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ENUMERATION

OF THE

LICHENS

FOUND IN

NEW BEDFORD, MASSACHUSETTS

AND ITS VICINITY,

FROM 1862 TO 1892.

BY

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*Unfading as motionless, the worm frets them not, and the Autumn fades them not. Strong in loveliness, they neither blanch in heat nor pine in frost. To them, slow-fingered, constant-hearted, is entrusted the weaving of the dark, eternal tapestries of the hills; to them, slow-pencilled, iris-dyed, the tender framing of their endless imagery. Sharing the stillness of the unimpassioned rock, they share also its endurance, and while the winds of departing Spring scatter the white hawthorn blossom like drifted snow, and Summer dims on the parched meadow the drooping of its cowslip gold, far above, among the mountains, the silver Lichen-spots rest star-like on the stone; and the gathering orange stain upon the edge of yonder rock reflects the sunsets of a thousand years.—Ruskin, *Modern Painters*, P. VI, Chap. 10.*

PREFACE.

With this Enumeration I terminate my thirty years' labor on the New Bedford Lichens. Such lists are not usually considered of much importance. But the region has been thoroughly explored; its Lichen flora is comparatively rich for the area included, and contains a number of new and interesting plants; and as it is not likely that any one will go over it again, it seems worth while to make the record of it.

The region explored, bounded on the south by the waters of Buzzard's Bay, embraces a distance of from eight to ten miles from the city of New Bedford, or what could be conveniently covered in a day's walk. But excursions have been made, as holidays permitted, to the Vineyard Islands, Nantucket, and Cape Cod, and especially to the vicinity of Weymouth and Quincy, on the side of Massachusetts Bay, whose maritime rocks afforded some Lichens not found elsewhere. But I have not been able to explore the Quincy ledges and the Blue Hills of the same region so thoroughly as I could have desired.

The New Bedford region is low, with no considerable elevations, and its chief peculiarity is its extensive cypress swamps: (*Cupressus thyoides*.) This, with white and pitch pine, red cedar, and hemlock spruce, form its cone-bearing vegetation; while the deciduous-leaved trees are represented by a number of oaks, ash, elm, red maple, white, yellow, and black birch, &c., and a variety of shrubs. There are a few ledges of granitic rocks, but the maritime rocks are mostly only boulders not rich in lichens. The region about Weymouth and Nantasket is much richer in this respect, and is the chief source of the maritime lichens, especially in *Ferrucaria*. Of late years the clearing of the forests, the quarrying of the ledges, and the breaking up of the boulders, have tended to the destruction of Lichens. The largest cypresses have gone to the migratory steam saw-mill; the beeches went to the plane factory; and the hollies, once abundant, were converted into knick-knacks, so that few of any size remain: while the rocks and boulders exist only in the foundations of houses and factories. The enumeration includes fifty-six Genera, and three hundred and sixty-nine species of Lichens, of which thirty-nine were new when first discovered. Several of these have been found only in single specimens, and others are extremely rare; so that it is doubtful if any one could go over the ground again and collect as many species.

I take this opportunity to express my regret that the American professors of botany have so generally accepted the "Schwendener

theory," as it is called, that Lichens have no independent existence, but consist only of a fungus associated with an alga; and this, too, simply as a dogma, without having acquainted themselves with the arguments against it by the prominent Lichenographers of Europe, and by Professor Tuckerman in this country, and without having made any special studies of the plants themselves. These arguments constitute a considerable body of literature, of which none of these professors seem to have more than a little if any knowledge. Yet one of them has said (I quote from memory) that he knows no good reason why the Schwendener theory is not correct: which is certainly a rather remarkable statement, in view of the literature referred to. Another has said that I favored the theory, a statement for which he can find no foundation in anything I have written. I should be sorry to think that these professors have joined in the conspiracy of silence towards opposing arguments and investigations of such men as Nylander, Müller, Minks, Krempelhuber, Th. M. Fries, Tuckerman, and others, which my observation leads me to believe exists among the European advocates of the theory. The last word has certainly not yet been said upon it, and there are, as I have been told by a distinguished European Lichenist, symptoms of a reaction against it. I cannot see the propriety of our botanists who publish lists of American plants, placing Lichens among "Pyrenomycetes," and then arranging them according to Tuckerman's classification, inverted at that. This is certainly a labor-saving plan. But if Lichens, as such, do not exist, the plants hitherto called Lichens cannot be classified according to any existing Lichen system, but must find their place in some Fungus, Alga, or composite system. Our professors would have done better to hold their opinions in reserve until they had qualified themselves to form such as would have had some value.

In conclusion, I would recommend to some of our collectors of Lichens not to be too eager to exploit others for their own personal advantage, or for that of scientific societies to which they may belong; not to steal away a correspondent's correspondence; not to refuse due credit for long and laborious work gratuitously performed; not to send plants for examination under false names and false designations of the place where they grew; and not to acquire in Europe a reputation for dishonesty, which tends to throw discredit on those who do not pursue such methods.

The cited rhapsody on Lichens by Ruskin, is a fine specimen of his brilliant rhetoric. But it does not display any intimate acquaintance with them, except as bits of color in a landscape, and it would not bear criticism from a scientific point of view.

NEW BEDFORD, Dec. 1892.

LIST.

TRIBE I. PARMELIACEI.

1. RAMALINA, Ach. De Not.

1. **R. rigida**, (Pers.) Tuck. On red cedar and rarely on other trees, along the coast, in some localities very abundant; rarely on rails and stones. The apothecia now radiate. It varies considerably in size, the larger forms being referable to *R. gracilentia*, Nyl. —. *Exsic.*, Lojka, *Lichenotheca Universalis*, n. 105.

2. **R. calicaris**, Fr. A common lichen in its various forms.

a. fraxinea, Fr. On trees.

b. fastigiata, Fr. On trees and rails.

c. canaliculata, Fr. On trees, rarely on stones in walls.

d. farinacea, Schær. On stones in walls, infertile. Larger and fertile on trees, Barnstable. A very small plant on shaded rocks seems to be a reduced form of this.

3. **R. subfraxinea**, Nyl.? On cedars at Westport Harbor, 1888. The specimen found bore but a single small, lateral apoth., with fusiform spores, .018–25 by .003–4 mm., which is not the character assigned to those of this species; so that it remains doubtful.

2. CETRARIA, (Ach.) Fr., Müll.

1. **C. Islandica**, (Ach.) Th. Fr. On sterile soil, north of Acushnet cemetery, 1875; and in Dartmouth, Nantucket, and Weymouth. Sterile and not abundant.

2. **C. aleurites**, (Ach.) Th. Fr. On pitch pine and fences, 1862.

b. placorodia, (Ach.) Th. Fr. On rails.

3. **C. Fendleri**, Tuck. On pitch pine and rarely on dead wood, N. B., Nantucket, Edgartown 1882, Weymouth 1875.

4. **C. ciliaris**, Ach. On trees, especially white pine, and rails, common. A small form occurs on branches of white birch in low places. *Exsic.*, Lojka, n. 108.

5. **C. lacunosa**, Ach. On rails; and a finer condition, *v. Atlantica* Tuck., on white pine; and once on rock. *Exsic.*, Lojka, n. 109.

6. **C. Oakesiana**, Tuck. On white pine, N. B., and on stump of hemlock spruce, Weymouth. Rare and sterile.

7. **C. aurescens**, Tuck. On trees and rails. Rare and sterile, and much smaller than specimens I have seen from other localities. Spermatia .005-7 mm. long.

8. **C. juniperina**, (L.) Ach. On cypress in swamps.

3. **EVERNIA**, Ach., Mann.

1. **E. furfuracea**, (L.) Mann. On pitch pine, sterile. J. W. Dawson, in "Notes on the Flora of the White Mountains," in the *Canadian Naturalist* for April, 1868, p. 88, relates that at the unveiling of an Egyptian mummy in Montreal some time previously, quantities of this lichen, which he thinks was imported from Lebanon or Macedonia for such uses, were wrapped around the body to preserve the odor of the spices. Specimens were sent to Tuckerman, and were identified by him.

2. **E. prunastri**, (L.) Ach. On rails and stones in walls. Rare and sterile. Our plant was referred here by Tuckerman, but it seems to be the same as *E. thamuodes*, Nyl. *Behr.* p. 19.

4. **USNEA**, (Dill.) Ach.

1. **U. barbata**, (L.) Fr.

a. florida, Fr.

* *hirta*, Fr.

** *rubiginosa*, Michx.

b. ceratina, Schar.

c. dasyphoga, Fr. A specimen on rock is provided with convex cephalodia, which seem to take the place of apothecia.

One of our most common Lichens, especially *a* on trees, more rarely on rails and stones. As Payot says in his *Guide du Lichenologue au Mt. Blanc*, p. 5, it is very inflammable; and he relates an anecdote of a young man who, while collecting it at the top of a tree, struck a match to light his pipe. Throwing it away, it set fire to the Usnea, and he was frightfully burned, and could only escape by throwing himself from the tree into the snow. I have amused myself while in the swamps by setting fire to it on the lower branches of a tree, and seeing how rapidly it would burn to the top. But I remained on *terra firma*.

2. **U. trichodea**, Ach. On trees in swamps.

5. ALECTORIA, (Ach.) Nyl.

1. **A. jubata**, (L.), *b. chalybeiformis*, Ach. Common on trees, rails, and stones.
a. implexa, Fr. A single specimen only.

6. THELOSCHISTES. (Norm.) Tuck.

1. **T. chrysophthalmus**, (L.) Norm. On dead wood and trees, and a very small form on stones.
b. flavicans, Wallr. Collected by Tuckerman on Nantucket, 1872. Sterile.
2. **T. parietinus**, (L.) Norm. Common on trees and stones.
3. **T. polycarpus**, (Ehrh.) On rocks, N. B., and on rail, Penikese Island, 1873.
4. **T. lychnus**, (Nyl.) On rails, N. B., sterile, and on elm, Weymouth.
5. **T. concolor**, (Dicks.) On trees, rare.
b. effusa, Tuck. On trees.

