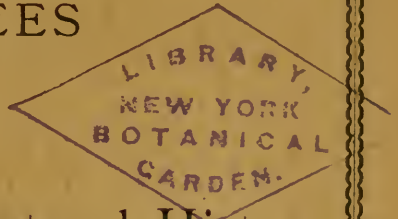


FORTY-FIRST ANNUAL REPORT

OF THE

TRUSTEES

OF THE



State Museum of Natural History

*Annual Report of the State Botanists*

FOR THE YEAR 1887.

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TRANSMITTED TO THE LEGISLATURE MAY 7, 1888.

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THE TROY PRESS COMPANY, PRINTERS.  
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# STATE OF NEW YORK.

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No. 19.

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## IN SENATE,

MAY 7, 1888.

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### FORTY-FIRST ANNUAL REPORT

OF THE

TRUSTEES OF THE STATE MUSEUM OF NATURAL HISTORY.

*To the Legislature of the State of New York:*

I have the honor to transmit herewith the Forty-first Annual Report of the Regents of the University as Trustees of the New York State Museum of Natural History, as required by law.

H. R. PIERSON,

*Chancellor.*

OFFICE OF THE REGENTS, *May 7, 1888.*



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REPORT OF THE BOTANIST.

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## REPORT OF THE BOTANIST.

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*To the Honorable the Board of Regents of the University of the State of New York:*

GENTLEMEN.—I have the honor to communicate to you the following report:

In the prosecution of the work of completing and arranging the State Herbarium the past year, specimens of the plants of the State have been collected in the counties of Albany, Greene, Lewis, Oneida, Oswego, Rensselaer, Saratoga and Ulster. Specimens have also been contributed which were collected in the counties of Broome, Cayuga, Kings, Orleans, Rensselaer and Wayne. Specimens of one hundred and seventy species of plants have been added to the herbarium, of which twenty-seven were contributed by correspondents and one hundred and forty-three were collected by the botanist. Of those collected by the botanist, one hundred and five species are new to the herbarium and to the State flora. Among the added species are twenty-six flowering plants, some of which are introduced and possibly may not be sufficiently abundant and well-established to be properly considered a part of our flora, but all were found growing without cultivation and it was thought best to place the fact on record. A list of the added species is appended and is marked A.

The number of correspondents who have contributed specimens is seventeen. The contributed specimens of extralimital species are not included in the foregoing enumeration. A list of the names of the contributors, and of their respective contributions, is marked B.

In the eastern part of the State, the months of July, August and September were unusually favorable to the production of fleshy fungi, the Hymenomycetes, and special attention was given to the collection of these plants. They constitute a large percentage of the added species and among them are many that are considered new to science. In consequence of their evanescent colors, painted

sketches were made of most of the new species while the plants were yet fresh. A record of the added species, together with descriptions of the new ones, is marked C.

Remarks concerning species previously known to belong to our flora and descriptions of new varieties are recorded in a chapter marked D.

The botanical reports have now become so numerous that an index to them is greatly needed, in order to facilitate reference to them and save time in consulting them. I have, therefore, prepared an index of the genera and species recorded in reports twenty-two to thirty-eight, inclusive. It is alphabetically arranged and is marked F.

Beaver dam is a body of water near to and connected with Beaver lake, in the eastern part of Lewis county. It was reported to me that the red-flowered variety of the white water lily, *Nymphaea odorata*, had been seen growing there. Wishing to obtain specimens of this interesting form, the locality was visited, but only the same form that was found last year in Mud pond was detected here. The external petals are tinged with red but the inner ones are white. The full red-flowered variety is yet a desideratum. There was found, however, in Beaver lake inlet, locally called "The Slough," a scarcely less interesting form of this plant. It has the very large flowers and leaves of the tuberous water lily, *Nymphaea tuberosa*, and yet the very distinct and pleasant fragrance of the white water lily. It is interesting, scientifically, because it tends to support the views of those botanists who consider these plants as mere forms of one species.

A form of the northern or Canadian blueberry, *Vaccinium Canadense*, in which the fruit is jet black and shining, was observed growing plentifully in the cleared land and pastures near Beaver lake. Thus, it happens that each one of our four common blueberries, which contribute to supply our markets with this excellent fruit, has its black-fruited variety, notwithstanding the general application of the name "blueberries." This variation is interesting and worthy of notice, because it indicates a tendency in these plants to vary in a part in which variation may be made the basis of useful improvement under proper treatment and culture. The fruit is the useful part of these plants and variation in it indicates capability of improvement in this direction. A similar variation has also been observed in the fruit of the black huckle-

berry, *Gaylussacia resinosa*. In it the fruit is commonly dull black without any bloom, but in the variety it is of a shining jet black and is readily distinguishable from the ordinary form. Dishonest berry pickers sometimes take advantage of the similarity in size and shape between this huckleberry and the black-fruited variety of the chokeberry, *Pyrus arbutifolia*. They mix the two fruits and the fraud is not likely to be detected till the taste reveals it. The flavor of large quantities of canned berries is sometimes spoiled by this reprehensible practice.

Mr. P. H. Dudley, civil engineer of the N. Y. C. and H. R. railroad, has, at my request, communicated to me some of the results of his investigations of the fungi destructive to wood. This is of such great practical importance that I have added a copy of his communication to this report. It is marked E.

Very respectfully submitted.

CHAS. H. PECK.

ALBANY, December 6, 1887.

(A.)

## PLANTS ADDED TO THE HERBARIUM.

*New to the Herbarium.*

Ranunculus septentrionalis <i>Poir.</i>	Inocybe agglutinata <i>Pk.</i>
Brassica campestris <i>L.</i>	I. nigridisca <i>Pk.</i>
Lunaria biennis <i>L.</i>	I. vatricosa <i>Fr.</i>
Dianthus barbatus <i>L.</i>	Hebeloma crustuliniforme <i>Bull.</i>
Lestivicum officinale <i>Koch.</i>	H. longicaudum <i>Pers.</i>
Valerianella olitoria <i>Poll.</i>	Flammula lubrica <i>Fr.</i>
Aster junceus <i>Ait.</i>	F. subfulva <i>Pk.</i>
Phlox maculata <i>L.</i>	Naucoria paludosa <i>Pk.</i>
Myosotis arvensis <i>Hoffm.</i>	N. unicolor <i>Pk.</i>
M. collina <i>Hoffm.</i>	N. triscopoda <i>Fr.</i>
Cuscuta tenuiflora <i>Engelm.</i>	N. carpophila <i>Fr.</i>
Physalis lanceolata <i>Mx.</i>	Galera inculata <i>Pk.</i>
Nepeta grandiflora <i>Bieb.</i>	Agaricus comptulus <i>Fr.</i>
Plantago Media <i>L.</i>	Stropharia albocyanea <i>Desm.</i>
Aristolochia Clematidis <i>L.</i>	Psilocybe clivensis <i>B. &amp; Br.</i>
Euphorbia Esula <i>L.</i>	P. senex <i>Pk.</i>
Salix amygdaloides <i>Ander.</i>	Deconica subviscida <i>Pk.</i>
Potamogeton Spirillus <i>Tuckm.</i>	Psathyrella minima <i>Pk.</i>
P. Zizii <i>M. &amp; K.</i>	Cortinarius balteatus <i>Fr.</i>
P. Hillii <i>Morong.</i>	C. pluvius <i>Fr.</i>
P. marina <i>L.</i>	C. muscigenus <i>Pk.</i>
Eleocharis diandra <i>Wright.</i>	C. brevipes <i>Pk.</i>
Panicum nervosum <i>Muhl.</i>	C. brevissimus <i>Pk.</i>
Deyeuxia Porteri <i>Vasey.</i>	C. albidifolius <i>Pk.</i>
Eatonia Dudleyi <i>Vasey.</i>	C. spilomeus <i>Fr.</i>
Bromus arvensis <i>L.</i>	C. flavifolius <i>Pk.</i>
Lepiota granosa <i>Morg.</i>	C. griseus <i>Pk.</i>
L. arenicola <i>Pk.</i>	C. badius <i>Pk.</i>
Tricholoma resplendens <i>Fr.</i>	C. subflexipes <i>Pk.</i>
T. Columbetta <i>Fr.</i>	C. paleaceus <i>Fr.</i>
T. intermedium <i>Pk.</i>	C. rigidus <i>Fr.</i>
T. terriferum <i>Pk.</i>	Hygrophorus Lauræ <i>Morg.</i>
T. tricolor <i>Pk.</i>	Lactarius aspideus <i>Fr.</i>
T. fuliginum <i>Pk.</i>	L. maculatus <i>Pk.</i>
T. putidum <i>Fr.</i>	Russula lepida <i>Fr.</i>
Clitocybe subsimilis <i>Pk.</i>	R. adulterina <i>Fr.</i>
C. caespitosa <i>Pk.</i>	R. atropurpurea <i>Pk.</i>
C. sulphurea <i>Pk.</i>	Boletus speciosus <i>Frost.</i>
C. tortilis <i>Bolt.</i>	B. auriflammeus <i>B. &amp; C.</i>
Collybia scorzonerea <i>Batsch.</i>	B. purpureus <i>Fr.</i>
C. hariolorum <i>D. C.</i>	B. hemichrysus, <i>B. &amp; C.</i>
C. strictipes <i>Pk.</i>	B. glabellus <i>Pk.</i>
C. alba <i>Pk.</i>	B. varipes <i>Pk.</i>
Omphalia subgrisea <i>Pk.</i>	B. indecisus <i>Pk.</i>
Mycena capillaripes <i>Pk.</i>	B. albellus <i>Pk.</i>
M. crystallina <i>Pk.</i>	Polyporus flavovirens <i>B. &amp; R.</i>
Entoloma sericeum <i>Bull.</i>	P. rimosus <i>Berk.</i>
E. flavoviride <i>Pk.</i>	P. mutans <i>Pk.</i>
Clitopilus erythrosporus <i>Pk.</i>	P. pineus <i>Pk.</i>
C. conissans <i>Pk.</i>	Merulius Ravenelii <i>Berk.</i>
C. caespitosus <i>Pk.</i>	M. himantioides <i>Fr.</i>
Pholiota minima <i>Pk.</i>	Hydnum fasciatum <i>Pk.</i>
Inocybe fibrillosa <i>Pk.</i>	Irpex nodulosus <i>Pk.</i>
I. subfulva <i>Pk.</i>	Radulum Pendulum <i>Fr.</i>
I. violaceifolia <i>Pk.</i>	Corticium olivaceum <i>Fr.</i>
I. asterospora <i>Quel.</i>	Clavaria albida <i>Pk.</i>
I. margarisporea <i>Berk.</i>	C. densa <i>Pk.</i>
I. commixta <i>Bres.</i>	Geaster Schæfferi <i>Vitt.</i>

Geaster vittatus *Kalchb.*  
Sphæropsis carpinea *S. & Br.*  
Cercospora Gentiana *Pk.*

Oöspora Cucumeris *Pk.*  
Sporendonema myophilum *Sacc.*  
Zygodesmus violaceofuscus *Sacc.*

## Not new to the Herbarium.

Nelumbium luteum *Willd.*  
Nymphæa odorata *Ait.*  
Stellaria longifolia *Muhl.*  
Vicia sativa *L.*  
Fragaria Virginiana *Duchesne.*  
Rubus villosus *Ait.*  
Galium circæzans *Mx.*  
G. trifidum *L.*  
Aster diffusus *Ait.*  
A. Tradescanti *L.*  
Erigeron annuus *Pers.*  
Solidago rugosa *Mill.*  
Gaylussacia resinosa *T. & G.*  
Fraxinus viridis *Mx.*  
Asclepias tuberosa *L.*  
Symphytum officinale *L.*  
Myosotis palustris *With.*  
Epiphegus Virginiana *Bart.*  
Juncus acuminatus *Mx.*  
J. marginatus *Rost.*  
J. Canadensis *Gay.*  
J. tenuis *Willd.*  
Cyperus filiculmis *Vahl.*

Scirpus polyphyllus *Vahl.*  
S. Torreyi *Olney.*  
Eragrostis capillaris *L.*  
Panicum clandestinum *L.*  
Botrychium lanceolatum *Angst.*  
Amanita phalloides *Fr.*  
A. rubescens *Fr.*  
Lepiota granulosa *Batsch.*  
L. illinita *Fr.*  
Tricholoma Peckii *Howe.*  
T. vaccinum *Pers.*  
T. fumosoluteum *Pk.*  
Clitocybe nebularis *Batsch.*  
C. laccata *Scop.*  
Collybia lentinoides *Pk.*  
Clitopilus prunulus *Scop.*  
Inocybe rimosa *Bull.*  
Marasmius præacutus *Ellis.*  
M. salignus *Pk.*  
Hygrophorus pratensis *Fr.*  
Clavaria stricta *Pers.*  
C. crispula *Fr.*  
C. pistillaris *L.*

## (B.)

## CONTRIBUTORS AND THEIR CONTRIBUTIONS.

Prof. W. R. Dudley, Ithaca, N. Y.

