W. G. FARLOW

Journal of Mycology

VOLUME 12

W. A. Kellerman

COLUMBUS, OHIO
1906

DATES OF ISSUE

Pages 1-40 were issued March 8, 1906

Pages 41-88 were issued May 31, 1906

Pages 89-136 were issued June 9, 1906

Pages 137-184 were issued September 29, 1906

Pages 185-232 were issued November 8, 1906

Pages 233-278 were issued December 5, 1906

For Table of Contents of the several bi-monthly parts see pages 1, 41, 89, 137, 185 and 233 respectively

Volume 12, No. 81 *January 1906*

Journal of Mycology

TABLE OF CONTENTS

W. A. KELLERMAN, PH. D.

Professor of Botany, Ohio State University, Columbus, Ohio

Entered as Second Class Matter, Post-office at Columbus, Ohio.

PRESS OF F. J. HEER, COLUMBUS, OHIO.

Cost of Separates.

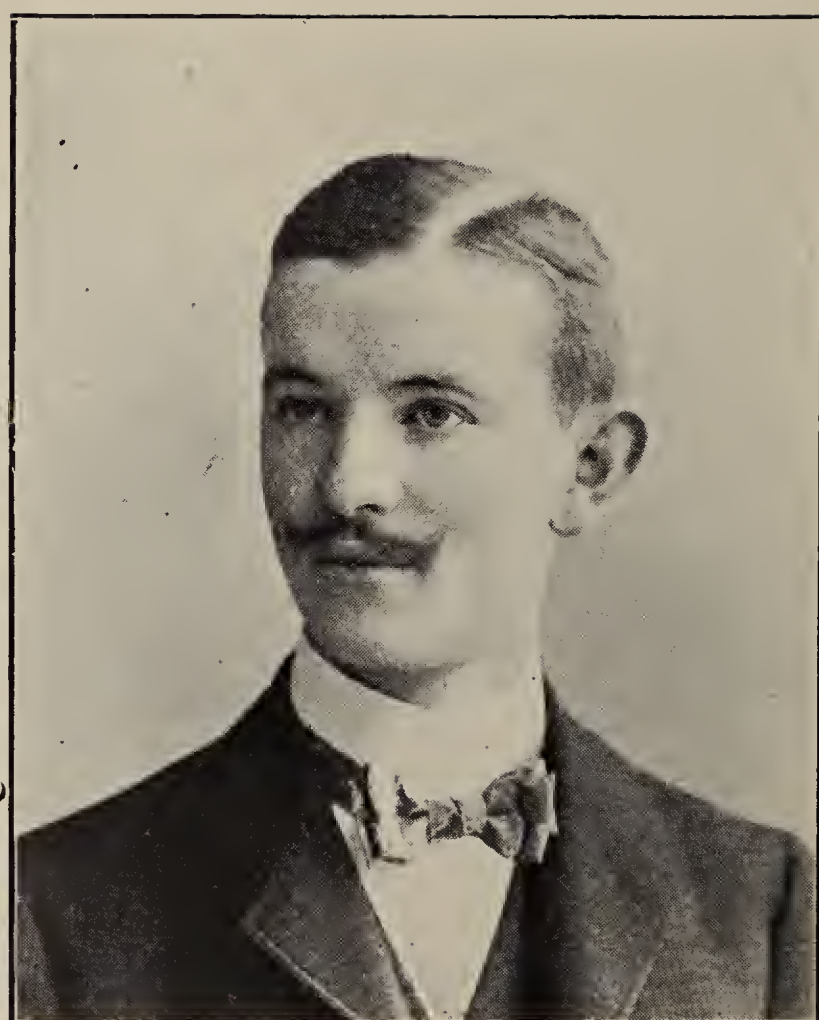
Contributors who desire separates of their articles will receive the same at cost, approximately as follows:

For 4 pages or less:	100 copies $1 75	200 copies $2 25
" 8 " "	100 " 2 50	200 " 3 25
" 16 " "	100 " 4 25	450 " 5 50

For more extended articles proportionately higher.

Plates not included in the above.

ADDRESS: EDITOR JOURNAL OF MYCOLOGY



H. Sydow

Journal of Mycology Portraits with Facsimile Autographs.

Journal of Mycology

VOLUME 12—JANUARY 1906

TABLE OF CONTENTS.

NORTH AMERICAN SPECIES OF MARASMIUS.

A. P. MORGAN.

(*Continued from page 247, Vol. 11.*)

124. MARASMIUS CHRYSOCHAETES B. & C. FUNGI CUB. 120.

Pileus white, convex, sulcate, umbilicate, depressed around the umbo. Stipe slender, elongated, glabrous, tawny, insititious. Lamellae few, white, rather broad, collariate.

Growing on dead leaves. Pileus 2 mm. in diameter, the stipe 2-3 cm. in length.

125. MARASMIUS GRAMINUM B. & BR. BERKLEY'S OUTLINES. 1860. *Agaricus graminum* Libert, Pl. Crypt. 1837.

Pileus membranaceous, convex then plane, umbonate, sulcate, very pale rufous. Stipe capillary, glabrous, shining, black, pale at the apex. Lamellae adnate to a free collar, equal, few and very distant (6-8), whitish; spores ovoid, 5-6 mic.

Growing on withered leaves of grasses. Pileus 4-6 mm. in diameter, the stipe 2-5 cm. long.

126. MARASMIUS CURREYI B. &. BR. ANN. & MAG. N. H.

Pileus nearly plane, sulcate, pale rufous, the grooves paler, the umbo tawny. Stipe quite smooth, shining, black, white at the apex. Lamellae few, cream-colored, attached to a collar round the stipe; spores ovoid-oblong, 9-11 x 5-6 mic.

Growing on leaves of grass. Pileus 6-10 mm. in diameter, the stipe 2-3 cm. long.

B. STIPE VELVETY OR PRUINATE.

a. Pileus Colored.

127. MARASMIUS ATRO-RUBENS Berk. Journ. Bot. 1842.

Pileus membranaceous, convex, regularly radiate-venose, dark reddish. Stipe very slender, umber, velvety. Lamellae rather close, cultrate, pallid.

Growing on old leaves and dead trunks in woods. Pileus 9-10 mm. in diameter.

128. MARASMIUS THUJINUS Peck, N. Y. Rep. 1902.

Pileus membranaceous, hemispheric or convex, often slightly umbilicate, minutely pulverulent-tomentose, distantly striate on the margin, cinereous tinged with lilac. Stipe capillary, glabrous or with a few minute scattered flocci, pallid, sometimes brownish toward the base. Lamellae few, distant, adnate, white.

Growing on fallen leaves of Thuja. Pileus 2-3 mm. in diameter, the stipe 1-2 cm. long, scarcely thicker than a hair.

129. MARASMIUS FELIX Morgan, sp. nov.

Pileus membranaceous, convex then explanate, glabrous, faintly plicate-rugulose, rufescent. Stipe more or less elongated, capillary, minutely pubescent, brown or blackish, white at the apex, the base insititious. Lamellae unequal, some of them forked, rather narrow, distant, adnate, white; spores ovoid-oblong, apiculate, 7-9 x 3-4 mic.

Growing on old leaves of Platanus, insititious on the petioles and veins. Preston, O. Pileus 2-6 mm. in diameter, the stipe varying in length from 2-8 cm. Pileus pale rufous or nearly white to testaceous, becoming more saturated with the color in drying. A near relative of *M. epiphyllus.* Pers.

b. Pileus white or whitish.

a'. Pileus Plicate — Sulcate.

130. MARASMIUS INSITITIOUS Fries. Hym. Eur.

Pileus membranaceous, tough, convexo-plane, subumbilicate, at length plicate-sulcate and whitish. Stipe horny, fistulous, floccose-furfuraceous, reddish-brown, tapering downward to the simple, insititious base. Lamellae broadly adnate, unequal, simple, distant, becoming white; spores elliptic-ovoid, 4 x 2.5 mic.

Growing on fallen leaves of oak, etc. Pileus 5-10 mm. in diameter, the stipe 2-3 cm. in length.

131. MARASMIUS SACCHARINUS Fries. Hym. Eur. *Agaricus saccharinus* Batsch El. Fung. 1784.

Pileus membranaceous, convex, somewhat papillate, glabrous, sulcate and plicate, white. Stipe very slender, flocculose, glabrate, obliquely insititious, reddish. Lamellae broadly adnate, narrow, thick, very distant, reticulate-conjoined, whitish; spores elliptic, 5 x 3 mic.

Growing on leaves, twigs, etc. Pileus 2-4 mm. in diameter, the stipe 1.5-2.5 cm. long.

b′. Pileus Even or Only Rugulose.

132. MARASMIUS PERFORANS Fries. Hym. Eur. *Agaricus perforans* Hoffman, Nom. Fung. 1789.

Ill-smelling. Pileus submembranaceous, rather plane, without striae, rugulose, glabrous, whitish. Stipe fistulous, equal, velvety, bay-black, the base insititious. Lamellae adnate, simple, rather close, whitish, most of them dimidiate; spores elliptic-ovoid, 5-6 x 2-3 mic.

Growing on leaves of Abies. Pileus 6-10 mm. in diameter, the stipe 2-4 cm. long.

133. MARASMIUS EPIPHYLLUS Fries. Hym. Eur. *Agaricus epiphyllus* Persoon, Synopsis. 1801.

Pileus membranaceous, rather plane, at length umbilicate, glabrous, plicate-rugose, milk-white. Stipe horny, fistulous, slightly velvety, brown below, insititious. Lamellae adnate, few and distant, entire venose, white; spores oblong, 6-7 x 2 mic.

Growing on the petioles and veins of old leaves. Pileus 5-10 mm. in diameter, the stipe 3-5 cm. long.

134. MARASMIUS MINUTISSIMUS Peck, 27 N. Y. Rep. 1874.

Very small, the whole surface invested with a minute glandular pubescence. Pileus membranaceous, convex then explanate, faintly rugulose, whitish. Stipe filiform, brown below, fading gradually to white at the apex, the base insititious. Lamellae few and distant (4-10), white, narrow, adnate, sometimes vein-like and imperfect; spores lance-oblong, 7-10 x 3-4 mic.

Growing on old leaves along the borders of fields next to woods. Pileus 2-5 mm. in diameter, the stipe 6-16 mm. long. The glandular hairs are longest on the lower part of the stipe, becoming smaller upward and on the pileus and most minute on the lamellae. Peck's description is of the smallest plants.

§2. *OMPHALIA. PILEUS SUBMEMBRANACEOUS; THE STIPE CENTRAL, CARTILAGINOUS, FISTULOSE, SOMEWHAT THICKENED UPWARD; THE LAMELLAE TRULY DECURRENT.*

I. CYATHIFORMES. *Pileus submembranaceous, at length depressed, umbilicate or even infundibuliform.*

A. STIPE GLABROUS.

135. MARASMIUS VAILLANTII Fries, Hym. Eur. *Fungus pileo candicante, etc.* Vaillant, Bot. Paris, 1727. *Agaricus Vaillantii* Persoon Synopsis. 1801.

Pileus submembranaceous, tough, soon explanate, depressed, plicate-rugose, whitish. Stipe stuffed, glabrous, brown, the apex thickened and paler. Lamellae broad, subdecurrent, thick, distant, white; spores elliptic, 10x6 mic.

Growing on old wood, fallen twigs, leaves, etc. Pileus 1-2 cm. in diameter, the stipe about 2.5 cm. long.

136. MARASMIUS LANGUIDUS Fries Hym. Eur. *Agaricus languidus* Lasch. Linnaea, No. 157.

Pileus a little fleshy, convex, gibbous or umbilicate, flocculose, rugose-sulcate, yellowish and flesh-color, becoming whitish. Stipe stuffed, thickened above, naked and pallid, below brown or blackish and sometimes villose thickened at the base. Lamellae adnate becoming decurrent, distant, narrow, venose-connected; spores 6-7x4 mic.

Growing on twigs, herbaceous stems, etc. Pileus 10-15 mm. in diameter, the stipe about 2.5 cm. long.

137. MARASMIUS HYPERELLUS Fries, Nov. Symb. 1857.

Pileus very thin, membranaceous, explanate, umbilicate, lineate-triate, rugulose when dry, whitish. Stipe filiform, fistulose, glabrous, brown or blackish, encircled by an orbicular base. Lamellae subdecurrent, distant, thin, whitish.

Growing on sticks. Pileus 10-12 mm. in diameter, the stipe 3.5-4 cm. long.

138. MARASMIUS VIRIDI-FUSCUS B. & C. Fungi Cub. 103.

Pileus thin, explanate, radiate-striate, pale green. Stipe slender, glabrous, thickened upward, brown or blackish below. Lamellae broad, distant, decurrent, green.

Growing on dead sticks. Pileus 10-12 mm. in diameter, the stipe 12 mm. long.

139. MARASMIUS CYATHIFORMIS B. & C. Fungi Cub. 104.

Caespitose. Pileus cyathiform, glabrous, brown when dry. Stipe dilated upward. Lamellae distant, decurrent.

Growing on dead wood. Pileus 2-2.5 cm. in diameter, the stipe 2-3 cm. long and 1 mm. thick.

140. MARASMIUS PURPURASCENS B. & C. Fungi Cub. 105.

Pileus thin, infundibuliform, minutely tomentose, striatulate, pale purple, when dry whitish. Stipe glabrous, concolorous. Lamellae close, narrow, decurrent, concolorous.

Growing on sticks in shady woods. Pileus 2 cm. in diameter, the stipe 2-3 cm. long.

B. STIPE VELVETY OR PRUINATE.

141. MARASMIUS LEUCOCEPHALUS Mont. Syll. Crypt. 1856.

Pileus membranaceous, convex then plane and depressed, at length infundibuliform, glabrous, white. Stipe cartilaginous, stuffed then hollow, pallid above, brownish below, villous-pruinose with pale tawny flocci, attached by a discoid base. Lamellae unequal, white, narrow in front and obtuse, broader behind, sinuate-adnate and long decurrent.

Growing on fallen sticks. Pileus 6-15 mm. in diameter, the stipe 2-3 cm. long.

142. MARASMIUS SEMISPARSUS Berkeley, Chall. Exp. 1875.

Pileus depressed, umber, gray-pulverulent, the margin naked and sulcate. Stipe umber, minutely tomentose, the base somewhat spongy. Lamellae distant, adnate-decurrent, concolorous.

Growing on the petiole of a dead leaf; Bermuda. Pileus about 4 mm. in diameter, the stipe 12 mm. long, twisted and compressed when dry.

143. MARASMIUS TOMENTOSIPES Peck, Bull. Torr. 1902.

Pileus thin, convex, afterward nearly plane, usually umbilicate, glabrous, the margin striate, yellow-brown or ferruginous, brown when dry. Stipe slender, hard, elastic, hollow, brown or black, tomentose. Lamellae narrow, rather distant, unequal, arcuate-decurrent, pale-yellow; spores elliptic, 6-7x3-4 mic.

Growing in coniferous woods; Idaho. Pileus 1-3.5 cm. in diameter. the stipe 2-4 cm. long and 1 mm. thick.

II. CLAVIFORMES. *Pileus membranaceous, campanulate or convex, never depressed.*

A. STIPE GLABROUS.

144. MARASMIUS ALBO-FUSCUS B. & C. Fungi Cub. 101.

Pileus plane, umbonate, thin, striate, reticulate, white, the center brown. Stipe solid, glabrous, slender, slightly thickened above. Lamellae few, distant, broad, adnate-decurrent, the interstices trabeculate.

Growing on logs in woods. Pileus 12 mm. in diameter, the stipe 2-3 cm. long.

145. MARASMIUS ALBICEPS Peck, 43 N. Y. Rep. 1889.

Pileus membranaceous, either convex or campanulate, glabrous, white. Stipe corneous, setiform, glabrous, black, paler at the apex, attached to the matrix by radiating brown hairs or fibers. Lamellae broad, distant, adnate- or arcuate-decurrent, white; spores obovoid or subelliptic, 6-8x3-4 mic. usually containing a shining guttule.

Growing among fallen leaves in woods. Pileus about 4 mm. in diameter, the stipe 2-3 cm. long.

B. STIPE VELVETY OR PRUINATE.

146. MARASMIUS CLAVAEFORMIS BERKELEY, LEA'S CAT. 1849.

Pileus convex, tough, white. Stipe slender, tapering downward and attached by a minute bulb, brown below, and clothed with a depressed velvety pubescence, thickened above and white sprinkled with furfuraceous particles. Lamellae distant, broad in front, behind long decurrent, whitish inclining to flesh-color.

Growing on dead sticks. Pileus 4 mm. in diameter, the stipe 2.5 cm. long.

147. MARASMIUS DECURRENS PECK, 24 N. Y. REP. 1871. *Marasmius resinosus* Saccardo. Sylloge V.

Pileus thin, convex, minutely tomentose, grayish or tawny. Stipe slender, firm, equal, gray, minutely tomentose. Lamellae arcuate-decurrent, subdistant, narrow, tapering toward each end, whitish with discolored edge, interspaces rugose-reticulated.

Growing on the ground in a shaded ravine. Pileus 8-12 mm. in diameter, the stipe 3-5 cm. long and 1 mm. thick.

148. MARASMIUS ACULEATUS PATONILLARD, BULL. SOC. MYC. 1900.

Pileus convexo-campanulate, thin, coriaceous, semipellucid, densely orchaceous-tomentose; the hairs straight, convergent-fasciculate, thus forming stellate warts. Stipe slender, tapering upward, clothed with a short, velvety, ochraceous tomentum. Lamellae few, distant, broadly adnate, subdecurrent.

Growing on the ground; Guadaloup. Pileus 2 cm. in diameter, the stipe 2 cm. long. The pileus bristles with warts like those of a Lycoperdon.

§ 4. *PLEUROTUS. PILEUS MORE OR LESS IRREGULAR; THE STIPE EXCENTRIC, LATERAL OR WANTING. COMMONLY GROWING ON WOOD.*

A. STIPE EXCENTRIC.

a. Lamellae colored.

149. MARASMIUS PURPUREUS B. & C. FUNGI CUB. No. 135. 1867.

Pileus convex then plane, thin, sulcate, tomentose, purple. Stipe excentric, very short, solid, thickened upward, whitish. Lamellae broad, distant, purple, adnexed, the interstices even.

Growing on stumps in woods. Pileus 2 cm. in diameter, the stipe 2-4 mm. long.

150. MARASMIUS CORACIPES B. & C. Fung| Cub. 93.

Pileus convex, thin, even, pale brown. Stipe subexcentric, concolorous with the pileus, rather thick, sulcate, glabrous. Lamellae close, narrow, unequal, adnexed, pale rufous.

Growing in woods. Pileus 12-15 mm. in diameter, the stipe 3.5-4 cm. long.

151. MARASMIUS OBLIQUUS B. & C. Fungi Cub. 136.

Pileus flabelliform, glabrous, polished, the margin involute. Stipe oblique, very short, cylindric. Lamellae distant, adnate-decurrent, brown when dry.

Growing on dead wood in ravines. Pileus 2 cm. in diameter, the stipe 2 mm. long.

b. Lamellae white.

152. MARASMIUS CAESPITOSUS Peck, 26 N. Y. Rep. 1873.

Pileus fleshy, convex, even, brown with a lilac tint, sometimes irregular. Stipe central or excentric, stuffed or hollow, pruinose. Lamellae close, free, somewhat united with each other at the stipe, narrowed outwardly, white.

Growing caespitosely on birch wood. Pileus 1-2 cm. in diameter, the stipe 3-5 cm. long.

153. MARASMIUS SEMIUSTIS B. & C. Fungi Cub. 102.

White, rufus when dried. Pileus excentric, convex then plane, rugose or sulcate, glabrous. Stipe short, compressed, glabrous. Lamellae distant, reaching the stipe, the spaces between rugose.

Growing on rotten wood. Pileus 8-12 mm. in diameter, the stipe 6-7 mm. long.

B. STIPE LATERAL AND VERY SHORT.

a. Lamellae colored.

154. MARASMIUS CURTISII Sacc. n Syd. Sylloge XIV. Marasmius haematodes B. & C. Fungi Cub. 139.

Pileus helmet-shaped, rigid, glabrous, deep red-brown. Stipe none. Lamellae venose, thick, concolorous.

Growing on dead sticks. Pileus 2 mm. in breadth.

155. MARASMIUS CONCOLOR B. & C. Fungi Cub. 138.

Pileus helmet-shaped, irregular, lobed, dull tawny, pulverulent. Stipe none. Lamellae broad, concolorous.

Growing on sticks in woods. Pileus 2-4 mm. in breadth.

156. MARASMIUS SABALI Berkeley, Chall. Exp. II. 1878.

Pileus reniform, tomentose, at length resupinate and culcate. Stipe very short. Lamellae thick, entire, rounded behind, distant, adnate; spores subglobose, 8 mic. in diameter.

Growing on petioles of Sabal Palmetto; Bermuda. The whole plant reddish when dry.

157. MARASMIUS ASPERIFOLIUS Patonillard, Jour. Bot. 1889.

Pileus sessile, resupinate or reflexed, glabrous, striate, pale brown. Lamellae distant, concolorous or paler, unequal, hirsute, attached to a hairy stipitiform tubercle, cystidia numerous, clavate, prominent.

Growing on bark of Murraya; Martinique.

158. MARASMIUS CALOSPORUS Pat. in *Duss*. En. 1903.

Pileus sessile, resupinate, at first pezizoid, then split and almost dimidiate, very thin, membranaceous, white, glabrescent. Lamellae few, white-yellowish, distant, radiating from an excentric point; spores ovoid, smooth, 10 x 7 mic.

Growing in clusters on rotten branchlets of Clibadium, Guadaloupe. Pileus minute, scarcely 2 mm. in breadth.

b. Lamellae white or pallid.

159. MARASMIUS MERULINUS B. & C. Fungi Cub. 133. *A.* (Collybia) Merulius Bertero ms. in Montagne, Flora Fernand. 1835.

"Lamellae in the center, agaricine, at the margin meruline." *Montagne.* It is said to differ from *M. spaniophyllus* by its white pileus.

Growing on sticks in woods; "Alabama." *Berk.*

160. MARASMIUS ARACHNOIDEUS B. & C. Fungi Cub. 137.

All white. Pileus resupinate, adnate, the stipe very short, at length obliterated, arising from an arachnoid mycelium. Lamellae few.

Growing on dead wood. Pileus 2 mm. in breadth.

161. MARASMIUS NIDULUS B. & C. Fungi Cub. 134.

Pileus resupinate, at first pezizaeform, at length free on one side, pruinose-floccose, white. Stipe very short, pruinose. Lamellae few, thick, ventricose.

Growing on sticks in woods. Pileus 2-6 mm. in breadth.

162. MARASMIUS HAWAIENSIS P. Hennings, Monsunia I. 1899.

Pileus membranaceous, tough, sessile, reniform or subflabellate, yellow-brown, subrugulose, the margin entire or incised. Lamellae radiating behind, rather broad, few, branched, reticulate, anastomosing, pallid.

Growing on trunks covered with mosses; Hawaia. Pileus 1-3 cm. broad, 1.5-2 cm. long.

UREDINEOUS CULTURE EXPERIMENTS WITH PUCCINIA SORGHI, 1905.[1]

W. A. KELLERMAN.

For three seasons previous, reports of infection experiments have been made dealing with quite a number of Rust species. This fourth report is, unfortunately, extremely brief; due to the fact that a Winter mycological collecting trip was made to Guatemala that lasted into Spring. Also other work that had been in the meantime neglected, demanded much time and, besides, class duties in college were pressing. Consequently nothing was carried to completion this season except the Maize Rust experiments which can be outlined in a few sentences.

First let me recur to the completed work with this species one year ago. At that time I secured what was taken to be infection of Maize plants direct with teleutospores (but below will be differently interpreted) ; and thereafter extended inoculation work was carried on with the uredospores so secured.

SUMMARY OF PREVIOUS WORK.

No inoculations with Maize Rust were on record previous to 1904. Work for that season was published in the *Journal of Mycology,* 11:26-33, Jan. 1905, and the point settled beyond possible doubt were these: That, using uredospores, the species was readily transferred to any and all the "agricultural species" of Maize; that teosinte (*Euchlaena luxurians*) was also a host for this species of Rust (not before reported) ; that attempts to inoculate *Sorghum vulgare, Saccharum officinarum,* and *Tripsicum dactyloides* were unfruitful.

AN AECIDIUM NOT DETECTED.

In the progress of the work no Aecidium was encountered, though spores were taken from teleutosporic pustules that had been exposed all winter (on sweet corn), and with sowings

---

[1] Contributions from the Botanical Laboratory of the Ohio State University, XXIII.

therefrom uredospores were obtained also later teleutospores. The pustules were cursorily examined before used and nothing was observed but teleutospores.

DR. ARTHUR'S DISCOVERY OF THE AECIDIUM.

Before my work was published Dr. Arthur had the rare good fortune to demonstrate the aecidium stage of the Maize Rust. Twice I had, as I supposed, obtained uredospores by using teleutospores direct on Maize plants — and scant material yet remaining enabled me to get a *third inoculation* with spores from my teleutosporic pustules. As far as seemed consistent with probable success in this third attempt at inoculation the pustules were disintegrated and the mass of spores (with loss of course) was subjected to microscopic scrutiny; but no uredospores were seen. Doubtless further search should have been made — uredospores *might have been found,* and that, of course, would have been of far greater value than the successful inoculation. Dr. Arthur used aecidiospores of Oxalis to inoculate Maize. The final link in the absolutely complete demonstration was this only — to use teleutospores of Maize rust to secure the aecidium on Oxalis. This I did.

WORK WITH THE TELEUTOSPORES IN 1905.

The chain of evidence was in fact complete — or at least neither Dr. Arthur nor myself longer could doubt that the life cycle of this Rust included three stages — aecidium, uredo and teleuto. Confidently therefore on my return from Guatemala I instituted experiments in the month of April and early in May, using teleutospores from sweet corn that had been exposed all winter. In due time the several Oxalis plants on which sowings were made responded generously and repetitions were equally satisfactory.

REPETITION OF FORMER WORK.

The theory I proposed one year ago, namely, that an aecidium might be suppressed at will (or under circumstances), I now abandon. It is very probable that *a few uredospores* viable were harbored by the teleutosporic pustules and these in that case of course gave the inoculation of the Maize. Uredosporic inoculation as shown by numerous experiments later was not difficult, but a very certain result to be anticipated whenever spores fell, or were placed, on the proper host.

SIGNIFICANCE OF THE PHENOMENA OF UREDOSPORIC INOCULATION.

The surprise that the rather rare aecidium of Oxalis should belong to the very common and very abundant Rust of Maize was shared by many mycologists. But the reinterpretation of my work — which does not seem irrational — clears up the matter. Doubtless then the Rust of Maize is carried over from year to year in part by means of surviving uredospores. Finally, it may be said that while this interpretation was, of course, not unthought of by uredinists, I preferred myself to record the final judgment only after further work had been carried on in my own experimental laboratory. Therefore this is the conclusion of the whole matter.

CULTURES OF UREDINEAE IN 1905.[1]

BY J. C. ARTHUR.

The present article forms the sixth of a series of reports[2] by the author upon the culture of plant rusts. They cover the years from 1899 to the present year, inclusive. In these studies the grass and sedge rusts hold a prominent place, but other heteroecious and autoecious species have been included, and during the present season the work has been extended to the so-called *opis, micro* and *lepto* forms, and also to species with amphispores.

The coöperative agreement between the Bureau of Plant Industry of the U. S. Department of Agriculture and the Indiana Experiment Station, which existed for carrying on the culture work in the spring of 1904, was again established, extending from July, 1904, to April 30, 1905, making it possible to have an assistant during this period, who devoted nearly his whole time to the study of the rusts. The position was first held by Mr. J. C. Marquis, who was succeeded on October 1, 1905, by Mr. Frank D. Kern, and after the expiration of the coöperative agreement Mr. Kern was retained by the Experiment Station to continue the work. After May 10 all the work fell upon Mr. Kern until September, covering the most important part of the culture period, the author being absent in Europe. It could not, however, have been entrusted to better hands, as the fine ability displayed in the work during the previous season, coupled with considerable experience already acquired, enabled him to meet the new conditions as they arose, and the judgment and caution indispensable in securing authoritative results.

Much of the completeness of the work is due to the kindly assistance of correspondents, who have sent teleutosporic material, and especially to Messrs. E. Bethel, Denver, Colo.; J. M. Bates, Red Cloud, Neb.; A. O. Garrett, Salt Lake City, Utah;

---

[1] Read before the Botanical Society of America at the New Orleans meeting, January 1, 1906.

[2] See Bot. Gaz. *29*: 268-276; Jour. Mycol. *8*: 51-56; Bot. Gaz. *35*: 10-23; Jour. Mycol. *10*: 8-21 and *11*: 50-67.

J. J. Davis, Racine, Wis.; E. Bartholomew, Rockport, Kansas; H. H. Whetzel and H. S. Jackson, Ithaca, N. Y.; C. L. Shear and P. L. Ricker, Washington, D. C.; Wm. J. Horne, Santiago de las Vegas, Cuba; Jos. J. Wolfe, Durham, N. C.; Lewis Kaufman, Morrison, Iowa; R. D. Echlin, Washington, Iowa; R. E. Buchanan, Ames, Iowa; H. L. Bolley, Fargo, N. D.; and H. L. Shantz, Lincoln, Neb.; to whom my warmest thanks are extended. I am also much indebted to Messrs. Bethel and Garrett for rooted wild plants on which to make sowings, and to Dr. Davis for field observations and the suggestion which led to successful sowings of *Puccinia Eleocharidis.*

During the present season 85 collections of material with resting spores and 15 collections with active spores were employed, from which 484 drop cultures and 13 Petri dish cultures were made to test the germinating condition of the spores, these being made almost wholly from the resting spores. Out of the 85 collections with resting spores 32 could not be made to germinate, although every condition seemed favorable, and were therefore useless. There were in all 194 sowings of spores made, representing 45 species of rusts, and for this purpose 100 species of hosts were utilized, which were grown temporarily in pots in the greenhouse.

A few cultures were made with heteroecious species for which no clue to the alternate host had been obtained, and with one exception the results were negative. These negative trials are here recorded to serve for reference.

1. Puccinia on *Carex Pennsylvanica,* sent by Rev. J. M. Bates from Red Cloud, Neb., was sown on *Urtica gracilis* with no infection. Similar material in former seasons has been tried on twenty-one other species of hosts with negative results.[3]

2. Puccinia emaculata Schw. on *Panicum capillare* L. from Lafayette, Ind., was sown on *Ambrosia artemisiaefolia, Rudbeckia triloba, R. laciniata* and *Steironema ciliatum,* with no infection. This very common and distinctive rust was sown in former seasons on fourteen other species of hosts with negative results.[4]

3. Puccinia tosta Arth., on *Sporobolus asperifolius,* sent from Denver, Colo., by Mr. E. Bethel, was sown on *Napaea dioica Symphoricarpos racemosus, Xanthoxylum Americanum, Aesculus glabra* and *Viola papilionacea,* with no infection. Sowings of what is taken to be the same species of rust, but on

---

[3] See Jour. Mycol. *10*: 10. 1904; and *11*: 51. 1905.

[4] See Jour. Mycol. *8*: 52. 1902; Bot. Gaz. *35*: 12. 1903; and Jour. Mycol. *10*: 10. 1904.

another host, were made in 1903 on six other species of hosts with negative results.[5]

4. Puccinia Crandallii Pamm. & Hume, on *Festuca confinis,* sent from Boulder, Colo., by Mr. E. Bethel, was sown on *Dodecatheon Meadia, Hydrophyllum appendiculatum, Aquilegia Canadensis, Anemone Canadensis, Thalictrum dioicum, Rudbeckia triloba, Gutierrezia Sarothrae,* and *Lonicera Japonica,* with no infection.

5. Uromyces graminicola Burr. on *Panicum virgatum,* sent from Red Cloud, Neb., by Rev. Bates, was sown on *Psoralea Onobrychis,* with no infection; while similar material sent by Mr. Bartholomew from Stockton, Kans., was sown on the same host and also on *Cassia Chamaecrista, Polemonium reptans* and *Rudbeckia laciniata,* all with no infection.

6. Uromyces Junci (Schw.) Tul. on *Juncus effusus,* sent by Mr. Jackson from Ithaca, N. Y., was sown on *Rudbeckia laciniata, R. triloba,* and *Falcata comosa,* with no infection. What is believed to be the same species of rust, but on another host, was sown in 1902 on a species of *Iris* with negative results.

The following species of rusts were successfully grown, and the data supplement that obtained from previous cultures of this series, or that published by other investigators obtained by means of similar cultures. The results in connection with *Puccinia Pruni-spinosae,* the plum rust, are especially interesting, being the first studies of the kind with American material.

