Lichenes collected on the Missouri and its tributaries, by
J. V. Hayden, M.D. To which are added a few others from the
same region. By Edward Tuckerman, A.M. T896p
1859

Fam. I. Collemacei, Nyl.

Leptogium saturninum (Dicks.) Nyl. Syn. p. 127. Collema, Ach. Tuckerm. Synops.
Lich. N. E. p. 92. Rocky Mountains, ^{fertile;} Herb. Hook. Beside this there
are ^{possibly more than one} ~~probably several~~ species, occurring with Lecidea decipiens, on
the earth, at Deer Creek, North Platte, and doubtless elsewhere
in similar habitats; but the fragments before me are all infertile,
and otherwise too imperfect for determination

Fam. II. Lichenacei, Nyl.

Cladonia pyxidata (L.) Fr. Lichenogr. p. 216. Black Hills of The Upper Missouri,
Dr. Hayden. The horizontal thallus of another species, perhaps
C. Mitrula, Tuck., occurs, from the same region.

(1858)
Pilophorus acicularis (Ach.) Th. Fr. Comm. Stereoc. p. 41. Stereocaulon (Pilophoron) acic-
ulare, Tuckerm. Synops. p. 47. Pilophoron, Tuck. Suppl. in Amer. Journ. Sci.
1858, p. 426. On stones and dead trees. Rocky Mountains, Herb.
Hook.

Dead twigs.
Usnea barbata (L.) Fr. Lichenogr. p. 18. a. campestris, Schær. Nebraska, Dr. Hayd-
en; and in the Black Hills, The same. Small, fruticulose, infert-
ile states, from smooth becoming rough, and sometimes sorediate (v. hirta,
Auct.)

2
U. cavernosa, Tuck. in Agass. L. Superio^{ry} Append. U. lacunosa, Nyl. Syn. p. 271. Trees in mountainous districts. On Pines in the Wind river mountains, with Alectoria Fremontii, Tuck. ^{Hayden.} Extending eastward to the White Mountains of New Hampshire.

Alectoria jubata (L.) Ach. ~~canvixia~~, ~~F. lich. n. 188~~ Syn. p. 290. Nyl. Syn. p. 280. Trees. Nebraska, ~~W~~ Hayden.

A. Fremontii, Tuckerm. Suppl. l.c. p. 422. Nyl. Syn. p. 281. Evernia, Tuck. exs. n. 52. On Pine trees, in company with Usnea cavernosa, in the Wind river mountains, fertile, Hayden. Also on the earth with Ramalina californica var., and Parmelia saxatilis, ^{Bear Park, Black Hills;} a soediate, sterile state; The same. A characteristic lichen of the coniferous trees of Northern California and Southern Oregon. It has not yet been detected to the eastward of the Rocky Mountains.

Evernia vulpina (Wulf.) Ach. Syn. p. 245. ^{Tuck. exs. n. 53.} Chlorea, Nyl. Syn. p. 274. On trees. Pines in the Laramie mountains; and on the earth, with Cetraria Islandica, at the summits of Wind river mountains; and at Bear Butte, Black Hills, Upper Missouri, Hayden. First observed in California, by Menzies (Vancouver's Voyage) and according to Dr. Newberry, abundant (as it is also very luxuriantly fertile) on the branches of Labocedrus and the Western Juniper in California and Oregon. This is another characteristic lichen of the Western Coast of North America, Dr. Hayden's localities being the most Eastern as yet known. Occurs also, but very rarely fertile, in Europe.

E. Prunastri (L.) Ach. Syn. p. 245. ^{Tuck. exs. n. 54.} Nebraska, on the earth, ^{sterile;} Hayden. Bear Park, Black Hills, on the earth, small and sterile; The same.

Dactylina ramulosa (Hook.) Tuck. Obs. Lich. in Proceed. Acad. Amer. 1862. Dufourea, Hook.

append. to Parry's 2^d Voy. p. 424. Evernia, Tuck. Synops. p. 11. On the earth, Rocky mountains, Herb. Hook.

D. madreporiformis (Wulf.) Tuck. l.c. Dufourea, Ach. Nyl. Syn. p. 287. On the earth, Rocky Mountains, Dr. C. C. Parry (Herb. Gray.)

Ramalina calicaris (L.) Fr. Lichenogr. p. 30, var. farinacea, Schær. On the earth, infertile, Black Hills, Hayden.