Lunaria biennis *L.*  
Fragaria Virginiana *Duch.*  
Aster junceus *Ait.*  
A. diffusus *Ait.*  
A. Tradescanti *L.*  
Fraxinus viridis *Mx.*  
Myosotis arvensis *Hoffm.*  
M. collina *Hoffm.*  
Cuscuta tenuiflora *Engl.*  
C. epilinum *Weihe.*  
Plantago Media *L.*

Aristolochia Clematitis *L.*  
Euphorbia Esula *L.*  
Salix amygdaloides *And.*  
Juncus Canadensis *Gay.*  
Potamogeton Zizii *M. & K.*  
P. Spirillus *Tuckm.*  
P. Hillii *Mor.*  
P. marina *L.*  
Panicum nervosum *Muhl.*  
Deyeuxia Porteri *Vasey.*  
Eatonia Dudleyi *Vasey.*

Prof. B. D. Halsted, Ames, Iowa.

Sphærotheca lanestris *Hark.*  
Cercospora rosæcola *Pass.*  
Peronospora Claytoniæ *Farl.*  
Puccinia prunispinosæ *Pers.*

Uromyces Lupini *B. & C.*  
U. Betæ *Kuhn.*  
Æcidium Phacelææ *Peck.*

Prof. W. G. Farlow, Cambridge, Mass.

Puccinia Malvacearum *Mont.*  
Ustilago antherarum *Fr.*  
Monilia Linhartiana *Sacc.*  
Phragmotrichum Chailletii *K. & S.*  
Exoascus Wiesneri *Rathay.*

Geoglossum atropurpureum *Pers.*  
Microsphaeria Vaccinii *C. & P.*  
Leptosphaeria Silenes-acaulis *DeNot.*  
Dothidea Wittrockii *Eriks.*

Prof. H. A. Green, Troy, N. Y.

Umbilicaria Muhlenbergii *Tuckm.*

C. E. Fairman, M. D., Lyndonville, N. Y.

Polyporus sulphureus <i>Fr.</i>		Nidularia pulvinata <i>Schw.</i>
Perichæna corticalis <i>Batsch.</i>		

E. C. Howe, M. D., Lansingburgh, N. Y.

Eleocharis diandra <i>Wright.</i>		Agropyrum caninum <i>R. &amp; S.</i>
Bromus arvensis <i>L.</i>		

H. C. Gordinier, M. D., Troy, N. Y.

Bromus arvensis <i>L.</i>		Aristolochia Clematitis <i>L.</i>
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Harold Wingate, Philadelphia, Penn.

Orthotricha microcephala *Wing.*

P. H. Dudley, New York.

Lenzites striata <i>Sw.</i>		Lentinus Nicaraguensis <i>B. &amp; C.</i>
<i>L. abietina Fr.</i>		Trametes Pini <i>Fr.</i>

W. C. Stevenson, Jr., Philadelphia, Penn.

Lepiota Americana *Peck.*

J. A. Lintner, Albany, N. Y.

Reticularia Lycoperdon *Bull.*

George T. Fish, Rochester, N. Y.

Nulumbium luteum *Willd.*

H. L. Griffis, Binghamton, N. Y.

Sporendonema myophilum *Sacc.*

A. P. Morgan, Preston, Ohio.

Hydnum casearum <i>Morg.</i>		Hydnum alboviride <i>Morg.</i>
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C. J. Curtis, Lincolnton, N. C.

Fistulina hepatica <i>Fr.</i>		Lactarius atroviridis <i>Pk.</i>
Hypomyces hyalinus <i>Schw.</i>		Boletus leprosus <i>Pk.</i>
Boletus flexuosipes <i>Pk.</i>		Boletus dictyocephalus <i>Pk.</i>

Rev. J. L. Zabriskie, Flatbush, N. Y.

Polyporus rimosus *Berk.*

S. H. Wright, M. D.

Polyporus Curtisii <i>Berk.</i>		Clathrus columnatus <i>Bosc.</i>
<i>P. sanguineus Fr.</i>		

(C.)

## PLANTS NOT BEFORE REPORTED.

### *Ranunculus septentrionalis*, *Poir.*

In wet places, rarely in pine woods. Albany and Rensselaer counties. Common. June. I have not seen, in the vicinity of Albany, the true *R. repens*, with which this species has been confused.

### *Brassica campestris*, *L.*

About houses and in cultivated grounds. Menands, Albany county. June. The specimens belong to variety *colza*, which has probably been introduced in "bird seed."

**Lunaria biennis, L.**

Escaped from cultivation at Ithaca. May. Prof. W. R. Dudley.

**Dianthus barbatus, L.**

Established in woods near Ithaca. June and July. Dudley.

**Levisticum officinale, Koch.**

Occasionally established by roadsides and in waste places. Cayuga county. Dudley. Sandlake, Rensselaer county. June.

**Valerianella olitoria, Poll.**

Frontenac island, Cayuga lake. May. Dudley. Introduced and synonymous with *Fedia olitoria* Vahl.

**Aster junceus, Ait.**

Sphagnous swamps. Round marsh, Dryden. September. Dudley.

**Phlox maculata, L.**

Roadsides. Sandlake. June. Probably introduced in this locality, or escaped from cultivation, but the plants were growing remote from any dwelling.

**Myosotis arvensis, Hoffm.**

Ithaca. May and June. Dudley.

**Myosotis collina, Hoffm.**

Ithaca. May. Dudley.

**Cuscuta tenuiflora, Engelm.**

Near Union Springs. Growing on peppermint, *Mentha piperita*. August and September. Dudley.

**Physalis lanceolata, Mx.**

Cultivated grounds. Menands. Our plant is well described in the Manual under the name *Physalis Pennsylvanica*. It has probably been introduced from the south or west, but is very persistent.

**Nepeta grandiflora, Bieb.**

Roadsides. Menands. September. Introduced.

**Plantago Media, L.**

University grounds, Ithaca. June. Dudley.

**Aristolochia Clematitis, L.**

Lansingburgh, Rensselaer county. *H. C. Gordnier*. Union Springs.  
June. *Dudley*. Introduced.

**Euphorbia Esula, L.**

Groton. June and July. *Dudley*.

**Salix amygdaloides, Ander.**

Fall creek, Eddy pond, Cayuga lake, Cayuga marshes, etc. Abundant.  
May. *Dudley*.

**Potamogeton Spirillus, Tuckerm.**

Cayuta lake. August. *Dudley*. Lower Saranac lake, Essex county.  
Sandlake.

Two forms occur. In one the submersed leaves are rather long and straight; in the other they are shorter and somewhat recurved, and give the plant a peculiar appearance. The Cayuta-lake specimens are very small, being but one or two in. long.

**Potamogeton Zizii, M. & K.**

Fall creek. August and September. *Dudley*. Normanskill creek near Kenwood, Albany county.

**Potamogeton Hillii, Morong.**

Malloryville. July. *Dudley*.

**Potamogeton marina, L.**

Near the outlet of Seneca lake. July. *Dudley*.

**Eleocharis diandra, Wright.**

Lansingburgh. *E. C. Howe*.

**Panicum nervosum, Muhl.**

Woods near White church. July. *Dudley*. Cold Spring, Putnam county, and Adirondack mountains.

**Deyeuxia Porteri, Vasey.**

Thatcher's pinnacle, West Danby. August. *Dudley*. This is *Calamagrostis Porteri* of the Manual. It is a rare and local species.

**Eatonia Dudleyi, Vasey.**

South hill. June. *Dudley*. The specimens placed in the State Herbarium by Dr. Torrey, and labeled *Koeleria Pennsylvanica*, belong to this species, which has until recently been confused with *Eatonia*

*Pennsylvanica*. The characters by which it is separated from *E. Pennsylvanica* are, according to the author of the species, "its slender culms and panicle, the very short cauline leaves, the longer and wider lower glume, the more obtuse upper one and the shorter obtuser flowering glumes." The flowers have a peculiarly blunt appearance by which the plant may be easily recognized.

**Bromus arvensis, L.**

Troy. *Gordinier* and *Howe*. Sparingly introduced. June.

**Lepiota granosa, Morg.**

Prostrate trunks of trees, old stumps and decayed wood. Catskill mountains. September.

Our specimens do not agree rigidly with the description of the species to which we have referred them. The pileus is either obtuse or umbonate, even or radiately rugose-wrinkled, and is generally even and regular on the margin. The stem also is either equal or slightly thickened at the base, but these variations are not of specific importance. The flesh of the stem is yellowish as in *Lepiota amianthinus* to which this species is closely related, both in color and structure, but from which it may be distinguished by its habitat, its larger size and its entire membranous persistent annulus.

**Lepiota arenicola, n. sp.**

Pileus at first broadly conical, then convex or nearly plane, obscurely punctate with minute granular squamules, whitish or cinereous, substriate and crenulate on the margin; lamellæ broad, subventricose, distant, free, white; stem slender, equal, stuffed, glabrous, whitish, the annulus imperfect, obsolete or quickly evanescent; spores oblong or subfusiform, acute at one end, .0005 to .0006 in. long, .0002 to .00024 broad.

Pileus 3 to 6 lines broad; stem 8 to 12 lines long, about 5 lines thick. Sandy soil. Karner, Albany county. August.

The spores indicate an affinity of this species with *L. metulispora*, of which it might be regarded as a dwarf variety, but it differs in its smaller size, more expanded pileus, distant lamellæ and glabrous stem. The mycelium binds the sand into a globose mass at the base of the stem.

**Tricholoma resplendens, Fr.**

Thin woods. Catskill mountains. September.

**Tricholoma Columbetta, Fr.**

Woods. Selkirk, Albany county. August.

**Tricholoma intermedium**, *n. sp.*

Pileus thin, campanulate, obtuse, glabrous, slightly viscid when moist, greenish-yellow, flesh white; lamellæ crowded, free or slightly adnexed, white; stem equal, firm, glabrous, white; spores broadly elliptical, .0002 in. long, .00016 broad.

Pileus 2 to 3 in. broad; stem 1 to 2 in. long, 3 to 5 lines thick.

Thin woods. Catskill mountains. September.

This species resembles some forms of *T. equestre*, from which it is separated by its white lamellæ. It appears to be intermediate between that species and *T. sejunctum* from which its glabrous pileus and crowded lamellæ distinguish it.

**Tricholoma terriferum**, *n. sp.*

Pileus broadly convex or nearly plane, irregular, often wavy on the margin, glabrous, viscid, pale alutaceous, generally soiled with adhering particles of earth carried up in its growth, flesh white, with no decided odor; lamellæ thin crowded, slightly adnexed, white, not spotted or changeable; stem equal, short, solid, white, floccose-squamulose at the apex; spores minute, subglobose, .00012 in. long.

Pileus 3 to 4 in. broad; stem 1 to 1.5 in. long, 6 to 8 lines thick.

Woods. Catskill mountains. September.

This and the next preceding species belong to the section *Limacina*.

**Tricholoma tricolor**, *n. sp.*

Pileus broadly convex or nearly plane, sometimes slightly depressed in the center, firm, dry, obscurely striate on the margin, pale alutaceous, inclining to russet, flesh whitish; lamellæ thin, narrow, close, adnexed, pale yellow, becoming brown or purplish-brown in drying; stem stout, short, firm, tapering upwards from the thickened or subbulbous base, white; spores broadly elliptical or subglobose, .0003 in. long.

Pileus 2 to 4 in. broad; stem 2 to 3 in. long, 6 to 12 lines thick.

Woods. Selkirk. August.

Remarkable for its varied colors and for the peculiar hue assumed by the lamellæ in the dried state.

**Tricholoma fuligineum**, *n. sp.*

Pileus convex or nearly plane, obtuse, often irregular, dry, minutely squamulose, sooty-brown, flesh grayish, odor and taste farinaceous; lamellæ subdistant, uneven on the edge, cinereous, becoming blackish in drying; stem short, solid, equal, glabrous, cinereous; spores oblong, elliptical, .0003 in. long, .00016 broad.