1. Melampsora Medusae Thuem.— Teleutosporic material obtained near Lafayette, Ind., on *Populus deltoides* was sown April 17 on *Larix laricina* and *L. decidua,* which resulted in abundance of spermogonia appearing April 25, and a greater abundance of aecidia May 1, upon both hosts.[6]

2. Gymnosporangium Juniperi-Virginianae Schw.— Three samples of teleutosporic material were used, one from the eastern states, and two from the central west. The test was designed to show whether any difference existed between the two regions in the power of the species to infect the cultivated apple; the apple orchards of Iowa and the central west generally being well known to be especially free from this rust. All the teleutosporic material was on *Juniperus Virginiana,* and to all appearances equally good. That sent from Durham, N. C., by Mr. Wolfe, was sown on a seedling apple out of doors April 27, and showed abundant spermogonia May 9, but did not develop

---

[5] See Jour. Myc. *10*: 10. 1904.
[6] See Jour. Mycol. *10*: 13. 1904; and *11*: 52. 1905.

aecidia, although conditions appeared favorable. Material from Washington, Iowa, sent by Rev. Echlin, was sown April 22, on a small plant of the York Imperial apple in the greenhouse, and showed abundant spermogonia on May 5; another sowing was made out of doors on a seedling apple April 27, and showed spermogonia on May 13, but further observation was prevented by insect depredation. A second lot of material was received from Ames, Iowa, sent by Mr. Buchanan, and was sown out of doors on seedling apple and *Crataegus coccinea,* and in the greenhouse on *Amelanchier Botryapium.* The sowing on apple gave abundant spermogonia, but failed to make further development, while on the other hosts there was no infection. So far as these tests go there appears to be no difference between the eastern and western forms of the species in their power to infect the cultivated apple. Many cultures have been made showing the full life cycle of this rust (often called *G. macropus*). A good summary of the subject, especially in reference to the question underlying the present work, was given a short time ago by Professor Pammel[7] of the Iowa State College.

3. Puccinia Sambuci (Schw.) Arth. — Teleutosporic material of fine quality on *Carex lupulina,* collected in Noble county, near Beavor Dam, Ind., was sent by Mr. Whetzel. It was sown on *Sambucus Canadensis* May 8, giving rise to abundant spermogonia May 14, and aecidia May 25.

4. Puccinia albiperidia Arth. — Teleutosporic material was gathered near Lafayette, Ind., on *Carex tetanica,* and sown April 7 on *Silphium perfoliatum, Polemonium reptans, Ambrosia trifida, Rudbeckia laciniata, Steironema ciliatum,* and *Ribes gracile.* Only the last host showed infection, giving abundant spermogonia April 14, and aecidia April 27, the others remained entirely free from rust.

A part of the teleutosporic material was sent to Dr. H. Klebahn, Hamburg, Germany, who sowed it on *Ribes Uva-crispa, R. aureum* and *R. rubrum.* No infection resulted on *R. rubrum,* but on *R. Uva-crispa* spermogonia showed May 8, and on *R. aureum* May 15. The further development, however, was slow, soon coming to naught in the first case, and persisting much longer, but with little advance in the second case. Dr. Klebahn in commenting upon his results says that the imperfect development of the infection on *R. uva-crispa* may be ascribed, in part at least, to the late sowing, for the teleutospores germinated freely. The host plants had already passed the most active period of growth, and the weather was too warm. His results are exactly in accord with our own under similar conditions. The

[7] Bull. Iowa Exper. Sta., No. 84: 16–24. August, 1905.

failure to secure good aecidia made it impossible to give an opinion on the identity of this species of rust,[8] as compared with European forms.

5. PUCCINIA CARICIS-SOLIDAGINIS Arth. — Teleutospores on *Carex sparganioides* gathered near Lafayette, Ind., were sown April 22 on *Aster paniculatus* and again on May 11 on *A. paniculatus, A. Drummondii, Ribes rotundifolium, Urtica gracilis,* and *Solidago Canadensis.* No infection occurred except on the last host, this giving spermogonia May 18 and aecidia May 28 in very great abundance. In 1902 cultures of this species were made with teleutospores taken from *Carex Jamesii* and *C. stipata.*[9]

6. PUCCINIA PECKII (DeT.) Kellerm. — Teleutosporic material on *Carex lanuginosa,* gathered at Red Cloud, Neb., by Rev. Bates, was sown May 19 on *Hydrophyllum appendiculatum, Steironema ciliatum,* and *Onagra biennis.* On May 26 spermogonia, and May 31 aecidia appeared on *O. biennis,* the other hosts remaining entirely unaffected. This result is a duplicate of that obtained in 1904.[10].

7. PUCCINIA CARICIS (Schum.) Reb. — Teleutosporic material on *Carex stipata,* gathered near Lafayette, Ind., was sown April 18 on *Urtica gracilis,* and gave spermogonia April 24, and aecidia May 1, in great abundance.

A collection in excellent condition made at Denver, Colo., by Mr. Bethel, on *Carex aquatilis,* was sown on *Urtica gracilis* April 10, giving few but well developed spermogonia April 18, and numerous aecidia April 29. It was sown again April 25, and gave abundant spermogonia May 1, followed with very numerous aecidia May 8.

Both of these sowings were tried on the evidence of the microscopic examination of the collections. It was found that the medium-sized teleutospores, and large uredospores found intermixed, agreed with those known to belong to this species, and the results confirmed the diagnosis. Both collections give new hosts for the species.[11] More interesting still was the presence in the Colorado collection of abundant amphispores, which agree in every particular with those collected on *Carex stricta* by C. H. Peck in New York, distributed in Thuemen's *Myc. Univ., No. 746,* and first called *Uromyces Caricis* Pk., then *Puccinia Caricis-strictae* Diet. This fortunate collection enables us to show beyond a reasonable doubt, that the *Uromyces Caricis*

---

[8] For record of previous cultures see Jour. Myc. *8*: 53. 1902; *10*: 11. 1904; and *11*: 58. 1905.

[9] See Bot. Gaz. *35*: 21. 1903.

[10] Jour. Mycol. *11*: 58. 1905.

[11] For previous cultures see Bot. Gaz. *29*: 279. 1900; *35*: 16. 1903; and Jour. Mycol. *8*: 52. 1902.

of Peck is the amphisporic form of *Puccinia Caricis*. What determines the production of amphispores in this species is an interesting question, in view of the fact that only twice have they been found, and at such a great distance apart. The amphispores in the Colorado collection did not germinate in drop culture, although the same conditions gave fine germination of the associated teleutospores.

8. Puccinia fraxinata (Schw.) Arth. — A collection of teleutospores on *Spartina cynosuroides*, sent by Mr. Bartholomew from Hill City, Kans., was used to sow April 29, on *Fraxinus lanceolata, Adelia acuminata* and *Ligustrum vulgare*. Only the first host gave results, showing spermogonia May 5, and aecidia May 14, the sowing being made on a cut branch placed in water in the greenhouse.[12]

9. Puccinia amphigena Diet. — Teleutosporic material on *Calamovilfa longifolia* sent by Rev. Bates from Red Cloud, Neb., was sown on *Smilax hispida* May 27, and began to show spermogonia June 2, and aecidia June 10, both in abundance.[13]

10. Puccinia verbenicola (E. & K.) Arth. — Teleutosporic material on *Sporobolus longifolius*, sent from Red Cloud, Neb., by Rev. Bates, was sown on *Verbena urticaefolia* May 3, and showed spermogonia May 9, and aecidia May 20. Another collection on same host, obtained near Lafayette, Ind., was sown on same species of *Verbena* May 27, and showed spermogonia June 2, and aecidia June 10.[14]

11. Puccinia pustulata (Curt.) Arth. — Teleutosporic material on *Andropogon furcatus*, gathered by the writer at English Lake, Ind., was sown on *Pentstemon hirsutus* and *Comandra umbellata* May 27, with no infection of the *Pentstemon*, but abundant growth on the *Comandra*, spermogonia appearing June 2, and aecidia June 14. This result confirms work done in 1903.[15]

12. Puccinia Pammelii (Trel.) Arth. — The cultural results of 1904[16] were verified by sowing teleutospores from *Panicum virgatum*, obtained by the writer at English Lake, Ind., upon*Euphorbia corollata*. A sowing was made May 26, giving spermogonia June 2, and aecidia June 9.

13. Puccinia subnitens Diet. Teleutosporic material on *Distichlis spicata*, sent from Red Cloud, Neb., by Rev. Bates, was

---

[12] For previous cultures see Bot. Gaz. *29*: 275. 1900; and Jour. Mycol. *11*: 57. 1905.

[13] For previous cultures see Bot. Gaz. *35*: 20. 1903; and Jour Mycol. *10*: 11. 1904.

[14] For previous cultures see Bot. Gaz. *29*: 274. 1900; *35*: 16. 1903; and Jour Mycol. *11*: 56. 1905.

[15] Jour. Mycol. *10*: 17. 1904.

[16] Jour. Mycol. *11*: 56. 1905.

sown on *Erysimum asperum, Sophia incisia,*[17] *Lepidium Virginicum,* and *Bursa Bursa-pastoris,* with success in each case. The sowing was made April 18, and spermogonia appeared on *Eryisimum* and *Sophia* April 25, *Lepidium* April 26, and *Bursa* April 27, while aecidia were observed on all by May 8. The aecidia develop with considerable difficulty on *Bursa,* and Rev. Bates writes that they are not common or abundant in the field on this host. On *Lepidium* they also start with less ease than on the other species, but under good conditions grow well.[18]

14. PUCCINIA POCULIFORMIS (Jacq.) Wettst. — Teleutosporic material on *Agrostis alba,* sent from Ithaca, N. Y., by Mr. Jackson, was sown on *Berberis vulgaris* April 13, and showed numerous spermogonia April 22, with abundance of aecidia May 4.

15. PUCCINIA SORGHI Schw. — The work of last year,[19] in which only aecidia were used, was verified this season by sowing teleutospores. The material was obtained in Lafayette from an early garden variety of sweet corn. It was sown April 17 on *Oxalis cymosa* (the common wild wood sorrel of the region), *O. Ortgiesii* (a yellow-flowered greenhouse weed), *O.*————, (a tuberous pink-flowered form of greenhouses), and *O. Bowici* (a pink-flowered form with large flowers and leaves, also grown in greenhouses.) All remained free, except *O. cymosa,* which showed numerous spermogonia on April 27, and aecidia on May 5. A second sowing was made May 1 on *O. cymosa, O. Origiesii, O. Bowiei, and O. corniculata* (growing out of doors over a grass-covered conduit for steam pipes), and again all remained free except *O. cymosa,* which gave spermogonia May 8, and eacidia May 14. It is not apparent why no infection should occur on the four hosts other than *O. cymosa,* but there is no reason to suppose that it was due in any degree to lack of vigor or suitable conditions.

The aecidiospores raised in the first trial above were sown May 6 on seedlings of the yellow dent field corn variety of *Zea Mays,* and in a week, May 13, showed uredospores, which increased in abundance until teleutospores were observed June 15. The uredospores from this culture (on yellow dent corn) were sown May 16 on small plants of garden sweet corn, and gave

[17] This is probably not the correct name of the plant used for the cultures. It is, however, the name also used last year for the trial host, which is the common species of *Sophia* in this region, and the error in determination is due to the confusion existing in the current manuals. The species is also different from the one on which the fungus was collected last year in Nebraska by Rev. Bates (Jour. Mycol. *11*: 116. 1905), and that is also incorrectly named. But for the sake of simplicity the name *S. incisa* will be used in this article for both species.

[18] For previous cultures see Bot. Gaz. *35*: 19. 1903; and Jour. Mycol. *11*: 54. 1905.

[19] Bot. Gaz. *38*: 64. 1904.

uredospores in plenty on May 23, and would doubtless have been followed by teleutospores in due time, had the culture been continued. These results in transferring the rust from field corn to sweet corn, and the reverse, are in accord with those obtained by Kellerman.[20]

At the same time the first sowings were made, April 17, teleutospores were also sown on a seedling *Zea Mays,* under favorable conditions, but no infection resulted. The drop cultures, which are made just previous to every sowing, showed that the teleutospores germinated freely, but the few uredospores intermixed were not viable. In this case, at least, the teleutospores appeared to be incapable of infecting the host from which taken, and in so far agree with the general rule regarding grass and sedge rusts.

16. Puccinia Polygoni-amphibii Pers. — In 1904 [21] it was possible to verify in a measure the work upon this species by Dr. Tranzschel of St. Petersburg, by sowing aecidiospores from*Geranium maculatum* and obtaining teleutospores on *Polygonum emersum.* This season the reverse order of sowing was tried. Teleutospores from *P. emersum* obtained in this vicinity were sown April 15 on *G. maculatum* and *G. Robertianum,* with no infection of the latter, but most abundant infection of the former, showing spermogonia April 23 and aecidia May 1. A second sowing was made April 27, using the above two hosts and also *G. pusillum,* and again infection occurred only upon *G. maculatum,* which showed great numbers of spermogonia May 3, and aecidia May 9. These results agree with common observation, for the aecidium on *G. maculatum* (*A. sanguinolentum* Lindr.) is common in the United States, while no aecidia have yet been reported on *G. Robertianum* or *G. pussillum.*

17. Puccinia Helianthi Schw. — A sowing of teleutospores, taken from *Helianthus grosse-serratus* growing on the grounds of the University, was made May 17 on *H. grosse-serratus* and two plants of *H. annuus* with equally abundant results in each case, spermogonia showing May 25, and aecidia June 2.

18. Puccinia lateripes B. & Br. — After many vain attempts to secure good fungous and host material of this species for culture work, the present season's excellent results have given much satisfaction. All the material was obtained near Lafayette, Ind. Sowings of teleutospores from *Ruellia ciliosa* were made April 25 on both *R. ciliosa* and *R. strepens,* with equally positive results in both cases, showing spermogonia May 5, and aecidia May 18. Another sowing of the same material was made on *R. strepens* May 27, which gave spermogonia June 5, and aecidia

[20] Cf. Jour. Mycol. *11*: 27. 1905.
[21] Jour. Mycol. *11*: 59. 1905.

June 15. A sowing of teleutospores from *R. strepens* on *R. ciliosa* May 8, and another June 7, gave no infection.

Many writers, following Lagerheim, who received his clue from Burrill, have made two species of the rusts on these two hosts. It is true that the gross appearance, and to some extent the microscopic characters of the two are perceptibly different. These differences are shown, so far as the development went, in the results of the cultures. The aecidial groups grown on *R. ciliosa* were small and round, one to two millimeters across, without noticeable hypertrophy of the tissues, and confined to the blade of the leaf. On *R. strepens,* however, they took possession of the veins, petioles and stems, and made large swellings from 20 to 25 millimeters long, and in one case the main steam for a distance of ten centimeters or more was greatly swollen and distorted. The differences also extended to the peridial cups and to the spores. On *R. ciliosa* the cups were mostly one-half millimeter high, and on *R. strepens* fully one millimeter high. The aecidiospores from *R. ciliosa* measured 15-19 by 20-26μ, and from *R. strepens* 17-21 by 24-30μ. These two cultures were from the same source of infection, and must therefore be one and the same species. Had uredospores and teleutospores been raised, it is believed that the differences recorded in the books for the two hosts would have been found. In short it is believed that the differences of size and appearance are entirely due to the influence of the hosts. The loose, somewhat succulent tissues of *R. strepens,* and its vigorous habit of growth, are correlated with the greater development of the fungus, while the firm close tissues of *R. ciliosa,* not only prevent luxuriant development of the parasite, but its parts become smaller throughout. These differences in the hosts also account for the failure to infect *R. ciliosa* with spores from *R. strepens,* while the reverse process succeeded. There appears to be no reason to doubt that under very favorable conditions the infection of *R. ciliosa* with spores from *R. strepens* could be accomplished, and the resulting development be the same as when the infecting spores came from *R. ciliosa* itself.[22]

19. Puccinia Pruni-spinosae Pers.— The *Aecidium punctatum* Pers. (*A. quadrifidum* DC.) occurring in various parts of the United States and Canada on different species of *Anemone, Hepatica* and *Thalictrum* so closely resembles the European form which bears the same name, that little doubt has existed of their genuine identity. In 1904 Dr. Tranzschel[23] of St. Petersburg made cultures of this aecidium, sowing the aecidiospores from *Anemone coronaria* on *Amygdalus communis* (almond) *Prunus spinosa* (blackthorn), *P. divaricata* (cherry-

[22] For previous cultures see Kellerman in Jour. Mycol. *9*: 107. 1903.
[23] Trav. Mus. Bot. Acad. Sci. St. Petersb. *11*: 67-69. 1905.

plum) and from *Anemone ranunculoides* on *P. spinosa,* producing in each the characteristic uredospores of *Puccinia Pruni-spinosae,* the rust of plums and peaches.

This work by Dr. Tranzschel suggested the following trials with American material. Aecidiospores from *Hepatica acutiloba* (*Aecidium hepticatum* Schw.) were sown on three small plants of *Prunus serotina* (wild black cherry), established in pots in the greenhouse, on *Prunus Americana* (native plum), *P. Cerasus* (cultivated cherry), and *Amygdalus Persica* (peach), the last two seedlings. The sowings were made May 1 to 4, and in fifteen days afterward, uredospores appeared on *P. serotina,* but the other plants remained wholly free, watch being continued for a month and more. The successful sowings were as follows:

May 1, Aecidiospores sown on *P. serotina;* May 16, uredospores; May 22, teleutospores.
May 1, Aecidiospores sown on *P. serotina;* May 16, uredospores.
May 2, Aecidiospores sown on *P. serotina;* May 17, uredospores.

On May 23, a sowing of uredospores, which had been grown on *P. serotina,* was made on *A. Persica,* under seemingly most favorable conditions, but no infection took place, watch being kept for two months.

From these results there can be no further question of the general identity of the American and European plum and cherry rusts, and their connection with the *Aecidium punctatum.* It is not possible to state what significance is to be attached to the failure to infect peach, plum and cultivated cherry with spores that readily infected the wild cherry. Careful search for two seasons in the vicinity of the diseased hepaticas, the fungus being perennial, has failed to detect any rust on plums, cherries or peaches, wild or cultivated, although growing in plenty; and furthermore *Puccinia Pruni-spinosae* has not yet been reported from Indiana, although said to occur in the adjoining state of Illinois on *P. serotina, P. Virginiana,* and *P. Americana.*

20. Puccinia Xanthii Schw. — Teleutosporic material on *Xanthium Canadense,* gathered near Lafayette, Ind., on Nov. 5, 1904, was sown on the second and third leaves of seedlings of the same species of host April 3. On April 8 small yellow dots began to show, which closely simulated spermogonia, but which microscopic examination by means of sections proved were only the very young teleutosporic sori. The yellow dots increased in size, appearing like small pimples, and finally broke through the epidermis, exposing the teleutospores April 21, eighteen days after inoculation. Another sowing was made April 13, on the cotyledons of the same species of host, and on the second leaves of *Ambrosia trifida.* The *Xanthium* seed-leaves showed yellow dots on April 22, and open sori May 1, also in eighteen days from sowing, but the *Ambrosia* leaves remained free.

These results agree essentially with those reported by Carleton,[24] who was able to infect *Xanthium* in eighteen and fourteen days, but could not infect *Ambrosia*. He says, however, that "in all these cases spermogonia preceded the teleutospores in the infected spots." In connection with an account of cultures with *Puccinia heterospora* he adds that "numerous experiments were also made with other *lepto* species, including *Puccinia Grindeliae* Pk., *P. variolans* Hark., *P. Lygodesmiae* E. & E., and *P. Sherardiana* Korn., with results similar to those above mentioned," but he does not report the details of these cultures, if such they were.

Taking the observations here recorded for *P. Xanthii*, especially in connection with those for *P. Silphii* and *P. Grindeliae*, reported below, it seems safe to assume that these species, and those quoted as mentioned by Carleton, belong to a group of rusts in which teleutospores and their resulting sporidia are the only spore-forms produced in the life-cycle, aecidia, uredo, and even spermogonia being wholly absent.

The following nine species have never been tested before by the culture method, so far as the writer knows, either in this country or abroad. They embrace an interesting diversity of habit. Besides the grass and sedge forms, with which this series of cultures has been most concerned, there are two leptopucciniae, one micropuccinia and one brachypuccinia, also one of the grass rusts is chiefly interesting for its amphispores.

1. Puccinia Silphii Schw. — Teleutosporic material was gathered March 31, 1905, near Lafayette, Ind., on dead and weathered leaves of *Silphium integrifolium*, and sown April 10 on vigorous plants of the same host, and also on *S. perfoliatum*. There was no infection on the latter host, but on the former clear yellow dots showed April 15, which sectioned and placed under the microscope proved to be very young teleutosori. These yellow dots rapidly enlarged, forming pale pimples scattered over yellow patches of the leaf, with much hypertrophied tissues, and April 20 broke through the epidermis, exposing the abundant teleutospores. Another sowing on the same two hosts was made April 25, and with the same results: there was no infection of *S. perfoliatum*, and the most abundant infection of *S. integrifolium*, showing as yellow dots May 2, and exposed teleutospores May 5. As the rust occurs on both these species of *Silphium*, and many others as well, the results may be taken as indicative of biological races.

2. Puccinia Grindeliae Pk. — Excellent teleutosporic material on *Gutierrezia Sarothrae* was sent by Mr. Bethel, collected

[24] Bulletin Bureau Pl. Industry, No. 63: 26. 1904.

at Boulder, Colo., March 27, 1905, on weathered stems. Mr. Bethel also kindly sent growing plants of the host and of *Chrysothamnus nauseolus.* The latter is not a recorded host for *P. Grindeliae,* but for a similar species, *P. tuberculans* E. & E. A sowing was made on *G. Sarothrae* April 12, which showed yellow dots April 21, and numerous open teleutosori May 2. Another sowing was made on both hosts April 26, with no infection on *C. nauseolus,* but most abundant infection on *G. Sarothrae,* showing yellow dots May 4, and open teleutosori May 15. The yellow dots were investigated, as in the other instances, and found to be the early stages of teleutosori, with no trace of spermogonia.

3. Puccinia Solidaginis Pk. — Teleutosporic material was sent by Mr. Garrett, collected at Salt Lake City, Utah, on *Solidago trinervata,* April 8, 1905. It was sown on *S. Canadensis* May 17, showing yellow dots June 2, and an abundance of open teleutosori June 7, with considerable hypertrophy of the tissues. Although the yellow dots were not specially investigated, they gave the same appearance of being young sori, as in the above species of leptopucciniae.

4. Puccinia transformans E. & E.— Remarkably fine teleutosporic material, forming considerable excrescences on leaves and stems of *Stenolobium Stans* (*Tecoma Stans*), was sent by Mr. Horne, who collected it at Santiago de las Vegas, Cuba, May 3, 1905. It was sown on two young plants of *S. Stans* May 13, and in both cases gave abundance of spermogonia May 29, and of teleutospores June 5.

Fine material gathered by Mr. J. B. Rorer on the pods of *S. Stans* in the Bahama Ids., at Nassau, New Providence, March, 1904, was sent for identification. The pods contained many seeds, which were planted in the greenhouse, and provided the host plants for the above inoculations. The teleutospores of this collection were in good germinating condition. As there were no growing plants of *S. Stans* at hand, they were sown May 20 (1904) on vigorous young plants of *Campsis radicans* (*Tecoma radicans*), but gave no infection, although the conditions seemed particularly favorable.

Since the cultures were made a study of the characters of the species has been undertaken, and the conclusion reached that all North American collections, so far as known, belong to *P. transformans* (*P. exitiosa* Syd. & Holw.). An original specimen of *P. transformans,* collected in Baja California by K. Brandegee in 1893 *on Tecoma Stans,* has been examined, and found to agree with other specimens on the same host from the West Indies, and also with the type material of *P. exitiosa* on *Tecoma mollis,* that is *Stenolobium mollis,* from Mexico. The species possesses considerably smaller spores, with thinner walls and finer sculpturing, than *Puccinia elegans* Schröt., reported only from Argentine, South America, an original specimen of which I have been able to examine through the courtesy of Dr. P. Hennings of the Botanical Garden, Berlin. *P. transformans* has not yet been reported from any locality in the United States.

5. Puccinia Kuhniae Schw. — Teleutosporic material, gathered near Lafayette, Ind., Nov. 3, 1904, on *Kuhnia eupatorioides,* was sown on the same host May 19. On May 28 spermogonia appeared sparingly, which were examined under the microscope in section, and these were followed June 5 by uredo in fair abundance. The species, therefore, belongs to the group of brachypuccinia.

6. Puccinia canaliculata (Schw.) Lagerh. — An observation in the field made in 1904 led to the present successful cultures. Aecidia were found in remarkable abundance on seedling *Xanthium Canadense* over an area 8 to 10 meters in diameter, beyond which the aecidium did not occur, although the hosts were equally plentiful and equally exposed. Later in the season, the middle of June, uredosori were found upon what appeared to be a seedling sedge extending over approximately the same area that had been occupied in the spring by the cocklebur cluster cups, and this was followed in August by teleutosori. Although the sedge did not fruit, yet it was not difficult to ascertain that it was a species of *Cyperus,* and the rust *Puccinia canaliculata.*

On May 11 a sowing of aecidiospores, obtained from the locality mentioned, was made in the greenhouse on *Cyperus esculentus,* other species of the genus not being at hand, and on June 2 uredo were noticed, although they probably appeared earlier and were overlooked, being small and pale. Another sowing was made on the same species of host May 17, and uredo first noticed June 2. The plants did not grow well, and the infected leaves were removed for the herbarium before time enough had elapsed in which to develop telutosori. Cultures with teleutosporic material will doubtless confirm this association of the *Xanthium* and *Cyperus* rusts.

7. Puccinia Eleochardis Arth.— Teleutosporic material on *Eleocharis palustris* was sent by Dr. Davis from Racine, Wis., and with it the information that from observations in the field he believed this to have its aecidial phase on *Eupatorium.* Acting upon this suggestion, a sowing was made May 5 on *Eupatorium perfoliatum,* which gave rise to spermogonia May 13, and aecidia May 22. Another sowing on the same species of host May 11, gave spermogonia May 20, and aecidia May 30. Both trials produced an abundance of aecidia, with all the characteristics of the common and widely distributed form on this host, and closely related species.

8. Puccinia substerilis E. & E. — Fine material on *Stipa viridula* collected in August, 1904, at Boulder, Colo., was sent by Mr. Bethel, who also sent living plants of *S. viridula* and *S. comata.* This material showed a great abundance of amphispores,[25] but almost no teleutospores. The amphispores gave good germination, and were sown April 6 on *S. viridula* and *S. comata.* Uredospores of the usual kind began to appear on *S. viridula* April 18, but no infection on *S. comata.* Another sowing was made April 22 on *S. comata,* which also gave no infection. Uredospores continued to form for a month on *S. viridula,* but no amphispores or teleutospores were produced.

Mr. Bethel also sent fine teleutosporic material on *Stipa comata,* collected in March, 1905, at Boulder, Colo. This was sown on *Aster ericoides* April 18, and contrary to expectation gave no infection. When the failure became assured, it was sown again, April 29, on *A. ericoides, A. multiflorus,* and *A. Novae-Angliae,* but in each case without infection. This negative result throws some doubt on the assumption that the American *Stipa* rusts on the several species of hosts belong to one species, having its aecidia on certain species of *Aster,*[26] and the present very incomplete report is therefore entered under the name *P. substerilis.* Reducing this name to a synonym of *P. stipae,* as the writer did a few months since,[27] is now believed to have been premature.

9. Puccinia Seymouriana Arth. — At the time this species was published,[28] it was suggested upon grounds of spore resemblance that its *Aecidium* was *A. Cephalanthi* Seym. From combined morphological and geographical data I was then willing to assert that "although cultures must be awaited, yet there can be little doubt that the early stages of *P. Seymouriana* occur upon *Cephalanthus.*" Persistent efforts to secure material for this trial were finally rewarded by the writer finding especially good teleutospores on *Spartina cynosuroides* at English Lake, Ind., in the northern part of the state, in March, 1905. These were sown on *Polygala Senega* April 20, with no infection, and later on *Cephalanthus occidentalis,* May 13, with abundant results. On May 18 great numbers of spermogonia began to show, and on May 27 still greater numbers of aecidia, thus verifying the prediction made three years before.

10. Uromyces acuminatus Arth. — Finding the aecidium of this very common rust was due to a fortunate accident. Of the many trials to find the connection between the two phases

---

[25] For description and illustrations of the amphipores in this species see Bull Torr. Bot. Club *32*: 38. 1905.

[26] For cultures of *Puccinia Stipae* see Jour. Mycol. *11*: 63. 1905.

[27] Jour. Mycol. *11*: 11. 1905.

[28] Bot. Gaz. *34*: 12. 1902.

of a heteroecoius rust, during my seven years of experimental work, this is the first instance of success without the aid of some probable clue, and in this case may be ascribed to good luck and the exuberant enthusiasm of Mr. Kern, who made all the sowings of the season.

Teleutosporic material on *Spartina cynosuroides,* collected at Palmer, Neb., by Rev. Bates, was sown May 26, on whatever plants were available in the greenhouse, that are recorded as bearing aecidia of unknown teleutosporic connection. These hosts were: *Polemonium reptans, Polygala Senega, Cassia Chamaecrista, Psoralea Onobrychis, Rudbeckia laciniata, Ambrosia artemisiaefolia, Thalictrum dioicum, Viola papilionacea,* and *Steironema ciliatum.* To our great surprise *S. ciliatum* began to show spermogonia June 1, and abundant aecidia June 6, all others having no infection. Another sowing was at once made, June 2, which likewise gave spermogonia June 7, and aecidia June 12.

The aecidium on this host is recorded or known to the writer from Iowa, Illinois, Nebraska, Kansas, Wyoming and Minnesota. A collection made in Wisconsin [29] on *S. lanceolatum* is thought by Burrill[30] to be specifically distinct. Schlechtendahl's name, *Caeoma Lysimachiae,* sometimes used for American specimens, was founded on an aecidium on *L. thyrsiflora L.* (*Naumburgia thyrsiflora* (L.) Duby) from vicinity of Berlin, and doubtless is entirely distinct from American forms, with the possible exception of the reference in Farlow & Seymour's Host Index,[31] the basis for which is unknown to the writer. Schweinitz's name [32] *Aecidium Lysimachiae* applies to the form on *Lysimachia quadrifolia* and L. *terrestris,* only reported from North Carolina, and may well be considered distinct. What is now much needed is teleutosporic material from the Atlantic and Gulf coasts to be used in cultures for testing the above points, and in general the question whether the eastern and western forms are one species or not.

The great prevalence of this rust on *Spartina,* and the comparative rarity of the aecidia on *Steironema,* is doubtless due in part to the hardiness of the uredospores, which enable them to live over winter and start the uredostage in the spring under favorable conditions. This is the opinion expressed by Mr. Bartholomew in a recent interview, and is my own opinion, founded in part upon finding uredosori upon young blades of *Spartina* only a few inches long at such an early date in spring that infection by means of aecidiospores seemed highly improbable.

---

[29] Trelease, Paras. Fung. Wis. p. 30.
[30] Burrill, Paras. Fung. Ill., I. Uredineae, p. 233.
[31] L. c. p.75. 1890.
[32] Schrift. d. nat. Ges. Leipzig *1*: 67. 1822.

SUMMARY.

The following is a complete list of successful cultures made during the season of 1904. It is divided into the two series: species previously reported by the writer or other investigators, and species now reported for the first time.

A. Species previously reported.

1. MELAMPSORA MEDUSAE Thuem. — Teleutospores from *Populus deltoides* Marsh. sown on *Larix laricina* (DuR.) Koch.

2. GYMNOSPORANGIUM JUNIPERI-VIRGINIANAE Schw.—Teleutospores from *Juniperus Virginiana* L. sown on *Malus Malus* (L.) Britt.

3. PUCCINIA SAMBUCI (Schw.) Arth. — Teleutospores from *Carex lupulina* Muhl. sown on *Sambucus Canadensis* L.

4. PUCCINIA ALBIPERIDIA Arth. — Teleutospores from *Carex tetanica* Schk. sown on *Ribes gracile* Michx.

5. PUCCINIA CARICIS-SOLIDAGINIS Arth. — Teleutospores from *Carex sparganioides* Muhl. sown on *Solidago Canadensis* L.

6. PUCCINIA PECKII (DeT.) Kellerm. — Teleutospores from *Carex lanuginosa* Michx. sown on *Onagra biennis* (L.) Scop.

7. PUCCINIA CARICIS (Schum.) Reb. — Teleutospores from *Carex stipata* Muhl. and *C. aquatilis* Wahl. sown on *Urtica gracilis* Ait.