Cetraria Islandica (L.) Ach. Syn. p. 229. Tuck. exs. n. 3. Nyl. Syn. p. 298. On the earth, with Evernia vulpina, infertile, Summit of Wind river mountains, Hayden.

C. nivalis (L.) Ach. Syn. p. 228. Tuck. exs. n. 59. Platysma, Nyl. Syn. p. 302. On the earth, in alpine and arctic districts. Wind river valley, Rocky Mountains, fertile; Hayden. An interesting addition to our knowledge of the lichen-flora of the Rocky Mountains.

Peltigera aphthosa (L.) Hoffm. Fr. Lichenogr. p. 44. Tuck. exs. n. 9, 102. On the earth, Rocky Mountains, Dr. Parry (Herb. Gray.)

P. canina (L.) Hoffm. Fr. Lichenogr. p. 45. Tuck. exs. n. 103. On the earth, with the last, Rocky Mountains, Dr. Parry (Herb. Gray.)

P. rufescens (Neck.) Hoffm. Fr. Lichenogr. p. 46. Tuck. exs. n. 104. On the earth. Kansas, Hayden.

P. horizontalis (L.) Hoffm. Fr. Lichenogr. p. 47. Tuck. exs. n. 12. On the earth. Bear Peak, Black Hills, fertile, Hayden.

Parmelia saxatilis (L.) Fr. Lichenogr. p. 61. Nyl. Syn. p. 388. On pine trunks, Valley of the Wind river Mountains; ^{and on} Black Hills, with Evernia Prunastri, &c.; on the earth; ~~Bear Peak, B.~~ Hayden.

- P. physodes (L.) Ach. Fr. Lichenogr. p. 64, ^{Pine trunks,} Tuck. exs. n. 72. On ~~trunk and rocks~~, Valley of Wind river Mountains, Hayden.
- P. caperata (L.) Ach. Syn. p. 196. Tuck. exs. n. 75. On trunk, and stones. Nebraska, Hayden.
- P. conspersa (Ehrh.) Ach. Syn. p. 209. Rocks and stones. Fort Clark, Nebraska, Hayden. Red Buttes, North Platte, The Same.
- P. molliuscula, Ach. Lichenogr. p. 492; Syn. p. 211. Nyl. Syn. p. 393. P. chlorochroa, Tuck. Obs. Lich. l. c. 4, p. 383. On the earth. Near Fort Clark, and near Cannon-ball river, on the Upper Missouri; Deer Creek, North Platte; Valley of the Big Horn; and West side of Wind river Mountains, Hayden. Black water of the Platte, and head of the Platte, ^(Herb. Gray) Dr. H. Engelmann. ^{Inscr.} Inscription Rock (U. S. Pacif. R. Surv.) Dr. Bigelow (Herb. Torr.) First found by Tilesius, in Kamtschatka (Herb. Floerk.) but the lichen is pronounced by Dr. Nylander, l. c., to be identical with the ^{above-cited} Acharian species, which was found by Thunberg at the Cape of Good Hope. It is unknown in a fertile state, and is confined, in this country, to the regions ~~above~~ named above.

Physcia parietina (L.) Nyl. Syn. p. 410.

var. polycarpa, Fr. Tuck. Obs. Lich. l. c. 4, p. 385. On dead branches of Sarcobatus, Deer Creek, North Platte, Hayden.

var. lychnea, Schær. Tuck. l. c. On cedars, Inscription Rock. (U. S. Pacif. R. Surv.) Dr. Bigelow (Herb. Torr.)

P. ciliaris, (L.) DC., var. angustata, Tuck. Synops. p. 32. Eusd. Obs. Lich. l. c. p. 388. Rocky Mountains, fertile, Herb. Hook.

P. pulverulenta (Schreb.) Nyl. Syn. p. 419. On the earth, infertile (with the aspect of var. muscigena, Schær.) Nebraska; and Black Hills, Hayden.

Umbilicaria cylindrica (L.) Delis. Tuck. Synops. p. 71, var. microphylla, pumila aggregata. Rocks. Base of Big Horn Mountains, ^{Hayden} Red Buttes, North Platte. ^{The Same} Very small and closely crowded fronds, which are often fertile. ~~and~~

Squamaria crassa (Huds.) DC. Nyl. ~~Rubrofulva~~ ^{friabile,} Lich. Scand. p. 130. On the earth, with Placodium fulgens, in the bad lands of Judith, Nebraska, Hayden. The first, and as yet, only indication of this well-known European lichen in North America. The specimen is infertile.