Pileus 1 to 2.5 in. broad; stem 1 to 1.5 in. long, 3 to 5 lines thick. Among mosses in open places. Catskill mountains. September. This and the next preceding species belong to the section *Genuina*.

***Tricholoma putidum*, Fr.**

Under pine trees. Catskill mountains. September.

Our specimens agree accurately with the description of *T. putidum*, except that the pileus is not umbonate; but this character is limited by Fries in *Icones Selectæ* to young plants.

***Clitocybe subsimilis*, n. sp.**

Pileus at first conical or subturbinate, then plane, nearly obconical; soft, fleshy, pure white, the margin at first involute and somewhat tomentose, then even or marked with irregular ridges, as if from matted tomentum, flesh white, taste mild; lamellæ in the young plant adnate, in the adult, decurrent, subdistant, often branched, white, the interspaces venose; stem equal or merely subbulbous, by no means obclavate, solid, soft, elastic, white; spores broadly elliptical or subglobose; .0002 to .00025 in. long, .00016 to .0002 broad.

Pileus 1 to 1.5 in. broad; stem 1 to 2 in. long, 2 to 4 lines thick.

Under pine trees. Catskill mountains. September.

This species is closely related to *Clitocybe clavipes*, of which there is said to be a white variety. I have separated our plant not only because of its pure white color, but also because of its peculiar stem, which is not at all obclavate as in *C. clavipes*, though sometimes it is slightly and abruptly bulbous. Its resemblance to *C. clavipes* has suggested the specific name. It is very unlike *C. obtexta* in its dry pileus and subdistant lamellæ.

Variety *monstrosa*. Lamellæ reticulately branched or anastomosing, causing the hymenium to appear porous either wholly or in part.

With the typical form.

***Clitocybe cæspitosa*, n. sp.**

Pileus thin, infundibuliform; often irregular, slightly silky, hygrophanous, grayish brown when moist, subcinereous or argillaceous when dry; lamellæ narrow, close, decurrent, somewhat branched, white; stem equal, stuffed or hollow, silky, white; spores minute, subelliptical, .00012 to .00016 in. long.

Pileus 1 to 1.5 in. broad; stem about 1 in. long, 2 to 3 lines thick.

Thin woods. Catskill mountains. September.

The plant is remarkable for its cæspitose mode of growth and its irregular, deformed appearance. The pileus is somewhat perforated. The relationship is with *C. expallens*, *C. Adirondackensis*, etc.

**Clitocybe sulphurea, n. sp.**

Pileus convex, slightly umbonate, moist or subhygrophanous, pale yellow, streaked, flesh yellowish; lamellæ subdistant, adnate, unéven or serrulate on the edge, pale yellow; stem equal or tapering upwards, curved or flexuous, hollow, colored and streaked like the pileus, yellowish within; spores broadly, elliptical or subglobose, .00025 to .0003 in. long, .0002 to .00025 broad.

Pileus 1 to 2 in. broad; stem 1 to 3 in. long, 2 to 4 lines thick.

Decaying wood of spruce and balsam. Wittenberg mountain. September.

Distinct from *Tricholoma sulphureum*, which it resembles in color, by its moist pileus, adnate lamellæ, hollow stem and lack of odor.

**Clitocybe tortilis, Bolt.**

Hard ground in an old road. Sandlake. August. A species closely allied to *C. laccata* and appearing like an irregular dwarf form of that species. Sometimes cæspitose.

**Collybia scorzonerea, Batsch.**

Woods. Adirondack and Catskill mountains. July and September. The species is distinguished from *C. maculatus* by the yellowish hue of the pileus and lamellæ. The stem is sometimes attenuated and radicating at the base and sometimes blunt.

**Collybia hariolorum, D. C.**

Woods. Catskill mountains. September.

**Collybia strictipes, n. sp.**

Pileus thin, broadly convex or nearly plane, glabrous, slightly rugose on the disc, moist or subhygrophanous, pale yellow, more highly colored on the disk, paler when dry; lamellæ thin, crowded, adnexed or subfree, white; stem equal, straight, hollow, glabrous, slightly mealy or pruinose at the top, white, with a dense white tomentum at the base; spores ovate, pointed or acuminate at one end, .00025 to .0003 in. long, .00016 broad.

Pileus 1.5 to 2 in. broad; stem 1.5 to 2.5 in. long, 2 to 3 lines thick.

Woods. Catskill mountains. September.

**Collybia alba, n. sp.**

Pileus thin, convex or hemispherical, even, obtuse, glabrous, white; lamellæ broad, subdistant, ventricose, adnexed or nearly free, white; stem short, equal or slightly thickened at the top, solid, glabrous,

white; broadly elliptical or subglobose, .00016 to .0002 in. long, .00012 to .00016 broad.

Pileus 3 to 5 lines broad, stem about 1 in. long, .5 to 1 line thick.

Mossy decayed wood and stumps. Gansevoort. July.

A small white species related to *C. Micheliana*, *C. muscigena* and *C. ludia*, but differing from these by its broad ventricose lamellæ.

### **Omphalia subgrisea, n. sp.**

Pileus membranaceous, convex or nearly plane, glabrous, striatulate, grayish-brown with a paler margin; lamellæ distant, arcuate-decurrent, cinereous; stem slender, short, stuffed, generally curved, sprinkled with minute mealy particles, colored like the pileus.

Pileus 2 to 3 lines broad; stem 6 to 10 lines long.

Decayed wood of birch, *Betula lutea*. Blue Mountain lake, Adirondack mountains. July.

In color this plant resembles *Mycena vulgaris*, or grayish forms of *M. clavicularis*; in size, *M. corticola*. When very young the stem is conical and the pileus is more narrow than its base.

### **Mycena capillaripes, n. sp.**

Pileus membranous, campanulate, glabrous, hygrophaneous, livid gray or brownish and striate when moist, paler when dry, odor weak, alkaline; lamellæ ascending, subdistant, adnate, whitish or livid-white, the edge obscurely brownish-purple; stem slender, almost capillary, fragile, glabrous, hollow, colored like the pileus; spores narrowly elliptical, .0003 in. long, .00016 broad.

Pileus 3 to 5 lines broad; stem 1.5 to 2.5 in. long, scarcely .5 line thick.

Under pine trees. Karner. August.

This species is related to *Mycena rubromarginata* from which I have separated it because of its smaller size, slender stem, paler color, smaller spores and alkaline odor. It is also much smaller and paler than *M. purpureofusca*.

### **Mycena crystallina, n. sp.**

Pileus membranous, at first conical or convex, then nearly plane, sometimes with a slight umbo and reflexed margin, even or obscurely striate on the margin, everywhere beset with minute shining viscid glandular particles, pure white; lamellæ narrow, thin, adnate, close, white; stem short, slender, hollow, colored and adorned like the pileus, attached by white woolly hairs.

Pileus 2 to 5 lines broad; stem 4 to 8 lines long.

Fallen leaves of pine. Catskill mountains. September.

The species belongs to the *Basidipes* and is closely related to *M. saccharifera*, from which it is separated because of its larger size, more numerous closer adnate lamellae and pure white color. The glands occur in every part of the plant and cause it to appear as if slightly sticky or viscid when pressed between the fingers. They are not visible to the naked eye, but under a lens they appear like minute globular shining particles. In the dried state the specimens assume a slight yellowish tint.

***Entoloma sericeum*, Bull.**

Sandy pastures. West Albany. June.

***Entoloma flavoviride*, n. sp.**

Pileus thin, at first broadly conical, then convex or subconcave by the upcurving of the margin, dingy yellowish-green, slightly silky and shining when dry; lamellae broad, subdistant, ventricose, free or slightly adnexed, dingy or cinereous; stem equal, hollow, fibrous-striate, whitish; spores angular, uninucleate, .00045 to .0005 in. long, .0003 to .0004 broad.

Pileus 6 to 12 lines broad; stem 1 to 2.5 in. long, 1 to 2 lines thick.

Low swampy woods. Karner. August.

The color of the pileus is a peculiar dingy yellowish-green or olive-green by which the species is easily recognized.

***Clitopilus erythrosporus*, n. sp.**

Pileus thin, hemispherical or strongly convex, glabrous or merely pruinose, grayish-incarnate, flesh whitish with an incarnate tint, taste farinaceous; lamellae narrow, crowded, arcuate, strongly decurrent, colored like the pileus; stem equal or slightly tapering upward, hollow, slightly pruinose at the top, colored like the pileus; spores elliptical, rosy-red, .0002 in. long, .00012 to .00016 broad.

Pileus 1 to 2 in. broad; stem 1 to 1.5 in. long, 2 to 3 lines thick.

Decayed wood and among fallen leaves in woods. Catskill mountains and Menands. September and October.

The species is easily recognized by its peculiar uniform color, its narrow, crowded and very decurrent lamellae and its bright rosy-red spores.

***Clitopilus conissans*, n. sp.**

Pileus thin, convex, glabrous, pale alutaceous, often dusted by the copious spores; lamellae close, adnate, reddish-brown; stem slender, brittle, hollow, white; spores narrowly elliptical, bright rosy red, .0003 in. long, .00016 broad.

Plant caespitose; pileus 1 to 1.5 in. broad; stem 1 to 2 in. long, 1 to 2 lines thick.

A single tuft of this peculiar species was found growing at the base of an apple tree in the Catskill mountains, in September. The species is remarkable for the copious bright colored spores which were so thickly dusted over the pilei of the lower specimens as to conceal the real color of the surface. They are quite as bright as and a little longer than those of the preceding species. The general aspect of the plant with its dark colored lamellæ is suggestive of some species of *Hypholoma* or *Psilocybe*, but the color of the spores requires its insertion in this place.

***Clitopilus caespitosus* n. sp.**

Pileus at first convex, firm, nearly regular, shining white, then nearly plain, fragile, often irregular or eccentric from its tufted mode of growth, glabrous but with a slight silky luster, whitish, flesh white, taste mild; lamellæ narrow, thin, crowded, often forked, adnate or slightly decurrent, whitish, becoming dingy or brownish-incarnate; stem caespitose, solid, silky-fibrillose, slightly mealy at the top, white; spores very pale incarnate, .0002 in. long, .00016 broad.

Pileus 2 to 4 in. broad; stem 1.5 to 3 in. long, 2 to 4 lines thick.

Thin woods and pastures. Catskill mountains. September.

This is a large, fine species, very distinct in its caespitose habit, white color and very pale, sordid tinted spores. But for the color of these the plant might easily be taken for a species of *Clitocybe*. The tufts sometimes form long rows.

***Pholiota minima*, n. sp.**

Pileus membranous, hemispherical or campanulate, umbonate, glabrous, hygrophamous, brown and striatulate when moist, pale buff or yellowish-white when dry; lamellæ rather close, subventricose, adnexed, ferruginous; stem slender, solid, glabrous, shining, similar to the pileus in color, annulus near the middle, slight, evanescent; spores elliptical, .0003 in. long, .0002 broad.

Pileus 2 to 4 lines broad; stem 8 to 12 lines long, .5 line thick.

Among *Polytrichum*. Catskill mountains. September.

The species is distinguished from *P. mycenoides*, to which it is closely related, by its smaller size, paler color, umbonate pileus and solid stem.

***Inocybe fibrillosa*, n. sp.**

Pileus thin, convex or nearly plain, obtuse or subumbonate, densely fibrillose, tawny, the disk usually darker in color and adorned with appressed fibrillose scales; lamellæ close, adnate, at first yellowish or

yellowish-olivaceous, then cinnamon-brown; stem equal, hollow, fibrillose-squamose, pallid; spores even, .0004 in. long, .00025 broad.

Pileus 10 to 18 lines broad; stem about 1 in. long, 1 to 2 lines thick. Damp mossy banks in woods. Bethlehem, Albany county. August. The species belongs to the Squarroseæ.

***Inocybe subfulva*, n. sp.**

Pileus at first broadly conical or subcampanulate, then convex or nearly plane, umbonate, fibrillose-squamose, tawny-ochraceous; lamellæ broad, close, rounded behind, adnexed, ventricose, pallid, becoming tawny-cinnamon; stem, equal, firm, solid, fibrous-striate, obscurely pruinose, a little paler than the pileus; spores stelletely rough, .0004 to .0005 in. long, .0003 to .00035 broad.

Pileus 8 to 16 lines broad; stem 1 to 2 in. long, 1 to 2 lines thick. Sandy soil, in fields. Selkirk. August.

Related to *I. calospora*, from which it differs in the erect scales of the pileus, the adnexed lamellæ, the solid stem and the somewhat elliptical shape of the spores. The species belongs to the Lacereæ.