8. PUCCINIA FRAXINATA (Schw) Arth. — Teleutospores from *Spartina cynosuroides* Willd. sown on *Fraxinus lanceolata* Borck.

9. PUCCINIA AMPHIGENA Diet. — Teleutospores from *Calamovilfa longifolia* (Hook.) Hack. sown on *Smilax hispida* Muhl.

10. PUCCINIA VERBENICOLA (E. & K.) Arth. — Teleutospores from *Sporobolus longifolius* (Torr.) Wood, sown on *Verbena urticaefolia* L.

11. PUCCINIA PUSTULATA (Curt.) Arth. — Teleutospores from *Andropogon furcatus* Muhl. sown on *Comandra umbellata* (L.) Nutt.

12. PUCCINIA PAMMELII (Trel.) Arth. — Teleutospores from *Panicum virgatum* L. sown on *Euphorbia corollata* L.

13. PUCCINIA SUBNITENS Diet. — Teleutospores from *Distichlis spicata* (L.) Greene, sown on *Erysimum asperum* DC., *Sophia incisa* (Eng.) Gr., *Lepidium Virginicum* L. and *Bursa Bursa-pastoris* (L.) Britt.

14. PUCCINIA POCULIFORMIS (Jacq.) Wettst. — Teleutospores from *Agrostis alba* L. sown on *Berberis vulgaris* L.

15. PUCCINIA SORGHI Schw.— Teleutospores from *Zea Mays* L. sown on *Oxalis cymosa* Small.; aecidospores from *Oxalis cymosa*, sown on *Zea Mays;* and uredospores from *Zea Mays* sown on same host.

16. PUCCINIA POLYGONI-AMPHIBII Pers. — Teleutospores from *Polygonum emersum* (Michx.) Britt. sown on *Geranium maculatum* L.

17. PUCCINIA HELIANTHI Schw. — Teleutospores from *Helianthus grosse-serratus* Mart. sown on *H. grosse-serratus* Mart. and *H. annuus* L.

18. PUCCINIA LATERIPES B. & Br. — Teleutospores from *Ruellia ciliosa* Pursh, sown on *R. ciliosa* Pursh and *R. strepens* L.

19. PUCCINIA PRUNI-SPINOSAE Pers. — Aecidiospores from *Hepatica acutiloba* D C. sown on *Prunus serotina* Ehrh.

20. PUCCINIA XANTHII Schw. — Resting teleutospores from *Xanthium Canadense* Mill. sown on same host.

B. Species reported now for the first time.

1. PUCCINIA SILPHII Schw. — Resting teleutospores from *Silphium integrifolium* Michx. sown on same host.

2. PUCCINIA GRINDELIAE Pk. — Resting teleutospores from *Gutierrezia Sarothrae* (Pursh) B. & R. sown on same host.

3. PUCCINIA SOLIDAGINIS Pk. — Resting teleutospores from *Solidago trinervata* Greene, sown on *S. Canadensis* L.

4. PUCCINIA TRANSFORMANS E. & E. — Resting teleutospores from *Stenolobium Stans* (L.) Don. sown on same host.

5. PUCCINIA KUHNIAE Schw. — Teleutospores from *Kuhnia eupatorioides* L. sown on same host.

6. PUCCINIA CANALICULATA (Schw.) Lagerh. — Aecidiospores from *Xanthium Canadense* Mill. sown on *Cyperus esculentis* L.

7. PUCCINIA ELEOCHARIDIS Arth. — Teleutospores from *Eleocharis palustris* (L.) R. & S. sown on *Eupatorium perfoliatum* L.

8. PUCCINIA SUBSTERILIS E. & E. — Amphispores from *Stipa viridula* Trin. sown on same host.

9. PUCCINIA SEYMOURIANA Arth. — Teleutospores from *Spartina cynosuroides* Willd. sown on *Cephalanthus occidentalis* L.

10. UROMYCES ACUMINATUS Arth. — Teleutospores from *Spartina cynosuroides* Willd. sown on *Steironema ciliatum* (L.) Raf.

Purdue University, Lafayette, Ind.

PEZIZA FUSICARPA GER. AND PEZIZA SEMITOSTA B. & C.

ELIAS J. DURAND.

Peziza fusicarpa Ger. is one of the common discomycetes of the eastern United States. The attractive bowl-shaped ascomata were among my earliest collections in the group, and have been ever since among my favorite objects of observation during the summer months. This continued interest has resulted in the accumulation of a large series of notes which I have been several times on the point of arranging for publication. This has seemed the more desirable because the available descriptions of *P. fusicarpa* and its allied forms are at best incomplete, and certain recent attempts at elaboration have introduced at least as many new elements of confusion as they have dispelled. Mr. Morgan's note on *Peziza pubida* B. & C., in the July number of this Journal has called up the matter once more, and the following contribution is offered in the hope of adding something to our knowledge of the species, and at the same time of clearing up what I believe to be certain misconceptions regarding some of our choicest fungi.

It may not be out of place to state at once that these observations are based on about 50 separate collections, besides numerous ungathered plants in the field. The individuals are occasionally so abundant on the rich sloping banks of ravines near Ithaca, that quarts of them may be gotten in some spots. The herbarium material studied includes the specimens of *P. fusicarpa* collected near Poughkeepsie by Gerard, and sent by him to Cooke to be figured in Mycographia (fig. 113), as well as other specimens from the same locality and collector in the Ellis Herbarium, at the New York Botanical Garden. Inasmuch as no one seems to know the whereabouts of Gerard's own herbarium, or even whether it is longer in existence, these two specimens must be regarded as the most authentic of the species to which access may be had.

Other specimens examined include *P. pubida* B. & C.: the type in Berkeley's herbarium at Kew; *P. semitosta* B. & C.: Berkeley's type at Kew, as well as a duplicate of Dr. Michener's original collection in the herbarium of Elias Fries, at Upsala. What appear to be portions of the types of both the last named species are also present in Massee's herbarium, now at the New York Botanical Garden.

Peziza morgani Mass. is represented by the type in Massee's herbarium as above, as well as by a specimen sent me by Mr. Morgan himself marked "type." Of *P. hainesii* Ell. the type and other examples so named in the Ellis Collection, at New York, have been studied.

My conclusions based upon a study of the material indicated may be stated briefly as follows: *Peziza fusicarpa* Ger. (1873), *P. pubida* B. & C. (1875), and *P. morgani* Mass. (1902) are specifically identical and synonymous; *P. semitosta* B. & C., while closely allied to *P. pubida* B. & C., is not identical with it, but is specificly distinct; *P. hainesii* Ell. (1881) is identical with *P. semitosta* B. & C. (1875), as recently stated by Ellis himself (Jour. Myc. 10: 170).

Whether these species shall be assigned to Lachnea or Macropodia of Saccardo's arrangement may be regarded as a matter of individual opinion. The descriptions indicate the presence or absence of a stem as the primary distinction between the genera. This is surely a most illusive character. *P. fusicarpa* shows great variability in this respect. Often in a single cluster one finds a range from cups absolutely sessile to those with stems of maximum size. An examination of hundreds of growing plants shows that one-half or two-thirds, perhaps, possess some sort of a stem. Lachnea as defined by Saccardo and others is certainly a complex which must be broken up. The name even must be abandoned for a genus of fungi. Macropodia Fckl. was based on a single species *M. macropus* (Pers.) Fckl., which is included by many writers in Helvella, a refernce which seems at least problematical. The excipular structure of the species here considered is quite different from that of most of the species of Lachnea, but corresponds more closely to that of *M. macropus.* The general pliable, leathery texture indicates further relationship with that species. In Macropodia, then, our plants may best be placed until the time when the whole group shall have been thoroughly worked over and revised in accordance with other and perhaps better bases of arrangement.

My ideas of the characters and specific limits of the two species may be gotten from the following descriptions.

MACROPODIA FUSICARPA (Ger.) Durand.

Peziza fusicarpa Ger., Bull Torr. Bot. Club 4: 64. 1873.
Peziza (*Sarcoscyphae*) *pubida* B. & C., Grev. 3: 153. 1875.
Macropodia pubida (B. & C.) Sacc., Syll. 8: 159. 1889.
Lachnea fusicarpa (Ger) Sacc., Syll. 8: 172. 1889.
Peziza velutina B. &. C. (ined.) in Curtis Bot. N. Car. . 132. 1867.
Peziza morgani Mass., Journ. Myc. 8: 190. 1902.
Exsicc.: Ellis, N. A. F. n. 1269; E. & E., F. Col. n. 1307.
Illust.: Cooke, Mycog. *figs. 110, 113;* Grev. 3. *pl. 44. f. 226;* Seaver, Bull. Lab. Nat. Hist. Iowa 5, *pl. 20. f. 1.*

Plants solitary or gregarious, often densely so, sessile or stipitate; ascomata at first closed, then expanding until hemispherical-cupulate, the margin slightly incurved, occasionally becoming saucer-shaped; hymenium at first bluish-pallid or creamy-white changing to ochraceous, finally becoming dark brown when old or dry, externally slightly darker, velvety on account of the short bay-brown hairs, which are flexuous, rather thin-walled, obtuse, 1-4 (rarely more) septate, the segments somewhat irregular, about 100-250x20μ (rarely longer); plants variable in size, .5-4 cm. in diam., 1-2.5 cm. deep, fleshy-leathery, pliable, flesh thin; excipulum and hymenium equally thick, the former composed of two distinct layers of equal thickness: the ental one of interwoven hypae, 5μ thick, running more or less parallel to the sides of the cup; the ectal one parenchymatous, cells more or less quadrate, somewhat longer than broad, with rather thick walls, arranged in rows at right angles to the surface, some of the rows being continued outward to form the hairs; stem either entirely absent or up to 1.5 cm. high, .5-1 cm. thick, compressed, often longitudinally sulcate or puckered at the summit, velvety. Asci stout, cylindrical-clavate, apex rounded, not blue with iodine, 260-325x15-18μ; spores 8, obliquely uniseriate or rarely subbiseriate above, hyaline, continuous, fusiform, at maturity distinctly granular roughened, contents granular, 2-guttulate, straight or curved, 32-44x10-11μ (majority 36-41μ). Paraphyses cylindrical, septate, brown, slightly thickened above, 6-8μ thick.

On soil and humus, rarely on very rotten wood, in rich woods and on slopes of ravines, July to Sept. Ontario to Alabama and Iowa.

A common and characteristic, but variable species. The average diameter is about 2 cm., but specimens twice that size are not uncommon. Berkeley and Massee described their plants from dried material in which the hymenium is brown. Gerard, on the other hand, described the hymenium as "at first ochraceous, at length dark brown." The creamy or ochraceous tints are the ones most often seen, but in very fresh young specimens the color is paler resembling that of *Lachnea hemispherica.* As previously stated, about one-half to two-thirds of the ascomata possess some sort of a stem, and all variations may be seen in a single group. The length of the hairs also varies considerably, but those longer than 250 μ are rarely seen. The dried flesh when moistened up is distinctly leathery-gelatinous, but this character is not evident in the fresh state. The young spores are smooth and smaller than mature ones, the latter being distinctly roughened in all the examples I have seen. The shape is distinctly fusiform rather than elliptical-oblong as in the next species. They are very rarely as short as 33μ. In Gerard's collections of *P. fusicarpa* they measure 33-43x10-12μ; in the type of *P. pubida* 35-40x10μ, while those of the type of *P. morgani* are 35-40x10-11μ. The paraphyses are nearly colorless in young plants, but the contents soon become brownish, finally deep brown throughout — a change coordinate with the change in color of the hymenium from cream-color through ochraceous to brown.

The identity of *P. morgani* with *P. pubida* (as represented in Ellis, N. A. F. n. 1269) was first indicated by Mr. Seaver (l. c.), in 1904. He also later called attention to the fact that the specimen in Rab.-Winter, F. Eur. n. 3275, called *P. pubida* B. & C., is different, being smooth, and having different spores. Mr. Seaver's position is well taken, as I had already satisfied myself by examination of several copies including the one at Kew quoted by Massee. The specimens under that number belong to a species nearly allied to, if not identical with, *Peziza atrovinosa* Cke., the spores being elliptical, 15x8-9μ, rugose roughened, and brown when mature. This latter species is not uncommon in the eastern United States.

Peziza velutina B. & C. was mentioned by Curtis (l. c.), and was said by Cooke to be "undescribed and uncertain." Dr. Peck (Rep. 28:68) declared that according to specimens from Curtis it is the same as *P. fusicarpa* Ger. In the Kew Herbarium the name of the type specimen of *P. pubida* was first written "P. velutina B. & C.," then the "velutina" was lined out and "pubida" written above it. It seems probable, therefore, that Berkeley first thought of naming the species "P. velutina," and reported that name to Curtis (before 1867), but before publication (1875) decided to substitute the name pubida, which he did.

Material examined: ONTARIO: Hull, J. Macoun; Toronto, J. Dearness.

CONNECTICUT: Redding, F. S. Earle; Mt. Carmel, R. Thaxter.

NEW YORK: Poughkeepsie, W. R. Gerard; Ithaca, Durand et al.; Canandaigua, Durand; Honeoye, Durand.

PENNSYLVANIA: Bethlehem, E. A. Rau (Herb. Ellis); West Chester, Everhart and Haines.

WEST VIRGINIA: Nuttallburg, L. W. Nuttall.

ALABAMA: Peters.

OHIO: Preston, A. P. Morgan.

IOWA: Decorah, E. W. D. Holway; Iowa City and Mt. Pleasant, F. J. Seaver.

MACROPODIA SEMITOSTA (B. & C.) Sacc., Syll. 8:159.1889.

Peziza (*Sarcoscyphae*) *semitosta* B. & C., Grev. 3: 153.1875.

Peziza hainesii Ell., Bull. Torr. Bot. Club 8:65.1881

Lachnea hainesii (Ell.) Sacc., Syll. 8:186.1889.

Exsicc.: Ellis, N. A. F. n. 562; E. & E., N. A. F. n. 2740.

Illust.: Cooke, Mycog. *f. 109;* Grev. 3. *pl. 44. f. 225;* Jour. Linn. Soc. Bot. 31. *pl. 16. f. 19.*

Plants sessile or short stipitate, cupulate or urceolate, 2-4 cm. diam.; hymenium creamy-white when fresh becoming brown on drying; cup clothed externally with rufous brown hairs which are obtuse, up to 4-5-septate, scarcely constricted at the septa, rather thin walled, up to 350μ long, rarely longer; stem when present stout, more or less longitudinally plicate and sometimes lacunose below. Asci clavate-cylindrical, apex rounded, 300-325x15μ; spores uniseriate, hyaline, continuous, granular-roughened, elliptical to elliptical-oblong, 25-33x10-12μ (majority 28-32μ); paraphyses cylindrical, apex slightly thickened, septate, brown.

On rich woodland soil, burnt soil, or much decayed wood, Aug.-Oct. Pennsylvania and Delaware.

I have not seen this species in the fresh state and so can give no more information about it than can be gotten from herbarium material. It seems to agree in size, form, color, and certainly in the structure of the excipulum, with *M. fusicarpa,* the chief differences being found in the somewhat longer external hairs, and the shape and size of the spores. The latter are relatively much broader being elliptical or oblong-elliptical with rounded ends, rather than fusiform, and average 28-32μ long as against 36-41μ in *M. fusicarpa.* The largest spores of *M. semitosta* barely surpass the smallest ones of *M. fusicarpa.*

Dr. Michener's collections seem to be somewhat immature, but Mr. Ellis's material seems to be better developed. The spores present agree perfectly in all the specimens. In the type of *M. semitosta* they measure 25-33x10-12μ, while in that of *P. hainesii* they are 30-31x10-12μ.

Material examined: PENNSYLVANIA: Dr. Michener, n. 3936; West Chester, Haines and Jefferies.

DELAWARE: Wilmington, A. Commons.

Botanical Department, Cornell University.

NOTES FROM MYCOLOGICAL LITERATURE XVII.

W. A. KELLERMAN.

SYMBIOSIS IN THE GENUS LOLIUM, E. M. FREEMAN, Minn. Bot. Studies, 3: 329-334, Oct. 18, 1904, admits that it cannot be affirmed without reservation that the entire life-history of L. temulentum is understood, but it can be affirmed that the yearly life-cycle is known, and that the parasite can live on indefinitely, infecting generation after generation of Lolium plants without spore generation. Professor Freeman also says that the nature of the fungus still remains an open question. "I have previously enumerated the objections to the assignment of this fungus to the ergot-forming parasites and it certainly has little or no resemblances to the Uredineae. Nor has it any similarity to the Hyphomycetes and Pyrenomycetes of molded grains. The Ustilagineae seem to furnish the closest affinities."

Terminology of the spore-structures in the Uredineales, J. C. Arthur, Bot. Gaz. 39:219-222, March 1905, contains this suggestion relative to proposed designation: "The new terms consist of four words, with their derivatives, one for each of the four stages of uredineal fungi. For the sorus of the initial stage, usually designated by a cipher, and called spermogonium, pycnidium, etc., I propose *pycnium;* derivatives *pycnial, pycniospores,* etc. For the sorus of the first spore-stage, usually designated by the Roman numeral I, and called aecidium, roestelia, peridermium, etc., I propose *aecium;* derivatives *aecial, aeciospore,* etc. For the sorus of the second spore-stage, usually designated by the Roman numeral II, and called uredosorus, etc., I propose *uredinium* (uredo); derivatives *uredinial, urediniospore* or if preferred *uredospore,* etc. For the sorus of the third spore-stage, usually designated by the Roman numeral III, and called teleutosorus, I propose *telium;* derivatives *telial, teliospores,* etc."

The common Ithphallus impudicus, generally considered to be a saprophyte only, has been found to be the cause of a destructive root rot of the vine in Hungary. According to the account given by Istvanffi (Ann. Inst. Cent. Ampelologique Roy. Hongrois 3:1-55, 1904) the subterranean part of the stem is entwined by a network of the characteristic cord-like strands of mycelium of this fungus. From these, branches are sent into the interior of the stem. Small roots are totally destroyed by strands which penetrate them lengthwise, destroying all the tissues and leaving only the thin decaying cortex. In the older roots the cortex and phloem are totally destroyed, leaving only a mass of debris. The wood cylinder is last attacked, but this also is finally destroyed, leaving only scattered remnants of the vessels. [H. Hasselbring in Botanical Gazette.]

Sexual Reproduction in the Rusts by A. H. Christman, Botanical Gazette, April 1905, can not be sufficiently indicated in a word but possibly the following quotation may show the trend of the article: "Maire's conception that the nuclear fusion in the teleutospore is a *mixis,* was developed on the basis of the belief that no real cell fusion occurs in the life cycle of the rusts. It is at least a fair presumption that while no nuclear fusion occurs in the aecidium, the fusion of gamete cells described above presents all the essential features of sexual conjugations as found in other plants and animals. Superficially considered, Raciborski's conception that the sexual union may be regarded as consisting of two phases, cell fusion and nuclear fusion, might seem to fit the conditions found in the rusts. I am inclined, however, to accept Blackman's conclusion that the fusion in the teleutospore has wholly to do with the reduction of the number of chromosomes."

Otto Jaap, Fungi Selecti Exsiccati, Serie 4, Ausgegeben im Oktober 1904, contains: (76) Taphridium umbelliferarum f. peucedani, (77) Taphria coerulescens, (78) Exoascus alni incanae, (79) Mycosphaerella salicicola f. amygdalinae, (80) Ophiognomonia padi Jaap n. sp. on Prunus padus, (81) Diaporthe valida, (82) Aporia Jaapii Rehm n. sp. on Aspidium squamulosum, (83) Naevia Rehmii Jaap n. sp. on Juncus anceps, (84) Briardia purpurascens, (85) Lachnum arundinis, (86) Desmazierella acicola, (87) Mitrula pusilla, (88) Urocystis Fischeri, (89) Setchellia punctiformis, (90) Melampsora amygdalinae, (91) Uromyces ranunculi-festucae, (92) Uromyces scirpi f. hippuridis-scirpi, (93) Uromyces scirpi f. glaucis-scirpi, (94) Puccinia angelicae-bistortae, (95) Rostrupia clymi, (96) Cyphella gregaria, (97) Polyporus brumalis, (98) Diplodina obionis Jaap n. sp. on Obione portulacoides, (99) Ovularia vossiana, (100) Didymaria linariae; and Supplement: 1. Magnusiella potentillae, 2. Nectria episphaeria, 3. Septoria nigerrima.

The effect of different Soils on the Development of the Carnation Rust is discussed by John L. Sheldon of the West Virginia Agricultural Experiment Station, see Bot. Gaz. Sept. 1905. The experiments reported and conclusions drawn are interesting, but since they are of little or no taxonomic significance they must be passed without further comment — with the remark, however, that he found that the soils favorable for the host were also favorable for the Rust.

Roland Thaxter, A New American species of Wynnea, Botanical Gazette, April 1905. It was found by the author in 1888, in Tennessee, growing on the ground in rich woods, in a single locality, where several clusters of its long bluntly pointed, rabbit-ear-shaped, dark brown apothecia were scattered in a limited space, each cluster borne on a well defined stout stem, emerging directly from the humus. The same thing was collected also in Ohio. Dr. Thaxter named the species Wynnea americana, illustrating the same by two plates — one showing the plant natural size and the other showing asci, spores and other details.

Minnesota Helvellineae, Daisy S. Hone, Minnesota Botanical Studies, 3: 309-321, Pl. XLVIII-LII, Oct. 18, 1904, is a list of 14 species, with newly written descriptions, all splendidly illustrated on heliotype plates.

Observations on Physalacria inflata (Schw.) Peck, by Jessie M. Polley, Minnesota Botanical Studies, 3:323-8, Pl. LIII, Oct. 18, 1904, treats of the rare and interesting fungus that was named Leotia inflata by Schweinitz in 1822. A new study of the plant from material collected at Detroit, Minnesota was made by Miss Polley.

J. C. Arthur in Leguminous Rusts from Mexico (collected by E. W. D. Holway), published in the June No. of the Botanical Gazette, 1905, enumerates 37 species. Of these the following are new species: Uromyces rugosa, U. montanus, U. cologaniae, U. clitoriae, U. bauhiniicola, Calliospora holwayi, C. farlowii, C. diphysae, Uredo aeschynomenis, Revenelia lysilomae, R. gracilis, R. pithecolobii, R. inconspicua, and R. pulcherrima. A new genus of Rusts,namely, Calliospora is proposed, with the following diagnosis: Teleutosori arising from beneath the epidermis, soon naked; teleutospores 2-celled by transverse partition, wall colored, with an external layer which swells in water; germ pores 2 in each cell, lateral. Aecidium and uredo wanting. Spermogonia arising from beneath the cuticle, conical.

Contributions to the Biology of Rhizobia, IV: two coast Rhizobia of Vancouver Island, B. C., by Albert Schneider is published in the Botanical Gazette for August 1905, and relates to forms found in the beach vetch, Lathyrus maritimus Bigel., and the beach clover, Trifolium heterodon Gray.

The V. Contribution to the Biology of Rhizobia by Albert Schneider, published in the Botanical Gazette for October 1905, deals with the isolation and cultivation of Rhizobia in artificial media.

Rusts on Compositae from Mexico is an important contribution to the mycology of that region, by J. C. Arthur in the Botanical Gazette for September 1905. They are mostly the collections of Prof. E. W. D. Holway, the list containing 54 species. The new species described are Coleosporium dahliae, C. steviae, Dietelia eupatorii, D. vernoniae, Uromyces senecionicola, Puccinia senecionicola, P. globulifera, P. gymnolomiae, P. caleae, P. axinophylli, P. noccae, P. jaliscana, P. diaziana, P. semi-insculpta, P. egregia, P. zaluzaniae, P. concinna, and P. paupercula.

Fertilization in the Saprolegniales, by B. M. Davis, in the Botanical Gazette, January, 1905, is mainly a critical discussion of Trow's reaffirmed conviction that a sexual act is present in the water molds, etc.; with then the remark that much more work must be done both on the Saprolegniales and Peronosporales before some of the points suggested by Trow's paper will be established.

The Polyporaceae of North America — XII. A synopsis of the white and bright-colored species. Bulletin of the Torrey Botanical Club, 32:469-493, September 1902. "The classification here adopted is acknowledged to be imperfect and artificial, but it is hoped that it will lead to something better when our knowledge of the plants treated is more complete." Synopses are given as in previous installments and the treatment is similar in other respects. The new genera proposed are: Ircipiporus (type Irpex mollis B. & C.); Dendrophagus (type Polyporus colossus Fr.); Rigidiporus (type Polyporus micromegas Mont.); Earliella (type Earliella cubensis Murrill n. sp.); Cubamyces (type Polyporus cubensis Mont.); Coriolellus (type Trametes sepium Berk.); Microporellus (type Polyporus dealbatus B. & C.); Flaviporellus (type Polyporus splitgerberi Mont.); Aurantiporus (type polyporus alboluteus E. & E.); Aurantiporus (type Polyporus pilotae Schw.); Pycnoporellus (type Polyporus fibrillosus Karst.); and Phaeolopsis (type Polyporus verae-crucis Berk.).

Frederick LeRoy Sargent's article Lichenology for Beginners III, published in the Bryologist, Sept. 1905, is illustrated by numerous figures; some of the subjects fully discussed are the chief forms of the thallus, the principal forms of apothecia, and the spores.

What to note in the Macroscopic study of Lichens II, by Bruce Fink, published in the Bryologist, September 1905, is treated under the following subheads: Variation in Lichens, the Apothecium, the Disk, the Exciple, Position of the Apothecia, Stipes and Podetia, Rhizoids and Cilia, Some other structures and Conclusion.

A Note regarding the Discharge of Spores of Pleurotus ostreatus, by C. C. Harmer, is given in the Torreya for August 1905. He says that a large plant left in the room one night, exposed to strong morning sunlight caused the spores to arise from the plant like tiny spirals of smoke or steam, to the height of two or three feet, making a very strange sight.

The Genus Cortinariuss a preliminary Study, by Calvin Henry Kauffman, in the Bulletin of the Torrey Botanical Club, June, 1905, is a partial monograph based on thorough study extending through a period of three years. A key is given for the Cortinarii in the vicinity of Ithaca. The subheads of the article are as follows: Introduction, Historical, General considerations, Generic description, Key to Subgenera, Structure of the pileus and stem, Gills, Spores, Habitat, Identification, and Species. Under the latter a key is given and seven new species described.

A New Polyporoid Genus from South America (called Phylloporia) by William A. Murrill, is noted in Torreya for

September 1904. It is the only species known which occurs parasitic on leaves. Looked at from above, the author says in speaking of the leaves, the host appears to be attacked by a leaf-parasite and it is quite surprising to find on the lower surface the sporophores of one of the Polyporaceae. The pileus is 5-8 mm. in diameter and 0.2-1 mm, thick.

TYCHO VESTERGREN, MONOGRAPHIA DER AUF DER LEGUMINOSEN-GATTUNG BAUHINIA VORKOMMENDEN UROMYCES-ARTEN, in Arkif foer Botanik, K. Svenska Vetenskaps-akademien I Stockholm, Band 4, No. 15, is an important monograph, the subheads being Morphologische Uebersicht, Verwandtschaftsverhaeltnisse, Uebersicht der Species and Diagnosen der species. The spores of 17 species included in the paper, each fully described, are illustrated on two lithographic plates. Eleven of the species are new. Most of the species are from South America (one only occurs in Europe) but a few also have been found in Mexico and the West Indies.

A NEW GENUS OF ASCOMYCETOUS FUNGI by Nathaniel Llyon Gardner forms vol. 2, No. 6, pp. 169-18, pl. 18, University of California publications, Botany, issued July 27, 1905. It is based on Sphaeria (Hypocrea) setchellii Hark., a species that was published some years ago. The generic name proposed is Nigrosphaeria; its scant mycelium penetrates the subhymenial tissues of the host — in the case investigated this being the saprohytic Pseudhydnotria Harknessii, which grows in sandy soil. Both host and parasite are ascomycetous fungi.

THE POLYPORACEAE OF NORTH AMERICA — X. AGARICUS, LENZITES, CERRENA AND FAVOLUS, by William Alphonso Murrill, Bulletin of the Torrey Botanical Club, 32:83-103, February 1905, treats of plants with variable daedaleoid or lamelloid hymenium and light-colored context and spores. The author says they recognize none of the ordinary specific or even generic limitations of the group and that if they are amenable to ordinary methods of cultivation, they would surpass *Oenothera* in supplying most excellent examples of mutation. The treatment of the subject is similar to that in previous installments and needs no further elucidation. It might be remarked that it is not altogether unappalling to some botanists to see the name Agaricus transferred to our common Daedalea quercina — and whether Mr. Murrill's nomenclature and many new genera of the Polyporaceae will be accepted by the older workers remains to be seen.

ORGANISMS ON THE SURFACE OF GRAIN WITH SPECIAL REFERENCE TO BACILLUS COLI, by Haven Metcalf, Science, N. S., 22:439-441, 6 Oct. 1905, is a preliminary note on work done in the Piedmont region and the Rice-belt of South Carolina, in 1903-4. Some of the conclusions are as follows: An immense but variable number and variety of micro-organisms were normally present on the surface of flowers, fruits and leaves. These were different in different localities, and different in successive years in the same locality, and showed no constant association with the host plants studied. . . . The most constantly present organisms were certain yeasts; in greatest number and variety on the peach, asparagus and iris; bue yet characteristically present on the cereals. . . . Bacteria giving the standard reactions of the colon group were found in thirteen out of sixteen rice fields examined, five of the eight wheat fields and all of the oat fields. All three peach orchards and both asparagus patches exhibited coli forms in both flower and fruit; but none were found on either flower or fruit of *Iris verna*.

A PRELIMINARY NOTE ON CLOVER DISEASES IN TENNESSEE by Samuel M. Bain and Samuel H. Essary, Science, N. S., *22*: 503, October 20, 1905, refers to the prevalence, greater or less, of *Uromyces trifolii, Pseudopeziza trifolii,* and *Macrosporium sarcinaeforme* but the author says: The most destructive disease thus far found is what appears to be an undescribed species of COLLETOTRICHUM. In its general appearance this disease very closely simulates the anthracnose of clover (*Stengelbrenner*), described by Mehner and Kirchner and by the latter attributed to the attacks of *Gloeosporium caulivorum* n. sp.

TWO CONIDIA-BEARING FUNGI, CUNNINGHAMELLA AND THAMNOCEPHALIS N. GEN., by A. F. Blakeslee, (with plate), is the first article in the September No. of the Botanical Gazette, 1905. The first species discussed is C. echinulata Thaxter, seldom reported, and the second is Thamnocephalis quadrupedata, growing in a gross dung cluture on fresh sphagum. The new genus is characterized as follows: Thamnocephalis. — Vegetative hyphae fine, continuous, anastomosing. Fructifications erect, consisting of a main stalk supported above the substratum by stout rhizoidal props and bearing a bushy crown of subdichotomously branched fertile hyphae terminated by sterile branches. Spores solitary, borne on the surface of spherical heads. Heads borne at the apex of short lateral stalks which arise at nodes from opposite sides of the fertile hyphae at right angles to their planes of branching.

CHROOLEPUS AUREUS A LICHEN, is what Albert Schneider maintains in the August (1905) No. of the Bulletin of the Torrey Botanical Club. Material collected at Vancouver Island presented opportunity for the study, and here is his conclusion: There seems to be little doubt that the network described represents a fungus symbiotically associated with the alga *Chroolepus aureus*. This association appears to be sufficiently constant to warrant placing this structure, heretofore classed as an alga, with the class *Lichenes*. The fungal symbiont does not appear to develop spores or any other special structures found with the fungal symbionts of the majority of lichens.

Annales Mycologici, vol. III, No. 3, June, 1905, contains: Bubák, Fr., Beitrag zur Kenntniss einiger Uredineen; Rehm, Ascomycetes exs. Fasc. 34; Sydow, Mycotheca germanica Fasc. VII (No. 301-350); Rick, J., Pilze aus Rio grande do Sul; Salmon, Ernest S., The Erysiphaceae of Japan, II; Lederer, Michael, Die Flechtenflora der Umgebung von Amberg; Neue Literatur; Referate und kritische Besprechungen.

Annales Mycologici, vol. III, No. 4., Aug. 1905, contains the following: McAlpine, D., A new genus of Uredineae — Uromycladium; Höhnel, Franz v., Mycologische Fragmente; Vueillemin, P., Identité des génres Meria et Hartigiella; Guilliermond, A., Remarques sur la Karyokinése des Ascomycétes; Cavara, Fr., Causeries mycologiques; Neue Literatur; Referate und kritische Besprechungen.