7. PARMELIA, (Ach.) De Not.

1. **P. perlata**, (L.) Ach. On rocks, N. B. and Weymouth, rarely on trees. Sterile. The N. B. specimens belong to the *var. Cetrarioides*, (Del.)
2. **P. perforata**, (Jacq.) Ach. On trees.
**corrugis*, Fr. The most common form. According to Müller, *Beitr.* n. 1074, this is the oldest name (Fr. *Syst.*, p. 283) for *P. hypotropa*, Nyl. *Exsic.* Lojka. n. 110. The apoth. are sometimes nearly an inch in diameter. A single specimen found in Deerfield swamp, 1883, has the medulla of the thallus saffron-colored.
3. **P. cetrata**, Ach. On trees. Only found once.
4. **P. subrugata**, Kremph. On trees. A single specimen only.
5. **P. crinita**, Ach. On trees, but more common on old walls, where it is sometimes fertile.
6. **P. tiliacea**, (Hoffm.) Flk. On trees, common, and once on stone in wall.
b. sublarvigata, Nyl. On trees.

A very large plant, reaching eight inches in diameter, on trees, not common, was called by Tuckerman *P. cetrata*, but seems more cor-

rectly referred by Nyl. to this species, of which it has the lobation and the appressed habit. The lobes of *P. perforata*, as I have seen it, are always free at the margin, and more or less ascendant.

7. **P. Borreri**, Tuck. On trees and rarely on rocks, seldom fertile.

b. rudecta, Tuck. On trees. According to Nyl., *Pyr. Or.* edit. 1891, p. 49, the spermatia of *b* differ from those of *a*, and he considers them distinct.

8. **P. saxatilis**, (L.) Fr. On rocks and trees, common.

b. sulcata, Nyl. On stones in walls.

9. **P. physodes**, (L.) Ach. On trees and stones. Seldom fertile.

10. **P. pertusa**, (Schrank.) Schær. On trees and rocks. Rare and sterile. I have a fertile specimen from Nova Scotia. sent by Prof. Rothrock. Tuckerman does not seem to have seen the American plant in this condition.

11. **P. colpodes**, (Ach.) Nyl. On trees, mostly in low places. My largest specimen is $5\frac{1}{2}$ inches in its longest diameter. *Exsic.*, Lojka, n. 112.

12. **P. olivacea**, (L.) Ach. On trees and rails, sterile.

b. proluxa, Ach. Cornell's ledge, Dartmouth, 1879. fertile.

c. sorediata, (Ach.) Nyl. On stones, sterile.

13. **P. caperata**, (L.) Ach. On stones and trees. common.

14. **P. conspersa**, (Ehrh.) Ach. On rocks and rails, common. *

15. **P. ambigua**, (Wulf.) Ach., *c. Halei*, Tuck. On cypress in swamps, 1863. Rare.

8. PHYSCIA, (DC., Fr.) Th. Fr.

1. **P. speciosa**, (Wulf., Ach.) Nyl. On rocks and trees. Only once found fertile.

2. **P. hypoleuca**, (Muhl.) Tuck. On trees. Rare. Also in Weymouth. A form occurs in which the thallus is lemon-colored beneath.

3. **P. leucomela**, (L.) Michx. On oak in woods in the north part of the city, 1885. Only a single sterile specimen found.

4. **P. aquila**, (Ach.) Nyl., *b. detonsa*, Tuck. On trees and rocks. *Exsic.*, Lojka, n. 122.

5. **P. pulverulenta**, (Schreb.) Nyl. On trees, rare and hardly fertile.

b. leucoleiptes, Tuck. On rocks, rare and sterile.

6. **P. stellaris**, (L.) On trees and rocks, common.

b. alipolia, Nyl. On rocks, rare.

7. **P. astroidea**, (Fr.) Nyl. On trees, rare.

8. **P. tribacia**, (Ach.) Tuck. Very common on elms.

9. **P. hispida**, (Schreb., Fr.) Tuck. On trees, and stones in walls.

10. **P. caesia**, (Hoffm.) Nyl. On rocks. Referred here by Tuckerman: but the specimens are hardly characteristic.

11. **P. obscura**, (Ehrh.) Nyl. On trees, rocks, and mosses.

b. endococcina, (Kbr., Nyl.) On trees. Nyl. in *Japan*, p. 33. distinguishes this from the var. *endochrysea*, Hmp., in which the thallus is lemon-colored within.

12. **P. setosa**, (Ach.) Nyl. On ash in swamps.

13. **P. adglutinata**, (Flk.) Nyl. On trees. I have not been able to find among my specimens the var. *pyrithrocardia* Müll., *Flora*, 1880, p. 278, said to have occurred among specimens sent him by me. *Exsic.*, Lojka, n. 162.

9. PYXINE, Fr., Tuck.

1. **P. Frostii**, Tuck. On shaded sides of rocks. Rare and sterile. 1864.

2. **P. soredata**, Fr. On trees and rocks. Seldom fertile.

10. UMBILICARIA, Hoffm.

1. **U. Muhlenbergii**, (Ach.) Tuck. On rocks, common. Once on rail, Weymouth. *Exsic.*, Lojka, n. 14.

2. **U. Dillenii**, Tuck. On rocks, reaching a large size. Sterile here, but fertile in Weymouth and Quincy.

3. **U. pustulata**, (L.) Hoffm. On rocks, common, and very rarely on bark and dead wood. *Exsic.*, Lojka, n. 12, in my set, but called in Sched. *U. Pennsylvanica*.

b. papulosa, Tuck. On rocks.

11. STICTA, (Schreb.) Fr.

1. **S. amplissima**, (Scop.) Mass. On trees and rocks. Common.
2. **S. aurata**, (Sm.) Ach. On trees in swamps. Rare and sterile. 1880.
3. **S. pulmonaria**, (L.) Ach. On trees and rocks, common, but not usually fertile. Often infested with the parasite *Celidium stictarum*, Tul.
4. **S. fuliginosa**, (Dicks.) Ach. On rocks, 1862, and on trees in swamps. Rare and sterile.
5. **S. crocata**, (L.) Ach. On rocks and trees. Sterile.
6. **S. scrobiculata**, (Scop.) Ach. On rocks and trees. Rare and sterile.

12. NEPHROMA, Ach.

1. **N. helveticum**, Ach. On rocks, and rarely on trees.

13. PELTIGERA, (Willd.) Hoffm., Fée.

1. **P. aphthosa**, (L.) Hoffm. On rocks, Weymouth. Only a single scanty specimen found here, on Clark's Point, 1863.
2. **P. horizontalis**, (L.) Hoffm. On rocks.
3. **P. polydactyla**, (Neck.) Hoffm. On rotting logs in swamps. Rare.
4. **P. rufescens**, (Neck.) Hoffm. Among mosses at the base of trees.
5. **P. canina**, (L.) Hoffm. On the earth. Common.
b. spuria, Ach. Common.
c. sorediata, Schær. Rare and sterile.

14. PHYSMA, Mass.

1. **P. luridum**, (Mont.) Tuck. On rocks and trees. *Exsic.*, Lojka, n. 70.

15. PANNARIA, Delis.

1. **P. lanuginosa**, (Ach.) Kbr. On shaded rocks extending to bark. Sterile.

2. **P. rubiginosa**, Thunb. On trees in swamps. Rare. *Exsic.*, Lojka, n. 71.
b. conoplea, Fr. On rocks. Rare and sterile.
3. **P. leucosticta**, Tuck. On rocks. 1864.
4. **P. brunnea**, (Sw.) Mass. On the earth at "Hockley." Weymouth, 1864.
5. **P. microphylla**, (Sw.) Del. On rocks. N. B. and Weymouth. Rare.
6. **P. tryptophylla**, (Ach.) Mass. On rocks and trees. N. B. Sterile. Once found fertile on tree in Weymouth, 1866.
7. **P. molybdæa**, (Pers.) Tuck., *b. cronia*, Tuck. On rocks and trees. Sterile.
8. **P. byssina**, (Hoffm.) Tuck. On earth about bank walls. Rare. 1868.

16. SPILONEMA, Born.

1. A sterile plant not uncommon on rocks, sent to Tuckerman as "*Ephebe minor*, n. sp." is considered by Tuck., *Genera*, p. 131, as perhaps belonging to this Genus.

17. EPHEBE, Fr., Born.

1. **E. pubescens**, Fr. Cornell's ledge, Dartmouth, sterile. But I once found a spermatogoniferous state, with minute spermatia.
2. **E. solida**, Born. On rocks. N. B. and Weymouth, 1866.

18. LICHINA, Ag., Mont.

1. **L. confinis**, (Sm.) Ag., **Willeyi*, Tuck. Cornell's ledge, Dartmouth, several miles from salt water, 1868.

The peculiarities of this plant were first pointed out by me to Tuckerman, who sent it to Schwendener as "*Thamnidium Willeyi*, Tuck." He described and figured it in *Algentyphen der Flechtengonidien*, but without adding anything material to my observations.

19. PYRENOPSIS, Nyl.

1. **P. compacta**, Willey. Nyl., *Japan*, p. 102. "Thallus black, very thin, effuse, glomerulose. Apoth. blackening, convex, immarginate, 0.3-0.4 mm. in diameter. Spores ellipsoid. .022-30 by .011-14 mm. Paraphyses scanty, the thekes blue with iodine." On earth

above a bank wall, south side of the road in Acushnet, east of the bridge, 1875, from which it has now disappeared. The same was also sent me from Illinois by Mr. J. Wolf.

2. **P. phæococca**, Tuck. On rocks, 1869, and what seems the same on the earth. Rare.

3. **P. subfuliginea**, Nyl. On rocks, rare. Separated by Nyl. from specimens sent him as *P. phæococca*.

4. **P. hæmateella**, Nyl., *Flora* 1877, p. 457, 1882, p. 455. *Japan*, p. 103. On rocks, rare. Spores spuriously bilocular.

5. **P. phylliscina**, Tuck. On rocks, Cornell's ledge, 1870, and in Quincy. Very rare. Under the influence of iodine the spores become pale brown, and faintly 1-2 septate. Remarkable for its needle-shaped spermatia. Nyl. in *Japan*, p. 102, says it seems to be separable as a subgenus *Amphopsis*.

6. **P. furfurella**, Nyl., *Scand.*, p. 28. On rock in railroad cutting near East Weymouth, and on stones, mostly in wet places, N. B., 1870. The same as *P. corallina*, Willey, in Tuck. *Syn.* I. p. 137, *vide* Nyl., *Japan*, p. 102.

[**P. pertenella**, (Maggopsis, Nyl. *Flora*, 1875, p. 102,) has occurred to me at Grand Manan. **P. hæmalea**, Nyl., and **P. Flotowiana**, Hepp., occur in Alaska, *vide* Nyl., *Behr.* pp. 6, 17, 68.]