S. rubina (Vill.) Hoffm. Pl. Lich. 2, p. 27, t. 32, f. 1. ^{Parmelia, Schær. Spicil. p. 435.} S. chrysoleuca (Sm.) Nyl. Lich. Scand. p. 131. Rocks. Snake forks of the Columbia, and elsewhere, Hayden. Very abundant and fine in the mountains of Texas (Wright) and New Mexico (Fendler.)

S. melanophthalma (Ram.) DC. Nyl. Lich. Scand. p. 131. Lecanora chrysoleuca, v. opaca, Ach. Rocks. Cretaceous sandstones, Deer Creek, North Platte; Red Buttes, North Platte; and at the base of the Big Horn Mountains, Hayden. An areolate form, of small scales; but these are occasionally better developed, when the lichen scarcely differs from the last, except in its blackish apothecia. We might find this in the Organ Mountains of Texas.

S. Haydeni, Tuck. msc: thallo subfoliaceo crassiusculo coriaceo-cartilagineo lacero-laciniato viridi-stramineo subtus versus centrum rufo-fuscescente lacinii lobato-divisis ma-

Published in Tuck. Syn. p. 184. ^{orgine albicante crenulatis convolutis; apotheciis}
On the earth, in calcareous soil, Laramie Plains; where, according to Dr. Hayden, "it covered many square miles, in most cases detached and blown about by the wind; sometimes even drifted. It is found in situ where the ground is moist, where it is most abundant oftentimes. There is no wood or rock for it to be attached to." Hayden, litt.

Thallus apparently free; irregularly shaped; of rather thick and leathery, deeply and irregularly divided, elegantly white-notched lobes, which are rolled closely backwards, or together, concealing the under surface. This is often similar to the upper, at the tips, but becomes reddish-brown towards the centre, agreeing in this with S. rubina; like which also the tips of the lobes become sometimes blackish beneath. I find neither apothecia nor

spermogones. Resembles *S. rubina* as to colour, but differs very ^{greatly} ~~much~~ in other respects, and appears to be quite distinct from all described species.

S. plicatilis, Tuck. msc: thallo crustaceo-subfoliaceo appresso gyroso-plicato ambitu lobato albescente; ^{Wahlenbergii} apotheciis appressis disco plano fusco-nigro nudo margine thallino tenui sub-crenulato. Sporæ octonæ in thecis lato-clavatis incolores ex ovoideo-ellipsoideo dein oblongæ plus minus irregulares simplices limbatæ protoplasmate demum guttulosa $1\frac{1}{2}$ -2 plo diametro longiores. Rocks. On cretaceous sandstone, Red Buttes, North Platte, in company with *S. melanophthalma*, &c., ^{Hayden.} Thallus closely appressed to the rock, gyrose-plicate (as in *Lecidea Wahlenbergii*) passing at the margin into short lobules; from greenish-glaucous becoming white, the tips of the lobules often blackening at the edge. Apothecia of middling size; appressed; the naked, blackish-brown, flat disk bordered by a rather thin, at length somewhat crenulate thalline margin. Spores colourless; ellipsoid; single. The specimens small and imperfect, but ~~they~~ ^{they} ~~show~~ ^{present} the characters of the plant sufficiently marked.

Placodium friabile (Vill.) Lichen, Vill. Dauph. 3, p. 979, t. 55. *Parmelia*, Schær. Spicil. p. 426; & lich. Helv. n. 339. *Lecanora*, Schær. Enum. p. 64. *Lichen fulgens*, Sw. / *Parmelia*, Ach. Fr. Lichenogr. p. 119; & lich. Suec. n. 287. *Lecanora*, Ach. Syn. p. 183. Moug. & Nestl. Cr. Vog. n. 1052. *Placodium*, Nyl. Prodr. Gall. p. 74; Lich. Scand. p. 157. On the earth, in calcareous soil. Bad lands of Judith, Nebraska; and at Deer Creek, North Platte; infertile, ^{Hayden.} Exactly agreeing with the European lichen, which was observed in Greenland by J. Vahl. (It. Fr. Lich. Arct.) but has not, ~~been~~ ^{but} till now, been detected elsewhere in North America.

var. *bracteatum*, Ach., thallo granuloso-conglobato. With a; and fertile at Deer Creek.