Hedwigia, Band XLIV, Heft 6, 25 Aug. 1905, has for mycologists the four articles: P. Dietel, Uber die Arten der Gattung Phragmidium II; P. Magnus, Uber die Gattung, zu der Rhizopodium Dicksonii Wright gehört; Fr. Bubàk und J. E. Kabat, Mykologische Beiträge III; P. Magnus, Zwei parasitische Harpographium-Arten und der Zusammenhang einiger Stilbeen mit Ovularia oder Ramularia.

Hedwigia, Band XLIV, Heft 2, 31 Jan. 1905, has the following mycological papers: P. Hennings, Fungi amazonici IV, a cl. Ernesto Ule collecti; Zoltan von Szabo, Uber eine neue Hyphomyceten-Gattung; P. Dietel, Uber die Arten der Gattung Phragmidium (Anfang).

Hedwigia, Band XLIV, Heft 3, 13 Mar. 1905, contains mycological articles, for example: P. Dietel, Uber die Arten der Gattung Phragmidium (Schluss); Jos. Stefan, Beitrag zur Kenntniss von Collybia racemosa Pers.; P. Hennings, Einige schädliche parasitische Pilze auf exotischen Orchideen unserer Gewächshäuser.

The Report of the Botanist of the Connecticut Agricultural Experiment Station for the year 1904, part IV, pp. 311-384, pl. XVIII-XXXVII, issued May 1905, is a discussion by G. P. Clinton under three heads as follows (1) Notes on Fungous Diseases, etc., for 1904; (2) Downy Mildew or Blight, Peronoplasmopora cubensis (B. & C.) Clint.; (3) Downy Mildew, or Blight, Phytophthora infestans (Mont.) DeBy. of Potato. Attention is called especially to the two last articles which are exhaustive. Dr. Clinton takes up the history, systematic classification, life cycle, spraying experiments and conclusions; also for the Melon blight a bibliographical list of all the more important articles on the subject.

JOURNAL OF MYCOLOGY

A Periodical Devoted to North American Mycology. Issued Bi-monthly; January, March, May, July, September and November. Price, $2.00 per Year. To Foreign Subscribers, $2.25. Edited and Published by W. A. KELLERMAN, PH. D., COLUMBUS, OHIO.

EDITOR'S NOTES.

The matter of concise and uniform citation in connection with publication of scientific matter is an affair of such importance and as such so universally recognized that no comment further need be made here; yet do not Periodicals have a duty to perform in the way of facilitating this matter? Are not one or two scientific magazines yet direlict?

These items should invariably be given as a running head line, in addition to page number; on the left page the *Name of the Journal,* and the *Volume Number;* on the right, the *date* (immediately opposite and adjacent to the vol. no.), and the *Topic of the article* (the author's name may be prefixed if desired). If it is a New Series, or Second or Third Series, etc., the *proper abbreviations* should be prefixed to the Volume No. The *Serial No. of the issue* should not be given in the running head lines.

Every periodical should (and practically all do) have a cover. This is very convenient for very mnay purposes — and one of these is the *conspicuous display* of the *Serial No.* of the issue. It is a convenience to the librarian who keeps periodicals in order for patrons, and no less to the person consulting the file. But no reference to the *No.* should be included in an *ordinary citation of literature.* The volume and page are ordinarily sufficient but the date is sometimes advantageous in looking up a reference, though the less the searcher has to hold in mind while hunting the better. We repeat: The *Serial No.* should *not* be given *on any page* of a scientific publication, but should be conspicuous on the cover, the latter to be discarded when the Nos. are bound into a volume.

Professor Schaffner has kindly seen this No. through the press during the absence of the editor.

PRICE LIST.

Journal of Mycology, Vol.	8—1902	$2 00
" " "	9—1903	2 00
" " "	10—1904	2 00
" " "	11—1905	2 00
" " "	Current Vol	2 00
Index to North American Mycology (authors, titles, subjects, new species and hosts, new names and synonyms) since Jan. 1, 1901. *Printed on one side of page.* Seven parts have been issued. Price per part		25
Index to Uredineous Infection Experiments with List of Species and Hosts for North America, *printed on one side of page*		50
Portraits of Mycologists, reprinted from the Journal of Mycology (Peck, Ellis, Arthur, Burrill, Farlow, Tracy, Earle, Atkinson, Holway, Thaxter, Clinton, Magnus, Oudemans, Patouillard, Hennings Rehm, Cooke, Saccardo,, Dietel, each		10
Ohio Fungi exsiccati. Though the set is designed primarily for exchange a few copies are for sale. Issued in fascicles of 20 specimens each. Ten fascicles now ready. Price per fascicle		1 00
Mycological Bulletin. A popular leaflet of 4 pages, illustrated, 24 Nos. per year. Vol. II, 1904, Vol. III, 1905, each 50 cents; bound in cloth, 75 cents. Current year		25
New Genera of Fungi. Published since 1900; the original descriptions reproduced with full citation. Annual Supplements are to follow. Printed on one side of page only. Price		75
First Supplement to New Genera of Fungi published since 1900, with the original descriptions		50
Index to Journal of Mycology, volumes 1-10		75
Mycological Glossary		25

Volume 12, No. 82 *March 1906*

Journal of Mycology

TABLE OF CONTENTS

W. A. KELLERMAN, PH. D.

Professor of Botany, Ohio State University, Columbus, Ohio

Entered as Second Class Matter, Post-office at Columbus, Ohio.

PRESS OF F. J. HEER, COLUMBUS, OHIO.

Cost of Separates.

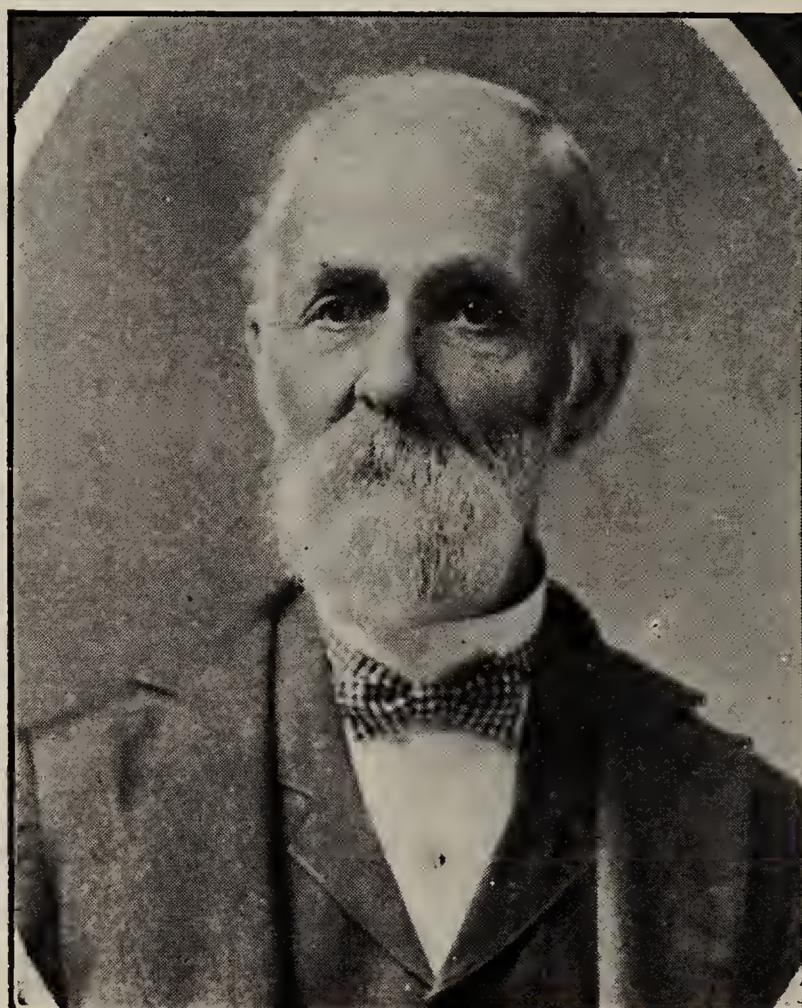
Contributors who desire separates of their articles will receive the same at cost, approximately as follows:

For	4 pages or less:	100 copies	$1 75	200 copies	$2 25
"	8 " "	100 "	2 50	200 "	3 25
"	16 " "	100 "	4 25	450 "	5 50

For more extended articles proportionately higher.

Plates not included in the above.

ADDRESS: EDITOR JOURNAL OF MYCOLOGY



Very truly yours
J. B. Ellis

Journal of Mycology

VOLUME 12—MARCH 1906

TABLE OF CONTENTS

OBITUARY—JOB BICKNELL ELLIS.

W. A. KELLERMAN.

Mr. J. B. Ellis, one of the former editors of this Journal, passed away December 30, 1905. When the present editor proposed to publish a Journal of Mycology in 1885 Mr. Ellis heartily joined in the enterprise and agreed to furnish practically all the copy for the unpretentious periodical. Though three names are printed as editors on the title page of the first four volumes it was Mr. Ellis alone who furnished most of the articles and gave the character to the Journal. It was then, as it is now, largely taxonomic and devoted to the American Fungi. The pages record incidentally a wonderful expansion of American Mycology during the past two decades. Mr. Ellis did more than any other botanist during the period of his mycological activity toward making known the parasitic fungi of the United States. The Journal of Mycology was an avenue of publication not only for his many species; but the monographs published in the first four volumes of the Journal made it possible for many botanists to undertake the study of the parasitic species. We estimate highly the influence this exerted on the development of American Mycology. His multitudes of new species were of course not all published in this periodical — his contributions appearing in great number in the Botanical Gazette, Torrey Bulletin, American Naturalist, Proceedings of the Philadelphia Academy and elsewhere. His early work in connection with Dr. M. C. Cooke of England, a veteran still living, appeared in Grevillea. This period, 1875 to 1879, might be regarded perhaps as Mr. Ellis' apprenticeship — and surely a good foundation was laid. Subsequently the herbarium he had already built up, and the mycological library then accumulated, though not large, furnished him with the equipment for independent work. He did not make extended collecting trips over the country; but he brought together from a small area an immense number of new fungi; and specimens from young and enthusiastic collectors and incipient botanists poured in upon him. Over this he worked with great diligence. His descriptions are of course not always full, his knowledge of some things he published was scant, but who could or did do better! Pioneers can not do the critical work that is possible to the well trained student who has the advantage of all the facilities and appliances later developed. Perhaps not more to his contributions in print than to his work on exsiccata is due the impetus he gave to the study of mycology in this country for the quarter of a century during the period of his greatest activity. He began his Fungi Nova-Caesariensis about 1878, but soon changed the title to North American Fungi, and "N. A. F." can well be regarded as classic in American Mycology. A second set was begun later called Fungi Columbiani. The large number of subscribers both at home and abroad shows the high estimate placed on these exsiccata. The contributions of various young botanists over the country assisted materially of course in the issuance of so many centuries, though one needs merely to glance at the list of specimens to see what a large number Mr. Ellis collected with his own hands. Mention must be specially made of the personal assistance given by him to so many correspondents — those who were beginning the study of fungi, especially the parasitic species. Even with the pressure of the work entailed by undertaking to report on such material sent to him, never was one seeking help denied assistance; an answer was sure to come by the next mail. Recognition therefore can justly be accorded for the indirect as well as the direct part Mr. Ellis took in the development of Mycology in this country.

Great industry on his part and the activity of many persons throughout the country enabled him to accumulate a vast herbarium rich in type specimens. This was purchased a few years ago by the New York Botanical Garden.

No list will here be given of the numerous contributions published by J. B. Ellis, all the articles being fresh in the memory of the working mycologists, but special mention must be made of his important work of 793 pages and 41 full page plates bearing this self-explanatory title: The North American Pyrenomycetes, a contribution to Mycologic Botany, by J. B. Ellis and B. M. Everhart, with original illustrations by F. W. Anderson; published by Ellis and Everhart, Newfield, New Jersey, 1892.

It is interesting to note the beginning of a correspondence with the mycologist Ravenel of South Carolina, which perhaps influenced him to work along the line he thereafter so conspicuously followed. It is said by one who wrote a sketch of his life a few years ago that Mr. Ellis saw by chance a notice of "Fungi Caroliniani exsiccati," the first thing of the kind ever issued in America. He at once wrote to the author of that work, and the correspondence was permanent — interrupted only by Ravenel's death. The first letter was written in 1857 and doubtless this friendship was one of the incentives to Mr. Ellis' persistent and fruitful labors in the mycological field.

Allusion has just been made to the sketch of Mr. Ellis' life, prepared by Mr. Anderson a few years ago and published in the Botanical Gazette. The latter spent much time at the home of Mr. Ellis while making the drawings for the North American Pyrenomycetes. Mr. Anderson was a most promising and enthusiastic mycologist taken away unfortunately when just beginning a career of great usefulness, and I consider it a tribute to him as well as to Mr. Ellis that I can select from his sketch of Mr. Ellis the salient points in the several following paragraphs:

J. B. Ellis was born in Potsdam, N. Y., Jan. 21, 1829. Industrious over his books when not at work on his father's farm he was prepared at the age of sixteen to teach a winter-school, for which service he received ten dollars a month and "boarded around." This doubtless well-earned salary was paid partly in cash (five dollars) and partly in grain, the last of the grain being turned over to him, says Mr. Anderson, just twenty years afterward. In June, 1851, Mr. Ellis graduated from Union College. While a student here he paid some attention to botany. He taught at various schools, but no positon seemed to be very permanent. His interest in plants continued unabated. In 1853, while a classical teacher at Bartlett's Boarding School in Poughkeepsie during two years, he collected plants on Saturdays and, said he, "on Sunday, too, if he could steal away, for Mr. Bartlett was very pious." In the fall of 1856 he became principal of the Canton Academy and in 1863 went into one of the public schools of Pottsdam village. During the war of the rebellion he was in the United States Navy. At the close of the war he settled at Newfield, New Jersey, where he resided until his death.

It was not, however, until 1878 that Mr. Ellis began devoting his whole time to the study of Fungi. With characteristic modesty he refrained from attending scientific meetings, so that practically all of the botanists and many amateurs, though they know his name as of an old friend, never met him personally. Mr. Anderson says that with considerable quiet humor he tells how that when he was teaching at Mr. Bartlett's School, he determined on three different occasions to go down on the boat to New York and stay there several days to "do the city" and each time returned home on the first train he could get, suffering with a violent headache caused by the excitement of the trip and the noisy bustle of the city. In spite of ill health he attained an age not far from three score and ten. He was industrious and studious; a good linguist as well as botanist; of sensitive nature; always practiced the strictest simplicity and regularity in his daily life.

The hundreds of new species by Ellis, very many tagged *E. & E.*, also many by *E. & M., E. & Hk., E. & Hol., E. & Hals., E. & Barth., E. & Dear., E. & Fairm., E. & Morg., E. & Lang., E. & K.*, also still other initials, testify to Mr. Ellis' activity. Then the long list of species designated as *"ellisii"* and *"ellisiana"* by other botanists witnesses the high appreciation of his services to systematic mycology. The genus "Ellisiella" was also named in his honor by Saccardo. Dr. Farlow's bibliography on North American Fungi shows a long list of articles by J. B. Ellis, also many signed Ellis & Everhart, Ellis & Harkness, Ellis & Holway, Ellis & Kellerman, Ellis & Martin; more recently still other names have been in the same manner associated. Mr. Ellis was also honored by important foreign societies, for example in July, 1878, he was elected a corresponding member of the Academy of Natural Sciences of Philadelphia. In August, 1882, he was elected a corresponding member of the Cryptogamic Society of Scotland and in December of the same year was elected a corresponding member of "Die Kaiserlich-Königliche Zoologisch-Botanische Gessellschaft in Wien."

Mr. Wm. C. Stevenson, Jr., an intimate and appreciative friend of Mr. Ellis for many years, has kindly furnished me the following statement:

"The first time I had the pleasure of meeting Mr. J. B. Ellis was in April, 1873. We previously had corresponded on Mycological subjects and exchanged some few specimens, but at the time mentioned being in the neighborhood of Newfield took the opportunity of calling on him. I received a warm cordial welcome and was soon in his study examining some of his recent finds. The limited time at my disposal passed only too rapidly, but it was the beginning of a close, personal friendship, which lasted until his death. It grew stronger with each recurring year, and I had an opportunity of learning his nature, such as few of his other correspondents had.

His kind, genial open heartedness was always a strong point in his character, and no true student of the Fungi ever had cause for regret if he acted with a tithe of the confidence and fairness which was shown by him.

He was willing to divide honors in his public work, which while it for the time placed another in an equal light with himself, yet in the end only tended to brighten and enhance his own standing among the leaders in his chosen field. He certainly acted on the principle that it was "better to give than receive," and in the end it bore fruit to his credit far above what he could have expected.

The many tramps we had together in the fields and woods around Newfield were particularly gratifying to me, as I had on such occasions opportunity to see how unbiased and open he was in his thoughts and dealings. They were, so to speak, academic treats to me, the pupil learning from the master who was always patient and willing to impart his knowledge and overlook shortcomings on the part of his companion. In 1884 the British Association for the Advancement of Science met in Canada, and the American Association in Philadelphia. It was arranged that a joint meeting of the botanists of the two associations should be held at the Academy of Natural Sciences in Philadelphia on the evening of September 8. Mr. Ellis was present at that joint meeting. Here for the first time he met scores of workers in the botanical and mycological fields whom he had known by name and through correspondence. It was a great treat to him, and he often rehearsed to me the pleasure that evening gave to him. It seemed to add new spirit and enthusiasm to his future work and plans.

His visits to my home were looked forward to by me as special treats, and my expectations were always more than realized. His strong cardinal points as I saw and knew him were honesty and charity in the fullest degree."

Very fitly this short account of the life and work of Mr. Ellis may conclude with a reference to his devoted wife, who ceased her work some years ago. The statement I take entire from Science, Aug. 11, 1899:

In the death of Mrs. Arvilla J. Ellis, of Newfield, New Jersey, on July 18, 1899, there passed away another of those patient workers to whose fidelity science owes so much. Not known as a botanist, not a member of a scientific society, not the author of a scientific paper, she nevertheless contributed more to the advancement of our knowledge of the fungi than many of those whose names are frequently appended to scientific articles in the journals. Many years ago she began aiding her husband, Mr. J. B. Ellis, in the arduous labor of preparing and mounting the specimens for the 'North American Fungi' and later for the 'Fungi Columbiani,' and with her own hands bound the books in which these were delivered to subscribers. Had it not been for her help the first of these great distributions — numbering 3,600 specimens — would have been suspended early in its history, and the second — numbering 1,400 specimens — would never have come into existence. To her deft fingers, which wrought so patiently, botanical science is indebted for the more than two hundred thousand specimens of the fungi which Mr. Ellis distributed to the botanists of the world.

RUST NOTES FOR 1905.

J. M. BATES.

Finding the aecidium of Puccinia subnitens growing on several species of Chenopodiaceae, Cruciferae, and on Cleome serrulata, I determined to test it on Monolepis Nuttalliana. The culture was made April 6. May 12 several ripe aecidia were found, but many more on Roripa sinuata which grew with it and on Bursa bursa-pastoris. It is very nearly immune. Cultures made on Sophia incisa showed more affiliation than those on Bursa, some of which failed entirely. Lepidium apetalum shows itself a good host. Culture on Chenopodium hybridum failed; probably made too late. It has been made earlier this year.

April 18th I brought down from Orleans Puccinia poculiformis on Elymus canadensis to test on a hedge of Berberis vulgaris. It looked very strong, but when the aecidia appeared, I could find no more near the culture than fifty feet away, and but little more than the year before without culture. Nor could I find any such Puccinia growing within several blocks of the hedge, though abundant on Hordeum jubatum and other hosts a mile south.

May 14th I made a culture of Puccinia amphigena, Calamovilfa longifolia, on the only plant of Smilax hispida found in three years, in this region. It grows a mile away from the grass, and, the year before, had no æcidium on it. The winter before my experiment, it had been cut to the ground. The fresh shoots were therefore in fine condition for this late experiment. I had no chance to view it until June 10, when I found the whole plant covered with æcidia. As the Puccinia grows in abundance miles away from any species of Smilax in Cherry Co. there can be no doubt that it has the same faculty as Puccinia poculiformis of living over without the first stage. The appearance of this rust at the late date of May 14 is specially interesting. I hope to test it much earlier this year.

June 14, three miles west of Red Cloud, I found one plant of Oenothera biennis, about 15 inches high, with ripe æcidia *covering the under side* of the lowest leaves and unripe ones following the leaves as they developed to the very summit. As Aecidium Peckii comes in distinct sori, I saw that I had something new, and gathered all that was fit. Looking then for the clue, I found Carex Pennsylvanica growing all around it and uredo in abundance within three feet, growing scarcer as you departed from the source, until at four feet there was none at all. The patch of grass land on which it grew had been burned over, the previous winter, so that I found No. III, though of course some of it had escaped. I cöllected a set of the uredo. June 20 I was in Sargent, Custer Co., and found the same rust on Oenothera biennis, Oe. sinuata and Carex Pennsylvanica, in vacant town lots. Four miles out, I found it again, and the next day in Arcadia again. Dr. Bessey says he found it once in Iowa on Oe. biennis and Prof. Holway reports the same. Nov. 3, I was able to collect a set of III. on Carex Pennsylvanica at Red Cloud, and since then have made collections of same at Sargent. The III. looks like a pale weak uredo, but Prof. Holway reports it as a good teleutosporic form and a new species.

I have given these details, because it seems to me that the relationship between the two or three hosts is abundantly established. Nevertheless "to make assurance doubly sure," I have sent material to Dr. Arthur and have made several cultures myself on different hosts of the Onagraceæ.

Red Cloud, Nebraska.

MICROMYCETES AMERICANI NOVI.

Lecti a cll. Doctoribus C. E. Fairman et S. Bonansea
Auctore P. A. Saccardo.

Fungilli aliquot novi, qui hic describuntur, lecti et missi fuerunt a viris prælaudatis. Cl. Doct. Charles E. Fairman eos decerpsit prope Lyndonville, Orleans County, N. Y., non longe a lacu Ontario et notis nonnullis declaravit. Cl. Doct. Silvius Bonansea Italus, sed nunc Mexici incola, mycetes suos collegit in Monte del Disierto in Tenancingo, in quo districtu zona temperata calidae jungitur.

I.

Mycetes boreali-americani a Doct. Fairman lecti

A. Teleomycetae.

1. Hypoxylon pumilio Sacc. et Fairm. sp. n. — Minutum, extus e roseo isabellinum, breviter effusum, rarius in acervulos exiguos 1 mm. latos limitatum, plerumque 4-6 mm. long. 2 mm. lat., applanatum v. vix convexulum; peritheciis unistratosis perexiguis, globulosis vix 200 μ diam., medietate superiori discretis, hinc prominulis, extus tenuiter roseo-pruinosulis, intus nigris, ostiolo brevissimo lato obtuso, minutissime pertuso, fere deterso hinc nigricante, 90-100 μ diam., ascis cylindricis deorsum sensim tenuato-stipitatis, apice rotundatis, 130 x 6-8, parte sporif. 70-80 μ longa, octosporis; paraphysibus filiformibus ascos multo superantibus; sporidiis oblique monostichis, ovato-oblongis, inaequilateris, 12-14 x 5.5-6, fuligineis, crasse 2 guttatis, rarius guttulis inaequalibus 3-4 foetis.

Hab. in ligno putri in silvis pr. Lyndonville, N. Y., Sept. 1905.

Nonnihil affine *H. nectriodeo* Sacc. et Fr. et *H. nectroidi* Speg. a quibis mox dignoscitur peritheciis applanato-effusis, multo minoribus. Stroma, cui perithecia insituntur est maculiforme, pariter roseo-isabellinum. Species pertinent ad subgenus *Placoxylon* Sect. *a.*

2. Xylaria brevipes Sacc. et Fairm. sp. n. — Stromatibus solitariis v. rarius binatis, lignicolis, cylindraceis, basi rotundatis paullo crassioribus, sursum sensim tenuatis, brevissime stipitatis, ob ostiola acutiuscula vix prominula asperulis, glabris, opace nigris, intus candidis, totis 2.5 cm. longis, 3 mm. diam.; stipite crassiusculo, cylindraceo, longitrorsum sulcato, glabro, nigro, 1-3

mm. long., 1-1.5 mm. cr., peritheciis immersis, globosis, monostichis, 250-300 μ diam., nigris; ascis cylindraceis longe sensimque tenuato-stipitatis parte sporif. 70 x 5.5-6; sporidiis recte v. oblique monostichis, ellipsoideis, inaequilateris, utrinque obtusatis, 11-12 x 4-4.5, fuligineis.

Hab. ad truncos dejectos pr. Lyndonville, N. Y., 1905.

Pertinet ad subgen. *Xyloglossa* Sect. *b.* Habitu aliquid accedit ad *X. corniformem* et *X. cupressiformem* sed characteribus variis recedit.

3. Erostella transversa Sacc. et Fairm. sp. n. — Peritheciis inter librum et periderma evolutis et rima transversali crassiuscule marginata circ. 2 mm. longa erumpentibus sed non emergentibus, in quoque acervulo 4-6, globulosis, 500-750μ diam., peridermate secedente subliberis et saepe collapso-concavis, glabris, nigris, collis brevissimis, ostiolis obtusis; ascis clavatis, subsessilibus sed deorsum tenuatis, apice rotundatis, 44-48 x 5.5-6, octosporis; paraphysibus filiformibus, asco multo longioribus minute guttulosis; sporidiis distichis allantoideis, leviter curvis 8-9 x 2.5, perfecte hyalinis.

Hab. in cortice *Betulae* sp. in silvis pr. Lyndonville, Sept. 1905.

Ab Erostella vasculosa Sacc. et E. ambigua (Berl.) Sacc. differt sporidiis brevioribus, angustoribus, peritheciis rimose transverseque erumpentibus, etc. Cl. Berlese anno 1900 (Ic. fung. III, p. 9) instituit gen. *Togninia* quod essentialiter congruit cum subgen. Erostella (Calosphaeriae) a me condito anno 1882 (Syll. I, p. 101) quod ergo praeferri debet.

4. Rosellina elaeospora Sacc. et Fairm. sp. n. — Peritheciis late et dense gregariis, superficialibus, globosis, glabris, circ. ½ mm. diam., papillatis, senio papilla amissa perforatis, carbonaceis, nigris; ascis tereti-elongatis, deorsum tenuato-stipitatis, 60 x 7-8 μ octosporis, filiformi-paraphysatis; sporidiis oblique monostichis, elliptico-navicularibus, inaequilateris, utrinque obtusatis, 13-15 x 4.5-5 μ, rarius usque ad 16 x 5.6 μ, fumoso-oblivaceis, 2-3 guttulatis v. granulosis.

Hab. ad truncos putrescentes dejectos in silvis pr. Lyndonville, N. Y., Sept. 1905.

Praesertim sporidiis fumoso-olivaceis dignoscitur.

5. Otthiella Fairmani Sacc. sp. n. — Peritheciis in acervulos minutos, suborbiculares, 1 mm. diam., erumpenti-superficialibus, in quoque acervulo paucis (5-7), globosis, subinde paullulum connatis, non v. obtuse papillatis, nigris, glabris, 400 μ diam.; ascis tereti-elongatis, utrinque tenuatis, subsessilibus, 110-130 x 13-15μ, octosporis; paraphysibus filiformibus, copiosis; sporidiis distichis, oblongo-fusoideis, curvulis, utrinque acutulis, media septatis et denique constritulis, 30-32 x 5.5-6 μ, hyalinis v. dilutissime ochraceis, articulo super. saepe paullo crassiore.

Hab. ad cortices dejectos in silvis pr. Lyndonville, N. Y., 1905.

A ceteris generis specieibus omnino diversa.

6. Leptospora sparsa Sacc. et Fairm. sp. n. — Peritheciis superficialibus, sparsis, globulosis, carbonaceis, nigris, glabris, 300-400 μ diam., breviter obtusule papillatis; ascis elongato-cylindraceis basi sensim tenuato-substipitatis, 112-120 x 8-9 μ, octosporis, apice paullulum tenuatis, rotundatisque; sporidiis distichis, cylindraceis sursum curvatis, 33 x 4 μ, continuis, hyalinis, eguttulatis.

Hab. ad ligna putrida in silvis pr. Lyndonville, N. Y., 1905.

Peritheciis laxe sparsis, glabris, minoribus, non pachydermaticis, sporidiis non nucleatis, etc., a *Lept. spermoide* aliisque distinguenda species.

7. Leptosphaeria perplexa Sacc. et Fairm. sp. n. — Peritheciis gregariis, epidermide initio velatis, mox liberis, globosis, basi applanatis, nigris, nitidulis, 250-300 μ diam., ostiolo conico-acuto, tertiam perithecii partem subaequante praeditis, vetustis submuticis; ascis cylindraceis, breve stipitatis, filiformi-paraphysatis, 85-90 x 10-11 μ, octosporis; sporidiis breve fusoideis, utrinque acutulis, curvulis, 3-septatis, non v. vix constrictis, 22-25 x 5-6 μ flavido olivaceis.

Hab. in caulibus emortuis *Solidaginis* sp., pr. Lyndonville, N. Y., Sept. 1905.

Exemplaria in Boltonia forte eandem speciem sistunt, sed senescentia. A typica *Lept. doliolo* (in Angelica, etc.) differt peritheciis fere dimidio minoribus et ostiolis typice longioribus et acutioribus. Exemplaria in Dipsaco apud Rehm Ascom. n. 194 potius hanc speciem quam *Lept. doliolum* spectant.

8. Ceratostoma Fairmani Sacc. sp. n. — Peritheciis late et laxe gregariis, ligno putri molli fere totis immersis, globulosis, 0.4-0.5 mm. diam., nigris, glabris, rostellatis; rostello cylindraceo-acutiusculo, 500 x 100μ, nitidulo, levissime longitrorsum sulcato; ascis fusoideo-clavatis, subsessilibus, deorsum sensim tenuatis obtusisque, apice quoque leviter tenuatis obtusisque, octosporis, 19-22 x 8-8.5, aparaphysatis; sporidiis oblique monostichis v. subdistichis, ellipsoideis, 7 x 3-3.5 μ, e fronte rectis, e latere curvis, olivaceis, inaequaliter 1-3-guttulatis.

Hab. in truncis putridis pr. Lyndonville, N. Y., Oct. 1905.

Affine *C. avocettae*, a quo differt ascis subfusoideis, aparaphysatis, sessilibus, sporidiis brevioribus, etc.

B. *Deuteromycetae.*

9. Micropera ampelina Sacc. et Fairm. sp. n. — Pycnidiis sparsis v. seriatis, erumpenti-superficialibus inaequaliter globosis, astomis, ceraceo-membranaceis, olivaceis, albo-furfura-

ceis, 700 μ diam., basi stipitiformi crassa, 400 μ longa immersa praeditis, intus albidis farctis, excipulo minute celluloso, strato proligero crasso dilute olivaceo; sporulis tereti-fusoideis, curvis, utrinque obtusulis, 28-30 x 7.5-8 μ farctis, hyalinis; basidiis bacillaribus 15 x 2.5, hyalinis.

Hab. in ramulis nondum emortuis *Vitis viniferae,* Ridgway, Orleans Co., N. Y., Aug. 1904.

A ceteris generis speciebus probe distincta. Furfur a granulis crystallinis refrangentibus constat. Sporulae initio ellipsoideae rectiusculae, 10-11 x 4-5 μ.

10. Verticillium discisedum Sacc. et Fairm. sp. n. — Minutissimum, confluendo effusum pruinam album maculiformem in *Lachneae* disco fingens; hyphis sterilibus repentibus, parcis, fertilibus seu conidiophoris brevibus, 50-80 x 4 μ, plerumque cedo 1-septatis, sursum trifidis, ramis tereti-fusoideis apice ramulos seu basidia verticillato terna v. quaterna cuspidata, raepe curvula, 15-20 x 3 μ, gerentibus; conidiis obovoideis, majusculis, continuis, hyalinis, eguttatis, 8.5-9 x 5.5-6, in basidiorum apice solitariis.

Hab. in disco *Lachneae hemisphaericae,* Lyndonville, N. Y., 1905.

Affine *Verticillia epimyceti* sed colore albo, conidiis majoribus differt.

11. Helminthosporium orthospermum Sacc. et Fairm. sp. n. — Late effusum tenuiter, velutinum, opace nigrum; hyphis sterilibus repentibus parcis; fertilibus seu conidiophoris erectis, simplicibus, interdum fasciculatis, rectis, 3-4-septatis, non contrictis, 50-60 x 5 μ, fuligineis; conidiis cylindraceis, apice rotundatis, basi ima conico-truncatis, rectis, 60-80 x 10-12, rarius usque ad 110 μ longis, 12-14 septatis, non constrictis, septis binis summis approximatis, fuligineis.