***Inocybe violaceifolia*, n. sp.**

Pileus thin, convex or nearly plane, fibrillose, subsquamulose, grayish; lamellæ close, adnexed, at first pale violaceous, then brownish-cinnamon; stem firm, solid, slender, fibrillose, whitish; spores even, .0004 in. long, .00025 broad.

Pileus 6 to 12 lines broad; stem about 1 in. long, 1 line thick. Mossy ground in woods. Selkirk. August.

A small, pale species, remarkable for the violaceous tint of the young lamellæ. It belongs to the Rimosæ.

***Inocybe asterospora*, Quel.**

Woods and open places. Sandlake. June. South Ballston. July.

***Inocybe margarispora*, Berk.**

Grassy ground in thin woods. Greenbush, Rensselaer county. June. Our specimens are a little smaller than the typical ones, but they appear to belong to this species.

***Inocybe commixta*, Bres.**

Adirondack mountains. July.

**Inocybe agglutinata**, *n. sp.*

Pileus at first conical, then campanulate or convex, umbonate, fibrillose, pale tawny, streaked or spotted with appressed fibrils, the umbo usually darker; lamellæ close, broad, ventricose, adnexed, at first whitish, then brownish-cinnamon, often white on the edge; stem firm, solid, white or whitish and pruinose above, brownish or tawny and fibrillose below; spores even, .0004 to .00045 in. long, .0002 to .00024 broad.

Pileus 6 to 12 lines broad; stem 1 to 2 in. long, 1 to 2 lines thick. Under pine trees. Catskill mountains. September.

This is a beautiful and well marked species. The fibrils of the pileus appear as if agglutinated to its surface, though it is not viscid. Sometimes they form tawny spots like appressed scales. In very wet weather they are apt to wash away and disappear. In general appearance the plant resembles *I. Whitei*, but the umbonate dry pileus at once distinguishes it. The real affinity is with *I. geophylla*.

**Inocybe nigridisca**, *n. sp.*

Pileus thin, at first convex, then nearly plane or somewhat centrally depressed, umbonate, moist, minutely fibrillose, blackish-brown with a grayish margin when moist, cinereous when dry; lamellæ close, rounded behind, free or slightly adnexed, at first grayish, then ferruginous-brown, sometimes tinged with yellow; stem slender, firm, solid, flexuous, minutely villose-pruinose, reddish-brown; spores nodulose, .0003 in. long, .0002 broad.

Pileus 4 to 8 lines broad; stem 1 to 1.5 in. long, .5 line thick.

Under cinnamon fern, *Osmunda cinnamomea*. Kasoag. Oswego county. June.

The adornment of the pileus and stem is so minute that at first sight the plant appears to be glabrous. The margin of the pileus soon becomes elevated, causing the center to appear depressed. The species belongs to the Velutinæ. It is distinguished from *I. paludinella* by its darker color, and its moist or subhygrophanous character.

**Inocybe vatricosa**, *Fr.*

Damp ground under willows. Catskill mountains. September.

The pallid color, decumbent stem and webby veil are characteristic of this species. The European plant is said to be inodorous, but our specimens had a radish-like odor. In it the spores are even, elliptical, .0004 in. long, .00024 broad. I find no description of the spores of the European plant. A variety with the disk reddish occurs in the same locality. It appears somewhat like a diminutive form of *Hebeloma longicaudum*.

**Hebeloma crustuliniforme, Bull.**

Open woods. Catskill mountains. September.

A small form, but exhibiting well the characters of the species.

**Hebeloma longicaudum, Pers.**

Woods. Catskill mountains. September.

In our plant the pileus is not umbonate, nor do all the descriptions ascribe this character to the species.

**Flammula lubrica, Fr.**

Decayed wood and ground among fallen leaves. Catskill mountains. September.

This species closely resembles *F. spumosa* in general appearance, but it may be distinguished by its somewhat spotted pileus and its white flesh. The spores also are paler than those of *F. spumosa*.

**Flammula subfulva, n. sp.**

Pileus convex, viscid, innately fibrillose, spotted toward the margin with darker appressed scales, sordid-tawny, flesh grayish-white; lamellæ close, adnate, brownish-ochraceous; stem equal or slightly tapering upward, fibrillose, solid, whitish; spores brownish-ochraceous, elliptical, uninucleate, .00024 to 0003 in. long, .00016 broad.

Pileus 1.5 to 2.5 in. broad; stem 2 to 3 in. long, 2 to 4 lines thick.

About the base of trees. Catskill mountains. September.

The plant is more or less caespitose. It is allied to *F. spumosa*, but differs in its tawny squamose-spotted pileus and grayish-white flesh.

**Naucoria paludosa, n. sp.**

Pileus very thin, broadly convex or plane, glabrous, hygrophanous, brown and striatulate on the margin when moist, buff-yellow when dry; lamellæ close, thin, rather broad, adnexed, at first yellowish or pallid, then brownish-ochraceous; stem slender, equal, hollow, brittle, glabrous, pallid or brownish; spores ferruginous, elliptical, uninucleate, .0004 in. long, .0002 broad.

Pileus 6 to 12 lines broad; stem 1 to 2 in. long, .5 to 1 line thick.

Wet, marshy or damp ground under willows and alders. Catskill mountains. September.

**Naucoria unicolor, n. sp.**

Pileus thin, broadly convex, plane or slightly depressed, glabrous, hygrophanous, yellowish-brown and striatulate on the margin when moist, paler when dry; lamellæ thin, close, slightly rounded behind,

colored like the pileus; stem equal, tough, hollow, glabrous, colored like the pileus, with white mycelium at the base; spores broadly elliptical, brownish-ferruginous, .00025 to .0003 in. long, .0002 broad.

Pileus 6 to 10 lines broad; stem 1 in. long, .5 to 1 line thick.

Decayed wood and old stumps of deciduous trees. Selkirk. August.

### *Naucoria triscopoda*, Fr.

Decayed wood. Catskill mountains. September.

Our specimens belong to the form having the pileus striatulate on the margin when moist. This form is figured and described in *Icones Selectæ* as *Agaricus triscopopus*.

### *Naucoria carpophila*, Fr.

Borders of woods. Catskill mountains. September.

### *Galera inculta*, n. sp.

Pileus thin, somewhat fragile, campanulate, then convex or nearly plane, obtuse or rarely with a small umbo, hygrophanous, cinnamon color and striatulate when moist, buff color and atomate when dry, sometimes minutely pitted or corrugated, rarely rimose-squamulose; lamellæ broad, subdistant, ventricose, adnexed, white crenulate on the edge, at first pallid, then pale cinnamon; stem straight or subflexuous, hollow, brittle, slightly silky striate, reddish-brown, sometimes slightly pruinose-mealy at the top and white villose at the base; spores subelliptical, pointed at each end, brownish-ferruginous, .0006 to .00065 in. long, .0003 broad.

Pileus 6 to 12 lines broad; stem 1 to 1.5 in. long, .5 to 1 line thick.

Damp ground under willows and alders. Catskill mountains. September.

This is a very distinct species. The pileus, when dry, resembles in color that of *Galera tener*; when moist, that of *Clitocybe laccata* in its small glabrous striatulate form. The specimens were found growing with *Naucoria paludosa*, from which they may be distinguished by the more campanulate pileus, the broader, more distant lamellæ and the larger spores.

### *Agaricus comptulus*, Fr.

Cultivated ground. Menands. August.

Closely allied to *A. campestris*, from which it may be separated by its smaller size, the yellowish hue of the dry plant and by the smaller spores.

### *Stropharia albocyanea*, Desm.

Bushy pastures. Catskill mountains. September.

**Psilocybe clivensis**, B. & Br.

Borders of woods. Catskill mountains. September.

**Psilocybe senex**, *n. sp.*

Pileus thin, hemispherical, obtuse, hygrophanous, dark brown and striatulate when moist, pale cinereous and shining when dry, somewhat squamose with superficial subfasciculate whitish fibrils, the margin appendiculate with the same; lamellæ broad, subdistant, adnate, at first grayish, then brown or blackish-brown with a white edge; stem slender, hollow, fragile, minutely floccose-pruinose, subpellucid, white; spores brown, elliptical, .0003 in. long, .0002 broad.

Pileus 6 to 10 lines broad; stem 1.5 to 3 in. long, 1 line thick.

Decayed wood in woods. Catskill mountains. September.

The species is apparently related to *P. canifaciens*, but is at once distinguished by its slender white stem. The specific name has reference to the white hairs or fibrils of the pileus, which are suggestive of the white hairs of old age.

**Deconica subviscida**, *n. sp.*

Pileus thin, at first subconical, then convex or nearly plane, often slightly umbonate, glabrous, hygrophanous, pale chestnut or reddish tan color, subviscid and striatulate on the margin when moist, pallid or dull buff when dry; lamellæ broad, subdistant, adnate or slightly decurrent, at first whitish or dingy, then brownish ferruginous; stem equal or tapering downwards, fibrillose, hollow, brownish toward the base, paler above, the fibrils whitish or grayish; spores ovate, brown, .0003 in. long, .0002 broad.

Pileus 3 to 6 lines broad; stem about 1 in. long, 1 line thick.

Horse dung and manured ground. Menands. August.

This species has many characters in common with *D. bullacea*, from which I have separated it because of its scarcely viscid pileus without a separate cuticle, and its different spores. It is gregarious, and in wet weather appears in great abundance and in successive crops. The slight whitish veil is perceptible in the young plant.

**Psathyrella minima**, *n. sp.*

Pileus membranous, hemispherical, obtuse, obscurely striatulate when moist, even and pruinose-atomate when dry, dingy-yellow or reddish-brown, becoming paler in drying; lamellæ broad, adnate, white, becoming yellowish-cinnamon; stem capillary, minutely mealy or furfuraceous under a lens, pellucid, white; spores black, narrowly elliptical, .00025 to .0003 in. long .00012 to .00015 broad.

Pileus 1 to 2 lines broad; stem 4 to 6 lines long.

Excrement of deer in woods. Adirondack mountains. July.

About the size of and growing with *Coprinus radiatus* from which it is clearly distinct by its entire pileus and persistent adnate lamellæ.

**Cortinarius balteatus** *Fr.*

Grassy ground in pastures. Catskill mountains. September.

Our specimens belong to a form which may be called variety *bulbosus*. Stem strongly bulbous, at first almost wanting, the pileus appearing to rest on the bulb which is abruptly pointed beneath.

The typical form occurs in Europe and is said to grow especially under pine trees.

**Cortinarius pluvius**, *Fr.*

Woods. Catskill mountains. September.

**Cortinarius muscigenus**, *n. sp.*

Pileus at first ovate, then convex or concave from the recurving of the margin, subumbonate, glabrous, viscose with a separable pellicle, tawny-orange and widely striate on the margin when moist, tawny and shining when dry, flesh dingy white, tinged with yellow; lamellæ broad, ventricose, adnate, with a broad shallow emargination, somewhat rugose on the sides, yellowish, becoming cinnamon; stem long, subequal, viscid, even, silky, solid, white or whitish; spores .0005 to .0006 in. long, .0003 to .00036 broad.

Pileus 1.5 to 2.5 in. broad; stem 3 to 4 in. long, 3 to 4 lines thick. Mossy ground under balsam trees. Wittenberg mountain. September.

Closely related to *C. collinitus* from which it is separated by its more highly colored pileus, striate margin and even, not diffracted-squamose, stem.

**Cortinarius brevipes**, *n. sp.*

Pileus convex, silky-fibrillose, sordid white, flesh yellowish-white; lamellæ close, adnexed, pale violaceous becoming cinnamon; stem short, silky-fibrillose, bulbous, whitish, pale violaceous within; spores subelliptical, .0004 in. long, .00024 broad.

Pileus 1 to 2 in. broad; stem about 1 in. long, 4 to 6 lines thick. Woods. Catskill mountains. September.

The species belongs to the tribe Inoloma and is related to *C. albo-violaceus*, from which it is separated by its smaller size, short stem and yellowish-white flesh.

**Cortinarius brevissimus**, *n. sp.*

Pileus convex, often irregular, at first minutely silky, then glabrous, dingy white or argillaceous, flesh whitish; lamellæ close, adnexed, at first pale violaceous, then whitish, finally cinnamon; stem equal, very

short, hollow, silky-fibrillose, white, pale violaceous within; spores broadly elliptical, .00024 to .0003 in. long, .0002 to .00024 broad.

Pileus 8 to 12 lines broad; stem 5 to 8 lines long, 3 to 4 lines thick.