Spores ellipsoid, single, from once and a half to twice and a half longer than wide. Not as long, in the apothecia examined, as they are described by Koerber (Syst. p. 119) and pretty regular; but much as in the var. alpinum, Th. Fr. Lich. Arct. p. 81, with the description of which our plant generally agrees. The var. bracteata of Schær. Lich. Helv. n. 340, is similar, but has dyblastish spores, and is separated as a species of *Amphiloma*, Koerb. Syst., and later, of *Gyalblechia*, Koerb. Parerg. Other Swiss specimens in my herbarium, as *Lichen citrinus*, Schleich., agreeing entirely in external characters with the granulose state of *P. friabile*, and, so far as appears with Schærer's variety abovenamed, have oblong spores (often a little constricted at the middle) in which the simple protoplasm becomes at length irregularly divided, or guttulate.

P. elegans (Link) DC. Fl. Fr. 2, p. 379. Nyl. Prodr. Gall. p. 74; Lich. Scand. p. 136. *Parmelia*, Ach. Meth. Fr. Lichenogr. p. 114; & Lich. exs. n. 109. Rocks. Red Buttes, and Deer Creek, North Platte, on cretaceous sandstones, Hayden.

Lecanora vitellina (Ehrh.) Ach. ~~P.~~ Nyl. Lich. Scand. p. 141. *Parmelia*, Fr. Lichenogr. p. 162. Rocks (cretaceous sandstones) Deer Creek, North Platte; Red Buttes; and Base of Big Horn Mountains, Hayden.

L. ferruginea (Huds.) Nyl. Lich. Scand. p. 143. Rocks (calcareous sandstones) Base of Big Horn Mountains, Hayden. Apothecia smallish, the disk intensely coloured, the margin blackening. Thallus obscure in the only specimen, which grows commingled with the areolate state of ~~St.~~ *Squamaria melanophthalma*; the lichen perhaps nearest to the var. *fusco-atra*, Bayerh., but with higher-coloured fruit.

L. cerasula, Tuck. msc.: thallo obsolescente; apotheciis mediocribus sessilibus disco plano fusco-nigro nudo ^{nigrescente} margine cerasiunculo subintegr^o, ~~nigrescente~~ demum flexuoso. Sporæ octonæ in thecis clavatis incolores obtuse ellipsoideæ regulariter dyblastæ sporoblastis ~~separatis~~ ^{nunc} isthmo junctis 2-2½ plo diametro longiores. Paraphyses articulatae. ~~Septuaginta~~ Rocks (Jurassic) at the head of Powder river, Hayden. Thallus indeterminate in the

Solitary specimen which occurs. ~~represented and compared with Lecanora~~
~~Styphelia~~ Apothecia crowded, in the specimen; of almost middling size; sessile;
 a rather thick, at length flexuous margin, which is white below, but black-
 ens above, bordering, not prominently, a flat, naked, brownish-black
 disk; which is received by a thick, colourless hypothecium, resting on
 the gonidial layer. Spores always colourless (the sporoblasts in their most
 perfect state, showing only a slight yellowish tinge, often imperceptible) from short-
~~ellipsoid~~ ellipsoid becoming rather oblong-ellipsoid, with obtuse tips; septate-dy-
 blastish; the two regular sporoblasts (which in one stage of development
 occupy only the middle of the spore, and meet, or are connected by
 an isthmus) filling at length the ends of the spore, and the rather wide
 intervening space crossed by the, often obscure, thin dissepiment; from
 twice to twice and a half longer than wide. Paraphyses articu-
 late, often conspicuously. The lichen has the aspect of Lecidea, but the
 spores, if I do not mistake, indicate its affinity with Lecanora, in several
 groups of which, Lecideine forms commonly occur. There is not in fact
 wanting some resemblance in our plant to Lecanora Bischoffii (Hepp sub
 Psora, Lich. Eur. n. 81. Rabenhorst Lich. Eur. n. 77. Rinodina, Koerb. Parerg.
 p. 75) both as respects apothecia and spores; but the former are much
 smaller in the European lichen, and the latter coloured.

L. oreina, Ach. Syn. p. 181. Nyl. Lich. Scand. p. 147. Parmelia, Fr. Lichenogr. p. 113. Schær. Spicil.
 p. 416; & Lich. Helv. n. 331. Tuckerm. Synops. p. 37. Cretaceous Sandstone, Deer
 Creek, North Platte; and at the base of the Big Horn Mountain, ^{Nyl. Lich. Scand. p. 148.} Hayden.