Hab. in ligno putrescente (quercino?), Lyndonville, N. Y., Julio, 1905.

Subaffine *Helm. folliculato* sed distinctissimum conidiophoris multo brevioribus et conidiis multo longioribus.

II.

Mycetes Mexicana a Doct. S. Bonansea lecti.

A. Teleomycetae.

Bonanseja Sacc. n. gen. (Etym. a cl. doct. Silvio Bonansea fungi detectore.) — Ascomata epidermide tecta dein erumpenti-subsuperficialia, disciformia, ceracea (brunnea), disco mox aperto, applanato; exciptulo brevissimo obsolete prosenchymatico. Asci cylindracei, paraphysati, octospori. Sporidia sphaeroidea hyalina, nucleata, dein brunnea.

Gen. *Stictophacidio* Rehm affine sed praecipue sporidiis globosis distinguendum. Est quasi *Pseudopeziza* Sphaero-phaeospora.

12. Bonanseja Mexicana Sacc. sp. n. — Ascomatibus epiphyllis, secus nervos seriatis et interdum confluentibus, rimose erumpentibus et peidermide bullata exalbata tectis v. cinctis, disciformi-applanatis, 400-600 μ diam., tenuissime marginatis, ambitu circulari-angulosis, umbrinis, ceraceit; ascis cylindraceis rarius cylindrico-clavulatis, 100 x 8 v. 100 x 11 (si clavulatis deorsum sensim tenuatis, parte sporif. 50-60 μ longa, apice obtusis, octosporis, paraphysibus bacillaribus, hyalinis, 2-3 μ cr., continuis, simplicibus; sporidiis typice monostichis, rarius subdistichis, globosis, 7-8 μ diam, initio hyalinis, dein brunneis, 1-raro 2-nucleatis, levibus.

Hab. in foliis languidis v. emortuis *Anonae cherimoliae,* Tenancingo, Mex., 1905.

Excipulum tenuissimum rufo-melleum, granulis crystallinis copiosis asperulatum.

B. Deuteromycetae.

13. Phyllosticta consors Sacc. sp. n. — Pycnidiis hypophyllis, raro et epipylls, n maculis, *Phleosporae Mori* hinc inde dense aggregatis, globulosis, prominulis, 70-80 μ diam., ostiolo exiguo impresso; sporulis ellipsoideo-oblongis, saepe curvulis, 4-4.5 x 2-2.1 μ, hyalinis, minutissime 2-guttulatis.

Hab. in maculis ochraceo-brunneis *Phleosporae Mori,* ad folia *Mori albae* cultae, Tenancingo, Mex., No. 1905.

14. Hendersonia Mexicana Sacc. sp. n. — Maculis minutis, epiphyllis, subinde paullulum elevatis, nigricantibus non v. vix discolori-marginatis, circ. 1 mm. diam.; pycnidiis subhemisphaericis, epidermide velatis sed prominulis, 140-160 μ diam., subastomis; contextu minute celluloso, fuligineo; sporulis tereti-oblongis utrinque obtuse rotundatis, 3-septatis, ad septa constrictis, 12-14 x 5.5-7 μ, fuligineis; basidiis obsoletis.

Hab. in foliis languidis *Perseae gratissimae* vulgo *Aguacate,* Tenancingo, Mex., Nov. 1905.

Ad subgen. *Phyllohendersoniam* spectat. Septa manifestissima.

15. Gloeosporium apiosporium Sacc. sp. n. — Maculis angulosis v. subcircularibus, amphigenis, brunneo-alutaceis, 6-8 mm. diam., saepe confluentibus, nervis obscuratis limitatis; acervulis plerumque hypophyllis, innatis, creberrimis, punctiformibus, brunneis; conidiis obpiriformibus, apice rotundatis, 8 x 2.5 μ, crasse 1-2-guttatis, sessilibus, in cirros filiformes, tortuosos, copiosissimos, alutaceos demum totas maculas obtegentes protrusis.

Hab. in foliis languidis *Arctostaphyli tomentosae* vulgo *Madrono de arbol,* in territorio Mexici, Nov. 1905.

Gl. alpino affine. Basidia nulla v. brevissima.

16. CERCOSPORA COLEROIDES Sacc. sp. n. — Maculis amphigenis, subcircularibus, 3-5 mm. diam., subgriseis linea atrobrunnea cinctis; interdum confluentibus; caespitulis amphigenis laxe gregariis punctiformibus, artis 200 μ diam., hypostromate celluloso, pulvinato, fuligineo, erumpente; conidiophoris e superficie hypostromatis orientibus dense stipatis, paliformibus, simplicibus, continuis, olivaceis, 40-50 x 5.5-6, apice truncatulis; conidiis in apice conidiophori solitariis, bacillaribus, rectis v. curvis, basi truncatis, olivaceis, brevioribus, 90-100 x 5-6 μ et 3-4-septatis, longioribus 140-150 x 5-6 μ et 10-12 septatis, non constrictis, septis superioribus minus evidentibus, articulis plerumque utrinque 1-guttulatis.

Hab. in foliis lànguidis *Casimiroae edulis* vulgo *Zapote blanco,* Tenancingo, Mex., Nov. 1905.

Ob caespitulos punctiformes conidiis radiantibus conspersos *Coleroam* in mentem revocat. Ob hypostrome conspicuum haec species et aliae consimiles ad *Exosporium* nutant.

Patavii ex Institute botanico Universitatis. XXX Januarii MCMVI.

EINIGE NEUE PILZE AUS NORD AMERICA.

VON PROF. DR. FR. BUBAK, TABOR IN BOEHMEN.

1. PUCCINIA PTILOSIAE Bubàk n. sp. — Teleutosporenlager rundlich oder elliptisch, auf beiden Blattseiten, hauptsächlich aber oberseits, anfangs bedeckt, später ganz nackt, $\frac{1}{6}$-1 mm. breit, rundlich oder elliptisch, dunkel kastanienbraun, staubig. Teleutosporen einförmig, ellipsoidisch, seltener länglich, 33-48μ lang, 22-29μ breit (selten nur 18μ breit), an beiden Enden abgerundet oder wenig verjüngt, in der Mitte schwach eingeschnürrt, mit brauner, 2.5μ dicker, deutlich warziger Membran. Warzen circa 1μ dick, ihr Abstand 1-2μ. Keimporus der oberen Zelle scheitelständig oder um $\frac{1}{3}$ herabgerückt, jener der Basalzelle in der unteren $\frac{1}{2}$ liegend. Stiel kurz, hyalin, brüchig.

Kalifornien: Amador County auf Blättern von *Ptilosia lactucina,* am 29, VII, 1896, leg. Hansen.

Diese neu beschriebene Puccinia-Art, steht der *Puccinia Picridis strigosae* Sydow (Monographia Uredinearum I, p. 131) am nächsten ist von derselben aber durch viel schmälere Teleutosporen verschieden. Auch von *Pucc. Picridis* Haszl. ist sie weit verschieden.

Puccinia Ptilosiae Bubák ist wohl eine Brachypuccinia, wie Pucc. Picridis. Auf den mir vorliegenden Exsiccaten konnte ich aber keine Uredosporen auffinden.

2. PHYLLOSTICTA CONVEXULA Bubák n. sp. — Flecken bräunlich, unbestimmt oder fehlend; Fruchtgehäuse, unterseits, zwischen den dicht stehenden Perithecien von Sphaerella con-

vexula (Schw.) Thüm. zerstreut, anfangs subepidermal, später mit kurz konischen Scheitel hervorbrechend, kuglig, wenig abgeflacht, endlich breit geöffnet, 60-100μ breit, schwarz, von gelbbraunem, undeutlich zelligem, unten dunklerem Gewebe.

Sporen bacillenartig, 1.5-2μ lang, 1μ dick, hyalin auf kurzen, stäbchenförmigen, hyalinen Sporenträgern.

Missouri: Emma, Salina Co. auf Blättern von *Carya tomentosa*, leg. C. H. Demetrio, misit cl. Dr. O. Pazschke.

Phyllosticta convexulla m. ist von allen Carya- und Juglans-Phyllosticten durch die winzigen Sporen verschieden. Sie kommt in Gesellschaft mit Sphaerella convexula (Schw.) Thümen, wesshalb sie auch "convexula" genannt wurde.

3. Phoma Lophanthi Bubák. *Septoria Lophanthi* Ellis in schedis. Pykniden zerstreut, linsenförmig zusammengedrückt, subepidermal, später mit dem Scheitel hervorbrechend, 200-300μ breit, schwarz, mit 10-15μ dicken Wänden, von parenchymatischem, schwarzbraunem Gewebe. Sporen zylindrisch, 4.5-9μ lang, 1.5-2μ breit, gerade oder öfters gekrümmt, mit zwei polaren Oeltropfen, hyalin. Sporenträger papillenförmig, hyalin.

Ohio: Amanda, Fairfield, Co., auf toten Stengeln von *Lophanthus nepetoides*, leg. W. A. Kellerman, misit O. Pazschke.

Der Pilz wurde mir von Pazschke unter dem Namen "Septoria Lophanthi Ellis spec. in schedis" geschickt.

Die Sporen sind aber für eine Septoria, rechte Rhabdospora zu kurz und da auch gerade Sporen zahlreich vorkommen, so halte ich den Pilz eher für eine Phoma. Auch die zwei endständigen Oeltropfen weisen auf die Gattung Phoma hin.

Ich bemerke, dass ich nirgends in der Litteratur Septoria Lophanthi Ellis gefunden habe. *Septoria Lophanthi* Winter ist gänzlich verschieden.

4. Phomopsis missouriensis Bubák n. sp. — Pykniden zerstreut, subepidermal, mit kurzem Schnabel hervorbrechend, sonst von der geschwärzten epidermis bedeckt, anfangs linsenförmig, später flach konisch, bis ¼ mm. breit, mit sehr dicken (bis 60μ) Wänden, innen von gelbbraunem, aussen dunkelbraunem, parenchymatischem Gewebe. Sporen von zweierlei Art: 1) spindelförmig, 9-13μ lang, 2.5-3.5μ dick, beiderseits spitzig, oft mit zweiteiligem (ohne Querwand! Inhalte; 2.) Stäbchenförmig, gerade oder gekrümmt, bis 20μ lang, 1.5-2μ dick, aber seltener als die ersteren entwickelt. Sporenträger fadenförmig, bis 18μ lang, 1.5μ dick, unten strauchartig verbunden, hyalin.

Missouri: Emma, Salina Co., auf toten Stengeln von *Asclepias verticillata*, leg. C. H. Demetrio, misit O. Pazschke.

Die vorliegende neue Art gehört, wie alle anderen Species dieser Gattung als konidienform zu irgend einer Diaporthe, vielleicht zu *Diaporthe Asclepiadis* Ell. et. Ev.

Was die Abtrennung dieser Gattung von Phoma betrifft, so verweise ich auf meine Abhandlung in Oesterr. botan. Zeitschrift, 1905, Nr. 2, p. 78.

5. Haplosporella missouriensis Bubák n. sp. — Stromata über die Aeste in weitläufigen Gruppen, anfangs subepidermal, später hervorbrechend und nur an den Seiten bedeckt, flach polsterförmig, $\frac{1}{3}$-$\frac{2}{3}$ mm. breit, schwarz, mehr oder weniger glänzend, innen von hellgelblichem, aussen dunkelbraunem, parenchymatischem, ziemlich dickzelligem Gewebe. Kammern nicht zahlreich, einreihig, vollkommen, manchmal auch unvollkommen, unregelmässig. Sporen länglich oder zylindrisch, oft bohnenförmig gebogen, oder in der Mitte biskuitartig zusammengezogen, 13-18μ lang, 4.5-7μ breit, kastanienbraun, mit einem länglichen, in der Mitte der Spore liegenden Oeltropfel. Sporenträger fadenförmig, hin und her gebogen, 76-80μ lang, 2μ breit, am Scheitel gewöhnlich erweitert, hyalin.

Missouri: Emma, Salina Co., auf toten Aestchen von *Persica vulgaris,* leg C. H. Demetrio, misit O. Pazschke.

Dieser neue Pilz kommt in Gesellschaft mit *Sphaeropsis demersa* (Bon.) Sacc. von welcher er aber total verschieden ist.

6. Phleospora Hanseni Bubák n. sp. — Fruchtgehäuse oberseits, zerstreut, ohne Fleckenbildung, 150-220μ breit, von der ziemlich stark gewölbten Epidermis bedeckt, durch dieselbe durchschimmernd, besonders im Umfange schwarz konturiert, anfangs geschlossen später gewöhnlich deckelartig aufspringend und breit geöffnet, von hellen oder gelblichen, oben hellgelbbraunen, am Rande braunen, dickwändigen, lockeren Hyphen gebildet, welche oben keulenförmig verdickt sind und am Rande der Oeffnung paraphysenartige Gruppen bilden. Sporen stark sichelförmig bis halbkreisförmig gebogen, seltener gerade, 20-35μ lang, 2.5-3μ breit, zu beiden Enden allmählich verjüngt, einzellig oder mit einer deutlichen Querwand, hyalin auf papillenförmigen, hyalinen Sporenträgern.

Californien: Pine Grove, Amador Co., auf lebenden Blättern von Quercus Morehus, am 19. XII, 1894, leg. Hansen.

Ich stelle diesen interessanten Pilz in die Gattung Pleospora, da keine eigentliche Pyknide ausgebildet ist. Der basale Teil des Hymeniums ist oft cisternenartig vertieft, so dass zwei über einander liegende und sporifizierende Räume gebildet werden.

7. Rhabdospora Demetriana Bubák n. sp. — Pykniden auf silbergrauen, länglichen Flecken gruppiert oder ohne Fleckenbildung über die Stengel und Aesten verteilt, subepidermal, kuglig abgeflacht, 120-200μ breit, schwarz, mit breitem (oft bis 22μ) papillenförmigem Schnabel, mit circa 15μ dicken Wänden, von kastanienbraunem, parenchymatischem, am Schnabel fast schwarzem Gewebe. Sporen nadelförmig, 13-24μ lang, 1.5-2μ breit, gerade oder gebogen, gegen die Enden verjüngt, einzellig oder mit

einer wenig deutlichen Querwand, hyalin auf papillenförmigen Sporenträgern.

Missouri: Emma, Salina Co., auf trockenen Stengeln und Aesten von *Asclepias verticillata,* leg. C. H. Demetrio, misit O. Pazschke.

Diese neue Rhabdospora ist von *Rhabdospora cynanchica* S. B. R. durch grössere Pykniden, kürzere und schmälere Konidien gänzlich verschieden.

8. Leptothyrium californicum Bubák n. sp. — Flecken oberseits, rundlich, nicht scharf begrenzt, oft zusammen fliessend, braun, unterseits nicht sichtbar. Fruchtgehäuse oberseits, klein, auf den Flecken reichlich verteilt, circa 90μ breit, schildförmig, convex, schwarz, glänzend, subepidermal, später unregelmässig aufreissend, von ziemlich dickem, undeutlichem, schmutzig kastanienbraunem Gewebe. Sporen kurz ellipsoidisch, 4-6.5μ lang, 2-3μ breit, hyalin. Sporenträger kurz zylindrisch, circa 15μ lang, dichtstehend, hellolivenbräunlich.

California: Pine Grove, Amador County, auf lebenden Blättern von Quercus Morehus am 19. XII,1894,leg.Hansen.

Diese neue Leptothyrium ist von allen verwandten Arten gut verschieden; es kommt in Gesellschaft mit *Phleospora Hanseni* m. auf denselben Blättern vor.

9. Leptothyrium Pazschkeanum Bubák. n. sp. — Pykniden auf toten Stengeln und Aesten in weitläufigen Gruppen, flach, schildförmig, 50-120μ breit, braun, von hellgelbbraunem, parenchymatischem Gewebe, mit zentraler, dunklerer, unregelmässig rundlicher, nicht deutlich begrenzter Oeffnung.

Sporen bacillenartig, 3-4.5μ lang, 1μ dick, gerade oder schwach gebogen, hyalin, auf kurzen, undeutlichen Sporenträgern.

Missouri: Emma, Salina Co., auf toten Stengeln und Aesten von *Asclepias verticillata,* leg. C. H. Demetrio, misit O. Pazschke.

Eine sehr schöne Art, welche die toten Stengel und Aeste dicht mit braunen Pykniden bedeckt und bräunlich verfärbt.

10. Leptothyrium Kellermanni Bubák n. sp. — Pykniden hauptsächlich unterseits, seltener und nur vereinzelt auch oberseits, manchmal auf bleichen Flecken, zerstreut, flach schildförmig, im Umrisse rundlich, 90-150μ breit, mattschwarz, von kleinzelligem, olivendunkelbraunem Gewebe. Sporen bakterienartig, 3-4.5μ lang, 1μ dick, gerade, einzellig, auf schmal flaschenförmigen, 6-8μ langen, dünnen, unten büschelartig verbundenen, hyalinen Sporenträgern.

Ohio: Fairfield County, auf Blättern von *Sassafras officinalis,* leg. W. A. Kellerman, misit O. Pazschke.

Der neue Pilz kommt auf den Blättern in Gesellschaft mit *Sphaerella Sassafras* Ell. et Ev. vor.

Pseudostegia Bubak n. g. Melanconiacearum. — Fruchtlager flach, rundlich im Umrisse, subepidermal, später deckelartig die Epidermis aufhebend, dann flach schüsselförmig und am Rande mit Borsten besetzt. Sporen sichelförmig, einzellig, hyalin. Sporenträger aus dem Inneren der obersten dekapitierten Zellen hervorbrechend, zylindrisch, hyalin oder schwach gelblich.

11. Pseudostegia nubilosa Bubák n. sp. — Fruchtlager auf toten Blättern auf beiden Blattseiten, reichlicher aber oberseits, zerstreut oder gruppiert, manchmal zwischen den Nerven auch in kurzen Reihen stehend, flach, rundlich 120-160μ breit, schwarz, matt, nabelartig vertieft, von der Epidermis bedeckt, später dieselbe deckelartig auftreibend, dann nackt, schwach schüsselartig vertieft, mit weisslichgrauer Scheibe und ringsförmiger, schwarzer Kontur am Rande, und daselbst borstig, mit grosszelligem dünnwändigem, dunkelbraunem, circa 55μ dickem Hypostroma. Borsten kastanienbraun, auf schon länger entblössten Lagern ziemlich zahlreich, bis 45μ lang, circa 4μ dick, allmählich gegen den Scheitel verjüngt und unten oft zwiebelartig verdickt. Sporen schwach sichelförmig gebogen, beiderseits verjüngt, manchmal auch zugespitzt, 18-24μ lang, 2.5μ breit, einzellig, hyalin. Sporenträger als kurze, zylindrische Ausstülpungen aus dem Inneren der obersten, dekapitierten Zellen des Fruchtlagers hervorbrechend, circa 8μ lang, hyalin oder schwach gelblich.

Kentucky: Lexington auf toten Blättern von *Carex* sp., leg. W. A. Kellerman, misit O. Pazschke.

Ein sehr interessanter Pilz, welcher mit meiner neuen Gattung *Anaphysomene* (Annales Mycologici 1906) verwandt ist.

Das Mycel in Form von braunen, stellenweise dicken Hyphen dringt in dem toten Substrate bis in die Gefässe hinein.

Es ist möglich, dass er als Konidienstadium zu *Stegia Caricis* Peck (welche aber mit *Stegia subvelata* Rehm identisch ist) gehört.

Es scheint mir dann weiter, dass *Cyptosporium nubilosum* Ell. et Ev. mit meinem Pilze identisch ist, denn ich vermute, dass die Breite der Sporen nur durch einen Druckfehler statt 2.5μ-8.5μ angegeben ist. Sollte meine Vermutung zutreffen, dann müsste der vorliegende Pilz *Pseudostegia nubilosa* (Ell. et Ev.) Bubak genannt werden.

Bei Cryptosporium könnte er nicht verbleiben.

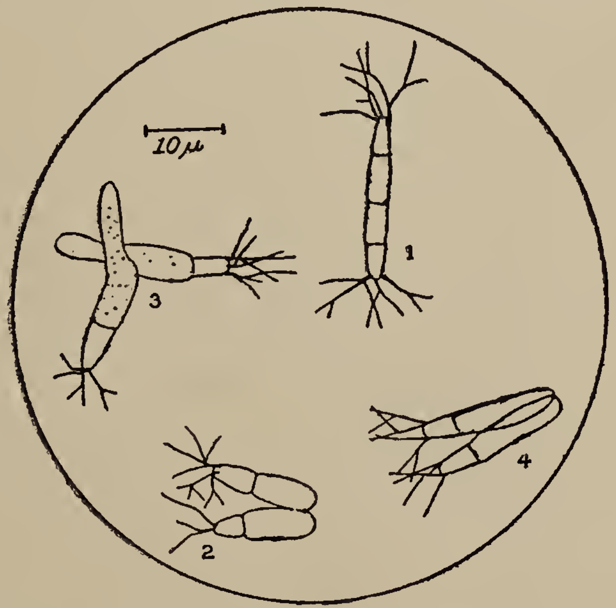
Es scheint mir überhaupt, dass unter dieser Firma, besonders unter den blätterbewohnenden Arten, viele genetisch verschiedene Pilze stecken.

Tabor, Böhmen, am 25 März, 1906.

DILOPHOSPORA ALOPECURI.

ERNST A. BESSEY.

Last November Dr. J. J. Davis of Racine, Wisconsin, sent to the writer some leaves of *Calamagrostis canadensis* collected in Kenosha County of that State. Among the galls caused by nematodes, for which reason they were sent, were found a few more obscure ones of different origin. At points the leaf was slightly swollen, the swellings taking in the space between two or three ribs and being 3 to 6 mm. long and 0.2 to 0.5 mm. in height. They contain pycnidia in one or two rows between each pair of ribs. They are immersed in the leaf tissue with the exception of a very small area around the ostiole which is without a beak. Usually they are at the upper, occasionally also at the lower surface of the leaf. The pycnidia are carbonaceous, spherical, 160 to 200 μ in diameter and entirely separate, with-



Dilophospora alopecuri, showing spore (1) and various stages of germination of spores (2, 3, 4).

out a stroma, or sometimes joined together by twos or threes. The spores are borne apparently singly on short sporophores, the long axis of the spore being continuous with that of the sporophore. When immature (but already free in the pycnidium) they are hyaline and one-celled. They soon however become segmented into four cells, the two middle cells becoming pale brown, the terminal cells and appendages remaining hyaline. (See fig. 1.) They are cylindrical or slightly fusiform, with rather truncate ends from which arise two to three usually once or twice forking appendages, tapering towards their ends. The spore may be slightly constricted at the septa. Rarely the spores are three-celled, either with the middle cell alone or the middle and one end cell colored. Exclusive of appendages the spores measure 15 to 20 by 2 to 2.3 μ, averaging about 17 x 2.1 μ. The appendages are 5 to 7 μ, rarely 10 μ long and about 0.5 μ in thickness at the base. In germinating the two middle cells become more turgid causing the spore to fall apart between them (Fig. 2). The germ tubes grow directly or obliquely from the middle septum. (Figs. 3 and 4.) The hyaline end cells do not germinate.

In spite of the discrepancies between description and actual structure the fungus was recognized as a species of *Dilophospora*, and agrees in every regard, except a very slight difference in size of spores, with de Thümen, *Mycotheca universalis* No. 456 *D. graminis* Desm. on *Dactylis glomerata*. It also agrees with Desmazières' figures.[1]) Saccardo[2]) gives the measurements as 10 x 1.7-2 μ, but de Thümen's specimens contain spores 11.6 to 13.3 x 2-2.3 μ, while Desmazières, who was the first to observe the spores, gives 12 to 13.3 as the length (1/50 mm. including appendages, these being $\frac{1}{4}$ to $\frac{1}{3}$ the length of the spore body) and represents them in his illustration as 15 μ long. The differences in size being so slight, it does not seem justifiable to consider the American form as distinct.

This fungus was described in 1828 for the first time by Fries[3]) as *Sphaeria alopecuri* and as such is described by Duby,[4]) two years later. In 1840 Desmazières,[1]) to whom as well as to Fries and Duby the original collector had sent part of his material, established for the fungus a new genus *Dilophospora* and applied the specific name *graminis* citing *Sphaeria alopecuri* Fr. as a synonym. He described the spores as one-celled and hyaline in which he has been followed by Corda,[5]) Bonorden,[6]) Fuckel,[7]) Allescher[8]) and Saccardo.[2]) Bonorden suggested that the spores were borne transversely, but this is false.

Fries[9]) in 1849 accepts Desmazières' generic name, but insists upon his own specific name, saying of *Dilophospora*: "Plures species in culmis graminum in terris calidioribus (Typus D. Alopecuri *Fr. El.* sub Sph.) The name should be accordingly *Dilophospora alopecuri* (Fr.) Fr.

---

[1] Ann. Sci. Nat. Bot. Ser. I. *14*:5-7. *pl. I. fig. 3.* 1840.

[2] Sylloge Fungorum. *3*:600. 1884.

[3] Elenchus Fungorum. *2*:91. 1828.

[4] Botanicon Gallicum. *2*:694. 1830.

[5] Icones Fungorum. *5*:30. 1842.

[6] Handbuch der Allgemeinen Mykologie. 227. 1851.

[7] Symbolae Mycologicae. 130. 1869.

[8] Rabenhorst, Kryptogamen-Flora Deutschland, &c. 2te Auflage, Bd. 1, Abth. 6. 947-948. 1901.

[9] Summa Veg. Scand. *2*:419. 1849.

PLEUROTUS HOLLANDIANUS SP. NOV.

D. R. SUMSTINE.

Horizontalis, imbricatus; pileo carnoso, tenui, sessili vel postice in stipitem brevem producto, semiorbiculari, ubique tomento denso tecto, albo vel luteo-albo, 1-3 cm. lat., 1-4 cm. long.; lamellis subdistantibus, simplicibus, inaequalibus, divergentibus, albidis, 1-3 mm. lat.; sporis subglobosis; cystidiis cylindraceo-fusoideis sursum acuminatis. P. *petaloidei* affinis sed forma, tomento pilei, latitudine lamellarum differt. Ad truncos putridos, Latrobe, Pennsylvania, 1903, 1904.

The thick tomentum of the pileus readily distinguishes this species. The type specimens are in the Carnegie Museum, Pittsburg, Pa. The name is given in honor of the director of the Carnegie Museum, Dr. W. J. Holland.

Wilkinsburg, Pa., Feb. 12, 1906.

NOTE ON WYNNEA AMERICANA.

D. R. SUMSTINE.

Mr. Jennings collected some plants at Ohio Pyle that agree fairly well with the description of *Wynnea americana* Thaxter (Bot. Gaz. 39:241. 1905.) There are some differences, however, but not sufficient possibly to establish a new species. I append a description of the Ohio Pyle specimens.

Apotheciis numerosis (3-11) in stipitem longum connatis, auritis, gelatino-carnosis, ad basim incisis, extus atrobrunneis, furfuraceo-tuberculatis, 2-8 cm. alt., 1-2 cm. lat.; stipite longo, solido, similiter, furfuraceo, coloratoque, radicato, supra valde incrassato, 3-6 cm. alt.; hymenio glabro, ochroleuco; ascis octosporis, cylindraceis longe stipitatis, iodo non tinctis; sporis monostichis, levibus, hyalinis, elliptico-fusiformibus, plerumque guttulatis; paraphysibus linearibus, vix apice incrassatis, septatis, ramosis.

Hab. in terra arenosa, Ohio Pyle, Pennsylvania, Septembri, 1905.

Wilkinsburg, Pa.

SECOND SUPPLEMENT TO NEW GENERA OF FUNGI PUBLISHED SINCE THE YEAR 1900, WITH CITATION AND ORIGINAL DESCRIPTIONS.

COMPILED BY P. L. RICKER.

II. Schizomycetae.

[Schizomycetae.]

Aplanobacter E. F. Smith n. g. Bacteriaceae. Bacteria in Relation to Plant Diseases, 1 : 171. 1905.

"An unattached, non-motile, rod-shaped organism, destitute of chlorophyll and multiplying by fission, sometimes forming threads of considerable length. The type of the genus, in the family Bacteriaceae, is that organism causing anthrax and most commonly known in literature as Baccillus anthracis Cohn."

III. Phycomycetae.

[Phycomycetae.]

Actinocephalum Saito n. g. Mucoraceae. The Botanical Magazine, Tokyo, 19:36, pl. 3.f. 1-12. 1905. Not Actinocephalus Kütz. Phyc. Gen. 190. 1843.

"Caespitulo griseo, mycelio inaequali, ramoso, citra substratum expanso; hyphis sporangiferis erectis, basi rhizoidibus destitutis, generaliter verticillatis ramosis, ramis capitulato-inflatis, diametro vesiculis 25-55μ; condiis globosis vel ovalibus, 20μ vel 18 x 21μ, monospermis in processibus insertis, hyalinis, echinulatis, zygosporis et chlamydo-sporis ignotis."

[*See Saitomyces Ricker.*]

[Phycomycetae.]

Actinomucor Schostakowitsch n. g. Mucoraceae. Zeitschrift für Angewandte Mikroskopie 8:35. 1903.

"Alle Eigenschaften dieses Pilzes treten besonders deutlich hervor, wenn er auf irgend welchem auf Wasser frei schwimmenden substrate wächst. * * * Bald nach der Sporenaussaat bedeckt sich die Fliege mit einem Mycel, welches in das Innere des Insektenkörpers eindringt, sich auch teilweise im Wasser verbreitet und dieselben Eigenschaften aufweist, die dem Mucoraceenmycel überhaupt eigentümlich sind."

"Nach drei bis vier Tagen bilden sich vom Mycel zahlreiche Auslaüfer; sie krümmen sich schwach bogenförmig und verbreiten sich nach allen Richtungen auf der Wasseroberfläche. Sie sind 10-15μ dick, unseptiert und zerzweigt."

"Die Sporagien, welche die Hauptzweige abschliessen, sind grösser als diejenigen, welche auf kurzen querliegenden Aesten sitzen und das Hauptsporangium wie mit einem kranz umgeben. Die Hauptsporangien sind kugelig, durchschnittlich 120μ im Durchmesser, mit zerbrechlicher, stark inkrustierter Membran versehen. Die Nebensporangien erreichen eine Grösse von nicht über 40μ im Durchmesser; ihr Membran ist fester als bei den Hauptsporangien. Die Columella der Hauptsporangien ist kegelförmig 90-100μ hoch, 60-80μ breit, mit glatter Membran und farblosem Inhalte; die Columella der Nebensporangien ist viel kleiner, knopfförmig, 40μ hoch und 30μ breit. Die Sporen sind kugelig gleichartig, durchschnittlich 7μ in Durchmesser, einseln farblos, behauft schwarzlich."

[Phycomycetae.]

PERONOPLASMOPARA Berl. n. g. Peronosporaceae. Report of the Connecticut Agricultural Experiment Station, 1904. 4:334. pl. 29-31. 1905.

"Conidiophores of the dichotomous or modified dichotomous type of branching; with branches spreading mainly at acute angles, the ultimate spore-bearing tips being separate and subobtuse. Conidia chiefly large, tinted (violet chiefly), with a conspicuous papilla of dehiscence and germination typically by zoospores. Haustoria small and usually simple."

[Phycomycetae.]

PHLOEOPHTHORA Klebahn n. g. Peronosporaceae. Centralblatt für Bakteriologie, und Parasitenkunde, Abt. II. 15:336. 1905.

"In den Intercellularräumen der kranken Rinde findet sich ein Pilz, dessen dicke, plasmareiche, mit spärlichen aber charakteristischen Querwänden versehene Hyphen bis an die Grenzen der Braunfärbung vordringen. Der Pilz bildet Dauersporen, im Gewebe der Rinde in den Intercellularen, in den Knospen auch zwischen den Blatt- und Blütenanlagen. Die Sporen sind rund oder oval, 18-28 μ dick und haben eine dicke, glatte, farblose oder schwach gelbliche Membran. Sie liegen innerhalb eines zweiten, zarten, meist etwas abstehenden Membran, welcher aussen eine kleinere, leere Zelle flach ansitzt, mitunter hat die Sporenmembran eine röhrenförmige Einstülpung nach innen, die, wenn sie vorhanden ist, stets da liegt, wo die kleinere Zelle aussen ansitzt. Diese Strukturen erinnern an die Oosporen, Oogonien und Antheridien der Peronosporaceen."

[Phycomycetae.]