20. OMPHALARIA, Dur. and Mont.

1. **O. phyllisca**, Tuck. On rocks. 1863.

21. COLLEMA, Hoffm., Fr.

1. **C. pycnocarpum**, Nyl. On trees, N. B., rare, and Weymouth, 1866.

2. **C. cyrtaspis**, Tuck. On trees, very rare, and sterile. 1867.

3. **C. microphyllum**, Ach. On a large elm near Whitman's pond, Weymouth. 1865.

4. **C. verruciforme**, Nyl. On red cedar and other trees, N. B. and Weymouth. 1866.

5. **C. leptaleum**, Tuck. On ash in swamps. 1867.

6. **C. microptychium**, Tuck. Found scantily and sterile on an elm in Weymouth. 1871.

7. **C. flaccidum**, Ach. On trees and rocks, N. B. and Weymouth.

8. **C. nigrescens**, (Huds.) Ach. On trees in swamps. *Exsic.*, Lojka, n. 101.

A small Collema, apparently belonging to this section (*Lathagarium*) found on elm in Weymouth, 1869, in sterile condition, is indeterminable for this reason.

9. **C. pulposum**, (Bernh.) Nyl. On the earth. Rare.

10. **C. crispum**, Born. On earth about rocks. More common than the preceding. 1863.

22. LEPTOGIUM, Fr. Nyl.

1. **L. bolacinum**, Stizenb. On trees. Rare and sterile.

2. **L. tenuissimum**, (Dicks.) Kbr. On the earth, extending to rocks, and once on a *Polyporus* on tree in swamp, N. B. On wood, Weymouth. 1865.

3. **L. lacerum**, (Sw.) Fr. On mosses at the roots of trees. 1865.
b. lophæum, Schaer. On earth about stones.

4. **L. pulchellum**, (Ach.) Nyl. On trees and rocks, N. B. and Weymouth. 1866.

5. **L. tremelloides**, (L. fil.) Fr. On trees.

6. **L. juniperinum**, Tuck.? Among mosses. The specimen very scanty and obscure. Another minute Leptogium, hardly exceeding $\frac{1}{4}$ of an inch of diameter, closely appressed, sterile, with the color of *L. tremelloides*, on beech, 1882, is uncertain.

7. **L. chloromelum**, (Sw.) Nyl., *b. stellans*, Tuck. On trees, rare, and only once found fertile. 1867.

8. **L. myochroum**, (Ehrh., Schaer.) Tuck., *a. saturninum*, Schaer. On trees, N. B. and Weymouth. Sterile.

23. PLACODIUM, (DC.) Næg. and Hepp.

1. **P. elegans**, (Link.) DC. On rocks.

2. **P. murorum**, (Hoffm.) DC. On rocks near the shore, N. B., and at Nantasket.

3. **P. cinnabarinum**, (Ach.) Anz. On stones in a wall west side of Chase road, Dartmouth, 1886, a little south of Kempton street; and in similar station, Weymouth. Spermatia minute.

4. **P. microphyllum**, Tuck. On dead wood, especially of old barns. 1879. Weymouth, Nantucket.

5. **P. citrinum**, (Hoffm.) Leight. On mortar in walls. 1881.
6. **P. aurantiacum**, (Lightf.) Næg. & Hepp. On trees and rocks.
b. erythrellum, (Ach.) On rails and stones.
7. **P. cerinum**, (Hedw.) Næg. & Hepp. On trees. 1864.
b. sideritis, Tuck. On rocks, rare. 1868.
d. stillicidiorum, Fr. On the earth, Smith's Neck. 1877.
8. **P. pyracea**, (Ach., Nyl.) On stone in wall, Kempton street, 1880. On rails, West Chop, Martha's Vineyard, 1890. On old shells, Smith's Neck, 1888.
9. **P. ferrugineum**, (Huds.) Hepp. On trees, rails, and stones. 1864.
b. Pollinii, (Anz.) On trees.
c. discolor, Willey. On trees, 1866.
10. **P. camptidium**, Tuck. On trees, N. B. and Weymouth, rare. Once on rail, N. B. 1864.
11. **P. vitellinum**, (Ehrh.) Næg. & Hepp. On rails, rocks, and rarely on the earth.

24. **LECANORA**, Ach., Tuck.

1. **L. rubina**, (Vill.) Ach. On rocks, rare.
2. **L. muralis**, (Schreb.) Schaer. On rocks, Fort Phoenix, Fairhaven, and at Potomska, Dartmouth. Rare.
3. **L. pallida**, (Schreb.) Schaer. On trees. Common.
b. cancriformis, Tuck. N. B. and Weymouth. Rare.
c. angulosa, Hoffm. On trees. Common.
4. **L. subfusca**, (L.) Ach. Very common on trees, rails, and stones.
a. allophana, Ach. On trees, &c.
c. argentata, Ach. On trees. Rare.
d. coilocarpha, Ach. On trees.
e. distans, Ach. On trees. Common.
5. **L. Hageni**, Ach. On dead wood and stones.
b. Sambuci, (Pers.) Tuck. On elm and poplar, Weymouth, 1867. On the same trees and on beech, N. B. and on poplar, Cotuitport, Cape Cod, 1886.
6. **L. atra**, (Huds.) Ach. On the roots of beech, Naushon Island, 1867; and on red maple and black birch, Smith's Neck, Dartmouth,

1884. These are, so far as I am aware, the only known stations in Massachusetts.

7. **L. varia**, (Ehrh.) Nyl. On trees and rails. Common.

b. symmicta, Ach. On trees and dead wood. But some of the plants so referred are so lecideoid in appearance that they must be considered as doubtful: and the spermatia have not been observed.

c. sæpincola, Fr. On cypress, Howland's spring swamp, 1885, (*vera*), and on rails, with the same reservations as in the foregoing.

8. **L. Cupressi**, Tuck. On cypress, 1874. Rare.

9. **L. orosthea**, (Sm.) Tuck. On trees, rarely fertile, 1868.

10. **L. athroocarpa**, (Dub.) Nyl. On white birch, N. B., 1864; but more common on poplar, N. B. and Weymouth. Spermatia needle-shaped.

b. dimera, Nyl. (Nyl.) Tuck. On poplar near Howland's spring, 1873. Rare.

A plant on rocks, Weymouth, 1875, only found once, with oblong, bilocular spores, .013-18 by .0055-7 mm., may perhaps be referred here.

11. **L. elatina**, Ach. On cypress and dead wood, N. B. and Weymouth. *a.* is rare.

b. ochrophæa, Tuck. Common on cypress and hemlock spruce.

c. minor, Tuck. Common on white pine.

12. **L. pallescens**, (L.) Schaer. On trees and dead wood. Common.

b. rosella, Tuck. On beech. Rare.

13. **L. tartarea**, (L.) Ach. On rocks, extending to trees. Common.

b. gonatodes, Ach. Only found once, 1881.

14. **L. cinerea**, (L.) Sommf. On rocks, N. B. and Weymouth. Common. 1863.

b. lacvata, Fr. On rocks, less common.

c. gibbosa, Nyl. On stones in walls; and the plant referred in Tuck. *Syn.*, p. 198, with spores only .018-25 by .011-13, to *L. verrucosa*, *b. mutabilis* T. Fr., on rails, Quincy, 1870, and also on rails, N. B., 1888, seems rather to belong here.

15. **L. lacustris**, (With.) Ach. On stones, N. B. and Weymouth.

16. **L. Bockii**, (Fr.) Th. Fr. On rocks, Nantasket, 1874, and N. B., 1877.

17. **L. fuscata**, (Schröd.) Th. Fr. *b. rufescens*, Th. Fr. On stones. N. B., 1863; and on rails. Cuttyhunk Island, 1882. and Weymouth. A plant on old bricks, N. B., has a rosulate thallus, reaching one-quarter inch in diameter, but does not seem to differ otherwise.

18. **L. privigna**, (Ach.) Nyl. On rocks.
c. Clavus, Kbr. On rocks. 1866.

25. RINODINA, Mass., Stizenb., Tuck.

1. **R. oreina**, (Ach.) Mass. On rocks. Spermatia .005–6 mm. long.

2. **R. chrysomelæna**, (Ach.) Tuck. On boulder. Chepachet lane, which has since been broken up, 1868, and on stone in woods south of Allen street, 1878. Very rare.

3. **R. Ascociscana**, Tuck. On trees and rocks, N. B. and Weymouth. Rare.

4. **R. sophodes**, (Ach.) Nyl., Tuck. On trees and rocks. Spermatia oblong, .004 mm. long.

b. atrocinerea, Nyl. On rocks.

b. confragosa, Nyl. On trees.

e. exigua, Fr. On trees and rails, including the *f. polyspora*. Th. Fr. A plant referred by Tuck., *Syn.* I, p. 211. to *R. constans*, seems rather to belong here, but is remarkable for the very numerous spores in the thekes.

Of a plant found only once at root of oak, 1874, Tuckerman remarks *in litt.*, that it a little counterfeits *R. Isidioides* (Born.) but is scarcely well separable from *sophodes*; and of another from Weymouth, 1874, that it shows another trait of *sophodes*, wanting to be squamulose.

5. **R. milvina**, (Wahl.) Br. and Rostr. On rocks.

6. **R. milliaria**, Tuck. On trees and rails, 1874. Spermatia needle-shaped. Sent to Lojka with a considerable number of other specimens shortly before his death, but I cannot learn that the fascicle containing them was ever issued.

7. **R. constans**, (Nyl.) Tuck. On trees. Spermatia minute.

26. PERTUSARIA, DC.

1. **P. velata**, (Turn.) Nyl. On trees and rocks. 1866.
2. **P. multipuncta**, (Turn.) Nyl. On trees: rarely on rocks.
3. **P. communis**, DC. On trees and rocks.
4. **P. leioplaca**, (Ach.) Schaer. On trees. 1866.
5. **P. marginata**, Nyl. On trees and rocks. Reaction of the thallus with iodine red. I know not where this name was first published, nor whether any description accompanied it. If not, the name *torquata*, Müll. *Beitr.*, n. 731, or *propinqua*, *ibid*, n. 716, both of which were issued at the same time, would have the preference. The former occurs on trees and the latter on rocks, but I cannot see any essential difference between them.
6. **P. pustulata**, (Ach.) Nyl. On trees and dead wood. 1866. Spermatia staff-shaped, .015 mm. long. Another specimen yielded pycnides with ovoid stylospores, .010 mm. long. The plant, as it occurs on poplar, is referred by Müller, *Beitr.*, n. 729, to *P. melaleuca*, Duby.
7. **P. Wulfenii**, DC. On trees. Very rare.
8. **P. globularis**, Ach. Running over mosses on rocks, N. B. and Weymouth. Rare.