L. Sophodes, Ach. Lichenogr. p. 356; Syn. p. 153. ^{Nyl. Lich. Scand. p. 148.} Parmelia, Ach. Meth. p. 155. Fr. Lichenogr.
 p. 149, excl. β. Tuckerm. Synops. p. 41. On dead branches of Sarcobatus, Deer
 Creek, North Platte, ^{Hayden.} Spores about eight in a ~~small~~ sporesack.

L. cinerea (L., Fr.) Nyl. Prodr. Gall. p. 81; Lich. Scand. p. 153, pr. p. Parmelia, Fr. Lichenogr. p.
 142. Rocks. Red Buttes, and at Deer Creek, North Platte; also at
 the base of the Big Horn Mountains. ^{Hayden.} The specimens all more or less app-
 roaching what has been separated as var. protuberans, Fr. l.c. (L. cinerea, v.
 gibbosa, Nyl. l.c. Urcularia gibbosa, Ach.)

L. calcarea (L.) Sommerf. Lapp. p. 102. *Parmelia*, Fr. Lichenogr. p. 187. *Aspicilia*, Koerb. Parerg. p. 94. *Lecanora cinerea*, v. *calcarea*, Nyl. Prodr. p. 82; Lich. Scand. p. 154.

var. Hoffmanni, Ach. Syn. p. 143. Lime-rocks. Cretaceous sandstones, Deer Creek, North Platte, Hayden.

L. subfusca (L.) Ach. Lichenogr. p. 393; Syn. p. 157. *Parmelia*, Ach. Meth., Fr. Summ. Veg. Scand. p. 107. Tuckerm. Synops. p. 39.

var. crenulata, Schær. Spicil. p. 391. Lichen crenulatus, Dicks. Cr. 3, 14, t. 9, f. 1. *Lecanora subfusca* v. *umbrina*, Nyl. Lich. Scand. p. 162. On cretaceous sandstones, Deer Creek; and a similar, and scarcely distinguishable form from ~~from~~ ^{on} dead branches of *Sarcobatus*, from the same locality, Hayden.

L. frustulosa (Dicks.) Ach. Lichenogr. p. 405; Syn. p. 159. Nyl. Prodr. Gall. p. 90; Lich. Scand. p. 166. ~~Parmelia~~ ^{Hayden} Lichen, Dicks. Cr. 3, 13. Sm. 2. Bot. t. 2273. *Parmelia*, Ach. Meth. p. 172. Fr. Lichenogr. p. 141. Schær. Spicil. p. 430; & Lich. Helv. n. 478. Rocks. Base of the Big Horn Mountains. First detected, in this country, on slate-rocks, in Vermont, by W. C. C. Frost.

L. atrocarpa, Duby Bot. Gall. 2, p. 669 (fide Nyl.) Nyl. Prodr. p. 88; Lich. Par. n. 39; Lich. Scand. p. 168. *L. fuscella*, Mafsal. *Lecania*, Ejusd. alc. Gen. p. 12. Koerb. Syst. p. 122, t. 3, f. 2. Rabenh. Lich. Eur. n. 238, 239. *Patellaria*, Nalg. in Hepp. Lich. Eur. n. 76. *L. subfusca*, v. *fuscella*, Schær. Enum. p. 78, & herb. pr. p., fide Ang. Catal. Lich. Sondr. p. 53. On dead branches of *Sarcobatus vermicularis*, growing commingled with *L. subfusca* v. *crenulata*, and *L. sophodes*; Hayden. Thallus thin, effuse, whitish. Apothecia minute; crowded; the disk at first flat, and brownish, but becoming a little tumid and blackish, excluding the thin, entire margin. Sporesacks clubshaped, 10-15-sporous. Spores colourless; from oblong becoming dactyloid and regularly tetrablastish; from three to five times longer than wide. Paraphyses thickened and brownish above. New to this country, though possibly not rare, as it is easily confounded with small forms of *L. subfusca*, and *L. sophodes*; from which it remarkably differs in its dactyloid, tetrablastish spores.

L. chrysops, Tuck. Suppl. in Amer. Journ. Sci. 25, p. 425. Cretaceous sandstones, Deer Creek, North Platte, Hayden. The white form also occurs, and is ^{sometimes} not unlike L. calcarca v. Hoffmanni; but by wetting the specimen, their typical colour ^{becomes} recognizable. Spores very numerous in oblong sporesacks; very minute; colourless; simple.

~~Lecidea Russelli~~ Urceolaria scruposa (L.) Ach. Parmelia, Fr.

Urceolaria scruposa (L.) Ach. Koerb. byst. p. 168. Nyl. Prodr. p. 96; Lich. Scand. p. 176.