Thin woods. Catskill mountains. September.

Related to the preceding species, but smaller, with a hollow stem and shorter spores.

#### **Cortinarius albidifolius, n. sp.**

Pileus thin, convex, subglabrous, whitish, tinged with yellow or pale ochraceous, the epidermis sometimes cracking and forming squamules, flesh whitish; lamellæ subdistant, slightly emarginate, adnate, whitish, becoming cinnamon; stem equal or slightly thickened at the base, solid, white, variegated below with yellowish floccose squamules, silky-fibrillose at the top; spores subglose or broadly elliptical; .00025 to .0003 in. long, .0002 to .00025 broad.

Pileus 1 to 2 in. broad; stem 2 to 3 in. long, 2 to 4 lines thick.

Woods. Catskill mountains. September.

Related to *C. ochroleucus*, but apparently distinct by the yellow scales of the stem and the adnate subdistant lamellæ. Both it and the preceding species belong to the tribe Dermocybe.

#### **Cortinarius spilomeus, Fr.**

Woods. Catskill mountains. September.

#### **Cortinarius flavifolius, n. sp.**

Pileus convex or nearly plane, fibrillose or squamulose, sometimes longitudinally rimose, varying in color from sordid buff to tawny yellow, flesh whitish; lamellæ subdistant, adnexed, at first a rich sulphur yellow, then yellowish cinnamon; stem slightly tapering upward, solid, whitish, peronate and slightly annulate by the copious silky, whitish veil; spores broadly elliptical, .0003 in. long, .0002 broad.

Pileus 2 to 3 in. broad; stem 2 to 3 in. long, 5 to 8 lines thick.

Woods. Catskill mountains. September.

The pileus is not truly hygrophanous, but the character of the stem indicates that the species belongs in *Telamonia* near *C. bivelus*. It differs from *C. limonius* by its dry pileus, and from *C. infucatus* by the color of the young lamellæ.

#### **Cortinarius griseus, n. sp.**

Pileus convex, obtuse or gibbous, fibrillose-squamulose with grayish hairs or fibrils, moist, pale gray; lamellæ subdistant, adnexed, at first pallid, then brownish-ochraceous; stem tapering upward from a

thickened or bulbous base, silky-fibrillose, whitish; spores .0004 to .0005 in. long, .0003 broad.

Pileus 1 to 3 in. broad; stem 2 to 3 in. long, 3 to 6 lines thick.

Mossy ground under balsam trees. Wittenberg mountain. September.

The fibrils of the pileus are similar to those of *C. paleaceus*, but the plant is much larger and stouter, and the spores are larger than in that species. It is well marked by its grayish color.

### **Cortinarius badius, n. sp.**

Pileus thin, at first conical, then convex or broadly campanulate, umbonate, hygrophanous, blackish-chestnut color when moist, bay-red or chestnut color when dry, sometimes tinged with gray, the umbo darker, usually whitish-silky on the margin when young, flesh, when moist, colored like the pileus; lamellæ broad, subdistant, ventricose, adnexed, at first yellowish or cream-color, then subochraceous; stem slender, equal, hollow, silky-fibrillose and subannulate by the whitish veil, when old colored like the pileus both without and within; spores .0005 in. long, .0003 broad.

Pileus 8 to 12 lines broad; stem 1 to 1.5 in. long, about 1 line thick.

Mossy ground. Catskill mountains. September.

The species is related to *C. nigrellus*, from which it differs in its broad lamellæ which are paler in the young plant and in its larger spores.

### **Cortinarius subflexipes, n. sp.**

Pileus thin, conical, then expanded and subacutely umbonate, hygrophanous, blackish-brown with the thin margin whitened by the veil when moist, subochraceous when dry; lamellæ thin, close, ventricose, adnexed, at first reddish-violaceous, then cinnamon; stem equal, flexuous, silky, shining, subannulate by the whitish veil, pale violaceous when young, pallid or reddish when old; spores .00024 to .0003 in. long; .0002 broad.

Pileus 6 to 10 lines broad; stem 1 to 1.5 in. long, about 1 line thick.

Thin woods. Catskill mountains. September.

Apparently related to *C. flexipes*, from which I have separated it because of its more glabrous pileus and different lamellæ. It and the two preceding species are referred to the tribe Telamonia.

### **Cortinarius paleaceus, Fr.**

Mossy or bare ground in open places. Catskill mountains. September.

**Cortinarius rigidus, Fr.**

Catskill mountains. September.

**Hygrophorus Lauræ, Morg.**

Woods. Catskill mountains. September.

The squamules at the top of the stem are sometimes reddish. The disc is sometimes yellowish.

**Lactarius aspideus, Fr.**

Borders of woods. Catskill mountains. September.

A pretty but rare species, easily known by its pale yellow or straw color and the lilac hue assumed by wounds of the lamellæ or flesh. In *Systema Mycologicum* the stem is described as hollow and spotted. In our specimens the stem is hollow but not spotted. It is colored like the pileus and the spores are broadly elliptical or subglobose slightly rough, .0003 to .0004 in. long.

**Lactarius maculatus, n. sp.**

Pileus fleshy, firm, at first convex and umbilicate or centrally depressed, then subinfundibuliform, glabrous, viscid when moist, concentrically spotted, especially toward the margin, varying in color from grayish-buff to grayish-lilac, flesh subconcolorous, taste acrid and unpleasant; lamellæ close, thin, sometimes forked, adnate to decurrent, pallid or cream color; stem short, equal or tapering toward the base, hollow, spotted, colored like, or a little paler than, the pileus; milk at first whitish with a cream-colored tint, wounds of the flesh and lamellæ changing to lilac; spores subglobose, echinulate, .0004 to .0005 in. long.

Pileus 3 to 5 in. broad; stem 1 to 2 in. long, 5 to 8 lines thick.

Thin woods and pastures. Catskill mountains and Menands. August and September.

This species is allied to *L. uvidus*, with which it was united in the Thirty-eighth Report as variety *magnus*. Having had the opportunity of investigating it in the fresh state, it seems to me to be a distinct species, readily recognized by its larger size and its firmer, spotted pileus which is centrally depressed or infundibuliform. I have not seen it at all umbonate. The spots of the pileus are arranged in concentric circles and by their confluence the pileus often appears to be zonate. The change of color assumed by wounds is similar to that which takes place in *L. uvidus*.

**Russula lepida, Fr.**

Woods. Menands. August.

Generally with the pileus red, but quite variable in this respect.

**Russula adulterina, Fr.**

Low swampy ground. Karner. June.

This is placed by Fries as a variety of *R. integra*.

**Russula atropurpurea, n. sp.**

Pileus at first convex, then centrally depressed, glabrous, dark purple, blackish in the center, the margin even or slightly striate, flesh white, grayish or grayish-purple under the separable pellicle, taste mild, odor of the drying plant fetid, very unpleasant; lamellæ nearly equal, subdistant, sometimes forked near the stem, at first white, then yellowish, becoming brownish where bruised; stem equal, glabrous, spongy within, white, brownish where bruised; spores subglobose, minutely rough, pale ochraceous with a salmon tint, .0003 to .0004 in. long.

Pileus 3 to 4 in. broad; stem 2 to 3 in. long, 5 to 8 lines thick.

Open woods. Gansevoort. July.

In color this species resembles *R. variata*, but in other respects it is very different. It is very distinct in the peculiar color of its spores, and in the brownish hue assumed by wounds.

**Boletus speciosus, Frost.**

Woods. Sandlake and Bethlehem. August.

A beautiful species belonging to the Calopodes.

**Boletus auriflammeus, B. & C.**

A single specimen of this very rare but well-marked species was found in Sandlake. August.

**Boletus purpureus, Fr.**

Oak woods. Menands. August.

**Boletus hemichrysus, B. & C.**

Pine stumps. Gansevoort. July.

The Boleti are generally terrestrial fungi as affirmed by Professor Fries in Hym. Europ., but this species appears to be an exception to the prevailing habit of the genus. *B. subtomentosus*, *B. paluster* and *B. felleus* sometimes grow on decayed wood, but they are usually terrestrial. Of this species only three specimens have been seen, all of

which grew from the side of an old pine stump. The tomentum of the pileus is nearly one line thick. The species belongs to the tribe Pulverulenti.

**Boletus glabellus, n. sp.**

Pileus fleshy, thick, broadly convex or nearly plane, soft, dry, subglabrous, smoky-buff, flesh white, both it and the tubes changing to blue where wounded; tubes nearly plane, adnate, small, subrotund, ochraceous tinged with green; stem subequal, glabrous, even, reddish toward the base, pallid above, adorned with a narrow reddish zone or circumscribing line at the top; spores oblong, brownish-ochraceous, with a tinge of green when fresh; .0004 to .0005 in. long, .00016 broad.

Pileus 3 to 5 in. broad; stem 1 to 3 in. long, 5 to 10 lines thick.

Grassy ground under oaks. Menands. July.

The species belongs to the Subpruinosi, and is easily distinguished from its allies by the reddish circumscribing line at the top of the stem. This disappears in the dried specimens.

**Boletus variipes, n. sp.**

Pileus from convex to nearly plane, thick, soft, dry, squamulose, punctate-squamulose or minutely tomentose, pale grayish-brown, sometimes tinged with yellow or ochraceous, flesh white, unchangeable; tubes convex or nearly plane, slightly depressed around the stem, small, subrotund, at first white, then greenish-yellow, the mouths dingy ochraceous; stem nearly equal, firm, more or less reticulated, whitish or pallid; spores oblong-fusiform, brownish-ochraceous with a greenish tinge, .0005 to .0006 in. long, .0002 broad.

Pileus 3 to 6 in. broad; stem 2 to 4 in. long, 4 to 12 lines thick.

Oak woods. Menands. August.

The species belongs to the Edules. It is separated from *B. edulis* by its squamulose pileus. This character and its paler stem also separate it from *B. separans*. The stem is variable in color, length and degree of reticulation.

Variety *albipes*. Stem whitish, wholly reticulated, the reticulations coarser toward the base.

Variety *pallidipes*. Stem pallid, slightly scurfy, even or obscurely reticulated toward the base.

Variety *tenuipes*. Stem elongated, slender.

**Boletus indecisus, n. sp.**

Pileus convex or nearly plane, dry, slightly tomentose, ochraceous-brown, often wavy or irregular on the margin, flesh white, unchangeable, mild; tubes nearly plane or convex, adnate, small, subrotund,

grayish, tinged with flesh color when mature, becoming dingy or brownish where wounded; stem minutely scurfy, often irregular or flexuous, reticulated at the top, pallid without and within; spores oblong, brownish flesh color, .0005 to .0006 in. long, .00016 broad.

Pileus 3 to 4 in. broad; stem 2 to 4 in. long, 4 to 6 lines thick.

Oak woods. Menands. August.

It belongs to the tribe Hyporhodie. It has the general appearance of *B. modestus*, but the tubes are not at all yellow. It differs from *B. alutarius* in color and in having the stem reticulated at the top, not scrupeose. Its mild taste will separate it from any form of *B. felleus*.

### **Boletus albellus, n. sp.**

Pileus convex, soft, glabrous, whitish, flesh white, unchangeable; tubes convex, free or nearly so, small, subrotund, whitish, not changing color when wounded; stem glabrous or minutely furfuraceous, substrate, bulbous or thickened at the base, whitish; spores brownish-ochraceous, .00055 to .00065 in. long, .0002 to .00025 broad.

Pileus 1 to 2 in. broad; stem 1 to 2 in. long, 3 to 6 lines thick.

Woods. Sandlake. August.

Closely related to *B. scaber*, of which it may possibly prove to be a dwarf form; but it is easily distinguished by its smooth or only slightly scurfy stem without any appearance of the colored dot-like squamules which are a constant and characteristic feature of that species.

### **Polyporus flavovirens, B and R.**

Ground in woods. Selkirk. August.

Our specimens agree very well with the description of *P. flavovirens*, except that they are smaller and the dry plant is not tough and fibrous. They are to this extent doubtful.

### **Polyporus rimosus, Berk.**

Trunks of locust, *Robinia pseudacacia*. Flatbush, L. I. *Rev. J. L. Zabriskie*.

### **Polyporus mutans, n. sp.**

Resupinate rather thick, tough, following the inequalities of the wood; pores minute, rotund, short, buff-yellow or cream color, becoming dingy red or dull incarnate where wounded, the subiculum fibrous, changing color like the pores, the whole plant assuming an incarnate hue when dried.

Decaying wood of deciduous trees. Selkirk. August.