27. CONOTREMA, Tuck.

1. **C. urceolatum**, (Ach.) Tuck. Common, especially on red maple: and, in a depauperate condition, on cones of pitch pine, West Chop, Martha's Vineyard, 1890. *Exsic.*, Lojka, n. 134, 174.

28. GYALECTA, (Ach.) Anzi.

1. **G. lutea**, (Dicks.) Tuck. On trees, and rarely on stones and dead wood. 1864. *Exsic.*, Lojka, n. 81.
2. **G. Pineti**, (Schröd.) Tuck. On the earth and bark, N. B. and Weymouth. Rare. 1864.
3. **G. geotica**, (Wahl.) Ach., **trivialis*, Willey. On naked earth, roadsides and wood paths, 1873. Rare. The same has been sent me from Illinois by Mr. J. Wolf.
4. **G. fagicola**, (Hepp.) Tuck. On trees, red cedar, and red maple, 1863: Fairhaven, 1868: New Bedford, and Smith's Neck, Dartmouth. The spores, which in some specimens are acicular, and

.029-42 by .003-5 mm., 6-8 locular, are in others fusiform, .013-18 by .003-45 mm., and 4-6 locular.

[*G. radiatilis*, Tuck., which occurs in N. B., is, according to *Syn.* I, p. 219, a fungus.]

29. URCEOLARIA, (Ach.) Flot.

1. **U. scruposa**, (L.) Nyl. On the earth, rocks, and dead wood. A state on the shaded side of stones in walls, in which the thallus is yellow, was formerly designated by Tuckerman as *v. ochroleuca*. But the color fades out in the herbarium.

b. parasitica, (Sommf.) Parasitic on the squamules of *Cladonias*.

30. THELOTREMA, (Ach.) Eschw.

1. **T. subtile**, Tuck. On trees, mostly in swamps. 1866.

2. **T. lepadinum**, Ach. On trees in deep woods. Deerfield swamp, 1873; and in the swamp north of Turner's pond, 1876. Very rare.

[*Myriangium Duriei*, Mont. and Berk., Tuck. *Syn.* I, p. 261, which occurs here (1876), is, according to Dr. A. Minks, not a Lichen. See Minks, *Was ist Myriangium?* in *Bericht der Deutschen Bot. Gesellschaft*, 1890, Heft 8.]

TRIBE II. LECIDEACEI.

31. STEREOCAULON, Schreb.

1. **S. paschale**, (L.) Fr. On the earth and rocks. Rare and poor.

2. **S. denudatum**, Flk. On the earth. Nantasket. Sterile. 1875.

3. **S. condensatum**, Hoffm. On the earth. Often sterile.

4. **S. pileatum**, Ach. On stones in walls. On a heap of stones, near Howland's spring. *optime*. 1881, 1885.

32. CLADONIA, Hoffm.

**Fusca.*

1. **C. aleicornis**, (Lightf.) Flk. On the earth, N. B. and Weymouth; occasionally with fibrils at the margin of the squamules.

2. **C. symphycarpa**, Fr. On the earth. 1865.

3. **C. Mitrula**, Tuck. On the earth. Rare. 1865.

4. **C. cariosa**, (Ach.) Spreng. On the earth.
5. **C. pyxidata**, (L.) Fr. On the earth.
b. pocillum, Ach. Rare.
6. **C. leptophylla**, Nyl. On the earth, Dartmouth. 1889. Very rare.
7. **C. fimbriata**, (L.) Fr., *b. tubæformis*, Fr. On the earth.
8. **C. gracilis**, (L.) Nyl. On the earth. Common.
a. verticillata, Fr.
***symphyocarpia*, Tuck. Very rare.
b. hybrida, Schær.
c. elongata, Fr., *f. macrocerus*. Very rare.
9. **C. turgida**, (Ehrh.) Hoffm. Earth about rocks, Acushnet and Dartmouth. Rare and sterile.
10. **C. papillaria**, (Ehrh.) Hoffm. On the earth.
11. **C. cenotea**, (Ach.) Schær., *b. furcellata*, Fr. On the earth under the shade of trees, hardly fertile. Wainio, in *Monogr. Cladon.* I. p. 489. (I have seen only this volume), considers our plant to be a *f.* of *C. glauca*, Flk., which he places next to *cenotea*.
12. **C. squamosa**, Hoffm. On rotting wood in swamps. Wainio, *op. cit.* p. 430. considers the *f. botryoides*, Tuck., *Syn.* I. p. 246. to be a distinct species. Our plants belong mostly to the *f. multibrachiata*, Flk. (*ventricosa*, Tuck. *Syn.*), but one specimen, in which the podetia are scarcely one-half inch long, may be referred to the *f. muricella*, (Del.) Wain., (*attenuata*, Tuck., *Syn.*)
13. **C. delicata**, (Ehrh.) Fr. On rails and the bark of coniferous trees in swamps.
14. **C. caespiticia**, (Pers.) Fl. On the earth and at the base of trees.
15. **C. furcata**, (Huds.) Fr. On the earth. Common.
a. crispata, Flot.
b. racemosa, Flot. A part of this belongs to *v. pinuata*, (Flk.) Wain., *f. foliosa*, Delis.
c. subulata, Flot.
16. **C. rangiferina**, (L.) Hoffm. On the earth and dead wood. Very common, but seldom fertile. It is said sometimes to occur with a thin, crustaceous thallus of subglobose or depressed *verruca*, and I have thought I detected traces of this in a specimen on dead wood.
b. sylvatica, L.
c. alpestris, L. Less common.

17. **C. lepidota**, Fr. On the earth, N. B. and Weymouth. Rare. A very pretty little Cladonia.

18. **C. uncialis**, (L.) Fr. On the earth. Common. Like the preceding, it is said to be rarely found with a thallus of small, crenate, ascendant, squamules.

b. adunca, (Ach.) Fr.

A much reduced plant on sand, Barnstable, 1880, seems to resemble the southern *c. Caroliniana*, Tuck., which I have not seen.

19. **C. Boryi**, Tuck. On the earth about rocks. Seldom fertile, but often luxuriant. 1863. *Exsic.*, Lojka, n. 210.

***Coccinea. Apoth. scarlet.*

20. **C. coccifera**, (L.) Willd. On the earth.

a. asotea, Ach.

b. plenrota, (Flk.) Schær.

c. ochrocarpia, Flk. Rare.

The name in Tuck. *Syn.* is *cornucopioides*, but the exhaustive synonymy in Wain. shows that the other is much the older.

21. **C. macilenta**, Hoffm. On rotting logs, 1865. Podetia yellow with iodine. We have also *C. bacillaris*, Nyl., differing only in yielding no reaction with iodine.

22. **C. flabelliformis**, (Flk.) Wain. On the earth. Only found once.

23. **C. cristatella**, Tuck. On the earth, rails, and rotting wood. Common.

b. ochrocarpia, Tuck. Rare.

c. paludicola, Tuck. On rotting logs in swamps.

d. vestita, Tuck. On dead wood. Rare.

33. BLEOMYCES, Pers., DC.

1. **B. Byssoides**, (L.) Schær. On the earth, Westport. The best form, only found once.

b. sessilis, Nyl. On the earth, and rarely on rocks.

2. **B. roseus**, Pers. On the earth, common: and rarely on rocks.

34. BIATORA, Fr.

** Thallus squamulose. Psora.*

1. **B. rufo-nigra**, Tuck. On the earth about rocks. Rare. 1863.

2. **B. ostreata**, (Hoffm.) Fr. A sterile plant resembling this occurred once (1864) on dead wood in the swamp north of Turner's pond.

3. **B. Friesii**, (Ach.) Tuck. On cypress in swamps. Rare. 1865.

4. **B. anthracophila**, Nyl. On dead wood.

** *Thallus uniform. Eubiatora.*

† *Spores simple.*

5. **B. coaretata**, (Sm.) Nyl. On stones, old bricks, and earth. 1864. Spermatia needle-shaped. .018 mm. long. A white, tartarous, rimulose, sterile crust, occurring rarely on shaded rocks, is associated with this, in herb., but is indeterminable.

6. **B. granulosa**, (Ehrh.) Poetsch. On the earth, and rarely on rocks.

7. **B. flexuosa**, Fr. On dead and carbonized wood. 1868.

8. **B. viridescens**, (Schrad.) Fr. On rotting wood in swamps. 1866.

9. **B. peliaspis**, Tuck. On dead wood. 1871. Rare.

10. **B. vernalis**, (L.) Fr. On trees, mosses, and dead wood.

11. **B. sanguineo-atra**, (Fr.) Tuck. On mosses at the base of trees.

12. **B. carmelenta**, Tuck. On dead wood. 1874. Rare. This Lichen is very close to *B. symmetricella*, Nyl.; and in fact, one of the N. B. specimens referred to it, presents no appreciable difference from a small specimen of the last named from Switzerland. *B. exsequens*, Nyl., in Hue. *Addenda*, n. 935, is also very similar.

13. **B. punctella**, Willey. On dead wood. 1878. Rare.

14. **B. turgidula**, Fr. On cypress in swamps (1874) and on dead wood.

15. **B. rivulosa**, (Ach.) Fr. On rocks, N. B. and Weymouth, and on bark, Weymouth. 1868.

16. **B. Nylanderi**, Anz. On pitch pine. 1867.

17. **B. uliginosa**, (Schrad.) Fr. On the earth, common. Rarely on carbonized wood.

18. **B. myriocarpoides**, (Nyl.) Tuck. On dead wood. Common on fence boards.

19. **B. varians**, (Ach.) Tuck. On trees, common. Rarely on dead wood.

20. **B. flavido-livens**, Tuck. On bark, mostly hemlock spruce. Seldom fertile. I have collected it also in the Katskills.

21. **B. lucida**, Fr. On the shaded sides of stones in walls; common. Rarely on dead rootlets, 1864.

Parasitic.

22. **B. oxyspora**, (Tul.) Tuck. On the thallus of *Parmelia Borreri*, N. B. and Weymouth.