Parmelia, Fr. Lichenogr. p. 190. Tuckerm. Synop. p. 43.

Nyl. Lich. Scand. p. 177.

var. gypsacea, Sommerf. Lapp. p. 100. ~~Urceolaria~~ Koerb. l. c. U. scruposa v. albissima, Ach.

Meth. p. 147. Urceolaria gypsacea, Ach. Lichenogr. p. 338; Syn. p. 142.

Lime-rocks, and on the earth in calcareous soil. Bad lands of Judith, Nebraska, Hayden. Not before recognized here.

(Psora)

Lecidea, Russellii, Tuck. Obs. Lich. in Proceed. Acad. Amer. Rocks (Jurassic) at the head of Powder river, Hayden. ^{First} Detected, at about the same time, on lime-rocks in Vermont, by W. Russell, and in Texas, by W. Wright. I have since found it on similar rocks in Maryland, and W. Peters has sent it from Alabama. And what I suspect to be a condition of the same lichen was collected by W. Wright on an island of Behring's Strait. Scales commonly much more separate than in L. globifera, but in these specimens they are crowded; differing however from the species named in being smaller, less lobed, and paler, with raised, white-powdery edges. And the large, rufous, well-margined apothecia sufficiently distinguish the present, which appears, in fact, in several respect, to approach rather to L. testacea. It has also often much the aspect of fine specimens of Lecanora cervina, a. glaucocarpa.

(Psora)

Lecidea, luridella, Tuck. Obs. Lich. l. c. On the earth, Snake fork of the Columbia

river, Hayden. First detected in the mountains of Santa Fe, New Mexico, by Mr. Fendler. Scales very small; from roundish becoming oblong; appressed, but the edges free and often a little elevated; crenate; or at length a little elongated and lobate; from pale-brownish (with a greenish tinge when wet) becoming chestnut-brown; rarely much reduced or glebulose. Apothecia small; adnate; becoming a little elevated; convex and apparently immarginate from the first; finally subglobose; from blackish-rufous at length black. Spores in eights, colourless, from ovoid becoming oblong-ovoid, and twice and a half as long as wide; the protoplasm separating commonly into two or more roundish-irregular portions, as commonly in *L. lurida*. ~~The spores from some specimens~~
~~distinguishable from the present, but with the present they~~
~~agree rather with~~ In the present group (*Psora*, *Majsal.*) scarcely any distinguishing characters are derivable from the spores, but those of the present ^{lichen} ~~species~~ ~~agree~~ agree rather with the spores of *L. lurida* in the variability of the sporoblast, and Koerber takes this feature into the character of the last-named species. The plant is much smaller in all its parts than either *L. lurida* or *L. globifera*, but agrees with the former in its dull, never ferruginous colour, and more appressed scales, and with the latter in its subglobose, immarginate apothecia.

L. (Psora) decipiens (Ehrh.) Ach. Meth. p. 80; Syn. p. 52. Nyl. Lich. Scand. p. 214. *Psora*, Hoffm. Pl. Lich. ~~tab.~~ 3, p. 62, t. 43, f. 1-3. Koerb. Syst. p. 177. *Lecanora*, Ach. Lichenogr. p. 409. *Biatora*, Fr. Lichenogr. p. 252; & Lich. Suec. p. 402. Tul. Mem. Lich. p. 175, t. 10, f. 28-31. On the earth, in calcareous soils. Bad lands of Judith, Nebraska, Hayden. Deer Creek, North Platte, Hayden. The lichen was known to Hoffmann, as North American (probably sent by Muhlberg) in 1796, and is in Muhlberg's Catalogue; and it was found by Sir John Richardson in Arctic America (Hook. Append. to Frankl. Narr. p. 750) but the only specimen ^{found in} ~~from~~ the United States

which I have yet been fortunate enough to see, are those of Dr. Hayden.