Sometimes a narrow, reflexed obtuse margin of a yellowish-brown color is formed. The pores are often oblique. The species appears to be quite distinct by reason of its peculiar colors.

**Polyporus pineus, n. sp.**

Resupinate, irregular from the inequalities of the matrix, rather tender but separable from the matrix, the thin subiculum and margin whitish, sometimes tinged with yellow; pores rather large, angular, unequal, two to three lines long, often oblique and lacerated, dingy whitish, becoming blackish where bruised or wounded, the whole plant becoming blackish or blackish-brown in drying.

Wood and bark of pine. Selkirk. August.

The species is apparently allied to *P. obliquus*, but the pores can not be described as very small, nor has our plant an "erect crested margin." It has a distinct subiculum on which the pores are formed and by reason of which the plant is separable from the matrix.

**Merulius Ravenelii, Berk.**

Bark of prostrate trunks of spruce, *Abies nigra*. Adirondack mountains. July to September.

This fungus varies in hue from flesh color to dark smoky red or brownish-red. The pores are at first shallow with obtuse folds or dissepiments, but with age these become thinner and the pores deeper so that the plant might easily be taken for a *Polyporus*. Its pure white margin contrasts conspicuously with its dark waxy hymenium. The specimens labeled *Merulius serpens* in Ravenel's *Exsiccati*, Vol. IV, 9, belong to this species.

**Merulius himantioides, Fr.**

Prostrate trunks of hemlock. Catskill mountains. September.

The color of the hymenium resembles that of *M. lacrymans*, but the subiculum is very different. The fungus is soft, tender and membranous, and by confluence becomes widely effused. The subiculum is sometimes studded with drops of a reddish color, and is composed in part of branching strings of mycelium.

**Hydnum fasciatum, n. sp.**

Pileus thin, coriaceous, nearly plane, umbilicate, blackish-brown, adorned with three to seven narrow elevated scabrous, tawny-gray concentric zones; aculei short, decurrent, ferruginous-brown; stem short, slender, tough, tawny-gray or blackish; spores subglobose, rough, .00016 in. broad.

Pileus 6 to 12 lines broad; stem 4 to 6 lines long.

Naked ground in woods. Catskill mountains. September.

The specimens were past maturity when collected, and the colors of young plants may vary somewhat from those here given. The species

is well marked by the peculiar elevated zones or lines of the pileus. The plant is closely gregarious, and sometimes the pilei are confluent. The relationship is with *H. connatum* and *H. zonatum*.

**Irpex nodulosus, n. sp.**

Resupinate, forming suborbicular patches four to ten inches or more in diameter, subseparable; the subiculum thick, tough; the hymenium dentate-porous toward the thick definite margin, centrally nodulose and prolonged into unequal compressed truncate or laciniate, rarely terete acute aculei, whitish, centrally yellowish or pale ferruginous.

Bark of standing trunks of poplar. Gansevoort. July.

**Radulum pendulum, Fr.**

Dead prostrate trunk of basswood, *Tilia Americana*. Argusville. July.

This is distinct from our other species by its reflexed pileate form. The pileus is whitish and pubescent, or at length nearly smooth. The species is quite rare.

**Corticium olivaceum, Fr.**

Decayed wood. North Greenbush and Slingerlands.

**Clavaria albida, n. sp.**

Plants 2 to 4 in. high, whitish; stem short, thick, generally tapering downwards, divided above into a few short, thick, much-branched ramuli, ultimate branches densely crowded, terminating in a few short, blunt teeth; flesh firm, dry, whitish, taste tardily acrid, then bitter; spores oblong, pale ochraceous, .0005 to .0006 in. long, .0002 broad.

Ground in thin woods. Menands. August.

The species has the structure of *C. botrytis* and *C. flava*, but it is readily distinguished from these by its uniform whitish color, the tips of the branches being concolorous.

**Clavaria densa, n. sp.**

Tufts 2 to 4 in. high, nearly as broad, whitish or creamy-yellow, branching from the base; branches very numerous, nearly parallel, crowded, terete, somewhat rugose when dry, the tips dentate, concolorous; spores slightly colored, subelliptical, .0003 to .0004 in. long, .0002 to .00034 broad.

Ground in woods. Selkirk. August.

Apparently closely allied to *C. condensata*, but differing decidedly in color.

**Geaster Schæfferi, Vitt.**

Woods. Catskill mountains. September.

The interior stratum of the external peridium is very thick in the fresh plant and conceals the short pedicel of the inner peridium, but in the dried state this stratum contracts and exposes the pedicel, which is about one line long. This character distinguishes the species from *G. rufescens*.

**Geaster vittatus, Kalchb.**

Under pine trees. Catskill mountains. September.

The thin outer coat of the external peridium cracks in parallel lines, causing the lacinae or rays to appear as if striped with white longitudinal lines. This character gives name to the species and serves to distinguish it from *G. saccatus* to which it is otherwise very closely related.

**Sphærospis carpinea, Sacc. & Br.**

Dead twigs of water beech, *Carpinus Americana*. Menands. May.

**Cercospora Gentianæ, n. sp.**

Spots suborbicular, brown or reddish-brown, sometimes confluent; hyphæ amphigenous, short, subflexuous, slightly colored, .0006 to .0012 in. long, growing from minute blackish tubercles; spores more narrow than the hyphæ, cylindrical or gradually narrowed toward one end, one to three-septate, colorless, .0012 to .0024 in. long.

Living leaves of gentian, *Gentiana linearis*. Number Four, Adirondack mountains. July.

**Oöspira Cucumeris, n. sp.**

Tufts loose, subconfluent, whitish or grayish, forming soft, velvety patches; hyphæ erect or diverging; spores catenulate, elliptical or oblong, colorless, .0004 to .0008 in. long, .00025 to .0003 broad.

Decaying fruit of muskmelon, *Cucumis Melo*. Menands. October.

**Sporendonema myophilum, Sacc. in litt.**

Hyphæ colorless, simple or branched, densely interwoven and forming a soft whitish somewhat waxy mass, some of them producing chains of globose or broadly-elliptical spores, .00016 to .0003 in. long.

Inhabiting the bodies of living mice. Binghamton. *H. L. Griffis*.

In the specimen contributed by Mr. Griffis the fungus had broken the skin of the mouse near the eyes, and also on the left shoulder. In the latter place the white patch was about six lines broad, and the ruptured margin of the skin had in some parts a bloody appearance. The mouse was said to be alive when caught, but it is quite probable

that the fungus would have killed it in a short time. It would be interesting to know if the fungus could be communicated to healthy mice in their food or otherwise, but my efforts to obtain a subject on which to try the experiment were unsuccessful.

**Zygodesmus violaceofuscus, Sacc.**

Roots of beech. Selkirk. August.

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(D.)

REMARKS AND OBSERVATIONS.

**Nymphæa odorata, Ait.**

A form with very large leaves and flowers, equaling in size those of *N. tuberosa*, grows in the inlet of Beaver lake, Number Four, Lewis county. It has the decided and delightful fragrance of the ordinary form.

**Rubus villosus, Ait. var. humifusus, T. & G.**

Professor Dudley finds this variety near Ithaca. The variety *frondosus* is much more plentiful, and from it most of the cultivated varieties appear to have been derived, if we may judge by the character of the fruit offered for sale in the markets. It is less cylindrical, more acid and has larger seeds than the fruit of the typical form. I am quite confident that the true *R. villosus* would produce a fruit of far better quality, if brought under successful cultivation, and it seems strange that some of our enterprising nurserymen have not succeeded in introducing it into more frequent cultivation.

**Vaccinium Canadense, Kalm.**

A black-fruited variety of this valuable little shrub is plentiful at Number Four, Adirondack wilderness. There is also a black-fruited variety of *V. vacillans*.

These varieties do not appear to have been designated by name, but they correspond to variety *nigrum* of *V. Pennsylvanicum* and variety *atrococcum* of *V. corymbosum*. Thus each of our common edible blueberries has its black-fruited variety. These black fruits are destitute of the bloom of the ordinary ones, and have a shining luster, but are scarcely different in flavor or quality from the ordinary blue ones. The black huckleberry, *Gaylussacia resinosa*, also has its corresponding variety, in which the fruit is jet black and shining. It also sometimes differs slightly in shape from the ordinary dull black fruit.

**Scirpus polyphyllus, Vahl.**

Gansevoort. July. A rare species with us.

**Scirpus Torreyi, Olney.**

Beaver lake at the inlet from Beaver dam. July.

This is a form in which the cluster of spikes is subtended by a bract equaling or slightly exceeding it in length.

**Lepiota amianthina, Scop.**

Specimens sometimes approach *L. granulosa* in the structure of the lamellæ which are somewhat emarginate and adnexed, but in all other respects they are true *L. amianthina*.

**Lepiota granulosa, Batsch. var. albida.**

A persistently whitish variety. Pastures. Catskill mountains. September.

**Tricholoma fumidellum, Plk.**

In the Catskill mountains a form of this species occurs which has the pileus umbonate and the umbo decidedly brown or smoky brown. Sometimes the cuticle is rimose areolate and then the plant imitates *Lepiota cristata* in general appearance. It is moist in wet weather and belongs to the tribe Spongiosa.

**Tricholoma fumosoluteum, Plk.**

Abundant among moss under balsam trees near the summit of Wittenberg mountain. The pileus is sometimes spotted thus indicating a relationship with the tribe Guttata, though its real affinities are with the Spongiosa. The taste is farinaceous and slightly bitter. The flesh is tinged with yellow under the subseparable epidermis.

**Tricholoma Peckii, Howe.**

This rare species occurs in the Catskill mountains.

Both the pileus and stem are adorned with beautiful tawny or tawny-red scales. The lamellæ when old become stained or spotted with brown or are discolored or dotted on the edge. The white flesh of the pileus has a farinaceous taste, then bitterish. The odor is also somewhat farinaceous. The pileus is viscid when moist, and the species is allied to *T. transmutans* and *T. albobrunneum*.

**Clitocybe nebularis.**

A cæspitose form of the species was observed in the Catskill mountains. Also a form in which the whole plant is white. This is the common form in these mountains. It has the same shape as the typical form, from which it differs only in color.

**Clitocybe laccata, Scop. var. amethystina.**

Specimens of this beautiful variety were found at Menands and at Karner in August. Two forms occur, in both of which the pileus is umbilicate and dark violaceous when moist, canescent or greyish when dry; in one the pileus is about one inch broad, convex and regular; in the other it is two to two and a half inches broad, and has the margin reflexed and often much lobed and wavy. In this form the lamellæ are broad, distant and often ruptured transversely. They are also more highly colored than in the typical form. The ordinary form has been found growing in circles in grassy places.

**Collybia lentinoides, Pk.**

A description of this species was published in the Thirty-second Report. Two varieties have been observed the past season.

Variety *rufipes*. Stem even, colored reddish-alutaceous like the pileus. This variety closely resembles ordinary forms of *Collybia dryophila* in color, and but for the serrated edge of the lamellæ it might easily be taken for that species. Albany Rural cemetery. June.

Variety *flaviceps*. Pileus buff-yellow and striatulate on the margin when moist, pale buff when dry; stems cæspitose, hollow, whitish.

In all the forms the essential characters of the species are the glabrous, hygrophanous pileus, the lamellæ with serrated edge and the stuffed or hollow stem.

**Collybia rubescentifolia, Pk.**

In the Thirty-ninth Report this species was referred to *Tricholoma*, but subsequent observations indicate that it is a *Collybia*. The pileus is pretty constantly umbilicate and is hygrophanous, being dingy-yellow or smoky-yellow when moist and pale-yellow or buff when dry. The change in the color of the lamellæ in the dried plant is a marked and constant character, and is suggestive of the specific name. The species is closely allied to *C. luteoolivacea* B. & C., but no hygrophanous character is attributed to that species nor any change in the color of the lamellæ. Besides, its stem is described as scurfy.

**Mycena pura, Pers.**

This species is quite variable in color. A form occurs under pine trees in the Catskill mountains, in which the whole plant has a purplish color, with the lamellæ a little paler than the pileus and stem. It is darker than the ordinary forms.

**Naucoria Highlandensis, Pk.**

This was found in the Catskill mountains, growing on buried pieces of charcoal. This habitat is the same as that of *Flammula carbonaria*, a species to which our plant is evidently allied, but from which it is separated by its white flesh and its adnexed lamellæ.

**Stropharia Johnsoniana, Pk.**

A form of this very rare species, which has hitherto been found in but one locality, occurs in the Catskill mountains. In it the pileus is wholly yellowish and sometimes marked with darker spots, and the stem is squamulose below the annulus, with upwardly directed squamules.