23. **B. Papillariae**, n. sp. Thallus wanting. Apoth. minute, yellowish flesh-colored, convex, immarginate. Hypothecium pale, the paraphyses conglutinate, the reaction with iodine blue. Spores ellipsoid, .005-10 by .002-3½ mm. On podetia of *Cladonia Papillaria*, 1876.

24. **B. Cladoniscum**, n. sp. Thallus wanting. Apoth. blackening, minute, convex, immarginate. Paraphyses closely agglutinate, the reaction with iodine blue. Spores ellipsoid, .009-11 by .003-4½ mm. Parasitic on *Cladonia Papillaria*, 1874. Very rare.

Two or three other specimens belonging to this section are too scanty for determination.

†† *Spores bilocular. Biatorina.*

25. **B. mixta**, Fr. On trees and dead wood. 1866.

26. **B. atropurpurea**, (Mass.) Hepp. On trees, especially hemlock spruce. 1866.

27. **B. Lanneri**, Hepp. On beech.

28. **B. gyalizella**, Nyl., *Labuan & Singapore* (1891), p. 38. "Thallus very thin, cinerascens; apoth. dark red, minute, gyalectaeform, urceolate, sessile, about 0.2 mm. in diameter. Spores about 24, oblong-ellipsoid, 2-4 locular, .010-16 by .005-6 mm. Paraphyses slender, the reaction with iodine blue. On swamp huckleberry, 1882, and on red maple, 1883."

29. **B. glauco-nigrans**, Tuck. On hemlock spruce, 1875. Very rare.

30. **B. Heerii**, Hepp. On thallus of *Peltigera*s: sometimes accompanied by Pycnides.

31. **B. globulosa**, (Flk.) Hepp. On dead cypress, 1876. Only found once.

32. **B. prasina**, Fr. On black birch. 1885.

b. sordidescens, Nyl. On dead wood, 1875; the most common form.

33. **B. micrococca**, Kbr. On pitch pine, 1878. On holly, Fairhaven, 1889. On dead cypress, N. B., 1885.

34. **B. flavens**, Tuck. On stone, N. B. Only found once in very small quantity.

35. **B. terrena**, n. sp. Thallus of coarse, crenate, ochroleucous granules. Apoth. minute, sessile, convex, immarginate, yellowish flesh-colored. Paraphyses slender, lax, the reaction with iodine blue. Spores ellipsoid, bilocular, .014-18 by .0035-55 mm. On earth above bank walls: not found recently. It has been sent me from Illinois by Mr. J. Wolff. It makes a very poor appearance in the herbarium.

+++ *Spores fusiform, 4-plurilocular. Bilimbia.*

36. **B. hypnophila**, (Turn.) Tuck. On mosses, the most satisfactory specimens, and on dead wood.

37. **B. Nægeli**, Hepp. On elm, 1881, and on poplar, 1886, not differing, so far as I can see, from the European lichen. Specimens on black birch and black cherry, referred here, are less satisfactory. A plant on *Polytrichum commune* was referred here by Tuckerman *in litt.*

38. **B. trachona**, Flot. On rocks and stones, N. B. and Weymouth. On dead wood, Weymouth, 1869, and N. B., 1875.

39. **B. declinis**, Tuck. On various trees, N. B. and Weymouth, 1867.

40. **B. melæna**, (Nyl.) Tuck. On cypress, 1881, and on dead wood, 1889. Rare.

41. **B. trisepta**, Næg. On dead wood N. B., and on stones, N. B. and Quincy; and I know not where else to refer a plant on earth, N. B., with constantly 4-locular spores, .016-20 by .004-5 mm.

42. **B. rubido-fusca**, n. sp. Thallus thin, glaucescent. Apoth. Peziza-like, elevated, brownish-red, the disk plane, with an entire concolorous margin. Paraphyses closely agglutinate, the reaction with iodine faint blue. Spores ellipsoid and fusiform, 4-6 locular, .013-22 by .004-5½ mm. On naked earth. Rare.

++++ *Spores needle-shaped, plurilocular. Bacidia.*

43. **B. rubella**, (Ehrh.) Rabenh. On elm, Weymouth.

44. **B. fusciorubella**, (Hoffm.) On various barks, and rarely on dead wood.

45. **B. suffusa**, Fr. On trees in swamps. Müller in *Beitr.* n. 1169, considers it a var. of *B. millegrana*.

46. **B. Schweinitzii**, Tuck. On various barks, and occasionally growing over mosses; the margin now white pruinose. *Exsicc.*, Lojka, n. 35.

47. **B. atro-grisea**, (Del.) Hepp. On dead branches of red cedar, Fairhaven, 1863. Very rare.

48. **B. inundata**, Fr. On stones near water, old bricks, and old mortar in walls.

49. **B. effusa**, (Sm.) Hepp. On hemlock spruce and pitch pine.
b. arcentina, Ach. On cypress and ash. Spermatia very minute.

50. **B. Beckhausii**, (Kbr.) Tuck. On beech, red maple, and dead wood.

b. abbrevians, Nyl. On poplar, 1885; the spores .009–15 by .002–3 mm.

51. **B. incompta**, (Borr.) Hepp. On trees and dead wood. Rare.

52. **B. endocyanea**, Tuck. *ms.* Thallus thin, contiguous, ciner-
ascent. Apoth. blackening, minute, at first plane with a thin margin, soon convex and immarginate, the hypothecium dark, the hymenium cœrulescent. Paraphyses conglutinate. Thekes narrowly clavate, the spores acicular, 4–6 locular. .022–36 by .002–4 mm. Spermatia .004–5 mm. long. On holly, rare. Has some resemblance to *B. chlorosticta*, but a different thallus.

53. **B. muscorum**, (Sw.) Tuck. On the earth. Rare.

54. **B. umbrina**, (Ach.) Tuck. On trees, and stones in walls, N. B. and Weymouth. Common. On exposed iron, Weymouth.

b. compacta, Stizenb. On rails, and rarely on trees. A plant on white pine, N. B. and Weymouth, formerly called by me *Arthonia pinguis*, is considered by Tuckerman to belong here. The spores are in wedge-shaped thekes, not spirally contorted. .018–27 by .004–5 mm., and the hymenium is cœrulescent above. Thallus determinate, greenish-cinerascent. Apoth. minute, blackening, globose, shining when wet. It is perhaps entitled to a separate place.

55. **B. chlorostieta**, Tuck. On cypress and hemlock spruce. Common. *Evsic.*, Lojka, n. 135.

b. substipitata, Stizenb. On cypress. Less common.

56. **B. chlorantha**, Tuck. On white pine, very common, and less frequently on other barks, rails, and stones. *Evsic.*, Lojka, n. 136.

††††† *Thekes polysporous.* *Biatorella.*

57. **B. geophana**, Nyl. On naked earth. Rare. 1870.

58. **B. moriformis**, (Ach.) On holly, elm, and witch hazel. Rare. 1876.

59. **B. campestris**, Fr. On the earth. 1874. Rare.

60. **B. albidula**, Willey, Tuck. *Syn.* II, p. 130. First noticed by me on bark from Rhode Island, 1878, and found on beech in N. B., 1883. It seems to be rare, but is so small that it is easily overlooked.

61. **B. resinæ**, Fr. On resin of white pine. 1864.

62. **B. difformis**, Fr. On resin of white pine, 1882. Rare. The reaction with iodine blue. See Wainio, *Adjum.* II, p. 143, and Minks, *Symbolæ*, n. 74.

35. HETEROTHECIUM, Flot., Tuck.

1. **H. porphyrites**, Tuck. On red maple in swamps. Rare.

2. **H. pezizoidium**, (Ach.) Flot. On cypress and hemlock spruce: rarely on other trees. 1875.

Here may be mentioned a doubtful plant, occurring on roots of hemlock spruce. Thallus, none visible. Apoth. middlingsized, the disk flat, reddish-brown. Reaction of the hymenium with iodine, blue. Spores in 8s. oblong-ellipsoid, 2-locular, brown. .029-.32 by .014-.16 mm. Its affinities seem to be with *Heterothecium*, but I cannot connect it with any known species.

36. LECIDEA, (Ach.) Fr., Tuck.

1. **L. tessellina**, Tuck. On a boulder along wood path north of Turner's pond, the only specimen in this vicinity. More abundant on boulders near Nantasket station, on the South Shore railroad, 1875. The N. B. specimen was on the face of a very hard boulder, from which fragments only could be detached with a chisel. Since it was first seen it has about doubled in size, pushing aside and supplanting the adjacent lichens. But it has extended slowly on the

naked rock from which the fragments were detached, not more than one-eighth inch, in at first thin, but at length thickening areoles, on which apothecia after a time appeared. On one of these naked patches a specimen of *Parmelia conspersa* has reached a diameter of over an inch; and another is completely covered with *Buellia petræa*, bearing apothecia.

2. **L. contigua**, Fr. On stones in walls, N. B., very common; and in Weymouth. The spores of our plant differ considerably in size, in some measuring .013-16-25 by .007-9-13 mm., and in others .006-9-13 by .003½-5-7 mm. (*v. meiospora*, Nyl.)

b. lignicola. On dead wood, Barnstable, 1879; and Bridge street, Fairhaven, 1883. Spores .013-18 by .007-10 mm.

3. **L. speirea**, Nyl. On shaded rocks. Rare. Spores .016-20 by .008-9 mm.

4. **L. albocærulescens**, (Wulf.) Schær. On rocks, mostly in low woods, N. B. and Weymouth.

5. **L. platycarpa**, Ach. On rocks, N. B. and Weymouth. Rare.

6. **L. enteroleuca**, Fr. On trees, rails, and stones. Not common.

c. achrista, Sommf. On poplar.

f. flavida, Fr. On hickory, Weymouth, and on rails.

7. **L. melancheima**, Tuck. On rails. Common.

8. **L. cyrtidia**, Tuck. On fragments of rock at the foot of a ledge in Quincy, 1871. On stones, N. B., 1869, and Weymouth. Not common.

9. **L. neglecta**, Nyl.? On rocks, sterile. See, as to this plant, Tuck. *Syn.* II. p. 84.

10. **L. acelinis**, Flot. On poplar, Weymouth. 1871. Very rare.

37. BUELLIA, De Not., Tuck.

* *Eubuellia*. Spores 2-plurilocular.