PYTHITES Pampaloni n. g. Saprolegnaceae. Atti della Reale Accademie dei Linceie V. 11:250. 1902. Fossil.

"Mycelium filamentosum tunc parce tunc crebre ramosum; hyphae incolores tunc uniformi crassitudine, tunc irregulariter varicosae; oogonia monospora, sphaeroidea, laevia, terminalia 70-100μ."

[Phycomycetae.]

Saitomyces Ricker n. n. Mucoraceae. Actinocephalum Saito 1905, not Actinocephalus Kütz. 1843.

Tpye **Saitomyces japonicus** (Saito) Ricker n. comb.

A. japonicus Saito, Tokyo Bot. Mag. 19:36. 1905.

[Phycomycetae.]

THAMNOCEPHALIS Blakeslee n. g. Mucoraceae. Botanical Gazette, 40:165. 1905.

"Vegetative hyphae fine, continuous, anastomosing. Fructification erect, consisting of a main stalk supported above the substratum by stout rhizoidal props and bearing a bushy crown of subdichotomously-branched fertile hyphae, terminated by sterile branches. Spores solitary, borne on the surface of spherical heads. Heads borne at the apex of short lateral stalks which arise at nodes from opposite sides of the fertile hyphae at right angles to their planes of branching."

[Phycomycetae.]

ZYGORHIZIDIUM Loewenthal n. g. Chytridiaceen. Archiv. für Protistenkunde, 5^2:228. pl. 7-8. 1905.

"Der gefundene Parasit würde in die Gattung Rhizidium in Umgrenzung von Fischer wohl hineinpassen, unterscheidet sich aber von ihr durch das Vorhandensein einer heterogamen Copulation, ein so wichtiger Unterschied, das trotz aller Scheu vor neuen Gattungen die Aufstellung einer neuen Gattung Zygorhizidium gerechtfertigt erscheinen dürfte.

Ebenso wie bei Rhizidium bildet sich der Körper aus der erstarkten Schwämspore; er bleibt ausserhalb der Wirtzelle, in welche nur eine Blase und davon ausgehende überaus feine, kurze Hyphen hineinwagen. Der ausserhalb liegende Teil ist mehr oder weniger genau kugelig, seine Grösse schwankt zwischen 4-15 μ. Nur die kleinsten Exemplare weichen erheblicher von der Kugelgestalt ab und sind länglich birnförmig, mit der Längsachse annähernd senkrecht zur Membran der Cylindrocystis-Zelle gestellt."

IV. ASCOMYCETAE.

[Ascomycetae.]

ACANTHOSTIGMELLA von Höhnel n. g. Sphaeriales. Annales Mycologici, 3: 327. 1905.

"Perithecien klein, häutig, oberflächlich, mit kurzzylindrischer Mündungspapille, die von derben Borsten umgeben ist, sonst fast kahl. Asci keulig, achtsporig, ohne Paraphysen. Sporen länglich, subhyaline, mit 2 bis mehreren Querwänden."

[Ascomycetae.]

ANIXIELLA von Höhnel n. subg. of Anixia. Sitzungsberichte der Kaiserl. Akademie der Wissenschaften, mathematisch-naturwissenschaftlichen Classe, 111:991. 1902.

"Asci aparaphysati."

[Ascomycetae.]

CHAETOMITES Pampaloni n. g. Sphaeriaceae. Atti della Reale Accademie dei Lincei V. 11:250. 1902. Fossil.

"Perithecia superficialia, 1 mm. lata, gregaria carbonaceomembranacea, aterrima, superne glabrata, inferne pilis densis, longissimis, tortuosis, simplicibus, fusci, vestita."

[Ascomycetae.]

CRYPTOSPORINA von Höhnel n. g. Hypocreaceae. (Cryptosporella aurea Fckl. and C. hypodermia (Fr.)). Oesterreichische Botanische Zeitschrift, 55: 54. 1905.

[Ascomycetae.]

DENDROSTILBELLA von Höhnel n. g. Pezizaceae. Oesterreichische Botanische Zeitschrift, 55: 22. 1905.

"Ist Stilbella mit büschelig und wirtelig verzweigten Sporenträgern. Sporen sehr klein. Gehört als Nebenfruchtform zu Coryne-Arten."

[Ascomycetae.]

DICTYONIA Syd. n. n. Rhemiomyces P. Henn. 1904. Not Sacc. & Syd. 1902. Bulgariaceae. Annales Mycologici 2:549. 1904.

[Ascomycetae.]

DIDYMASCINA von Höhnel n. g. Sphaeriales. Annales Mycologici, 3: 331. 1905.

"Ascomata eingesenkt, erst kugelig und geschlossen, dann sich mit rundlichem Porus öffnend, ohne deutliches oder mit im ausseren Teile gut entwickeltem Excipulum Schlauchboden flach, ohne eigene Wandung. Asci zylindrisch, 8-sporig; Sporen braun, zweizellig. Paraphysen zahlreich, fädig, verzweigt und oben netzig verbunden, ein Epithecium bildend. Holz und Rinden bewohnend."

[Ascomycetae.]

ENGLERULA P. Hennings n. g. Hypocreaceae. Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie, 34:49. 1904.

"Perithecia hyphicola superficialia, sicco subcornea, mellea, humido subgelatinosa, tenui-membranacea, sine structura cellulose, vix ostiolata. Asci ovoidei, 8-spori, aparaphysati. Sporae atrofuscae, 1-septatae. Spegazzimulae, Passerinulae an affinis?"

[Ascomycetae.]

EUANIXIA von Höhnel n. subg. of Anixia. Sitzungsberichte der Kaiserl. Akademie der Wissenschaften, mathematisch-naturwissenschaftlichen Classe 111:991. 1902.

"Asci paraphysati."

[Ascomycetae.]

FERACIA Rolland n. g. Spahaeriales. Bulletin Trimestriel de la Société Mycologique de France, 21: 28. 1905.

"Novum genus, de ferax, productif, fructueux; allusion à une plus grand quantité de spores dans la thèque.

Perithecia glabra, sparsa vel gregaria, erumpentia, membranacea, ostiolata.

Asci clavati, paraphysati, vigenti-quatuor aut ultrà sporidia phoeodictia gignentes."

[Ascomycetae.]

GEASTERINA Sacc, n. subg. of Pyrenopeziza. Annales Mycologici 2:16. 1904.

[Ascomycetae.]

HENNINGSOMYCES Saccardo n. g. Sphaeriaceae. Sylloge Fungorum 17:689. 1905.

"Perithecia superficialibus, atris, globosa-piriformibus, rostro leniter curvulo, noduloso instructis, basi circa 1 mm. latis, fere 2 mm. longis; ascis cylindraceis, breviter stipitatis, 85 μ long; sporidiis oblique et irregulariter monostichis, oblongo-ovatis, 10 septatis, brunneis 10 x 4."

[Ascomycetae.]

HYPOSTOMACEES Vuillemin n. fam. Annales Mycologici, 3:342. 1905.

[Ascomycetae.]

HYPOXYLINA Starbäck n. g. Xylariaceae. Arkiv för Botanik 5^7:29. 1905.

"Stroma pulvinatum vel pulvinato-effusum, tenue; perithecia acervulatim conjuncta, textura carnosa, densissime prismatica, nectriodea; sporidia continua ellipsoidea, fusca. Hypoxylon primo obtuitu in memoriam revocans textura molissima, sub lente si tenuissime praeparata, lilacino-vinosa genus facile Hypocreaceis adscribendum; a Penzigia peritheciis semiliberis vel basi tantum conjunctis nec non textura plane differt."

[Ascomycetae.]

LENTOMITELLA von Höhnel n. g. Ceratostomeae, Annales Mycologici 3:552. 1905.

"Wie Lentomita, aber die Sporen mit aussen aufgesetzten feinen Längsstreifen versehen, daher am optischen Querschnitte ringsum mit kleinen Wärzchen besetzt."

[Ascomycetae.]

MELANOSPORITES Pampaloni n. g. Hypocreaceae. Atti della Accademie dei Lincei V, 11:251. 1902.

"Perithecia superficialia, simplicia, mollia, membranacea, sphaeroidea, flavescentia, villo fusco, stipato tecta, 6 sporis nigris, sphaeroides-ellipsoideis 60-80μ."

[Ascomycetae.]

MICROTHYRITES Pampaloni n. g. Microthyriaceae. Atti della Reale Accademie dei Lincei, V, 11:250. 1902. Fossil.

"Perithecia superficialia, sparsa, simplicia, membranacea dimidiata, sentiformia, cellulis exiguis, poligonalibus, concentricis, 15-20 μ latis, fuscis, margine crenulatis."

[Ascomycetae.]

MITRULIOPSIS Peck n. g. Helvellaceae. Bulletin of the Torrey Botanical Club, 30:100. 1903.

"Ascomata fleshy, obovate or spathulate, stipitate; asci 8-spored, aparaphysate; spores filiform.

A genus related to Mitrula and Spathularia, but with fiiliform spores."

[Ascomycetae.]

Nematospora Peglion n. g. Saccharomycetaceae. Centralblatt fur Bakterologie Parasitenkunde und Infektions-Kranheiten Abteilung II, 7:754. pl. 1-11. 1904.

"Wie ich in der angeführten Arbeit sagte, sind die Sporen der Nem. Coryli fadenförmig oder besser ein wenig spindelförmig, die eine der Spitzen ist abgerundet, die andere läuft in ein langes Flagellum oder eine Geissel aus, die in jedem Zustande des Substrates, auf dem sich die Spore befindet, unbeweglich ist. Ihre Länge schwankt zwischen 38 und 40μ, ohne die Geissel, die 35-40 μ misst. Die Dicke der Spore betragt 2-3 μ."

[Ascomycetae.]

Nigrosphaeria Gardner n. g. Hypocreales. University of California Publications. Botany, 2:179. 1905.

"Parasitic mycelium consisting of scanty white filaments penetrating the subhymenial tissue of the host. Perithecia arising from single erect filaments, sphaerical, without an ostiolum. Asci broadly clavate. Peridium white, smooth. Ascospores single-celled, brownish or black. Paraphyses none."

[Ascomycetae.]

Paranectriella P. Henn. n. subg. Paranectria. Hypocreaceae Sacc. Syll. Fung. 17:812. 1905.

[Ascomycetae.]

Perisporites Pampaloni n. g. Perisporiaceae. Atti della Reale Accademie dei Lincei V, 11:251. 1902.

P. hirsutus. "Perithecia reniformia, simplicia, libera, virido carbonacea, cellulis fere 8 μ latis contexta, astoma, fere ad tertium sulco circulari praedita, 25-26 setulis atris, rigidis, perithecium fere aequantibus."

P. setosus. "Perithecia rotunda simplicia, libera, virido-carbonacea, cellulis minutis fere 4 μ latis contexta, globosa, astoma, 18 setulis artis, rigidis, perithecium fere acquantibus."

[Ascomycetae.]

Phaeosaccardinula P. Henn. n. g. Microthyriaceae. Hedwigia, 44:67, f. a-c. 1905.

"Perithecia superficialia (phyllogena) scutellato-dimidiata, contextu subradiato-celluloso, fusco. Asci subovoidei, 8-spori, paraphysati: Sporae oblonge cylindraceae, pluriseptatae, muraliae, fuscae. Saccardinula Speg. ascis paraphysatis, sporis fuscis etc. diversa."

[Ascomycetae.]

Phragmographum P. Henn. n. g. Hysteriaceae. Hedwigia, 44:68. f. a-d. 1905.

"Perithecia superficialia, sublinearia, simplicia vel ramulosa, rima longitudinali dehiscentia, submembranacea, atra. Asci subovoidei, clavati, 8-spori, paraphysati. Sporae longefusoideae, pluriseptatae, basi subrostratae, hyalinae. Aulographo affin. sed sporae pluriseptatae."

[Ascomycetae.]

PTEROMYCES Bomm. Rouss. & Sacc. n. g. Pezizales. Annales Mycologici 3:507. 1905.

"Ascomata perexigua, depresse globulosa, tenuissime carnosula, pallide colorata, supra circulariter dehiscentia et discum (nucleum?) pallidiorem ostendentia; excipuli contextu tenuissime pseudoparenchymatico, margine subintegro non flexuo nec vere distincto. Asci e basi fasciculati, clavulati, subsessiles, octospori, paraphysibus bacillaribus cincti. Sporidia ovoidea, continua, hyalina, minuta."

[Ascomycetae.]

ROBERTOMYCES Starbäck n. g. Pezizaceae. Arkiv för Botanik 5^7:5. pl. 1. f. 4. 1905.

"Apothecia erumpentia, patellariaceae, textura fuligineo-atrata, coriaceo-carbonacea, globulosa, in juvenibus stratu superficiale textura erecta prismatico gignuntur; inter ascos evolutos restant reliquiae contextus prismatici in epithecium globulosum, fuligineo-nigrum transeuntes. Sporidia hyalina, continua. Paraphyses nullae. Mirabile hoc genus Med. D: ri Robert Fries, peritissimo mycologo, fratisque ejus filio Phil. D: ri Robert E. Fries, diligentissimo botanico, ut amicitiae pignus dedicatum volui."

[Ascomycetae.]

ROLLANDIA Patouillard n. g. Gymnoascaceae. Bulletin Trimestriel de la Société Mycologique de France, 21: 83. 1905.

"Receptaculum déterminatum, ex hyphis septatis, ramosis, pannoso-contextis formatum. Asci suboctospori, ovoideo-globosi, minuti, hyalini, dense glomerati; glomeruli numerosi, sparsi, noduliformes, trama undique obvoluti. Sporae hyalinae."

[Ascomycetae.]

SEURATIACEAE Vuillemin n. fam. Perisporiales. Bulletin Trimestriel de la Société Mycologique de France, 21: 79. 1905.

[Ascomycetae.]

UNCINULITES Pampaloni n. g. Perisporiaceae. Atti della Reale Accademia dei Lincei V, 11:250. 1902. Fossil.

"Perithecia subglobosa, tenui membranacea, nigra, astoma, 30-35 μ, appendicibus simplicibus, 18-25 cm. longis, apice uncinatis, perithecium fere aequantibus, indivisis, ad apecem fuscis ad basim atris."

[Ascomycetae.]

UNGUICULARIA von Höhnel n. g. Pezizaceae. Annales Mycologici, 3: 404. 1905.

"Ascomata klein, Pezizella-artig, oberflächlich aufsitzend, nach unten verschmälert. Gewebe sehr kleinzellig bis fäserig. Asci keulig, 8-sporig, sporen 2-3 reihig, einzellig, länglich, Paraphysen sehr dünn; Ascomata aussen mit sehr dickwändigen, spitzen Haaren bedeckt."

(*To be concluded.*)

INDEX TO NORTH AMERICAN MYCOLOGY.

Alphabetical List of Articles, Authors, Subjects, New Species and Hosts, New Names and Synonyms.

W. A. KELLERMAN.

(Continued from page 231, Vol. II.)

ACER rubrum, host to Valsaria acericola Ellis & Fairman n. sp. Proc. Rochester Acad. Sci. 4:189. 2 Sept. 1905.

ACER, wood, host to Chaetosphaera ludens Morgan n. sp. Jour. Mycol. 11:105. May 1905.

ADOLPHIA infesta, host to Phyllachora adeolphiae Ellis & Kellerman n. sp. Jour. Mycol. 10:232. Sept. 1904.

AECIDIUM argithamniae Arthur n. sp., on Argithamnia schiediana Müll. Arg. (?) [Mexico.] Bull. Torr. Bot. Club, 33:33. Jan. 1906.

AECIDIUM batesianum Barth n. sp., on leaves and petioles of Delphinium albescens Rydb. Fungi Columbiani No. 1901.

AECIDIUM cardui Arthur n. sp., on Carduus hookerianus (Nutt.) Heller (Cirsium hookerianum Nutt.) Bull. Torr. Bot. Club, 33:33. Jan. 1906.

AECIDIUM falcatae Arthur n. sp., on Falcata comosa (L.) Kunze (Amphicarpaea monoica Ell.), and Apios apios (L.) MacM. (A. tuberosa Moench.) Bull. Torr. Bot. Club, 33:32. Jan. 1906.

AECIDIUM punctatum Pers. (Ae. quadrifidum DC.) [Cultures on Prunus serotina Arthur.] Jour. Mycol. 12:19. Jan. 1906.

AECIDIUM triostei Arthur n. sp., on Triosteum angustifolium L. Bull. Torr. Bot. Club, 33:32. Jan. 1906.

AESCHYNOMENE americana L., host to Uredo aeschynomenis Arthur n. sp. Bot. Gaz., 39:392. June 1905.

AGARICACEAE, synopsis of, with white context. [Murrill] Bull. Torr. Bot. Club, 32:491. Sept. 1905.

AGARICUS, *see Polyporaceae of North America X* . . . .

AGARICUS (Dill.) L. [Striglia Adams., Daedalea Pers., Daedaleopsis Schroet.] [Murrill.] Bull. Torr. Bot. Club, 32:83. Feb. 1905.

AGARICUS aesculi (Schw.) Murrill n. n. [Boletus aesculus flavae Schw., Polyporus aesculi Fr., Trametes incana Berk., Daedalea ambigua Berk., Trametes ambigua Fr., T. lactea Fr., Lenzites glaberrima B. & C., Daedalea glaberrima B. & C., Trametes berkeleyi Cooke.] Bull. Torr. Bot. Club, 32:89. Feb. 1905.

AGARIC, Another Fly. [Amanita olitoria Bull.] D. R. Sumstine. Jour. Mycol. 11:267. Nov. 1905.

AGARICUS confragosus (Bolt.) Murrill n. n. [Boletus confragosus Bolt., Daedalea confragosa Pers., D. rubescens A. & S., D. albida Schw., D. zonata Schw., D. discolor Fr., D. discolor, Kl., D. corrugata Kl., Trametes rubescens Fr., Lenzites klotzschii Berk., L. crataegi Berk., L. unguliformis B. & C., L. bicolor Fr., L. Cookeii Berk., L. proxima Berk.] Bull. Torr. Bot. Club, 32:86. Feb. 1905.

AGARICUS cothurnatus Peck, n. sp., rich soil along roadsides and paths. Bull Torr. Bot. Club, 31:181. Apr. 1904.

AGARICUS deplanatus (Fr.) Murrill n. n. [Daedalea elegans Spreng., D. deplanata Fr., Lenzites deplanata Fr., Trametes elegans Fr., T. centralis Fr.] Bull. Torr. Bot. Club, 32:91. Feb. 1905.

AGARICUS labyrinthiformis Bull., *syn of Agaricus quercinus q. v.*

AGARICUS juniperus Murrill n. sp., on a red cedar stump. Bull. Torr. Bot. Club, 32:85. Feb. 1905.

AGARICUS quercinus L. [A. labyrinthiformis Bull., Daedalea quercina Pers., Polyporus latissimus Fr., Daedalea quercina var. nigricans Fr.] [Murrill.] Bull. Torr. Bot. Club, 32:85. Feb. 1905.

AGARICUS rhodoxanthus Schw., *syn. of Boletinus rhodoxanthus q. v.*

AGARICUS rutilescens Peck n. sp., manured ground in pastures. Bull. Torr. Bot. Club, 31:180, Apr. 1904.

AGARICUS solidipes Peck n. sp., prairie pastures. Bull. Torr. Bot. Club, 31:180. Apr. 1904.

AGARICUS sphaerosporus Peck, n. sp., rich soil. Bull. Torr. Bot. Club, 31:181. Apr. 1904.

AGROPYRON spicatum (Ph.) Rydb., host to Puccinia pattersoniana Arthur n. sp. Bull. Torr. Bot. Club, 33:29. Jan. 1906.

AGUACATE, *see Dolichos reticulata.* . . . .

AMELANCHIER, dead twigs, host to Botryodiplodia amelanchieris Ellis & Fairm. Jour. Mycol. 10:229. Sept. 1904.

AMPHIPTERYGIUM amphifolium Hemsl. & Rose, host to Phyllosticta amphipterygii Ricker n. sp. Jour. Mycol. 11:111. May 1905.

Boletus unicolor Schw., *syn. of Trametes unicolor q. v.*

Bolentius rhodoxanthus (Schw.) Sumstine n. n. [Agaricus rhodoxanthus Schw., Gomphus rhodoxanthus Schw., Flammula rhodoxanthus Lloyd Myc. Notes, Paxillus flavidus Berk., P. paradoxus Cooke, Clitocybe pelletieri Lév., Flammula paradoxa Kalch., and F. tammi Fr.] Jour. Mycol. 11:166. July 1905.

Botryodiplodia amelanchieris Ellis & Fairm. n. sp., on dead twigs of Amelanchier. Jour. Mycol. 10:229. Sept. 1904.

Bouteloua (Artheropogon) curtipendulus (Mx.) [Mexico], host to Puccinia exasperans Holway n. sp. Ann. Mycolog. 3:21. Feb. 1905.

Bouteloua pringlei Scrib., host to Puccinia exasperans Holway n. sp. [Mexico.] Ann. Mycolog. 3:21. Feb. 1905.

Brodiaea capitata, host to Puccinia moreniana Dudley & Thompson n. sp. Jour. Mycol. 10:53. 1904.

Brodiaea capitata, host to Puccinia nodosa Ell. & Hark. Jour. Mycol. 10:53. Mar. 1904.

Caesalpinia pulcherrima Sw., *seePoinciana pulcherrima L* . . . .

Californian Uredineae [Dudley and Thompson], *see Notes on* . . . . .

Calliospora Arthur n. gen. Urediniaceae. Bot. Gaz. 39:390. June 1905.

Calliospora diphysae Arthdr n. sp., on Diphysa suberosa Wats., Mexico. Bot. Gaz. 39:391. June 1905.

Calliospora farlowii Arthur n. sp., on Parosela domingensis (DC.) Heller (Dalea domingensis DC.), Mexico. Bot. Gaz. 39:391. June 1905.

Calliospora holwayi Arthur n. sp., on Eysenhardtia amorphoides H. B. K. and E. orthocarpa Wats., Mexico. Bot. Gaz. 39:390. June 1905.

Calonectria (Chiajaea) atkinsonii Rehm n. sp. Ann. Mycolog. 2:178. Mar. 1904.

Canavalia ensiformis D. C., host to Ceratelium canavaliae Arthus n. sp. [Porto Rica.] Bull. Torr. Bot. Club, 33:30. Jan. 1906.

Cantharellus cigarius, the Chantarelle. W. N. Clute. Am. Bot., 7:101-2. 1 pl. 1905.

Carduus hookerianum (Nutt.) Heller, host to Aecidium cardui Arthur n. sp. Bull. Torr. Bot. Club, 33:33. Jan. 1906.

Carex aquatilis, host to Puccinia caricis (Schum.) Reb. [Arthur.] Jour. Mycol. 12:15. Jan. 1906.

Carex stipata, host to Puccinia caricis (Schum.) Reb. [Arthur.] Jour. Mycol. 12:15. Jan. 1906.

CORDYCEPS alutacea Link., *syn. of Podostroma alutacea q. v.*

CORTINARII, Partial Key to the Cortinarii of Ithaca, N. Y. [Kauffman.] Bull. Torr. Bot. Club, 32:318-321. June 1905.

CRONARTIUM comptoniae Arthur n. sp., on Comptonia peregrina (L.) Coult. (C. asplenifolia Gaertn.) and Myrica gale L. Bull. Torr. Bot. Club, 33:29. Jan. 1906.

CRYPTOGRAMME stelleri (Gmel.) Prantl, host to Hyalospora pellaeicola Arthur n. sp. Bull. Torr. Bot. Club, 33:30. Jan. 1906.

CORIOLUS, *see Polyporaceae of North America, XIII. The described species of . . . .*

CORIOLUS, synopsis [key] of the North American species. [Murrill.] Bull. Torr. Bot. Club, 32:641. Dec. 1905.

CORIOLUS albo-cervinus Pat., *syn. of Coriolus brachypus q. v.*

CORIOLUS brachypus (Lév.) Murrill n. n. [Polyporus brachypus Lév., P. albo-cervinus Berk., Coriolus albo-cervinus Pat.] Bull. Torr. Bot. Club, 32:646. Dec. 1905.

CORIOLUS arenicolor (B. & C.) Murrill n. n. [Polyporus arenicolor B. & C.] Bull. Torr. Bot. Club, 32:652. Dec. 1905.

CORIOLUS flabellum (Mont.) Murrill n. n. [Polyporus flabellum Mont.] Bull. Torr. Bot. Club, 32:648. Dec. 1905.

CORIOLUS hirtellus (Fr.) Murrill n. n. [Polystictus hirtellus Fr.] Bull. Torr. Bot. Club, 32:652. Dec. 1905.

CORIOLUS hirsutulus (Schw.) Murrill n. n. [Polyporus hirsutulus Schw.] Bull. Torr. Bot. Club, 32:643. Dec. 1905.

CORIOLUS ilicincola (B. & C.) Murrill n. n. [Polyporus ilicincola B. & C.] Bull. Torr. Bot. Club, 32:647. Dec. 1905.

CORIOLUS nigromarginatus (Schw.) Murrill n. n. [Boletus hirsutus Wulf. non Scop., B. nigromarginatus Schw., Polyporus hirsutus Fr.] Bull. Torr. Bot. Club, 32:649. Dec. 1905.

CORIOLUS planellus Murrill n. n. [Polyporus planus Peck.] Bull. Torr. Bot. Club, 32:649. Dec. 1905.

CORIOLUS pubescens (Schum.) Murrill n. n. [Boletus pubescens Schum., Polyporus pubescens Fr., Leptoporus pubescens Pat.] Bull. Torr. Bot. Club, 32:645. Dec. 1905.

CORIOLUS sartwellii (B. & C.) Murrill n. n. [Polyporus sartwellii B. & C.] Bull. Torr. Bot. Club, 32:646. Dec. 1905.

CORIOLUS sericeo-hirsutus (Kl.) Murrill n. n.]Polyporus sericeo-hirsutus Kl., Hexagona sericea Fr., Polystictus barbatulus Fr.] Bull. Torr. Bot. Club, 32:651. Dec. 1905.

CORIOLUS sobrius (B. & C.) Murrill n. n. [Polyporus sobrius B. & C.] Bull. Torr. Bot. Club, 32:649. Dec. 1905.

CORIOLUS subluteus (E. & E.) Murrill n. n. [Polyporus subluteus Ell. & Ev.] Bull. Torr. Bot. Club, 32:646. Dec. 1905.

DAEDALEA discolor Fr., *syn. of Agaricus confragosus (Bolt.) Murrill q. v.*

DAEDALEA discolor Kl., *syn. of Agaricus confragosus (Bolt.) Murrill q. v.*

DALEA domingensis DC., *see Parosela domingensis* . . . .

DAEDALEA elegans Spreng., *syn. of Agaricus deplanatus q. v.*

DALDINIA eschscholzii (Ehrenbg.) Rehm, ad lignum putridum. Ann. Mycolog. 2:175. Mar. 1904.

DAVIS, B. M. Fertilization in the Saprolegniales. Bot. Gaz. 39:61-4. Jan. 1905.

DAEDALEA glaberrima B. & C., *syn. of Agaricus aesculi q. v.*

DAEDALEA Pers., [Murrill], syn. of Agaricus (Dill.) L. Bull. Torr. Bot. Club, 32:83. Feb. 1905.

DAEDALEA quercina Pers., *syn. of Agaricus quercinus q. v.*

DAEDALEA quercina var. nigricans Fr., *syn. of Agaricus quercina q. v.*

DAEDALEA rubescens A. & S., *syn. of Agaricus confragosus (Bolt.) Murrill q. v.*

DAEDALEOPSIS Schroet., [Murrill], syn. of Agaricus (Dill.) L. Bull. Torr. Bot. Club, 32:83. Feb. 1905.

DAEDALEA unicolor Fr., *syn. of Cerrena unicolor (Bull.) Murrill q. v.*

DAEDALEA zonata Schw., *syn. of Agaricus confragosa (Bolt.) Murrill q. v.*

DAIRY Fungi, Some Suggestions from the study of. Charles Thom. [Plan for obtaining more definite knowledge of the forms.] Jour. Mycol. 11:117-124. May 1905.

DANTHONIA spicata, host to Balansia hypoxylon (Pk.) Atkinson. Jour. Mycol. 11:255. Nov. 1905.

DELPHINIUM albescens Rydb., host to Aecidium batesianum Barth. n. sp. Fungi Columbiani No. 1901.

DENDROPHAGUS Murrill non Toumey, *syn. of Tomophagus q. v.*

DENDROPHAGUS colossus (Fr.) Murrill, *syn. of Tomophagus colossus q. v.*

DERMATEA crataegicola Durand n. sp., on stems of Crataegus sp. Jour. Mycol. 10:100. May 1904.

DERMATEA puberula Durand n. sp., on dead stem of Vitis sp. Jour. Mycol. 10:101. May 1904.

DERMATELLA scotinus Morgan n. sp., on Carpinus americana, growing out of the inner bark through the periderm. Jour. Mycol. 10:98. May 1904.

DICHROMENA ciliata Vahl., host to Uredo dichromenae Arthur n. sp. [Porto Rico.] Bull. Torr. Bot. Club, 33:31. Jan. 1906.

(*To be continued.*)

NOTES FROM MYCOLOGICAL LITERATURE, XVIII.

W. A. KELLERMAN.

THE MYCOLOGICAL ARTICLES in Centralblatt f. Bakt. Parasitenk. u. Infektionskr., Zweite Abteilung, XIII Band, 1904, are: Chester, Frederick D., A review of the Bacillus subtilis group of bacteriaffi Düggeli, Max, Die Bakterienflora gesunder Samen und daraus gezogener Keimpflänzschen. (Forts. u. Schluss); Harrison, F. C., A bacterial disease of cauliflower (Brassica cleracea) and allied plants; Laubert, R., Beitrag zur Kenntnis des Gloeosporium der roten Johannisbeere; Lepeschkin, W. W., Zur Kenntnis der Erblichkeit bei den einzelligen Organismen, Die Verzweigung und Mycelbildung bei einer Bakterie (Bacillus) Berestnewi n. sp. [Schluss.]; Metcalf, Haven, Bacterium teutlium sp. nov.; Saito, K., Eine neue Art der "Chinesischen Hefe;" Semadini, Franc. Ottavio, Beiträge zur Kenntnis der Umbelliferen bewohnenden Puccinien; Smith, Erwin F., Ursache der Cobbschen Krankheit des Zuckerrohrs; Uyeda, Y., On the Tobacco Wilt Disease caused by a Bacteria (Preliminary Notice).

THE MYCOLOGICAL ARTICLES IN HEDWIGIA, BAND XLV, HEFT I, 14 Okt. 1905, are: Dritter Beitrag zur Pilzflora des Gouvernements Moskau, von P. Hennings [a long list with about eight new species described]; and Ueber Tracya hydrocharidis Lagerh. von E. Reukauf-Weimar [with figures of a section of a spore ball bearing conidia, conidia fusing, mycelium fusing, etc.].

THE LYCOPERDACEAE OF AUSTRALIA, NEW ZEALAND AND NEIGHBORING ISLANDS, illustrated with 15 plates and 49 figures, by C. G. Lloyd, has been issued from Cincinnati at the Lloyd Library, bearing date of April 1905. Australia is regarded by Mr. Lloyd as the richest country in the world in Lycoperdaceae; he says more strange and endemic genera are found there than in any other continent. This forty-two-page pamphlet gives descriptive notes and illustrations of the known species of that region. It is introduced by a brief characterization of the group Gastromycetes and its four families, Phalloideae, Nidulariaceae, Hymenogastraceae, Lycoperdaceae.

ERWIN F. SMITH IS THE AUTHOR OF BACTERIA IN RELATION TO PLANT DISEASES, Volume One (Methods of work and general literature of Bacteriology exclusive of Plant Diseases) which is Publication No. 27 of the Carnegie Institution of Washington, September 1905. It is a splendid volume of 285 pages, admirably illustrated, and even the taxonomic mycologist will inspect it with interest and profit The chapter on Nomenclature and Classifications will challenge closest scrutiny. Dr. Smith proposes one new genus, having for its type Bacillus anthracis Cohn. He says this volume is not intended to take the place of ordinary text-books of bacteriology, but rather to supplement the same, giving information where they are silent or misleading. That a modest claim is made is indicated by the quotation in the preface: "Man would never give anything to the public if he waited till he had reached the goal of his undertaking, which is ever appearing close at hand and yet slipping farther and farther as he draws nearer."

Charles E. Fairman publishes the Pyrenomyceteae of Orleans County, N. Y., in the Proceedings of the Rochester Academy of Science, vol. 4, pp. 165-191, figs. 1-6, Sept. 2, 1905. It is a fourth paper in the series of this author on the cellular cryptogams of that region. The Nos. are carried from 200 to 354, notes are given and the following new species are described: Lophiostoma imperfecta, Valsaria acericola, Anthostoma acerinum, Melanomma juniperi, and Caryospora cariosa.