**Hygrophorus miniatus, Fr.**

This species is very abundant in wet weather in all our woody and swampy districts, and is very variable in size and somewhat in color.

Variety *subluteus*. Pileus yellow or reddish-yellow, stem and lamellæ yellow, plant often cæspitose.

Thin woods. Catskill mountains. September.

**Lactarius rufus, Fr.**

Among moss, under balsam trees, near the summit of Wittenberg mountain. A small form, but very acrid, and thus distinguishable from large forms of *L. subdulcis*.

**Lactarius affinis, Pk.**

This occurred plentifully in the Catskill mountains in September. It is readily distinguished from *L. insulsus* by the characters indicated in the Thirty-eighth Report.

**Lactarius scrobiculatus, Fr.**

Fine specimens were found growing under hemlock trees in the Catskill mountains. The pileus in some was eight inches broad, pale yellow, very viscid, slightly zoned and distinctly bearded on the margin with coarse hairs.

**Russula sordida, Pk.**

A large form of this species was found growing under hemlock trees at Gansevoort. The pileus was four to eight inches broad, at first white or whitish, umbilicate or centrally depressed; then more or less stained with smoky-brown or blackish hues and subinfundibuliform. The flesh is white and taste mild; the stem is short, one to two inches thick, solid, white, and somewhat pruinose; the lamellæ are distant, unequal, very brittle, tinged with yellow. Every part of the plant turns blackish or violaceous-black where wounded. By this character it is distinguished from *R. nigricans*, in which the flesh at first becomes red where broken.

**Marasmius salignus, Pk. var. major.**

Pileus six to ten lines broad; lamellæ broad, distant, decurrent, the interspaces venose; stems often caespitose.

Bark of willows. Gansevoort. July.

**Marasmius androsaceus, Fr.**

Two forms of this species occur here as in Europe. There the form with paler pileus grows on fallen leaves of frondose trees, the one with darker or fuscous pileus on leaves of acerose trees. Here the form with pale pileus abounds, in wet weather, on fallen leaves of spruce trees, and the one with fuscous pileus on fallen pine leaves. Often the two forms grow in close proximity to each other, yet, in every instance observed, the difference of color corresponds to this difference in habitat.

**Marasmius præacutus, Ellis.**

Fallen pine leaves. Catskill mountains. September.

**Polyporus cæruleoporus, Pk.**

On exposure to the light the blue color gradually fades to a grayish hue. Sometimes specimens occur with one-half of the pileus exposed and faded, the other half sheltered and retaining its normal grayish-blue color. The pores retain the blue color longer than the pileus, but the whole plant fades in drying. The flesh of the pileus is white.

**Polyporus vulgaris, Fr.**

A form with vesicular pores, a vertical section of the hymenium being porous, was found on poplar at Gansevoort. September. *P. obducens*, *P. adustus* and *P. subacidus* have all a similar vesicular form. I am satisfied that the genus *Myriadoporus*, which was founded on such forms, is not a good one and should be abandoned.

**Solenia villosa, Fr. var. polyporoidea.**

At first granuliform, then cylindrical, often crowded and forming a continuous pure white stratum, appearing like a resupinate Polyporus, the villosity scarcely visible to the naked eye, but perceptible with a lens.

Decayed wood of hemlock. Adirondack mountains. July.

This differs from the typical form in its crowded mode of growth. Is it, therefore, a distinct species?

**Clavaria stricta, Pers. var. fumida.**

The whole plant is of a dingy, smoky-brownish hue. Otherwise as in the typical form. Catskill mountains. September.

In the fresh state the specimens appear very unlike the ordinary form, but in the dried state they are scarcely to be distinguished.

**Geoglossum microsporum, C. & P.**

A rare species, not observed since its discovery in 1871, till it was again found this year in the Catskill mountains.

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(E.)

## FUNGI DESTRUCTIVE TO WOOD.

NOTE.—P. H. Dudley, C. E., has investigated the action of certain fungi upon railroad ties and wooden structures. At my request he has communicated to me some of the results of his investigations. These results are of such great practical and economic importance, that with his permission, I have added to this report a copy of his communication.

66½ PINE STREET, NEW YORK, December 5, 1887.

Prof. CHARLES H. PECK, *State Botanist*:

MY DEAR SIR.—The well established fact that the decay of all timber, under ordinary usages, is due to the growth of many species of fungi, gives to your long and patient work, in collecting, identifying and calling attention to different species, a value and bearing of practical importance hardly expected a few years since. The enormous annual consumption of timber by railroad companies, ship-builders, architects, manufacturers and farmers, in conjunction with the decreasing supply and increasing cost, gives value to any knowledge which will help check any unnecessary decay of timber.

The experience gained from the failures of many of the expensive efforts to preserve timber has shown that specific knowledge of the



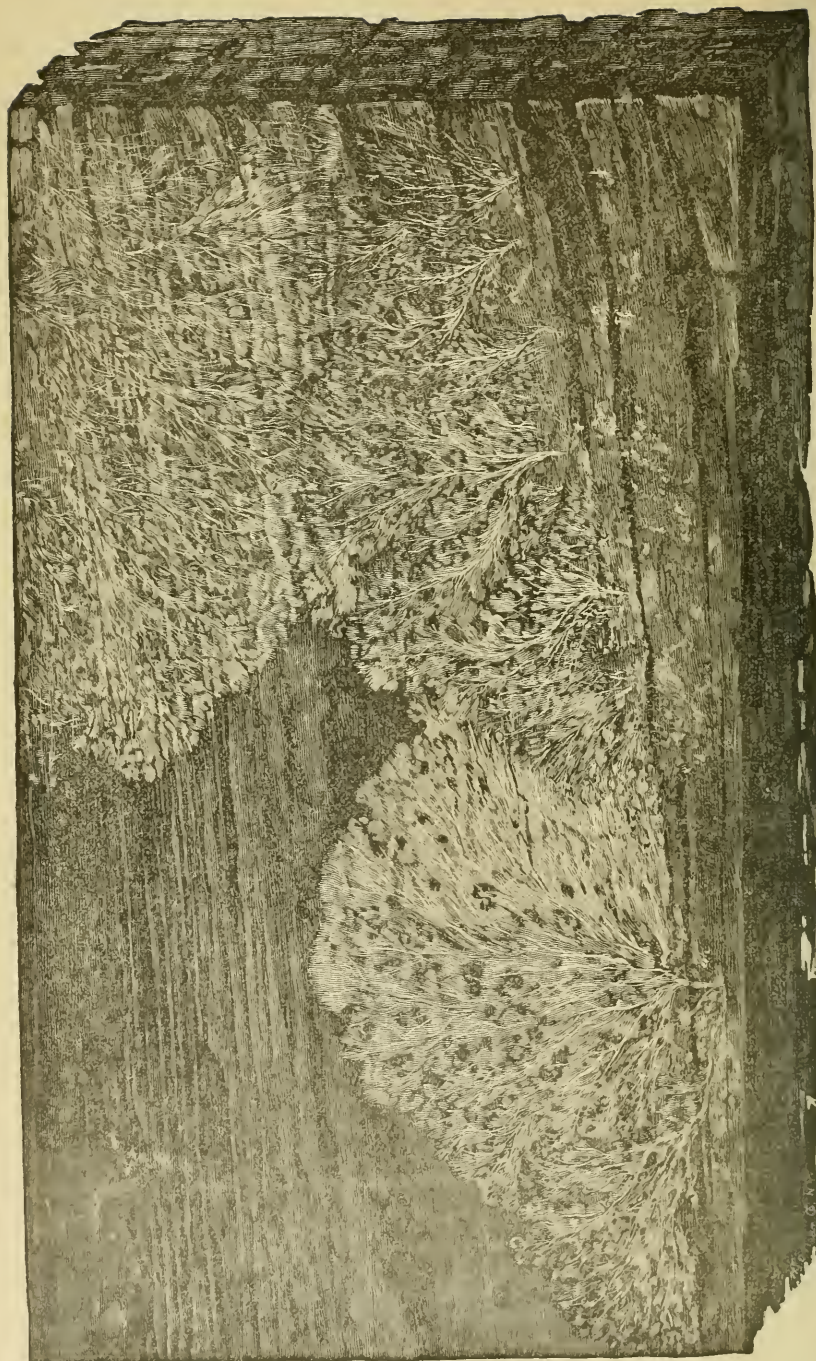


Fig. II. Mycelium of Polyporus radula, one-fourth size.

habitats and growth of definite species of fungi is required to best adapt the means to accomplish the desired work. Now that knowledge of the habitats of species of fungi has been acquired, simple and effective preventive measures suitable for many cases, without treatment, can at once be put into practice.

The study of the decay of timber used for construction is rendered very difficult, in most cases, from the fact that the entire structure of the wood may be destroyed by the growth of the mycelium, or its fermentative process, of the fungus without fructification taking place. This is especially true of railroad ties and bridge timbers. So little is seen in proportion to the destruction accomplished, it is due to this feature more than to any other, that the true function of the fungi on wood is not more generally understood by users and consumers of timber. It is not strange the idea is so prevalent that fungi are the accompaniments, instead of the cause of the decay of wood. A growth of mycelium, nearly similar to that shown in Fig. II,\* of a fungus on the under side of a plank, as in station platforms or between boards when piled in close contact, has not been sufficient in most cases to call attention to the injury, if not the destruction of the plank or timber upon which it is growing.

Fig. II shows the mycelium of *Polyporus radula*, Fr. growing on the under side of a plank from a station platform. After the mycelium has run over the wood in a dense mass, then, by means of the fluids it generates — some of them having an acid reaction — the fibers or wood cells are softened and penetrated by the mycelium, and in this way the process of disorganization is carried on.

This causes the wood to shrink, crack, and finally fall to pieces.

The mycelium of many other species of the higher Fungi differs from this to some extent, but the final effect of its growth on and through the wood is to destroy it. Besides the visible mycelium there are many other growths and ferments, invisible to the eye, which cause a rapid internal decay of large unseasoned painted blocks, such as truck bolsters, transoms, buffers, dock timbers, and end sills to cars.

In warm and damp weather it is not uncommon for such growths to occur upon timber when piled in close contact, according to the species of wood and fungi, in three to eight weeks. In this vicinity the timber on which such growths have started may not be considered sufficiently injured for construction — to be rejected. If it is thoroughly

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\* Figures I, II and III are from my paper entitled "Woods and Their Destructive Fungi," in the *Popular Science Monthly*, August and September for 1886, and are used by permission of the editor, Prof. W. J. Youmans.

dried or seasoned before use, the decay commenced is checked and will not revive until the wood again becomes moist from external causes. On the contrary, if such wood is put into structures while damp and unseasoned, then painted or confined where the moisture is retained, the decay will continue, the rapidity depending upon the continued amount of damp and warm weather or equivalent conditions. This is commonly and erroneously called "dry rot." Decay of dry wood can not take place without moisture.

It is well established by numerous proofs that seasoned woods last in all conditions of service where it is unfavorable for the growth of fungi, and decay in all conditions where they can grow, unless the timber is judiciously treated. The propagation of fungi upon timber may be either by germination of spores, which are thrown off by thousands when in fructification and disseminated by the air, or by revival of mycelium already on or in the wood.

Besides the ever-present spores of a fungus or its mycelium in timber, three essential conditions in combination are necessary for the decay of wood, or in other words, the growth of a fungus.

*First.* Moisture, either external or internal.

*Second.* A temperature between 40° and 120° Fahr., 75° to 90° being the most favorable for the maximum growth of fungi.

*Third.* A small amount of air, still or nearly quiet. Free circulation or winds check the growth of mycelium when in direct contact with it.

When wood must be exposed to these three conditions, sooner or later, according to its structure and cell contents, fungi grow and destroy it as a result of a natural law of their growth. Therefore, to protect seasoned wood from decay, the combination mentioned must be prevented from taking place by rejecting either one of the three elements; or, if that is impossible, an antiseptic or preservative must be used to prevent the growth of any fungi. This brief statement comprehends, both theoretically and practically, what is necessary to be done to preserve timber structures from decay, but to reduce the principles to practice, so as to meet all conditions of service which may occur, requires a knowledge of the structure of the particular wood, its cell contents, size of stick to be used and care in seasoning. Also a knowledge of the special fungus or fungi attacking the species of wood, and the value and proper use of preservatives and antiseptics.