1. **B. stigmæa**, Tuck. On quartz, Weymouth, 1866, and New Bedford. Rare. Reaction of the thallus with potash, red.

2. **B. lepidastræa**, Tuck. On rocks, N. B. and Weymouth.

3. **B. spuria**, (Schær.) Arn. On rocks.

4. **B. stellulata**, (Tayl.) Br. & Rostr. On stones in wall, Penikese Island, 1873; on Cuttyhunk Island, 1882.

5. **B. parasema**, (Ach.) Th. Fr. On trees and rails. Very common. Spermatia straight, .005½ mm. long.

b. triphragmia, Nyl. Only a single scanty specimen. Spermatia .007–9 mm. long.

6. **B. dialyta**, Tuck. On pitch pine and dead wood. Rare. On cones of pitch pine, Naushon Island.

7. **B. Eliza**, Tuck. On cypress in swamps. Rare. *Exsic.*, Lojka, n. 140.

8. **B. myriocarpa**, (DC.) Mudd. On bark, dead wood, and stones. N. B. and Weymouth; on exposed glass, N. B., 1881; on exposed leather, Nantucket, 1883.

9. **B. polyspora**, (Willey) Wain., *Brazil*, p. 171. On various trunks; on *Selaginella rupestris*, dead grasses, and old cowdung, N. B. and Weymouth.

10. **B. turgescens**, (Nyl.) Tuck. On rails, Weymouth, 1867; Provincetown, 1879; and N. B.

11. **B. Scharereri**, De Not. On cypress and dead wood, N. B., 1866; rare; on pitch pine, Naushon Island.

12. **B. vernicoma**, Tuck. On various trees, and on rocks, N. B., 1866; on *Umbilicaria Muhlenbergii*, Russell's Mills.

Parasitic.

13. **B. Parmeliarum**, (Sommerf.) On *Parmelia Borreri*, and *saxatilis*, N. B. and Weymouth.

14. **B. glaucomarioides**, Willey. On *Lecanora tartarea*, 1868. Spores 4-locular. .010–16 by .005–7 mm. See Tuck. *Syn.* II, p. 108.

15. **B. pertusaricola**, Willey. On *Pertusaria communis*, Quincy, 1869, Weymouth, 1875 and N. B.

*** Rhizocarpon. Spores muriform, excepting n. 16.*

16. **B. colludens**, (Nyl.) Tuck. On rocks, N. B. and Weymouth. On brick, Smith's Neck, Dartmouth, 1888.

17. **B. petraea**, (Flot. Kbr.) Tuck. On rocks; common. Spermatia .005–6 mm. long. A plant on bricks has simply 4-locular, decolorate spores .025 by .011 mm.; but it can hardly be more than an immature condition of this.

b. grandis, Flk.

d. albinca, Tuck.

e. lignicola. On dead wood, N. B. and Roxbury.

Dr. Müller, in *Beitrag.*, n. 1173, describes *Rhizocarpon atrotestaceum*, (*Lecidea*, Fr., *Syst.* p. 286.) sent to the latter by Schweinitz, as occurring on non-calcareous rocks in N. America. Dr. Eckfeldt informs me that the plant is not to be found in Schweinitz's herbarium in Philadelphia. I subjoin the description, which may enable collectors to look for and identify it. Thallus pale copper-colored, a little shining, thin, diffract—or here and there dispersed—areolate, bordered by a dark zone: the areoles commonly crowded, convex, the apoth. 2–4 times smaller, $\frac{1}{2}$ – $\frac{3}{4}$ mm. in diameter, convex, black without and within, naked, plane, or finally a little convex, with a thin margin: epithecium and hypothecium thick blackish-brown, the lamina hyaline-fuscescent. Spores in 8s. .025–30 by .013–17 mm., enveloped in a halo, finally brown, 4-locular, the cells 2–4 times divided.

TRIBE III. GRAPHIDACEI, Eschw., Nyl.

38. AGYRIUM, (Fr.) Nyl.

1. **A. rufum**, (Pers.) Fr. On dead wood, 1866; on dead stems of *Osmunda cinnamomea*: and on living bark of swamp huckleberry, 1884. On dead branches of red cedar, Cotuitport, Cape Cod, 1886.

39. XYLOGRAPHA, Fr.

1. **X. disseminata**, Willey. On old rails and shingles, and dead cypress roots, 1870. On living bark of cypress, 1876.

2. **X. opegraphella**, Nyl. On rails: common. *Exsic.*, Lojka, n. 142.

There are two other plants of rare occurrence which seem to belong to this Genus. But not having had any opportunity to compare them with *X. laricicola* and *X. cedrina*, Nyl., I feel unable to give a definite opinion about them.

40. PLATYGRAPHA, Nyl.

1. **P. periclea**, (Ach.) Nyl. On hemlock spruce, 1867, and near Myrick's station on the Old Colony railroad. Very rare.

41. GRAPHIS, Ach., Nyl.

1. **G. scripta**, (L.) Ach. On trees. Common.
- b. recta*, (Humb.) On white birch.
- c. limitata*, Ach.
- d. serpentina*, (Ach.)
- e. assimilis*, (Ach.) Rare.

2. **G. dendritica**, Ach. On trees, especially white pine. Common.

b. inusta, Ach., Nyl. The most common form.

c. medusala, Nyl. Rare.

It is here, leaving his account of this Genus, so rich in new and difficult forms in the Southern States, unfinished in the *Synopsis*, that we part company with the illustrious botanist who devoted his life to American lichens. And here I would pay a last tribute to the memory of one to whom, for the unbounded liberality of the information imparted from 1862 to the time of his death, and for his patience under my sometimes too great demands upon him, I am under such great obligations. The friend and correspondent of Elias Fries, Camille Montagne, and other distinguished European botanists of his day, as well as of Austin, Frost, Hall, Hayden, Peters, Ravenel, Russell, Wright, and others, his collaborators in this country, all honorable gentlemen, whose names will ever be associated with the golden age of American lichenology. Edward Tuckerman, if he had not the extensive knowledge of species possessed by some European lichenists, and if he was perhaps too reluctant to admit generic and specific differences, was surpassed by none of them in his disinterested love of truth, in the patience with which he sought to unravel the difficulties of the most difficult of all plants, and in the philosophic spirit with which he labored to trace their affinities and to bring them into natural connection.

In passing, it may be observed that according to Nyl., *Japan*, p. 108, *Graphis scolecitis*, Tuck., *Syn.* II, p. 125, is the same as *G. adscribens*, Nyl. *Syn. Nov. Caled.*, p. 78.

42. OPEGRAPHA, (Humb.) Ach., Nyl.

1. **O. demissa**, Tuck., *Gen.*, p. 199. On various barks, *Rhus venenata*, 1870. *R. copallina*, wild cherry, holly, witch hazel, and ash. In examining the apoth. of this species I have observed, lining the inner walls of the exciple, certain compact cells, .007–9 mm. long, but could detect nothing like stylospores or spermatia. I do not know in what light they are to be viewed.

2. **O. levidensis**, Willey. Thallus inconspicuous. Apoth. black, minute, sessile, rounded or oblong, with a thin connivent margin. Spores ovoid, bilocular, the upper cell wider, without color, .012–16 by .006–7 mm. Reaction with iodine blue. On rail, 1872. Only found once.

3. **O. lentiginosula**, Nyl.? Leight., *Great Britain*, p. 373. A very poor plant on white oak, 1881; only found once. Spores oblong-ellipsoid, bilocular, the upper cell wider, .013-18 by .006-8 mm., brown, the hypothecium without color. Paraphyses confluent. Reaction with iodine from blue vinous red.

4. **O. cinerascens**, n. sp. On dead stump, 1882; only found once. Thallus greenish-cinereous, uniform, determinate, about one-half inch in diameter. Apoth. black, numerous, sessile, oblong, short, the disk plane, with a thin, erect margin. Spores bilocular, oblong-ovoid, without color, .013-16 by .004-6 mm. Reaction with iodine vinous red. This and the preceding are only mentioned for further investigation.

5. **O. varia**, (Pers.) Fr. On trees, 1883. Not common.

b. pulicaris, (Hoffm.) Nyl.

c. diaphora, (Ach.) Nyl., *f. chlorina*, Schær. Apoth. originally yellow pruinose, but this has disappeared in the herbarium.

6. **O. atra**, (Pers.) Nyl. On trees. Not common.

b. hapalea, Ach.

7. **O. viridis**, Pers. On trees, 1866. Not common. The species is distinguished by the three-angled spores, a character noted, so far as I know, only by Kærber, *Syst.*, p. 286.

8. **O. vulgata**, Ach., Nyl. On trees, and rarely on dead wood. Spermatia needle-shaped, .011-16 mm. long.

b. lithyrga, (Ach.) Nyl. On shaded rocks, extending to adjacent bark, Weymouth, 1866. Spermatia staff-shaped, .009-11 mm. long.

9. **O. quaternella**, Nyl., *Flora*, 1885, p. 449. Apoth. black, irregular, heaped, 0.2-3 mm. in diameter, oblong-diform, the margin indistinct. Spores in 4s, oblong, 4-locular, .015-18 by .006-7 mm., finally brown. Hypothecium fuscous. Reaction with iodine vinous red. Parasitic on *Pertusaria velata*, 1879. Rare.

43. ARTHONIA, Ach., Nyl.

**Apothecia pale.*

1. **A. pyrroliza**, Nyl., *Flora*, 1885, p. 447, Willey, *Syn. Arth.*, n. 84. On trees, N. B. and Weymouth. Spermatia .005-6 mm. long. Formerly distributed by me as *A. pyrroliza*, 1866.

2. **A. cupressina**, Tuck. Willey, *op. cit.*, n. 97. On cypress in swamps, 1865; and rarely on dead wood, 1875.

3. **A. lecideella**, Nyl. Willey, *op. cit.*, n. 96. On trees, 1866. Rare.

4. **A. didyma**, Kbr.? A very scanty specimen on white pine, 1884, with 2-locular brown spores .010-14 by .006-8 mm., may belong here.

5. **A. glaucescens**, Nyl. On oak, 1867.

6. **A. biformis**, (Flk.) Schær., *f. develata*, Nyl. Willey, *op. cit.*, n. 114. (*A. velata*, Nyl.) On trees, 1867. Very rare.