Of the papers published in Bulletin de Societe Imperiale des Naturalistes de Moscou, 1904, N. S. tome XVIII, we find the following of interest to the mycologists: Nachtraegliche Bemerkungen zur Verbreitung der Fungi hypogaei in Russland von Fedor Bucholdtz. About one and a half dozen species are reported, accompanied with notes and comments.

A new edition or rather a recent reprint (1905) of the Mushroom Book by Nina L. Marshall, publishers Doubleday, Page & Co., contains, in addition to former half-tones also the following new illustrations, namely, Amanitopsis strangulata, Mycena galericulata, Lepiota granosa, Collybia maculata, Collybia platyphylla, Clitocybe illudens, Agaricus campestris, Cortinarius caninus, Cortinarius armillatus, Hydnum coralloides, Clavaria ligula, Strobilomyces strobilaceus, Boletus felleus obesus, Boletus scaber niveus, Elfvingia fomentaria, Calostoma (four species, colored), Leotia lubrica, Tremellodon gelatinosum, Peziza aurantia (colored), Peziza odorata (colored), and Panus strigosus.

Ernest S. Salmon, On the present Aspect of the Epidemic of the American Gooseberry-Mildew in Europe, Jour. Roy. Hort. Soc. 29:102-110, Dec. 1904, shows with the aid of a map that at about a dozen and a half localities in Ireland and in Russia this Fungus occurs. Prof. Rostrup reports it also in Denmark. This disease was introduced into Europe from America about the year 1900.

Some Diseases of the Potato, by George Massee, in the Journal of the Royal Horticultural Society, vol. XXIX, Parts 1-3. Dec. 1904, pp. 139-145, is a popular illustrated article dealing with Phytophthora infestans DeBary, Winter-rot (*Nectria solani* Pers.), Black Scab (*Oedomyces leproides* Trabut), Bacterial Disease (*Bacillus solanacearum* Smith), Potato Scab (*Sorosporium scabies* Fisch.).

The Fungoid Pests of the Vinery and Stove, M. C. Cooke, in Jour. Roy. Hort. Soc. 28:313-337, May 1904, popular, is accompanied by three colored plates illustrating thirty-three species.

In Pests of Orchard and Fruit Garden, Jour. Roy. Hort. Soc. 28:1-43, Oct. 1903, by M. C. Cooke, the three colored plates show spores, etc., of forty-three species.

Joseph Charles Arthur publishes in the Bulletin of the Torrey Botanical Club for Jan. 1906 (33:27-341) New Species of Uredineae, IV, from various localities as Porto Rico, Cuba, Mexico, and the United States. One species is a Uromyces, one Hyalospora, one Ceratelium, one Coleosporium, one Uredo and four Aecidiums. The genus *Ceratelium* is new, and one species is described on Canavalia from Porto Rico. "An especially interesting rust on account of the combination of a melampsoraceous fungus with a leguminous host. . . . . Except in the length of the telial column, there is considerable resemblance to Cronartium." In the descriptions Dr. Arthur has made use of the terms (lately proposed by him) *pycnium, aecium, uredineum* and *telium,* instead of spermogonium, aecidium, uredo and teleutospores.

P. Hennings enumerates a long list of fungi, including many new species, from eastern Africa, under the title Fungi Africae orientalis, the first part of which appeared May 22, 1900, and the second part 18 Nov. 1902, in Engler's Botanischer Jahrbücher, vols. 28 and 33. The new genera *Engleromyces* and *Busseella* are there described.

The original articles in 4e Fascicule (Tome XXI) of the Bulletin Mycologique de France, issued 31 Dec. 1905, are: R. Maire, Flore mycologique des iles Baleares (avec fig.); G. Bainier, Acrostalagmus roseus Bain. et Nemotogonum album Bain. (Pl. XII et XIII); F. Guéguen, Gliomastix (Torula) chartarum n. gen. et n. sp. (Pl. XIV et XV); F. Guéguen, Quelques mots sur les Aspergillus pathogènes.

An exhaustive study of the Life History of Hypocrea alutacea is published by Geo. F. Atkinson in the Dec (1905) No. of the Botanical Gazette (40:401-416), illustrated by three full page half tones. He unites Bresadola's H. lloydii with this species and the new name necessary in the light of present knowledge is formed as follows: Podostroma alutaceum (Pers.) Atkinson. Professor Atkinson satisfied himself that the American plants are identical with European ones not only by an examination of exsiccata Rab, F. Eur. 132 and 246, but also by an inspection in Paris in 1905 of the specimens of Hypocrea alutacea in the herbarium of the Museum of Paris among which were some specimens from Tulasne's herbarium.

An Index to Volumes 1-10, Journal of Mycology, occupied the entire space, pp. 289-387, of the November Number 1904.

The May No., 1905, Journal of Mycology, had the following table of contents: Morgan, A New Chaetosphaeria; Lawrence, Notes on the Erysiphaceae of Washington; Ellis and Bartholomew, Two New Haplosporellas; Beardslee, The Rosy-spored Agarics; Ricker, Notes on Fungi, II, New Species; Bates, Rust Notes for 1904; Thom, Suggestions from the Study of Dairy Fungi; Kellerman, Index to North American Mycology; Notes from Mycological Literature, XV; Editor's Notes.

An interesting new genus is proposed by M. F. Guéguen in the Bulletin de la Société Mycologique de France, tome XXI, 4e Fascicule, under the title *Gliomastix* (Torula) chartarum n. gen. n. sp.; contribution à l'étude de la formation endogène des conidies. As to name and place in systematic classification he says: Je donne à ce genre nouveau le nom de *Gliomastix* Gr. *gloios* visqueux; *mastix* fouet, qui rappelle l'etat mucilagineaux de ses conidies. Ce genre est aux *Torula* ce que sont les *Gliocladium* aux *Penicillium,* et les *Gliocephalis* aux *Sterigmatocystis.*

In the September (1905) No. of the Journal of Mycology the articles were as follows: Morgan, North American Species of Marasmius; Beardslee, The Amanitas of Sweden; Kellerman, Index to North American Mycology; Editor's Notes.

The following is the table of contents in the Journal of Mycology for November 1905: Morgan, North American Species of Marasmius; Atkinson, The Genera Balansia and Dothichloë in the United States, with a Consideration of their Economic Importance; Sumstine, Another Fly Agaric; Holway, Notes on Uredineae; Sturgis, Remarkable Occurrence of Morchella Esculenta (L.) Pers.; Bessey, Rostovtsev, S. J., Contributions to the Knowledge of the False Mildews (Peronosporaceae); Kellerman, Notes from Mycological Literature XVII; Index to Volume 11.

Uredineae Japonicae V, von P. Dietel, Eng. Bot. Jahrb, 34:583-592, 20 Jan. 1905, lists about four dozen Rusts, a large number of them being new species with Latin diagnoses.

P. Hennings gives a fifth installment of Japan Fungi — Fungi Japonici, V — in Engler's Botanischer Jahrbücher, 34; 592-606, 20 Jan. 1905, enumerating a large number of species, of which about eight are new.

Annales Mycologici, Vol. III, No. 1, Feb. 1905, has the following table of contents: Salmon, Ernest S., Cultural Experiments with an Oidium on Euonymus japonicus Linn. f.; Rick, Fungi Austro-americano Fasc. II.; Arthur, J. C. Baeodromus Holwayi Arth., a New Uredineous Fungus from Mexico; Holway, E. W. D., North American Uredineae; Copeland, Edwin Bingham, Fungi esculentes Philippinenses; Trotter, A., Ascochyta Salicorniae P. Magnus var. Salicorniae patulae Trotter; Kusano, S., Einege neue Taphrina-Arten aus Japan; Kuyper, H. P., Die Perithecien-Entwicklung von Monascus purpureus Went und Monascus Barkeri Dangeard, sowie die systematische Stellung dieser Pilze; Salmon, Ernest S., Preliminary Note on an Endophytic Species of the Erysiphaceae; Neue Literatur; Referate und kritische Besprechungen.

Ernest S. Salmon gives an account of his cultural experiments with an Oidium on Euonymus japonicus Linn. f. in the Annales Mycologici, Februar 1905, 3:1-15, plate I. The species was indeterminable specifically since no production of perithecia was observed. In the course of the discussion a new term is proposed, namely, *xenoparasitism*, which the author defines as follows: those cases where a form of a fungus which is specialized to certain host species and confined to them under normal circumstances, proves able to infect injured parts of a strange host.

Journal of Mycology, January, 1906, presented this table of contents: Morgan, North American Species of Marasmius; Kellerman, Uredineous Culture Experiments with Puccinia Sorghi, 1905; Arthur, Cultures of Uredineae in 1905; Durand, Peziza fusicarpa Ger. and Peziza semitosta B. & C.; Kellerman, Notes from Mycological Literature XVIII; Editor's Notes.

J. C. Arthur, Baeodromus Holwayi Arth., a New Uredineous Fungus from Mexico, Annales Mycologici, Feb. 1905, [3:18-20], gives an account of an interesting Rust collected by Professor Holway in central Mexico, alt. 3000-3400 metres, at a glance resembling a Leptopuccinia but the promycelium and large sporidia have bright orange contents. A new genus, *Baeodromus* is proposed for this Rust, the name derived from Greek *baios*, short, and *dromus*, course. As to to affinities the author says: "The relationship of these fungi is not clear. The gross appearance is that of the *Pucciniaceae*, and one might at first think that they belonged near the genus *Kuehneola*, yet the germination closely resembles that of the *Coleosporiaceae*. But from the compact structure of the sorus and the external promycelium, I am at present inclined to place the genus near *Pucciniastrum*, among the *Melampsoraceae*."

In Pests of the Ornamental Shrubbery, by C. M. Cooke, Jour. Roy. Hort. Soc. 29:1-25, Pl. XVI-XVIII, Dec. 1904, many species are popularly described and forty-six are illustrated on three colored plates.

Edible Fungi is the title of a popular article with a few text illustrations by M. C. Cooke on pp. 495-510 of the Journal of the Royal Horticultural Society, vol. XXVIII, May 1904.

F. S. Earle's Mycological Studies, II, in the Bulletin of the New York Botanical Garden, 3:(289)-(312), 14 April 1905, issued first as a Separate 30 June 1904, consists of New Species of West-American Fungi and New Tropical Fungi mostly from Porto Rico. The first contains 33 species and the second 18 species. In the latter the genus Meliola received most species, ten new forms described.

Annales Mycologici, vol. III, No. 5, October 1905, contains the following: Jaap, Otto, Beiträge zur Pilzflora von Mecklenburg; Höhnel, Franz v., Mycologische Fragmente; Rehm, Ascomycetes exs. Fasc. 35; Sydow, Mycotheca germanica Fasc. VIII-IX (No. 351-450); Vuillemin, P., Recherches sur les Champignons parasites des feuilles de Tilleul; Lind, J., Ueber einige neue und bekannte Pilze; Farneti, Rodolfo, Erpete furfuracea delle pere; Bucholtz, Fedor, Verzeichnis der bisher in den Ostseeprovinzen Russlands bekannt gewordenen Puccinia-Arten; Neue Literatur; Referate und kritische Besprechungen.

E. W. D. Holway, North American Uredineae, gives in Annales Mycologici for Feb. 1905 [3:20-4] descriptions of the following species: Puccinia exasperans (Mexico), P. gouaniae (Cuba), P. aequinoctialis (Cuba), P. distorta (Mexico), P. fumosa (Mexico), also critical notes on several other interesting species — saying that Sydow is in error in giving a new name to Puccinia kansensis (*P. buchloes* 1903); P. buchloes Schofield was published in 1902, a different species; Puccinia scandica Johans, hitherto known only from the alpine regions of Sweden, has been collected in Utah (A. O. Garrett) and in Washington (W. N. Suksdorf).

AMERICAN MYCOLOGICAL SOCIETY, NEW ORLEANS MEETING, JANUARY 1, 1906.

The American Mycological Society held its third annual meeting in connection with the American Association for the Advancement of Science at New Orleans, January 1, 1906.

In the absence of the President, Prof. Charles H. Peck, the Vice-President, Prof. F. S. Earle, presided.

The new constitution recommended by the committees of the Botanical Society of America, the Society for Plant Morphology and Physiology, and the American Mycological Society, as a basis for the union of the three societies, was adopted and the present officers continued as a committee with power to co-operate in the completion of the details of reorganization.

The following program was presented:

Some Reasons for Desiring a Better Classification of the Uredinales .... J. C. Arthur
Uredineae of the Gulf States .... S. M. Tracy
Some Peculiar Fungi New to America .... W. G. Farlow
North American Gill Fungi .... F. S. Earle
Lichens and Recent Conceptions of Species (read by title) .... Bruce Fink
The Affinities of the Fungus of Lolium temulentum .... E. M. Freeman
Peridermium cerebrum Peck, and Cronartium Quercuum (Berkeley) .... C. L. Shear
Ramularia: An Illustration of the Present Practice in Mycological Nomenclature .... C. L. Shear
Notes on Cultures of Colletotrichum and Gloeosporium . ... P. H. Rolfe
The Occurrence of Fusoma parasiticum Tubeuf in this Country .... Perley Spaulding
Notes on Pachyma cocos .... P. H. Rolfe
Pencillium glaucum on Pineapple Fruit .... P. H. Rolfe

C. L. Shear, *Sec'y-Treas.*

Mr. Ellis accumulated a valuable working library on systematic Mycology and many issues of exsiccati, a part of which has alreay been disposed of. The books and specimens remaining, given in the following list, are for sale by his daughter.

Books for Sale from the Library of J. B. Ellis:

Berlese, A. N. Monographia dei generi Pleospora, Clathospora e Pyrenophora. 12 col. plates. (Firenze) 1888. $4.

Icones Fungorum ad usum Sylloges Saccardianae accommod.. Vol I. (5 fasc.) II. (5 fasc.) II. fasc. 1-4. 15. fasc. 1. Cum 567 tabulis color. Abellini et Patavii 1894-1902.

Vol. 1. Pyrenomycetes (Lophiostomaceae et Sphaeriaceae Phaeo- et Hyalo-phragmiae. With 184 Taf. — II. Pyrenomycetes (Sphaeriaceae Phoeophragmiae, Dictyo- et Scolecosporae. With 188 Taf. — III. 1-4 Sphaeriaceae Allantosporae. With 127 Taf. — IV. I. Phycomycetes. With 67 col. plates.

Exsiccati. — One Set North American Fungi incomplete, lacking 13 Centuries, 2-5, 7, 8, 20-25, 29. $100.

Exsiccati. — Fungi Columbiani. Cent. 1-XIV. $84.

Exsiccati. — Some odd Centuries of North American Fungi and Fungi Columbiani (unbound); as good in every respect as the Centuries in the complete sets, at per Century. $3.

Ellis, J. B., and *B. M. Everhart.* The North American Pyrenomycetes. With 41 plates. Newfield 1892. $5 net.

Hedwigia 1875-1898, 15 vols. (bound).

Roumeguere's Revue Mycologique, 1879-1901, 9 vols. bound, the last 4 unbound. $30.

Persoon, Mycologia Europaea. 3 vols. 8 vo. 30 colored plates. $15.

Bresadola, Fungi Tridentini, vol. 1 (bound), 144 pp. and 95 colored plates and 2 nos. of vol. 2 (unbound), 81 pp., 90 plates. $20.

Cooke, M. C. Mycographia seu Icones Fungorum. Figures of Fungi from all parts of the world. Vol. I and II: Discomycetes. (All published). London 1875-79. With 113 colored plates. $15.

Cooke, M C. Grevillea complete. 22 vols. bound in cloth. $70.

Cooke, M. C. Handbook (Fungi), 2 vols. 8 vo. 1871. $12.

Corda, Anleitung. $4.

Bonorden's Handbook of Mycology, 336 pages. With 12 col plates. $5.

Currey, F. On the fructification of certain sphaeriaceous Fungi.With 3 plates. (London) 1858. $4.

Currey F. Synopsis of the fructification of the compound and simple Sphaeriae of the Hookerian Herbarium. 3 parts With 8 plates. (London) 1858-65. 4. $5.

Fries, E. Systema Mycologicum. 3 vol. c. indice. Acced. supplem.: Elenchus Fungorum. 2 vol. Lundae et Gryphisw. 1821-32. (M. 34.)

Fries, E. Observationes Mycologicae. Havnae 1824-28. 8. 368 pp. et 8 tab. color. Epicrisis Systematis Mycolog. s. synopsis Hymenomycetum. Upsaliae. bound 20. 1839-39. 8. 628 pp.

Fries, E. Hymenomycetes Europaei s. epicriseos systematis Mycologici Ed. 11. Upsal. 1874. 8. 760 pp. $20.

Stevenson, Mycologia Scotica. 434 pp. $5.

King's, Report (Gov. Survey), Botany. Vol. V. $5.

Wheeler's, Report (Gov. Survey), Botany. Vol. VI. $5.

Dr. George Winter, Die Pilze.

Dr. H. Rehm, Discomycetes.

Masse, Geo, Gasteromycetes.

McBride, T. H., Myxomycetes.

Massee, Geo., Fungi of Cuba, Ceylon, etc.

Also other books, pamphlets and papers. Send orders and apply for information and price when not given, to

Miss Cora E. Ellis, Newfield, New Jersey.

JOURNAL OF MYCOLOGY

A Periodical Devoted to North American Mycology. Issued Bi-monthly; January, March, May, July, September and November Price, $2.00 per Year. To Foreign Subscribers $2.25. Edited and Published by *W. A. KELLERMAN, PH. D., COLUMBUS, OHIO.*

EDITOR'S NOTES.

Owing to the absence of the editor from the latter part of December until April the notice of Mr. Ellis's death was not printed in the January No. of the Journal as it should have been. This second annual Guatemala trip interfered with prompt issuance of the January and March Nos. as well. Apology is due to contributors for delay in the appearance of their papers.

Occasion may here be taken to note both the rapid expansion of Mycology in this country, and the growth of Mycological literature since Mr. Ellis began his work. We desire to give ample credit to the pioneers in systematic Mycology — and no one would fail in this connection to recall the work of the trio now passed, Schweinitz, Ravenel and Ellis. Their work served largely as a guide and incentive to many who have since taken up the work. The general advance in all branches of science in the last half century is also a significant fact.

Yet one other factor may be cited as most potent of all, namely, the establishment of the Agricultural Experiment Stations. Mycology, especially the economic phases, has its peculiar home in these institutions. If space permitted reference would be made to some of the educational institutions, which early took up scientific work on fungi; Harvard of course would be first and foremost in this list. The U. S. Department of Agriculture has been a leader — but the subject is too wide for a brief editorial.

The Journal of Mycology when inaugurated and when Mr. Ellis was the *contributing* editor, was modest in its pretensions — yet most generously supported by the small band of mycologists in this country. Though it succumbed for a time, its revival was a necessity — in spite of the fact that Experiment Station Bulletins and two important botanical journals were furnishing an avenue for publication of the rapidly increasing mycological studies of ardent students. Mr. Ellis did not wish to resume his original place on the title page, yet he was as much interested as in the beginning and made frequent contributions.

Journal of Mycology, Vol. 12, pp. 41-88, Issued May 31, 1906.

PRICE LIST.

Journal of Mycology, Vol. 8—1902		$2 00
" " " 9—1903		2 00
" " " 10—1904		2 00
" " " 11—1905		2 00
" " " Current Vol.		2 00
Index to North American Mycology (authors, titles, subjects, new species and hosts, new names and synonyms) since Jan. 1, 1901. *Printed on one side of page.* Seven parts have been issued. Price per part		25
Index to Uredineous Infection Experiments with List of Species and Hosts for North America, *printed on one side of page*		50
Portraits of Mycologists, reprinted from the Journal of Mycology (Peck, Ellis, Arthur, Burrill, Farlow, Tracy, Earle, Atkinson, Holway, Thaxter, Clinton, Magnus, Oudemans, Patouillard, Hennings Rehm, Cooke, Saccardo,, Dietel, each		10
Ohio Fungi exsiccati. Though the set is designed primarily for exchange a few copies are for sale. Issued in fascicles of 20 specimens each. Ten fascicles now ready. Price per fascicle		1 00
Mycological Bulletin. A popular leaflet of 4 pages, illustrated, 24 Nos. per year. Vol. II, 1904, Vol. III, 1905, each 50 cents; bound in cloth, 75 cents. Current year		25
New Genera of Fungi. Published since 1900; the original descriptions reproduced with full citation. Annual Supplements are to follow. Printed on one side of page only. Price		75
First Supplement to New Genera of Fungi published since 1900, with the original descriptions		50
Index to Journal of Mycology, volumes 1-10		75
Mycological Glossary		25

Volume 12, No. 83 *May 1906*

Journal of Mycology

TABLE OF CONTENTS

W. A. KELLERMAN, PH. D.

Professor of Botany, Ohio State University, Columbus, Ohio

Entered as Second Class Matter, Post-office at Columbus, Ohio.

PRESS OF F. J. HEER, COLUMBUS, OHIO.

Cost of Separates.

Contributors who desire separates of their articles will receive the same at cost, approximately as follows:

For 4 pages or less:	100 copies $1 75	200 copies $2 25
" 8 " "	100 " 2 50	200 " 3 25
" 16 " "	100 " 4 25	450 " 5 50

For more extended articles proportionately higher.

Plates not included in the above.

ADDRESS: EDITOR JOURNAL OF MYCOLOGY

Dr L. Hollós

Journal of Mycology Portraits with Facsimile Autographs.

Journal of Mycology

VOLUME 12 — MAY 1906

TABLE OF CONTENTS

PERIDERMIUM CEREBRUM PECK AND CRONARTIUM QUERCUUM (BERK.)*

C. L. SHEAR.

The recent work of Klebahn,[1] Ed. Fischer,[3] and Shirai [2] on certain species of *Peridermium* and their relation to *Cronartium* naturally suggests the probable connection of our American species. The common occurrence of *P. cerebrum* on trunks and branches of *Pinus Virginiana* about Washington and also the abundance of *Cronartium Quercuum* (Berk.) on oaks in the same vicinity led to the suspicion that a connection existed between these two forms.

With a view of obtaining some more definite light on the subject, some outdoor inoculations were made in the spring of 1902 by applying the aecidiospores of *Peridermium cerebrum* to the leaves of *Quercus Prinus, Q. alba* and *Q. coccinea*. The inoculations were made just about sundown on the evening of May 1, twelve marked leaves being used in each case. No infection took place in the case of *Q. Prinus* and *Q. alba,* which are usually entirely free from the fungus in this vicinity.

On May 12 uredo sori were found on the under surface of the infected leaves of *Q. coccinea,* as follows:

*Read before the American Mycological Society. New Orleans, Jan. 1, 1906.

[1] Deutsch Bot. Gesell. **8**, 1890, 61, and later papers.

[2] Beiträge Krypt. Schweiz. **1**, 1898, 90, and elsewhere.

[3] Bot. Mag. **13**, 1899, 74.

No. 1	20
No. 2	17
No. 3	72
No. 4	62
No. 5	3
No. 6	3
No. 7	2
No. 8	11
No. 9	116
No. 10	20
No. 11	28
No. 12	0

On May 18 the cylindrical brown masses of teleutospores were found arising from many of the uredo sori. The surrounding uninoculated leaves on the same tree showed at this time an occasional uredo sorus, varying from one to three on a few of the leaves, but no signs of teleutospores were yet to be found. This seemed to indicate that infection had taken place later in the case of the natural inoculations than in the case of the artificial ones.

This experiment, conducted in the open woods where there was possibility or perhaps probability of infection from other sources is, of course, not conclusive. The large number of sori occurring on most of the artificially inoculated leaves as compared with the very small number found on the surrounding ones, taken in connection with their much earlier appearance, seems however to indicate a genetic relation between these forms.

Other attempts to produce artificial infection undertaken during the middle of the day failed, but later experiments made in the evening were apparently successful, as numerous sori of the *Cronartium* developed on the inoculated leaves and few or none on those uninoculated. Unfortunately, we have not thus far had opportunity to carry out artificial inoculation experiments under conditions which would preclude the possibility of infection from any other source.

As bearing upon the probability of the genetic relation of these two forms, additional evidence is furnished by the following observations: On May 17, 1903, a small tree of *Pinus Virginiana,* about five feet high, was found having a large spore-bearing excrescence of *Peridermium cerebrum* on its trunk about one foot from the ground. About two feet away two seedling oaks were growing, one *Quercus Marylandica* and the other *Q. Prinus,* bearing about a dozen leaves each. Most of the leaves on both of these plants had their under surfaces almost literally covered with the uredo sori of *Cronartium Quercuum,* and many showed teleutospores forming. We have been unable to find any record of the fungus occurring on *Q. Prinus* and have never found it ourselves except in this instance, in spite of diligent search in various localities where the *Peridermium* is found, but not in such close proximity to the oak, and we have never seen it on any host in such great abundance as it was on these two plants. The sori were not quite so numerous and well developed on the *Q. Prinus* as on *Q. Marylandica,* which is a normal and common host of the fungus.

Shirai [4] has, according to Klebahn [5], proven by successful inoculation of seedling oaks (*Quercus serrata, Q. variabilis* and *Q. glandulifera*) the connection between *Cronartium gigantium* (Mayr) Tubeuf and what he calls *Cronartium Quercuum* (Cooke) Miyabe. Whether this *Cronartium,* which occurs on the oaks in Japan, is identical with the plant occurring on our oaks we are unable to say, not having had an opportunity to examine Japanese specimens. The authority given by Tubeuf for *Cronartium Quercuum* is also (Cooke) Miyabe.

The American plant was first described, so far as we can learn, by Berkeley [6] in 1874 as *Cronartium Asclepiadeum Quercuum,* collected on *Quercus nigra* in South Carolina and on *Q. velutina* in Pennsylvania. We find no description of the plant by Cooke.

In regard to *Peridermium gigantium* (Mayr) Tubeuf, this was first described or mentioned at least by H. Mayr as *Aecidium gigantium* and transferred to *Peridermium* by Tubuef[7]. It is reported as occurring on *Pinus desiora, P. Thunbergi, P. parviflora* and *P. Linckuensis* in Japan. We had an opportunity during the past summer, through the kindness of Prof. Tubeuf, to examine the Japanese specimens of this fungus upon which his figures of the plant are based and which are preserved in the collection of the Forestry Institute at Munich. The specimens are identical in appearance with those collected on *Pinus Virginiana* in the vicinity of Washington. Moreover, the sweet sap containing spermatia, which is said to exude from the surface of the swellings produced by the fungus in Japan, is equally characteristic of our plant. We are, therefore, of the opinion that *Peridermium gigantium* (Mayr) Tubeuf is the same as *P. cerebrum* Peck, which was described many years before the Japanese plant. Though the matter can not be regarded as settled, all the evidence at hand at present points to the idenity of these plants and their genetic connection with the uredo and teleutospore stages which occur on various species of oak and which are known as *Cronartium Quercuum.*

It may be interesting to add a list of species of pine and oak upon which the two forms have been found in this country.

---

[4] l. c.

[5] Die Wirtswechselnden Rostpilse, 1904, p. 381.

[6] Grevillea, 1874, **3**, 59.

[7] Pflanzenkrankheiten durch Kryptogame Parasiten verursacht, 1895, p. 429.

Peridermium cerebrum.

The original specimens from New York were on *Pinus rigida*. It has also been collected on this host in New Jersey by Ellis (N. A. F. No. 1022) and by the writer. It is reported in Farlow and Seymour's "Host Index" as occurring on *P. ponderosa*. In Mohr's "Plant Life of Alabama" it is reported on *P. taeda*, *P. echinata* and *P. Virginiana*. There are specimens of a *Peridermium* from Mississippi and Texas in the pathological collection of the Bureau of Plant Industry, Department of Agriculture, which also appear to belong to this species. Its distribution, according to the records and specimens at hand, is from New York to Texas.

Cronartium Quercuum.

This is given by Farlow and Seymour as occurring on the following oaks: *Quercus coccinea*, *Q. nigra*, *Q. tinctoria - Q. velutina*, and *Q. virens-Q. virginiana*. There are specimens in the pathological collections of the Department of Agriculture on *Q. velutina*, *Q. Virginiana*, *Q. coccinea* and *Q. macrocarpa* (Fun. Col. No. 198). We have found it about Washington on *Quercus velutina*, *Q. coccinea*, *Q. Marylandica*, *Q. Phellos* and *Q. Prinus*. We have collected it in New Jersey on all the species last mentioned, except *Q. Prinus*, and also on the following additional species not before reported: *Q. alba*, *Q. digitata*, *Q. nana* and *Q. minor*. Its distribution, so far as indicated by the specimens seen, is from Pennsylvania and New Jersey to Mississippi and Texas. There are also specimens from Minnesota. Of course, if the connection between these two forms is correct, their distribution should be practically identical.

NORTH AMERICAN SPECIES OF HELIOMYCES.

A. P. MORGAN.

HELIOMYCES Le'ville Champ. exot. Am. Sc. Nat. 1844.

Pileus coriaceous - or membranaceous - tremellose, plicate-sulcate or rugulose. Stipe central, tough, cylindric, fistulose, Lamellae similar in substance to the pileus, the edge acute; spores white.

Small Agarics which are tremelloid when fresh and growing, and when dry have the appearance of Marasmii. Only about a dozen species have been described and these are very imperfectly known; the spores are recorded in but one or two species. The genus is certainly a very interesting one and worthy of the attention of students; but the species must be observed and described in their fresh and growing state, since they change their appearance remarkably in drying. No doubt some tropical species of Mycena and Marasmius described from the dried specimens belong properly in Heliomyces.

A. STIPE GLABROUS.

a. Pileus colored from the first.

1. HELIOMYCES BERTOROI Le'ville Champ. exot. 1844.

Pileus discoid, umbilicate, naked, radiate-sulcate, ferruginous. Stipe slender, somewhat woody, naked, cylindric, ferruginous-purpurascent.

Growing upon the bark of trees in Porto Rico. The plant is 4 cm. in height.

2. HELIOMYCES FOETENS Patouillard, Journ. Bot. 1889.

Ill-smelling; fascicular. Pileus thin, membranaceous, glabrous, rufous, the center umbonate, the margin pellucid and torn. Stipe slender, rigid, glabrous, the apex thickened, slightly striate. Lamellae numerous, very thin, equal, adnexed; spores ovoid, hyaline, 6 x 4 mic.

Growing on rotten wood of Prunus occidentalis upon the island of Martinique. Pileus 1.5-3 cm. in diameter, the stipe 6-8 cm. long and 1-2 mm. thick.

b. Pileus at first white.

3. HELIOMYCES PLUMIERII Le'ville Champ. exot. 1844. "Fungus crenatus tenuissimus niveus." Plumier, Traite des Fougères, 1705.

Pileus expanded, thin, striate, white, the margin crenate-dentate. Stipe cylindric, bulbillose at the base. Lamellae thin, serrulate.

Growing in the West Indies. Pileus 4-5 cm. in diameter, the stipe 9-10 cm. long and 4-5 mm. thick. A doubtful species.

4. HELIOMYCES DECOLORANS B. & C. Ann. & Mag. N. H. 1859.

Pileus glabrous, rugose, sulcate, white. Stipe rigid, shining white. Lamellae broad, decurrent, white, the interstices wrinkled.

Growing on dead wood, Alabama. Pileus 2-3 cm. in diameter, the stipe 5 cm. in height. The whole plant is at first white, in drying it changes color to rufous or tanny-brown.

B. STIPE PRUINOSE.

5. HELIOMYCES NIGRIPES Morgan. Agaricus nigripes Schweinitz, Syn. Car. 1822. Marasmius nigripes Fries, Epicrisis, 1838.

Tremelloid. Pileus very thin, pure white, pruinose, rugulose-sulcate, convex then expanded. Stipe thickest at the apex, tapering downward, black, white-pruinose, the base insititious. Lamellae pure white, unequal, some of them forked, adnate, the interstices venulose; spores hyaline, stellate, 3-5-rayed, the expanse of the rays 8-9 mic.

Growing on old leaves, sticks, etc. Pileus 1-2 cm. in diamter, the stipe 2-3.5 cm. long and 1-2 mm. thick. In the dry state, the lamellae are changed to flesh-color or rufous and red-brown, the stipe loses its black color and pileus and stipe become uniformly alutaceous. The pruinosity on the stipe and pileus consists of imperfect flocci and minute glittering cells.

6. HELIOMYCES VIALIS Morgan. Marasmius vialis Peck. 51 N. Y. Rep. 1897.

Pileus membranaceous, convex, pruinous, white. Stipe short, tough, solid, at first white, then brown or blackish, but covered with a white pruinosity, commonly swollen at the base into a small downy bulb. Lamellae arcuate, distant, decurrent, white.