L. (Psora) icterica, Montag. in Ann. Sci. Nat. 2, 2, p. 373; Syll. p. 337 (sub *Biatore*) *L. endochlora*, Tayl. New Lich. in Hook. Lond. Journ. Bot. 6, p. 151. Nyl. Enum. Gen. l. c. p. 123. *Lecanora Wrightii*, Tuckerm. Suppl. l. c. p. 425. On the earth in denuded spots, near the South Bend of Red River, Minnesota (lat. 46°) Mr. Lapham; and doubtless also within the range of the present list; the species becoming common on the prairies and hills of the Blanco (Mr. Wright) and in the valley of the Rio Grande, Texas (Dr. J. M. Bigelow) and extending southward to Mendoza (Taylor, l. c.) and Valparaiso (Montagne, l. c.) Thallus of separate, rather thin, crenate-lobate, at length bright-yellow scales; with raised, paler margins. Apothecia adnate; the reddish-brown disk equaling the paler margin; finally turgid and blackish, and the margin disappearing. Spores octosporous. Spores small; colourless; ovoid; simple; often limbate, or the protoplasm becoming at length guttulate. Apothecia at first with a *Lecanorine* aspect (as in the last species, which Acharius, in one of his works, referred to *Lecanora*) but properly *Biatore*.

L. (Biatore) erysibe (Fr.) *Biatore erysibe*, Fr. Lichenogr. p. 271. *Bilimbia*, Koerb. ~~Germ.~~ Syst. p. 213. *Lecanora*, Nyl. Prodr. p. 88; Lich. Scand. p. 167. *Patellaria* ~~Rabenh.~~ *Rabenhorstii*, Hepp. Lich. Eur. n. 75. *Biatorina*, Mafsal. Symm. p. 43. *B. prot-eiformis*, Mafsal. Sched. Crit. cit. Koerb. Koerb. Parerg. p. 139. *Lecidea luteola*, v. *erysibe*, Ach., & specim., fide Fr. l. c. On calcareous sand-stones, Deer Creek, North Platte, Hayden. Thallus crustaceous; thickish; somewhat areolate; or verruculose; pale whitish-brown. Hypothallus obscure. Apothecia minute; flattish; the naked, brownish-black disk more or less evidently marginate; and ^{bordered} ~~enclosed~~, more or less by a margin, of the substance of, but whiter than, the thallus; finally convex and immarginate. Spores in eights, in clubshaped sporesacks; colourless;

from shortish-ovoid-ellipsoid at length ellipsoid; from simple becoming soon regularly dyblastish (the at first approximate sporoblasts ^{at length} finally, more distant, as the spore becomes longer and narrower; and often, finally, irregularly broken) the length from once and a half to three exceeding the diameter. Determined mainly by a comparison with the full character of *Biatonia proteiformis*, Koerb. l.c., as I have no authentic specimens of the European lichen, which has not before been detected here. The specimens in hand resemble those, with black fruit, of *Lecanora athroscarpa*, as it occurs, at the same locality, on dead branches of *Sarcobatus*; accompanied, as is the present lichen, by *L. subfusca* v. *crenulata* (*L. Hageni*, Auct.) but the Lecideine character of the present appears to me to be more evident, and the spores (which, in the lichen before us, are those of ~~the group~~ *Biatonia*, Maffal.) sufficiently distinguish the plants.

L. epigza (Pers.) Schær. Spicil. p. 118; & Lich. Helv. n. 299, 300. Fr. Lichenogr. p. 290. Nyl. Prodr. Gall. p. 119. Lichen, Pers. in Ust. Ann. Bot. Psora, Hoffm. D. Fl. 2, p. 164. Diploicia, Maffal. Ric. p. 8, t. 179. Koerb. Syst. p. 175; Paterg. p. 117. On the earth, in calcareous soil, Bad land of Judith, Nebraska; ~~Hagen~~ and in similar situations on the North Platte, Hagen. Thallus crustaceous; effigurate; softish; of rather convex, white, often mealy lobules, which grow together at the centre, and are elongated, and, rather loosely, radiose, at the circumference. Apothecia of almost middling size; sessile; flattish; but the thin margin, which is at first white-pruinose, at length excluded by the turgid, black disk. Sporesacks clubshaped, octosporous. Spores fuscous; variously and irregularly ellipsoid, now oblique, now constricted (bicoctiform, Koerb.) septate-dyblastish; from twice to twice and a half longer than wide. Another very interesting addition to North American lichens, which is a fruit of Dr. Hayden's extensive

explorations in Nebraska, and the Indian Territory. The plant is otherwise only known in Southern Europe, and Northern Africa. It is nearest to *L. canescens*, which has a rather more crustaceous habit, and a wider geographical range; occurring also not uncommonly on trees; but the latter is unknown here.