***Apothecia black.*

† *Spores bilocular.*

7. **A. patellulata**, Nyl. On trees; the best form on poplar, but rare. Spermatia .003-4 mm. long.

b. subpallidiuscula, Nyl., *Flora*, 1885, p. 448. Willey, *op. cit.*, n. 154. (the first syllable accidentally omitted.) On trees.

8. **A. exilis**, (Flk.) Anz. A solitary and scanty specimen on dead wood, 1875.

9. **A. dispersa**, (Schröd.) Nyl. On trees, Quincy, 1870, and N. B.; the best state on witch hazel.

10. **A. subminutula**, Nyl., *Flora*, 1885, p. 311. Willey, *op. cit.*, n. 187. On white pine, 1884. Very rare.

11. **A. subminutissima**, Nyl., *Flora*, 1885, p. 448. Willey, *op. cit.*, n. 191. On small branches of pitch pine, 1882.

12. **A. terrigena**, Willey, *op. cit.*, n. 153. Nyl., *Flora*, 1885, p. 488. On naked earth in woods south of Allen street, 1881, and occasionally elsewhere.

13. **A. hibernica**, Nyl., *Flora*, 1876, p. 237? On oak, Quincy, and on witch hazel and barberry, N. B. Thallus very thin, whitish. Apoth. minute, black, numerous, scattered, rounded or oblong or irregular. Spores bilocular, ovoid, without color, .014-22 by .006-11 mm. Perhaps a plant on smooth bark of hemlock spruce, 1875, with similar apoth. and spores .013-18 by .007-9 mm., which I had distinguished in herb. as *A. abietina*, does not differ. Nylander's description of his plant is: "perhaps a subspecies of *A. excipienda*, from which it chiefly and constantly differs in its larger spores, .016-21 by .006-8 mm." Our plants were referred here provisionally by Nyl., but I am inclined to think they are not the same.

[*A. Austinii*, Willey, *op. cit.*, n. 15, is the same as *A. dispersula*, Nyl., *ibid.*, n. 183. See Nyl., *Japan*, p. 108.]

†† *Spores 4-plurilocular.*

14. **A. radiata**, (Pers.) Th. Fr. On trees. (*A. astroidea*, Auctt.)
b. Swartziana, (Ach.) Nyl. On oak, Weymouth.
** epipastoides*, Nyl. *Pyr. Or.*, edit., 1891, p. 84. On trees.
15. **A. hamamelidis**, Nyl., *Flora*, 1885, p. 447. Willey, *op. cit.*, n. 286. On witch hazel, 1872.
16. **A. subastroidella**, Nyl., *Flora*, 1885, p. 312. Willey, *op. cit.*, n. 282. On witch hazel, 1885. This and the preceding are very near to *A. radiata*.
17. **A. quintaria**, Nyl., *Flora*, 1885, p. 312. Willey, *op. cit.*, n. 284. On holly, 1884. Seldom producing spores.
18. **A. xylographica**, Nyl., *Flora*, 1885, p. 312. Willey, *op. cit.*, n. 285. On swamp huckleberry, 1884. Very rare.
19. **A. pinastri**, Anz. On white pine, 1885. Very rare.
20. **A. punctiformis**, Ach. On trees and shrubs. A plant on white pine, with 4-6 locular spores, .016-28 by .007-9 mm., the spermatia .005-7 mm. long, is characterized by Nyl. as "*A. punctiformis, optima*."
21. **A. caudata**, Willey, *op. cit.*, n. 225. On white pine, 1885. Spores fusiform-oblong, attenuate below, 6-8 locular, .027-36 by .005-7 mm. Reaction with iodine blue. Perhaps not differing from *A. hypobela*, Nyl.
22. **A. varians**, (Dav.) Nyl. Parasitic on *Lecanora pallescens* v. *rosella*, 1867. Very rare.

††† *Spores muriform.*

23. **A. spectabilis**, Flot. On white oak and ash in swamps.
24. **A. tædiosa**, Nyl. On trees, especially red maple, N. B.: Weymouth, 1866; Cotuitport, Cape Cod. *Exsic.*, Lojka, n. 144.

44. **MYCOPORUM**, Nyl.

1. **M. pycnocarpum**, Nyl. On trees, especially red maple, N. B., 1866; and on black birch, Weymouth. *Exsic.*, Lojka, n. 150.
2. **M. difforme**, Minks *in litt.* On oak, holly, hemlock spruce, and witch hazel. Thallus inconspicuous or glaucescent. Apoth. minute, black, rounded, oblong, or irregular. Spores oblong, constricted in the middle, acute at the ends, bilocular, usually with two

sporoblasts in each partition, .016-27 by .005-9 mm. Reaction of the thekes with iodine yellowish, or vinous red. Paraphyses none.

45. CYRTIDULA, Minks.

"Thallus endophloeoid, slightly indicated, the gonidema chroolepoid. Apoth. simple, solitary or heaped, disciform, but not rarely with a pyreniform habit, originally or at length free, or veiled by the substrate, without exciple, but covered with a lacunose, superior integument, the cyrtidium, with an open fissure regularly or irregularly running round or through it, at once and suddenly evacuated. Hypothecium arising from the thallus, the sterigmas slightly or well marked. Paraphyses always connected with each other and with the hyphose network of the cyrtidium. Thekes polymorphous in the same apoth., arising from the sterigmas next the paraphyses. Spores simple, unilocular, with the original blastidium transversely 2-pleio-blastish, finally longitudinally divided."—*Revue Mycologique*, April, 1891.

The plants of which this Genus is composed are very minute and inconspicuous, resembling small Arthonias or Pyrenulas, growing, as I have found them, on small branches of various trees, but also in Europe, parasitic. Dr. Minks has described, in the work cited, to which I must refer the reader, several species sent him by me, and has more recently named others yet to be described. The Genus is so obscure and difficult that I have not attempted any elaborate study of it, and can only give the names of the species.

1. **C. fuscorubella**, Minks, *l. c.*, p. 3. On small branches of red maple, 1881. Spores oblong, 2-3 locular, .013 by .005 mm.

C. limbata, Minks, p. 3. On young twigs of sassafras, 1881. Spores suboblong or cuneate, bilocular, .013 by .006 mm.

3. **C. Idæica**, Minks, p. 5. On branches of elder, 1870. Also in Europe. Spores narrowly cuneate or rarely oblong, hardly bilocular, .010 by .006 mm.

4. **C. microspora**, Minks, p. 8. On *clethra alnifolia*, *Ilex verticillata*, and perhaps also on oaks. Spores oblong, bilocular, .010 by .003 mm. Also in Texas.

5. **C. Americana**, Minks *in litt.* On holly, 1885, and other trees. Spores oblong, 4-locular, .015-18 by .005-7 mm. Spermatia very minute.

6. **C. macularis**, Minks *in litt.* On witch hazel, holly, and other trees. Spores oblong-ovoid, rarely colored, 3-locular, .018-27 by .007-10 mm. Also in Florida.

7. **C. ———**. A plant on *Rubus villosus*, 1891. Spores not found.
- [8. **C. rhoica**, Minks *in litt.* On *Rhus typhina*, West Thornton, N. H., 1881. Spores like those of *Mycoporum difforme*.
9. **C. stigmæa**, Minks *in litt.* On trees, Florida, W. W. Calkins, 1885. Spores oblong, obtuse, constricted in the middle, .018–22 by .003–4 mm., with four sporoblasts.]

Mention may here be made of a plant which Dr. Müller has characterized as a very distinct *Phacopsis*, **P. Mulleri**, n. sp. Apoth. adnate on the thallus of *Peltigera canina*, flat or slightly convex, rounded, at length confluent, immarginate, flesh-colored, and darkening. Spores oblong, simple and bilocular, without color, .011–15 by .003½–5½ mm. A similar plant has been sent me from California by Prof. Farlow. 1875.

TRIBE IV. CALICIACEI.

46. **ACOLIUM**, (Fée) De Not.

1. **A. tigillare**, (Ach.) De Not. On dead wood.

47. **CALICIUM**, Pers., Ach., Fr.

1. **C. trichiale**, Ach. On dead wood. A *Calicium* on a *Polyporus* on hemlock spruce in swamps, 1876, with simple, globose spores, .003½–5½ mm. in diameter, and which Tuckerman remarked were rather darker colored than was usual in this section, (*Cyphelium*), was referred here by him.
2. **C. brunneolum**, Ach. On decaying wood in swamps.
3. **C. phæocephalum**, (Turn.) Turn. & Borr., *b. aciculare*, (Fr.) Nyl. On dead wood of cypress, 1865, associated with *Coniocybe gracilescens*, in very small quantity.
4. **C. chrysocephalum**, (Turn.) Ach. On cypress in swamps. 1864.
b. melanocephalum, Nyl. On dead wood in swamps.
5. **C. lenticulare**, (Ach.) On dead wood. 1866.
6. **C. curtum**, Turn & Borr. On cypress, pitch pine, and dead wood.
7. **C. subtile**, Fr. On dead wood.
b. albonigrum, Nyl. On oak and tupelo.
8. **C. trachelinum**, Ach. On dead wood. 1866.

9. **C. roscidum**, Flk., Nyl., *b. trabinellum*, Nyl. On dead wood.
10. **C. Curtisii**, Tuck. On *Rhus typhina*, Weymouth.
11. **C. byssaceum**, Fr. On red maple, 1868; on oak, *Rhus venenata*, and most luxuriant on upper branches of witch hazel, 1882.
12. **C. polyporæum**, Nyl. On *Polyporus versicolor* on trees. 1875.
13. **C. populneum**, De Brogn.? Two apoth. of a *Calicium* on poplar, 1876, the spores not seen, may belong here. A *Calicium* on poplar was also sent me from Illinois by Mr. J. Wolf.
14. **C. pallidellum**, n. sp. A single specimen on *Pertusaria velata*, 1877, with very short, pale stipes, and bilocular spores, .006-10 by .003-5 mm., which distinguish it from *C. leucopodum*, Nyl.
15. **C. microcephalum**, (Sm.) Turn. & Borr. On rails; rare. 1866.
16. **C. turbinatum**, Pers. Parasitic on *Pertusaria pertusa*. 1866.
17. **C. tubæforme**, (Mass.) Parasitic on *Pertusaria pustulata*, N. B., 1866; and at Onset Bay, 1880.

48. CONIOCYBE, Ach.

1. **C. furfuracea**, (L.) Ach. On dead wood and dead leaves. 1862.
2. **C. gracilescens**, n. sp. A minute plant, resembling *C. pallida*, but with oblong spores, .005½ by .002 mm. Found only once in small quantity, 1865, associated with *Calicium phæocephalum*, *v. aciculare*.