*Species of fungi which I have found upon specific woods when used as railroad ties or in bridges.*

The fungi peculiar to white oak, *Quercus alba*, L., are *Polyporus*

*applanatus*, Fr.; *P. versicolor*, Fr.; *P. pergamenus*, Fr.; *Daedalea unicolor*, Fr.; *D. quercina*, Pers., and *Lenzites vialis*, Pk.

*Polyporus applanatus* attacks the heart wood of the white oak tie and is very destructive, and requires a moderate amount of air and moisture for its growth. The characteristic decay of these ties is from the under to the upper side, and is most rapid in stone ballast, or a coarse ballast which retains a little moisture and permits access of air. In a ballast containing considerable loam, which checks the circulation of air, and in wet cuts, the growth of the mycelium is retarded and the durability of the ties increased. In porous ballast, unless wet, the deeper the white oak ties are imbedded the better are the conditions of the growth of the fungi and the more rapid the decay of the ties. On the contrary, only imbedding the ties sufficient for the stability of the track increases the service of the ties by retarding the rapidity of the upward growth of the mycelium.

*Polyporus versicolor* attacks the sap wood of white oak ties and posts, and to a limited extent the heart wood.

*Polyporus pergamenus* attacks those ties from which the bark has not been removed.

*Daedalea unicolor*, *D. quercina* and *Lenzites vialis* have been found on ties laid on railroad bridges.

The structure of the white oak is so firm and dense that it readily sustains the heaviest traffic and it is quite difficult to impregnate the internal cells of the ties. Unless a process has been used which would sterilize the spores lodged in the wood or possible traces of mycelium, the exterior treatment on the unseasoned wood prevents the escape of the internal moisture, the same as a coat of paint. This will hasten decay, for it furnishes the requisite conditions for fermentations and internal growth of mycelium.

The fungi attacking ties of the chestnut, *Castanea vulgaris*, variety *Americana*, A. D. C. (*Castanea vesca*, L., variety *Americana*, Mx.), are *Polyporus sulphureus*, Fr.; *P. spumeus*, Fr. ? ; *P. hirsutus*, Fr.; *P. versicolor*, Fr.; *P. pergamenus*, Fr.; *Agaricus Americanus*, Pk. and *A. sublateritius*, Schæff.

*Polyporus sulphureus* is also very destructive to telegraph poles and large posts, attacking them near the ground line.

The chestnut contains naturally a stronger antiseptic than the white oak and resists, in contact with the soil, the growth of the fungi until the antiseptic is destroyed by the air, or contact with the rails and spikes. The decay of the chestnut tie is from the top downwards; therefore the deeper the tie is imbedded the longer the body lasts. The full advantage of this is lost in

some degree from the decay which takes place around the spikes and under the rails, from the fact that the iron in contact with this wood neutralizes its natural antiseptic. The ends and centers of chestnut ties are sound after the rails have cut into the wood enough to necessitate their removal. The opinion is quite prevalent that they do not decay, but are mostly destroyed by mechanical abrasion; which is not the fact, for the microscope reveals the truth, the presence of the mycelium of a fungus and its destructive work on the wood fibers as an important reason of their rapid abrasion.

The chestnut is lighter than the white oak and many of the wood fibers much coarser, which enables it to be impregnated with an antiseptic quite readily. The large ducts of the two woods are about the same size. The medullary rays of the chestnut are fewer than of the white oak, and it is, therefore, more easily indented as a tie.

The fungus which principally attacks the white cedar, *Chamaecyparis sphaeroidea*, Spach., is *Agaricus campanella*, Batsch. It even attacks the growing tree, and in most cases its mycelium is found in the ties when cut. The tree is a very slow grower and, as the lower limbs become shaded, they die and are attacked by their special fungus, and this communicates with the upright cells of the tree. It takes from ten to twenty years before the limbs break off and the wound or orifice is closed by the growing wood. As long as air has access to the mycelium it slowly grows and destroys the wood above and below the wound, the decay spreading laterally very slowly, owing to the small medullary rays and the preservatives they contain. As soon as the orifice is closed, shutting off the air supply, the decay for the time is nearly if not entirely checked. When the trees are cut for ties it is not uncommon to find one or more decayed spots, from one-half to an inch in diameter, extending nearly the entire length of the tie.

The durability of the wood is so great that such ties are not rejected as long as there is sufficient sound wood for spiking. This wood contains a natural preservative and is very durable in contact with the soil, but its structure is too light and delicate to long withstand the heavy traffic of trunk lines, though from its durability it is valuable for those of moderate traffic.

The fungi which destroy ties made of Tamarack, *Larix Americana*, Mx., are *Polyporus pnicola*, Fr. and *Trametes Pini*, Fr.

The fruit of the former always shows traces of phosphoric acid.

This wood is heavier than white cedar, the wood cells being larger, with thicker walls. It is also much stronger because the cells in the annual layer formed in the autumn are nearly solid and in sufficient number to resist indentation or cutting of the ties by the rails under

heavy traffic. It is a wood which can be easily treated so as to resist the attacks of fungi, and such ties have lasted over thirty (30) years in actual service.

The fungi attacking the hemlock, *Tsuga Canadensis*, Carr., are numerous. The following is a list so far as observed:

*Agaricus melleus*, Vahl.

*A. campanella*, Batsch.

*A. porrigens*, Pers.

*A. succosus*, Pk.

*A. rugosodiscus*, Pk.

*A. epipterygius*, Scop.

*Paxillus atrotomentosus*, Fr.

*Lenzites sepiaria*, Fr.

*Stereum radiatum*, Pk.

*Polyporus lucidus*, Fr.

*P. benzoinus*, Fr.

*P. epileucus*, Fr.

*P. Vaillantii*, Fr.

*P. subacidus*, Pk.

*P. medulla-panis*, Fr.

*P. pinicola*, Fr.

*P. abietinus*, Fr.

*P. borealis*, Fr.

This wood does not contain any natural antiseptic or preservative, and is readily attacked by a host of fungi, and decays very quickly. It is heavier than white cedar, but lighter than the tamarack, and, when well preserved by metallic antiseptics, makes a valuable tie.

The fungi destroying the wood of yellow pine, *Pinus palustris*, Mill., are *Lentinus lepideus*, Fr. See Fig. I.

*Sphaeria pilifera*, Fr. See Fig. III.

*Trametes Pini*, Fr., and *Merulius lacrymans*, Fr.

The first is the most destructive to ties in this vicinity, the decay

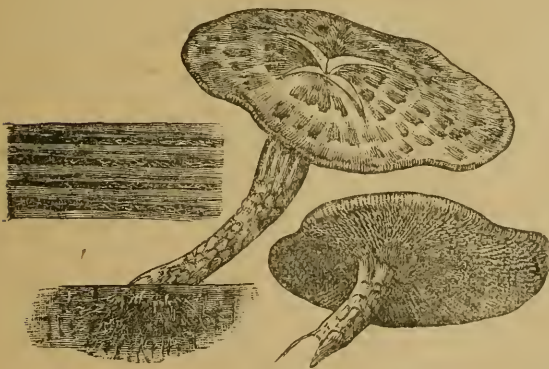


Fig. I. *Lentinus lepideus*, Fr. on Yellow Pine.

Showing the fruit of the fungus on, and the mycelium in, the wood. The size of the fruit varies from an inch to eight inches in diameter.

being most rapid on the bottom and extending upwards. In porous ballast the deeper the ties are imbedded the shorter the duration of service, so far as decay is concerned. The mycelium requires considerable moisture for its growth, and some air. A ballast which prevents a free circulation of the latter checks its growth. The sun and wind check its growth and oftentimes a tie which looks sound upon the surface will be so badly decayed underneath that its removal from the track will be necessary.

The mycelium of this fungus is usually pure white, and is not killed by freezing in the wood. In bridges it is very destructive.

*Trametes Pini* is also found upon ties of this wood, but is confined to the portions above ground. It will grow and fruit with less moisture than *Lentinus lepideus*, but as far as observed, its rapidity of destruction is not so great.

The fungus shown in Fig. III appears on the sap-wood of yellow pine, giving it a dark, dingy appearance, and if the dampness continues fermentations are set up, destroying the wood.



Fig. III. *Sphaeria pilifera*. Fr., magnified five diameters.

*Sphaeria Pilifera* attacks the sap-wood, discolors and quickly destroys this portion of the wood under favorable conditions for its growth. The resinous matter in yellow pine does not protect it in out-door situations, from attacks of the fungi mentioned.

The heart wood of yellow pine is so dense and firm that it is not readily penetrated by antiseptics. The same remarks in regard to imbedding white oak ties apply to this wood. In buildings, yellow pine is attacked by *Merulius lacrymans*, Fr., where it is warm and damp and the air stagnant.

White pine, *Pinus Strobus*, L., when used in bridges and trestles, is attacked by *Lentinus lepideus*, Fr., *Agaricus melleus* Vahl., *Polyporus Vaillantii* Fr. and, in warm inclosures, *Merulius lacrymans* Fr. Both the latter are very destructive.

There are many other woods whose structure is well adapted to their use as railroad ties, but which are so quickly destroyed by fungi as to be of no value unless judiciously treated. These are the beech, birches, elms and maples.

The above will be sufficient to call attention to the practical importance of a study of the fungi, in an economic sense as applied to the decay of wood.

The following simple but effective measures for the preservation of wood can at once be put in practice :

Timber, ties and boards should be seasoned before using, except when submerged. Green wood, according to the species, contains from twenty-five to forty-eight per cent of its weight of sap or moisture, and fully one-half these amounts must be removed to prevent decay in lumber painted on one side, or large sticks of timber painted on all sides, as buffers and car sills, transoms, truck bolsters and timbers.

All lumber and timber should be piled so there can be a free circulation of air around and between each board or stick. Stringers, six

to ten inches thick, should first be laid down, and the lumber piled on them in tiers, with narrow sticks between each board at the ends and centers. Grass and weeds should not be allowed to grow near the piles of lumber, impeding the circulation of air under them.

Large timber should be seasoned under sheds and not exposed to the rays of the sun, as the latter dries an exterior portion so rapidly that it prevents the proper escape of moisture from the outside, and internal decay is liable to occur.

If timber, ties or boards are piled in close contact, and remain so for any length of time, dampness will revive and start the growth of mycelium. It is not uncommon to see large sticks of timber, especially for freight cars, taken into the shops partially covered by mycelium, dressed, framed, put into cars and then painted, thus completing the essential condition for slow but certain decay. Such wood has only one-fourth to one-third the life of seasoned wood.

Boards, especially those used for sheathing freight cars, when piled

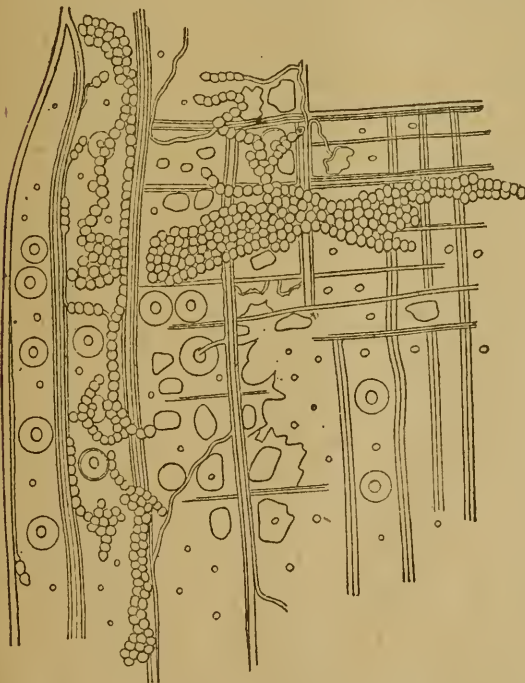


Fig. IV. Magnified 150 diameters, showing fungus growths discoloring the sap-wood of white pine. Such boards, when put into cars and when moisture reaches the unpainted surface.

in close contact, in summer, are attacked in a short time by fungi, which discolor the wood by filling the cells with growths, often similar to those shown in Fig. IV.

The species of fungi which discolor the sap-wood and then set up fermentations are exceedingly numerous and grow with great rapidity. Some of the forms found in white pine are spheres resembling those shown in Fig. IV.

This wood, on being dried, will remain discolored, but the seasoning will check the decay. This class of decay is

not confined to cars and railroad structures, but exists also in buildings, wharves and docks, where timber forms the major part.

The reasons for the first steps in checking the present unnecessary decay of timber must be first understood before we can derive full benefits of more expensive and complex treatment of timber.

Yours truly,

P. H. DUDLEY.

(F.)

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