.*, are not well defined and in herb. Sullivant the *S. Jamesoni* of the Wilkes Expedition was later considered to be *S. nitida*.