TRIBE V. VERRUCARIACEI.

49. ENDOCARPON, Hedw., Fr.

1. **E. miniatum**, (L.) Schær. On rocks.
b. complicatum, Schær.
c. aquaticum, Schær. On submerged stones in brooks, N. B. and Weymouth. Rare.
2. **E. arboreum**, Schwein. On trees, N. B. and Weymouth. Rare.
3. **E. hepaticum**, Ach. On the earth about stone walls.
4. **E. pusillum**, Hedw. On rocks and bricks, N. B. and Weymouth. Rare.

b. Garovaglii, Kph. On earth above bank wall, Kempton street, 1875; the spores in 2s or 3s, .036-72 by .014-27 mm. Very rare.

50. NORMANDINA, Nyl.

1. *N. jungermanniæ*, (Delis.) Nyl. On trees in swamps, 1873. Rare and sterile.

51. THELOCARPON, Nyl.

1. *T. intermediellum*, Nyl., in Hue, *Addenda*, n. 1647. On naked earth in woods south of Allen street. 1881. Only found once, and in small quantity.

2. *T. prasinellum*, Nyl., *Flora*, 1881, p. 451. On the top of board fences, 1886. Scarcely visible except after a rain.

52. STAUROTHELE, Norm.

1. *S. umbrina*, (Wahl.) On rocks near water, Weymouth, 1869; the spermatia .004 mm. long. In similar situations shores of Tobey's pond, N. B., and of Westport river, Westport.

2. *S. diffractella*, (Nyl.) Tuck. On rocks, Weymouth, 1870. Spermatia .005½-7 mm. long. Dr. Müller, in *Beitr.*, n. 672, makes for it a new Genus, *Willeya*, on account of the colorless spores and the absence of hymenial gonidea, as distinguishing it from *Polyblastia*.

53. TRYPETHELIUM, Spreng., Ach., Nyl.

1. *T. virens*, Tuck. On trees, especially yellow birch. A coarser form on beech and holly. *Exsic.*, Lojka, n. 148.

54. SAGEDIA, (Mass., Kbr.) Tuck.

1. *S. chlorotica*, (Ach.) Mass. On shaded rocks, the spores fusiform, 4-10 locular, .036-72 by .005-6 mm.; spermatia .003-5 mm. long. On submerged stones, brook running out of Deerfield swamp. the spores 4-locular, .014-20 by .005-6 mm. A very scanty specimen on black birch, Weymouth, with 4-locular spores .018-23 by .005-6 mm., might be referred to *v. carpinæ*, (Ach.) Nyl.

2. *S. cestrensis*, Tuck. On trees, N. B. and Weymouth. The specimens referred here, in Tuck. *Gen.*, p. 265, on hemlock spruce, have needle-shaped spores .072-118 by .003-4 mm. Also on stones south of Kempton street, 1878.

b. olivacea, Tuck., *ms.* The dark hypothallus predominating. On birch, Weymouth, and on beech, N. B.

3. **S. lactea**, Kbr. On holly, 1872, and witch hazel, N. B. and Weymouth. Rare.

4. **S. oxyspora**, (Nyl.) Tuck. On poplar, Weymouth, 1869, and on white birch, black cherry, and oak, N. B. and Weymouth.

55. VERRUCARIA, Pers., Tuck.

* *Spores simple.*

1. **V. epigæa**, (Pers.) Ach. On naked earth. Spermatia needle-shaped.

2. **V. maura**, Wahl., Th. Fr. On maritime rocks, Nantasket and Weymouth; Penikese Island, 1873; Smith's Neck, Dartmouth, 1886.

3. **V. ceuthocarpa**, Wahl., Nyl. On rock near Quincy Point landing, Weymouth Fore river.

4. **V. mucosa**, Wahl., Th. Fr. On maritime rocks, Weymouth Fore river, 1871. Spermatia oblong, .003-4 mm. long. A plant on a rock a little removed from the shore, Nantasket, 1871, with a brownish-red, dispersed-areolate thallus, formerly distinguished by me as *V. sanguinolenta*, is perhaps only an accidental state of this, influenced by the absence of sufficient moisture. Spermatia .004-6 mm. long.

5. **V. striatula**, Wahl. On stones near tide water at "Hockley," Weymouth Fore river.

6. **V. virens**, Nyl. On rocks, 1869.

7. **V. margacea**, Wahl., Nyl. On rocks, Weymouth, 1869. Quincy, 1870, and N. B.; on submerged stones, Weymouth and N. B.; and I have referred here a plant with a blackening crust, on submerged stones in Howland's spring.

8. **V. nigrescens**, Pers. On fragments of shells near the shore, old pottery and bricks.

9. **V. muralis**, Ach. On mortar in walls. More rarely on stones.

** *Spores bilocular.*

10. **V. consequella**, Nyl., Labuan & Singapore, (1891,) p. 43. "Hardly more than a *var.* of *V. consequens*. (Nyl. in Hue, *Addenda*, n. 1858). Spores ovoid, .012-15 by .005-6 mm. Pyrenium dimidiate. Paraphyses none." On exposed stones near tide water at "Hockley," Weymouth Fore river, 1871.

11. **V. distans**, n. sp. Differs from *V. Nylanderi*, according to Tuck., *Genera*, p. 269, in its capillary paraphyses, and its smaller, narrower, 2-3 locular spores, .014-21 by .005-7 mm. On shaded stones, head of Purchase street, 1866. Not found since.

56. PYRENULA, Ach., Næg. & Hepp., Tuck.

**Spores without color.*

1. **P. punctiformis**, (Ach.) Næg. On various barks. The spermatia in one specimen are .007-10 mm. long; in another .011-14 mm. long. Tuckerman has referred here a plant on white birch, Weymouth, in which the spores are from 4-locular, at length muriform, .018-25 by .007-9 mm.

b. fallax, Nyl. The paraphyses distinct.

2. **P. gemmata**, (Ach.) Næg. On trees, the spores .011-16 by .005½-8 mm. 1863.

b. macrocarpa, Hmpe. Kbr. *Parerg.*, p. 347? The apoth. and spores larger than in *a*; the latter .025-42 by .012-19 mm. A specimen of *a*, on buttonwood, 1880, has pycnides with oblong stylospores, .011-13 by .003-4 mm.

3. **P. hyalospora**, Nyl. On trees. Rare. 1868.

4. **P. leucochlora**, Müll., *Beitr.*, n. 615. Thallus thin, effuse, soon rimulose, glaucescent. Gonidia depauperate-seriate and sub-solitary, subglobose, .008 mm. in diameter, green. Apoth. about 0.2 mm. in diameter, dimidiate, spherical, black, shining, incurved at the base. Paraphyses at length lax, slender. Spores in 8s in broadly clavate thekes, without color, 2-locular, ovoid-ellipsoid, .012 by .006 mm. On red cedar, 1885; on hornbeam, red maple, beech, and dead wood.

5. **P. rhyponia**, (Ach.) Hepp. On branches of sassafras and *Smilax rotundifolia*, 1881. The spores are rare, and as seen, only 2-locular, .016-19 by .004-6 mm.; hence perhaps the same as *P. rhyponella*. (Nyl. in Hue, *Addenda*, n. 1827.)

***Spores colored.*

6. **P. leucoplaca**, (Wallr.) Kbr. On trees, N. B., 1873, and Weymouth. Spermatia oblong, .005½-7 mm. long.

7. **P. glabrata**, (Ach.) Mass. On trees, 1867.

8. **P. staurospora**, Tuck. ms. Resembles the preceding, but the four sporoblasts at length once divided. Spores .015-22 by .007-8 mm. Spermatia needle-shaped. Only a single specimen found on red maple in swamp, 1867.

9. **P. nitida**, Ach. On trees, especially beech, common, now predominated by the dark hypothallus.

10. **P. aspistea**, Nyl. Apoth. and spores smaller than in the preceding; the latter .016-19 by .007-11 mm. On alder, Russell's Mills, 1878. Very rare. *Exsic.*, Lojka, n. 248.

11. **P. thelena**, (Ach.) On oak and hemlock spruce; the oblong, 2-locular spores .019-36 by .008-12 mm. A plant on hickory and witch hazel has smaller, ellipsoid spores .013-19 by .006-9 mm., which may perhaps be *P. cinerella*, (Flot.)

12. **P. oblongata**, (Müll.) *Beitr.*, n. 887. Thallus very thin, white. Apoth. oblong, about 0.6-0.8 mm. long, depressed, dilated at the base. Perithecium dimidiate. Paraphyses confluent. Spores ellipsoid, brown, 2-locular, .014-18 by .007-8 mm. On white birch, 1868.

13. **P. Willeyana**, (Müll.) *Beitr.*, n. 886. Thallus indistinct, pale brown, intersected and bordered by dark lines. Apoth. one-half mm. in diameter, depressed-hemispherical, dilated at the base, and surrounded by a dark areole. Perithecium dimidiate. Paraphyses lax, slender. Spores 4 to 8, at length brown, 2-locular, the upper cell larger, .022-24 by .008-9 mm. On ash, rare, at least in fertile condition. The same has been sent from Illinois by Mr. J. Wolf.

14. **P. lactea**, (Mass.) On trees, N. B. and Weymouth. Spermatia staff-shaped, .007-9 mm. long. 1866.

15. **P. fallaciosa**, Stizenb. On trees. Spermatia staff-shaped, .007 mm. long. A plant on dead branches of white pine, with 4-locular spores, now thrice constricted, .014-21 by .005½-11 mm., is perhaps an immature state of this.

****Parasitic.*

16. **P. gemmifera**, (Tayl.) On *Placodium cerinum* and *Buellia petraea*, *lignicola*, 1879. Very rare. Spores in 8s, bilocular, brown, .007-11 by .003½-5½ mm.

17. **P. endococcoidea**, (Nyl. in Hue. *Addenda*, n. 1806); Leight., *Great Britain*, p. 461. Spores oblong, 4-locular, without color, .014-18 by .005½-7 mm. On *Buellia petraea*, 1875.

I have also met with parasites on *Peltigera canina*, *Lecanora cinerea*, and *Stereocaulon puschale*, with bilocular spores resembling those of *P. punctiformis*. But they are exceedingly scanty, and perhaps all these parasites should be excluded from Lichens.