L. parasema (Ach.) Nyl. Prodr. Gall. p. 123; Lich. Scand. p. 216. Lichen, Ach. Prodr. p. 64, pr. p. *Lecidea*, Ach. Meth. p. 35, pr. p.

var. *enteroleuca*, Nyl. l. c.; & Lich. Par. n. 57, *Lecidea enteroleuca*, Ach. Lichenogr. p. 177; Syn. p. 19. Fr. Lichenogr. p. 331; & Lich. Suec. n. 27. Tuckerm. Synops. p. 67. On rocks (cretaceous sandstone) Deer Creek, North Platte, Hayden. Thallus whitish; areolate; the hypothecium obscure. Apothecia smallish; soon convex and immarginate; the naked disk imposed upon a colourless hypothecium. Spores in eights; ovoid-ellipsoid; simple; limbate; once and a half to twice longer than wide.

L. vitellinaria, Nyl. ~~Bot. Notis~~ in Bot. Notis. 1852; Lich. Scand. p. 218. Th. Fr. Lich. Arct. p. 222. Parasitic on the crust of *Lecanora vitellina*, growing upon rocks. Cretaceous sandstones, Deer Creek, North Platte, Hayden. Apothecia minute; scattered here and there on the (sterile) crust of the cited *Lecanora*; the disk commonly exceeded by the margin. Spores colourless; short-ellipsoid; simple; becoming once and a half longer than wide. I have not yet observed these little apothecia on any other specimens than those collected by Dr. Hayden.

L. geminata, Flot. in Zw. exs. fide Nyl. Prodr. p. 129; Lich. Scand. p. 234. Rhizocarpon, Koerb. Syst. p. 259. *L. atroalba*, Fr. Lichenogr. p. 310, pr. p.; & Lich. Suec. n. 406, A. *L. dispersa*, Naeg. in Hepp Lich. Eur. n. 28. ~~Rhiz~~ *L. Montagnei*, Flot. msc. Rhizocarpon, Koerb. l. c. Rabenh. Lich. Eur. n. 329. *L. confervoides*, v. *atroalba*, Schær. Spicil. p. 128; & Lich. Helv. n. 443. Granitic and other rocks. On cretaceous sandstone, Red Buttes, North Platte; and at the base of the

Big Horn Mountains, Hayden. Thallus (in the specimens before me) of sub-tartarous, smallish, wart-like, ash-coloured areoles (often quite resembling those of *L. petraea*) which are mostly crowded into an irregular crust. Apothecia from the hypothallus; smallish; about equalling the areoles; flattish; the obtuse margin becoming at length thin, and a little flexuous; the black, naked disk, which is white within, resting on a black hypothecium. Spores 1-2; large; becoming brown, and at length blackish; oblong-ellipsoid and oblong; sometimes constricted-septate at the middle; becoming tetrablastish, and, at length, by repeated subdivision of the protoplasm, mural-polyblastish. Roundish spores also occur. This species occurs in a very constantly monosporous state (I have observed no other condition in the Western specimens, but New England ones show sporesacks varying from 1- to 2-sporous) and this state was separated by Flotow under the name of *L. Montagnei*, adopted as a species by several writers; but Nylander, properly, ^{as it appears to me,} unites both conditions in his *L. geminata*, an arrangement anticipating the emended *Rhizocarpon Montagnei* (which also includes both forms) of the ~~later~~ later work of Koerber (*Parerg.* p. 229). The lichen is now first published as North American; but ^{I have} long ^{possessed specimens from} ~~known~~ ^{collected} ~~in~~ ^{and have observed it} ~~in~~ ⁱⁿ Vermont, by W. Frost; and ~~in~~ ⁱⁿ myself, in Western Massachusetts.

~~Endocarpon nigritium, Ach. Lichenogr. p. 298, Syl. Prodr. p. 176; Lich. Par. p. 88; Pyrenoc. p. 15. Dermocarpon, Th. Fr. Lich. Arct. p. 255. On the earth. Deer Creek, North Platte; and on the Snake fork of the Columbia, alt. 6000 ft., Hayden.~~

Endocarpon pusillum, Hedw. St. Crypt. | Fr. Lichenogr. p. 411, a. Schær. Enum. p. 234, a; & Lich. Helv. n. 115. *Endopyrenium*, Koerb. Syst. p. 323. *Endocarpon Hedwigii*, Ach. & *E. hepaticum*, Ach. Lichenogr. p. 298. | *Nyl. Prodr.* p. 176; *Lich. Par.* p. 88; *Pyrenoc.* p. 15. *Dermocarpon*, Th. Fr. Lich. Arct. p. 255. On the earth. Deer Creek, North Platte; and on the Snake fork of the Columbia, alt. 6000 ft., Hayden.