Growing on damp ground by the roadside. Pileus 4-10 mm. in diameter, the stipe 1-2 cm. long and about 1 mm. thick. This fungus has almost the same style of coloration as Marasmius nigripes.

Index to the Species of Marasmius and Heliomyces.

INDEX — Concluded.

SECOND SUPPLEMENT TO NEW GENERA OF FUNGI PUBLISHED SINCE 1900 WITH CITATION AND ORIGINAL DESCRIPTION.

COMPILED BY P. L. RICKER.

(Concluded from Page 75.)

V. LABOULBENIINEAE.

[Laboulbeniinae.]

DISTICHOMYCES Thaxter n. g. Laboulbeniaceae. Proceedings of the American Academy of Arts and Sciences, 41:308. 1905.

"Receptacle consisting of a basal and subbasal cell surmounted by two parallel series of cells of indefinite number, any of which may bear either a sterile appendage or an antheridium externally, one of the series ending in a perithecium, the other terminated by the primary appendage. Appendages of the same type as those of Rickia and Peyritschiella. Antheridia at maturity terminial on a unicellular branch, becoming quite free in a complete group."

VI. AECIDIOMYCETAE.

[Aecidiomycetae.]

BAEODROMUS Arthur n. g. Uredinaceae. Annales Mycologici, 3: 19. 1905.

"Spermagonia globose, subepidermal. Telutospores catenulate, united laterally into compact definite sori; promycelium single from near apex of cell, external, recurved, bearing four globose sporidia."

[Aecidiomycetae.]

Calliospora Arthur n. g. Uredinales. Botanical Gazette, 39: 390. 1905.

"Telutosori arising from beneath the epidermis, soon naked; telutospores 2-celled by transverse partition, wall colored, with an external layer which swells in water, germ pores 2 in each cell, lateral. Aecidium and uredo wanting. Spermogonia arising from beneath the cuticle, conical."

[Aecidiomycetae.]

Phragmidiella P. Henn. n. g. Uredinales. Engler's Botanische Jahrbücher, 38:104. 1905.

"Uredosori haud paraphysati, uredosporae castaneo-obscurae, asperatae. Telutosporae 3-4 septatae constrictae, pallidulae."

[Aecidiomycetae.]

Uromycladium McAlpine n. g. Uredineae. Annales Mycologici, 3: 321. 1905.

"O. Spermogonia somewhat hemispherical, produced under the cuticle, without paraphyses at mouth, preceding the formation of any other spore.

I. Aecidia at present unknown.

II. Uredospores borne singly and generally much larger than telutospores, with several distinct germ-pores and without paraphyses.

III. Telutospores in clusters, composed of one spore and cyst, or two or three spores with or without a cyst, depressed globose. Germination as in Uromyces and without a period of rest, as fas as known."

VII. Basidiomycetae.

[Basidiomycetae]

Amauroderma Murrill n. g. Polyporaceae. Bulletin of the Torrey Botanical Club, 32:360. 1905.

"Hymenophore large, epixylous, stipitate, the stipe often much elongated; surface smooth, encrusted, not varnished; context brown, punky; tubes cylindrical, concolorous, the mouths usually light-colored at first; spores ovoid or globose, brown."

[Basidiomycetae.]

Aurantiporellus Murrill n. g. Polyporaceae. Bulletin of the Torrey Botanical Club, 32:486. 1905.

"Hymenophore large, annual, epixylous, effused, immarginate or narrowly reflexed; surface azonate, soft anoderm and orange-colored when young, becoming slightly encrusted and darker with age; context orange-colored, extremely soft and spongy throughout; tubes orange-colored, very large, thin-walled, irregular, lacerate, fragile; spores smooth, hyaline."

[Basidiomycetae.]

AURANTIPORUS Murrill n. g. Polyporaceae. Bulletin of the Torrey Botanical Club, 32:487. 195.

"Hymenophore large, annual, epixylous, sessile, dimidiate; surface anoderm, sodden, bibulous, reddish-orange, soon fading; context reddish-yellow, fleshy-tough to woody, juicy when fresh, rigid when dry, conspicuously zonate; tubes small, slender, thin-walled, brilliant orange when fresh, becoming dark, resinous and fragile on drying; spores smooth, hyaline."

[Basidiomycetae.]

CERRENELLA Murrill n. g. Polyporaceae. Bulletin of the Torrey Botanical Club, 32:361. 1905.

"Hymenophore thin, effused-reflexed, annual, epixylous; surface brown, zonate, anoderm, margin thin; context thin, coriaceous, brown; hymenium at first poroid, very soon becoming irpiciform, the teeth irregular and compressed; spores smooth, hyaline."

[Basidiomycetae.]

CORIOLELLUS Murrill n. g. Polyporaceae. Bulletin of the Torrey Botanical Club, 32:481. 1905.

"Hymenophore small, dry, annual, epixylous, semi- resupinate; surface white, anoderm, usually azonate; context white, thin, fibrous to corky; hymenium concolorous, tubes thin-walled, usually large and irregular, dentate, but not irpiciform; spores smooth, hyaline."

[Basidiomycetae.]

CORIOLOPSIS Murrill n. g. Polyporaceae. Bulletin of the Torrey Botanical Club, 32:358. 1905.

"Hymenophore thin, flexible or rigid, annual, epixylous, sessile, dimidiate, often largely resupinate; surface light-brown, zonate, anoderm, hairy, margin thin; context thin, coriaceous to woody, pale ferruginous, sometimes almost white; hymenium concolorous, tubes small, regular, thin-walled, entire; spores smooth, hyaline."

[Basidiomycetae.]

CUBAMYCES Murrill n. g. Polyporaceae. Bulletin of the Torrey Botanical Club, 32:480. 1905.

"Hymenophore large, annual epixylous, sessile; thin, dry, conchate; surface pelliculose, glabrous, normally azonate; context white or yellowish, thin, homogeneous, very soft and elastic; hymenium concolorous, tubes small and regular, rather thick-walled, firm and corky, mouths entire, spores smooth, hyaline."

[Basidiomycetae.]

DENDROPHAGUS Murrill n. g. Polyporaceae. Bulletin of the Torrey Botanical Club, 32:473. 1905. non Toumey 1900.

"Hymenophore very large, but of light weight, annual epixylous, sessile, dimidiate, thick and pulvinate; surface pelliculose, glabrous, azonate, margin very obtuse; context very thick, soft and spongy throughout; tubes small, dark-colored, thin-walled, fragile; spores smooth, hyaline."

[*See Tomophagus Murr.*]

[Basidiomycetae.]

Earliella Murrill n. g. Polyporaceae. Bulletin of the Torrey Botanical Club, 32:478. 1905.

"Hymenophore medium to large, annual, epixylous, semi-resupinate, thin and red but rigid; surface pelliculose, glabrous, zonate, more or less reddish-brown in color; context white, coriaceous, zonate; hymenium flesh-colored, tubes medium, irregular, becoming thin-walled; spores smooth, hyaline."

[Basidiomycetae.]

Flaviporellus Murrill n. g. Polyporaceae. Bulletin of the Torrey Botanical Club, 32:485. 1905.

"Hymenophore small, annual, epixylous, sessile or substipitate, flabelliform, yellow throughout; surface anoderm, margin thin; context very thin and friable; tubes small, thin-walled, fragile; spores smooth, hyaline or yellowish."

[Basidiomycetae.]

Flaviporus Murrill n. g. Polyporaceae. Bulletin of the Torrey Botanical Club, 32:360. 1905.

"Hymenium annual, often reviving, epixylous, sessile, dimidiate, imbricate; surface encrusted, glabrous; context thick, woody, brown; tubes thin-walled, minute, regular; spores smooth, hyaline."

[Basidiomycetae.]

Fomitella Murrell n. g. Polyporaceae. Bulletin of the Torrey Botanical Club, 32:365. 1905.

"Hymenium sessile, at times semi-resupinate, applanate, epixylous; surface glabrous, anoderm to encrusted, sulcate with age; context woody or slightly punky, brownish-olivaceous, rarely varying to pallid; tubes minute, cylindrical, usually thick-walled, rarely stratose; spores smooth, hyaline."

[Basidiomycetae.]

Gastrosporium Mattirolo n. g. Lycoperdales. Memorie della Reale Accademie Scienze di Torino, II. 53:361. 1903.

"Il Gastrosporium, come indica il nome, è formato da una cavità ripiena di innumeravoli minutissime spore, limita da una parete doppia."

"Il corpo fruttifero globoso-lobato è di color bianco latteo, di grossezza che varia da quella di un pisello a quella di una noce, misurando il più grosso esemplare esaminato un diametro di circa tre cent."

"Il Peridio è formato da due strati nettamente differenziati."

"L'esterno, dello spessore di circa ½ mill. puverulento, calceo, risulta (negli esemplarè essiccati) composto di un materiale farinoso, facilmente esportabile colle dita." * * * * *

"L'interno strato, spesso circa ⅓ di mill., e quindi meno sviluppato di quello esterno, nettamente dal primo differenziato, risulta di ife saldate fra di loro intimamente da una gelatina tenace, brillante."

"Le Gleba è formata da una massa di sostanza avente colore olivaceo chiaro, composta niente altro che da spore piccolissime, misuranti vel diametro circa 3 micra, a contorno circolore o leggermente ovale, le quali, solamente a forte ingrandimento, lasciano scorgere ancora il puto di attocco collo sterigma."

[Basidiomycetae.]

IRPICIPORUS Murrill n. g. Polyporaceae. Bulletin of the Torrey Botanical Club, 32:471. 1905.

"Hymenophore annual, epixylous, sessile, effused-reflexed, white or pallid throughout; surface anoderm, glabrous or velvety, not distinctly zonate, margin acute; context thin, leathery, pallid or brown; tubes alveolar; spores smooth, hyaline."

[Basidiomycetae.]

MICROPORELLUS Murrill n. g. Polyporaceae. Bulletin of the Torrey Botanical Club, 32:483. 1905.

"Hymenophore thin, annual, epixylous, usually flabelliform, stipitate, the stipe variously attacked and sometimes much reduced; surface anoderm; multizonate; context thin, white, fibrous, rigid and fragile when dry; tubes very minute, regular, thin-walled, fragile when dry; spores smooth, hyaline."

[Basidiomycetae.]

NIGROPORUS Murrill n. g. Polyporaceae. Bulletin of the Torrey Botanical Club, 32:361. 1905.

"Hymenium annual, epixylous, dimidiate-sessile to flabelliform, glabrous; context dark-brown, firm, homogeneous; tubes short, slender, thin-walled, black; spores smooth, hyaline."

[Basidiomycetae.]

PHAEOLOPSIS Murrill n. g. Polyporaceae. Bulletin of the Torrey Botanical Club, 32:489. 1905.

"Hymenophore annual, epixylous, stipitate; surface azonate, anoderm, yellow or brown; margin acute; context yellow, fleshy to tough and fibrous, not friable; tubes yellow, regular, minute, thin-walled; spores smooth, hyaline; stipe excentric or lateral with substance and surface like that of the pileus."

[Basidiomycetae.]

PORODAEDALEA Murrill n. g. Polyporaceae. Bulletin of the Torrey Botanical Club, 32:367. 1905.

"Hymenophore large, perennial, epixylous, sessile, conchate to ungulate, surface anoderm, sulcate, usually rough; context brown and woody; tubes concolorous, rarely in distinct layers, the hymenium varying from porose to daedaleoid; spores smooth, hyaline at maturity, becoming brownish with age, cystidia conspicuous."

[Basidiomycetae.]

PYCNOPORELLUS Murrill n. g. Polyporaceae. Bulletin of the Torrey Botanical Club, 32:489. 1905.

'Hymenophore annual, epixylous, sessile, dimidiate, simple or imbricate, reddish or orange-colored throughout; surface anoderm, margin thin; context thin, friable; tubes thin-walled, fragile, at length lacerate; spores smooth, hyaline or pale yellowish."

[Basidiomycetae.]

RIGIDOPORUS Murrill n. g. Polyporaceae. Bulletin of the Torrey Botanical Club, 32:478. 1905.

"Hymenophore annual, at times reviving, epixylous, sessile, dimidiate, conchate, simple or imbricate; surface pelliculose, multizonate, margin thin, incurved when dry; context thin, white, woody, very rigid when dry, tubes minute, regular, light brown, mouths pruinose when young; spores smooth, hyaline."

[Basidiomycetae.]

TOMOPHAGUS Murrill n. n. Polyporaceae. (Dendrophagus Murr. non Toumey.) Torreya 5:197. 1905.

VIII. DEUTEROMYCETAE.

[Deuteromycetae.]

ASTEROTHYRIUM P. Hennings n. g. Leptostromataceae. Botanische Jahrbücher für Systematik, Pflanzengeschichte und Pflanzengeographie, 34:54. 1904.

"Perithecia membranacea, dimidiato-scutellata, atra, poro pertusa, hyphis circumdata. Conidia oblonge fusoidea, 3 septata, hyalina. Cystothyrio, Discosiae affin."

[Deuteromycetae.]

DIDYMOBOTRYOPSIS P. Hennings n. g. Stilbaceae. Hedwigia 41:149. 1902.

"Mycelium effusum, albidum; stromata subcylindracea e hyphis hyalinis coalitis conflata, apice fimbriata. Conidiophora subulata. Conidia acrogena singularia, oblonga, hyalina, 1-septata. Didymobotryo Sacc. aff."

[Deuteromycetae.]

GLIOMASTIX Guéguen n. g. Dematiaceae. Bulletin Trimestriel de la Société mycologique de France, 21:240. 1905.

'Hyphae steriles decumbentes; fertiles breves, simplices aut subsimplices. Conidia mucilaginea catenata, terminaliter conglobata, turbulo brunneo e membrana conidiophori innata, mox annulari segmentatione tubuli denudata, inde disjunctores toriformes, inter conidias insertis."

[Deuteromycetae.]

MADURELLA Brumpt. n. g. Mucedineae. Comptes Rendus Hebdomadaires des séances de la Société de Biologie 58:999. 1905.

Mucédinée à thalle blanc, vivant en parasite dans divers tissus animaus (os, muscles, tissu conjoctif), possédant dans sa vie végétative des filaments d'un diamètre toufours superieur à 1 μ et pouvant atteindre 8 a 10 μ. Ces filaments sont cloisonnés et se ramifient de temps à autre, ils secrétant une substance brune. En vieillissant, ces filaments s'organisent en sclérote et leur paroi s' imprègne quelquefois de pigment brun. Dans ce sclérote se rencontrent en quantité variable des corpuscles arrondis de 8 à 30 μ de diamètre (chlamydospores?)."

[Deuteromycetae.]

MONILITES Pampaloni n. g. Moniliaceae. Atti della Reale Accademie dei Lincei, V. 11:252. 1902. Fossil.

"Hyphae septatae, hyalinae, vage ramosae, effusae; conidia globoso, elliptica, 18-21μ, utrinque obtusa, in catenas breves, interdum ramosas disposita, hyalina, laevia."

[Deuteromycetae.]

PHOMOPSIS Sacc. n. g. Sphaeropsideae. Annales Mycologici, 3:166. 1905.

"Pycnidio subcutanea, plus minus erumpentia, globosa-depressa, saepe longitudinaliter oblonga, non raro supra latiuscule aperta nec regulariter ostiolata, nigricantia, gregaria. Sporulae fusoideo-oblongae, rarius ellipsoideae, typice 2-guttulatae. Basidia filiformia v. acicularia, saepe demum secedentia et incurvata."

[Deuteromycetae.]

SARCINODOCHIUM von Höhnel n. g. Tubercularieae. Oesterreichische Botanische Zeitschrift, 55:16. 1905.

"Epidochien oberflächlich, gelatinös, lebhaft, gefärbt aus einem lockenzelligen Grundgewebe bestehend, das nach aussen allmählich in kurze, einfache oder wenig und unregelmässig verzweigte Sporenträge übergeht, die an der Spitze gehäuft, wenig teils einzellige, teils zwei-bis vier-zellige, kreuzförmig geteilte, rundliche oder längliche, hyaline Sporen bilden. Saprophyt."

[Deuteromycetae.]

TETRACOCCOSPORIUM Szabó n. g. Dematiaceae. Hedwigia, 44:77. f. a-b. 1905.

"Cespitulis effusis griseis, hyphis hyalino-sub-fuscis, septatis, ramosis, conidiis globosis, ramorum apicem acrogenis, atro-brunneis, duobus parietibus verticalibus angula recto inter se sitis partitis."

[Deuteromycetae.]

THYRSIDINA von Hönel n. g. Melanconieae. Annales Mycologici, 2:337. 1905.

"Pilz lebhaft gefärbt, gelatinös-fleischig, hervorbrechend. Stroma hell gefärbt, dick, aus plectenchymatisch verflochtenen Hyphen bestehend, die an der Spitze noch im Innern des Stroma je eine hyalodictiee, rundliche Spore entwickeln, die allmählich heranreifend an die Oberfläche kommt. Sporen schleimig verbunden."

MYCELIA STERILIA.

[Mycelia Sterilia.]

MYCORRHIZONIUM Weiss, new fossil form-genus of Mycorhiza. Annals of Botany 18:255-265. pl. 18-19. 1904. No species described.

INDEX TO THE GENERA.

INDEX TO NORTH AMERICAN MYCOLOGY.

Alphabetical List of Articles, Authors, Subjects, New Species and Hosts, New Names and Synonyms.

W. A. KELLERMAN.

(Continued from Page 79.)

EUSTACE, H. J., *see Stewart, F. C., Eustace, H. J., and Sirrine, F. A.* . . .

EVERHART, Benjamin Matlack. Obituary. Jour. Mycol. 10:225. Sept. 1904.

Eysenhardtia amorphoides H. B. K., host to Calliospora holwayi Arthur n. sp. Bot. Gaz. 39:390. June 1905.

Eysenhardtia orthocarpa Wats., host to Calliospora holwayi Arthur n. sp. Bot. Gaz. 39:390. June 1905.

Fagus, wood, host to Caryospora cariosa Fairman n. sp. Proc. Rochester Acad. Sci. 4:190. 2 Sept. 1905.

Fairman, Charles E. The Pyrenomyceteae of Orleans County, N. Y. Proc. Rochester Acad. Sci. 4:165-191. 2 Sept. 1905.

Fairman, Charles E. Some New Fungi from Western New York. Jour. Mycol. 10:229-231. Sept. 1904.

Falcata comosa (L.) Kunze, host to Aecidium falcatae Arthur n. sp. Bull. Torr. Bot. Club, 33:32. Jan. 1906.

Favolus, *see Polyporaceae of North America, X* . . . .

Favolus tenuis (Hook.) Murrill n. n. [Boletus reticulatus Hook., B. tenuis Hook., Polyporus polygrammus Mont., Hexagona tenuis Fr., H. polygramma Fr., H. favoloides Peck.] Bull. Torr. Bot. Club, 32:100. Feb. 1905.

Favolus variegatus (Berk.) Murrill n. n. [Hexagona variegata Berk.] Bull. Torr. Bot. Club, 32:101. Feb. 1905.

Fertilization in Saprolegniales. B. M. Davis. Bot. Gaz. 39:61-4. Jan. 1905.

Fertilization in the Saprolegniales. A. H. Trow. Bot. Gaz. 39:300. April 1905.

Festuca jonesii Vasey, *see Festuca subulata Trin.* . . . .

Festuca pacifica Piper ined., host to Puccinia piperi Ricker n. sp. Jour. Mycol. 11:114. May 1905.

Festuca subulata Trin. (F. jonesii Vasey), host to Puccinia kreageri Ricker n. sp. Jour. Mycol. 11:114. May 1905.

Fimbrystilis holmayana Fernald, host to Puccinia fimbrystilidis Arthur n. sp. [Mexico.] Bull. Torr. Bot. Club, 33:28. Jan. 1906.

Fimbrystilis polymorpha Breckl., host to Puccinia fimbrystilidis Arthur n. sp. [Mexico.] Bull. Torr. Bot. Club, 33:28. Jan. 1906.

Fimbrystilis sp., host to Puccinia fimbrystilidis Arthur n. sp. [Mexico.] Bull. Torr. Bot. Club, 33:28. Jan. 1906.

Flammula braendleri Peck n. sp., single or cespitose on decaying trunks. Bull. Torr. Bot. Club, 31:180. Apr. 1904.

Flammula eccentrica Peck n. sp., on decaying wood. Bull. Torr. Bot. Club, 31:179. Apr. 1904.

HYPOCRELLA hypoxylon E. & E., *syn. of Dothichloe atramentosa q. v.*

HYPOCRELLA hypoxylon Sacc. Syll. & Ellis p. p., *syn. of Balansia hypoxylon q. v.*

HYPOCREA lloydii Bresadola, *syn. of Podostroma alutacea q. v.*

HYALOSPORA pellaeicola Arthur n. sp., on Pellaea andromedaefolio (Kaulf.) Fée, and Crytogramme stelleri (Gmel.) prantl, (Pellaea gracilis Hook.) Bull. Torr. Bot. Club, 33:30. Jan. 1906.

INDEX to North American Mycology (continued). W. A. Kellerman. Jour. Mycol. 116-143. May 1904.

INDEX to North American Mycology (continued). W. A. Kellerman. Jour. Mycol. 10:251-283. Sept. 1904.

INDEX to Journal of Mycology, volumes 1-10. Jour. Mycol. 10: 289-387. Nov. 1904.

INDEX to North American Mycology (continued). W. A. Kellerman. Jour. Mycol. 11:125-148. May 1905.

INDEX to North American Mycology (continued). W. A. Kellerman. Jour. Mycol. 11:190-9. July 1905.

INDEX to North American Mycology (continued). W. A. Kellerman. Jour. Mycol. 11:217-231. Sept. 1905.

Discard Ionotus amplectens Murrill n. sp., etc., and insert:

INONOTUS amplectens Murrill n. sp.; the fruit-bodies were found encircling living twigs of Asimina parviflora (?). Bull. Torr. Bot. Club, 31:600. Nov. 1904.

Discard Ionotus corrosus Murrill n. sp., etc., and insert:

INONOTUS corrosus Murrill n. sp. Bull. Torr. Bot. Club, 31:598. Nov. 1904.

Discard Ionotus dryophilus (Berk.) Murrill n. n., etc., and insert:

INONOTUS dryophilus (Berk.) Murrill n. n. [Polyporus dryophilus Berk.] Bull. Torr. Bot. Club, 31:597. Nov. 1904.

INONOTUS fibrillosus Karst., *syn. of Pycnoporellus fibrillosus q. v.*

Discard Ionotus fruticum (B. & C.) Murrill n. n., etc., and insert:

INONOTUS fruticum (B. & C.) Murrill n. n. [Polyporus fruticum B. & C.] Bull. Torr. Bot. Club, 31:601. Nov. 1904.

Discard Ionotus hirsutus (Scop.) Karst., etc., and insert:

INONOTUS hirsutus (Scop.) Karst. [Boletus hirsutus Scop., B. spongiosus Lightf., B. hispidus Bull., B. flavus Poll., Polyporus hispidus Fr., P. endocrinus Berk., Inodermus hispidus Quell.] Bull. Torr. Bot. Club, 31:594. Nov. 1904.

Discard Ionotus jamaicensis Murrill n. sp., etc., and insert:

IONONOTUS jamaicensis Murrill n. sp. Bull. Torr. Bot. Club, 31:597. Nov. 1904.

Discard Ionotus Karst. [Inoderma Karst.], etc., and insert:

INONOTUS Karst. [Inoderma Karst.] Bull. Torr. Bot. Club, 31:593. Nov. 1904.

Discard Inonotus, Key to the North American species, etc., and insert:

INONOTUS, Key to the North American species. [Murrill.] Bull. Torr. Bot. Club, 31:594. Nov. 1904.

Discard Inonotus perplanus (Peck) Murrill n. n., etc., and insert:

INONOTUS perplexus (Peck) Murrill n. n. [Polyporus perplexus Peck.] Bull. Torr. Bot. Club, 31:596. Nov. 1904.

Discard Ionotus pusillus Murrill n. sp., etc., and insert:

INONOTUS pusillus Murrill n. sp.; the tiny brown sporosphores were found in large numbers emerging from the lenticels of small dead branches of Jacquinia. Bull. Torr. Bot. Club, 31:599. Nov. 1904.

Discard Ionotus radiatus (Sowerby) Karst, etc., and insert:

INONOTUS radiatus (Sowerby) Karst. [Boletus radiatus Sowerby, Polyporus radiatus Fr., P. glomeratus Peck, Inoderma radiatum Karst.] Bull. Torr. Bot. Club, 31:599. Nov. 1904.

Discard Ionotus texanus Murrill n. sp., etc., and insert:

INONOTUS texanus Murrill n sp., on a Mesquite (?) tree. Bull. Torr. Bot. Club, 31:597. Nov. 1904.

Discard Ionotus wilsonii Murrill n. sp., etc., and insert:

INONOTUS wilsonii Murrill n. sp., on decaying logs. Bull. Torr. Bot. Club, 31:598. Nov. 1904.

JECZEWSKI, Year Book of Diseases, *see Review of* . . . .

JONES, L. R. and Morse, W. J. Disease Resistance of Potatoes, Plant Diseases in Vermont in 1904, Potato Diseases and their remedies. [Experiments and general account; not taxonomic.] An. Rep. Vermont Agr. Exp. Sta., 18:264-291. 1905.

JUNIPERUS virginiana, host to Melanomma juniperi Ellis & Everhart n. sp. Proc. Rochester Acad. Sci. 4:190. 2 Sept. 1905.

KALMUSIA, A New Species of. A. P. Morgan. Jour. Mycol. 11:153. July 1905.

KALMUSIA aspera Morgan n. sp., growing on the hard wood of a prostrate trunk of Gleditsia. Jour. Mycol. 11:153. July 1905.

KARSCHIA crassa Fairman n. sp., on decaying wood in the woods. Jour. Mycol. 10:229. Sept. 1904.

KAUFFMAN, Calvin Henry. The genus Cortinarius: a preliminary study. Bull. Torr. Bot. Club, 32:301-325. 7 figs. June 1905.

KELLERMAN, W. A. Elementary Mycology. Jour. Mycol. 10:90-5. Mar. 1904.

Kellerman, W. A. Elementary Mycology, continued. Jour. Mycol. 10:144-9. May 1904.

Kellerman, W. A. Index to North American Mycology (continued). Jour. Mycol. 116-143. May 1904.

Kellerman, W. A. Index to North American Mycology (continued). Jour. Mycol. 10:251-283. Sept. 1904.

Kellerman, W. A. Index to North American Mycology (continued). Jour. Mycol. 11:125-148. May 1905.

Kellerman, W. A. Index to North American Mycology (continued). Jour. Mycol. 11:190-9. July 1905.

Kellerman, W. A. Minor Mycological Notes, III. [Podosphaera tridactyla; Abnormal Collybia radicata.] Jour. Mycol. 10:62-4. Mar. 1904.

Kellerman, W. A. Minor Mycological Notes, IV. [Uncinula parvula; Mycological Flora of Cedar Point.] Jour. Mycol. 10:114-6. May 1904.

Kellerman, W. A. Mycological Bulletin [24 Nos.] Vol. 3. 1905.

Kellerman, W. A. A New species of Naemosphaera [N. lactucicola]. Jour. Mycol. 10:113-4. May 1904.

Kellerman, W. A. Notes from Mycological Literature, IX. Jour. Mycol. 10:81-90. Mar. 1904.

Kellerman, W. A. Notes from Mycological Literature, X. Jour. Mycol. 10:156-8. May 1904.

Kellerman, W. A. Notes from Mycological Literature, XV. Jour. Mycol. 11:149-151. May 1905.

Kellerman, W. A. Notes from Mycological Literature, XVI. Jour. Mycol. 11:180-190. July 1905.

Kellerman, W. A. Notes from Mycological Literature, XVII. Jour. Mycol. 11:271-2. Nov. 1905.

Kellerman, W. A. Notes from Mycological Literature, XVIII. Jour. Mycol. 12:32-9. Jan. 1906.

Kellerman, W. A. Ohio Fungi Fascicle IX. [Labels.] Jour. Mycol. 10:55-62. Mar. 1904.

Kellerman, W. A. and Ricker, P. L. New Genera of Fungi published since the year 1900, with citation and original descriptions (continued). Jour. Mycol. 10:232-250. Sept. 1904.

Kellerman, W. A. Uredineous culture experiments with Puccinia sorghi. 1905. Jour. Mycol. 12:9-11. Jan. 1906.

Key to Agaricaceae [Murrill], *see Agaricaceae, snynopsis* . . . .

Key to the brown sessile Polyporaceae, *see Polyporaceae* . . . .

Key to the common species of Clitopilus, *see Clitopilus, Key* . . . .

Key to the Cortinarii, *see Cortinarii, Partial Key* . . . .

LEPIOTA brunnescens Peck n. sp., open wood and grassy places. Bull. Torr. Bot. Club, 31:177. Apr. 1904.

LEPIOTA glatfelteri Peck n. sp., ground in woods. Bull. Torr. Bot. Club, 31:177. Apr. 1904.

LEPTOPORUS pubescens Pat., *syn. of Coriolus pubescens q. v.*

LIFE history of Hypocrea alutacea. George F. Atkinson. Bot. Gaz. 40:401-416. Pl. XIV-XVI. Dec. 1905.

LISIANTHUS exsertus, host to Phyllosticta lisianthi Sny. n. sp. Ann. Mycolog. 2:171. Mar. 1904.

LLOYD, C. G. The Lycoperdaceae of Australia, New Zealand, and neighboring islands. Illustrated with 15 plates and 49 figures [42 pp.]. Issued at the Lloyd Library, Cincinnati, April 1905.

LOESELIA ciliata, host to Puccinia fumosa Holway n. sp. Ann. Mycolog. 3:23. Feb. 1905.

LOESELIA coccinea Don., host to Puccinia fumosa Holway n. sp. Ann. Mycolog. 3:23. Feb. 1905.

LOESELIA glandulosa, host to Puccinia fumosa Holway n. sp. Ann. Mycolog. 3:23. Feb. 1905.

LOPHIOSTOMA cephalanthis Fairman n. sp., on decortiated area of branch of Cephalanthus occidentalis. Jour. Mycol. 10:230. Sept. 1904.

LOPHIOSTOMA imperfecta Ellis & Fairman n. sp., on dead stems of Asclepias? Proc. Rochester Acad. Sci. 4:187. 2 Sept. 1905.

LUPINUS mexicana H. B. K., host to Uromyces montanus Arthur n. sp. Bot. Gaz. 39:386. June 1905.

LUPINUS sparsiflorus, host to Placosphaeria lupini Sny. n. sp. Ann. Mycolog. 2:172. Mar. 1904.

LUPINUS sp., host to Uromyces rugosa Arthur n. sp. Got. Gaz. 39:386. June 1905.

LYCOPERDACEAE, The, of Australia, New Zealand, and neighboring islands. Illustrated with 15 plates and 49 figures [42 pp.]. C. G. Lloyd. Issued at the Lloyd Library, Cincinnati, April 1905.

LYSILOMA tergimina Benth., host to Ravenelia lysilomae Arthur n. sp. Bot. Gaz. 39:392. June 1905.

MACROPODIA fusicarpa (Ger.) Durand. [Peziza fusicarpa Ger., Peziza (Sarcoscyphae) pubida B. & C., Macropedia pubida (B. & C.) Sacc., Lachnea fusicarpa (Ger.) Sacc., Peziza velutina B. & C. (ined.) in Curtis Bot. N. Car., Peziza morgani Mass. Durand.] Jour. Mycol. 12:29. Jan. 1906.

MACROPODIA pubida (B. & C.) Sacc., *syn. of Macropodia fusicarpa q. v.*

Polyporaceae of North America, X. Agaricus, Lenzites, Cerrena and Favolus. William Alphonso Murrill. Bull. Torr. Bot. Club, 32:83-103. Feb. 1905.

Polyporaceae of temperate America, A key to the brown sessile. William Alphonso Murrill. Torreya, 5:194-5. Nov. 1905.

Polyporaceae of North America, XIII. The described species of Bjerkandera, Trametes and Coriolus. William Alphonso Murrill. Bull. Torr. Bot. Club, 32:633-656. Dec. 1905.

Polyporus aesculi Fr., *syn. of Agaricus aesculi q. v.*

Polyporus albo-cervinus Berk., *syn. of Coriolus brachypus q. v.*

Polyporus arenicolor B. & C., *syn. of Coriolus arenicolor q. v.*

Polyporus auberianus Mont., *syn. of Fomes auberianus q. v.*

Polyporus aurantiacus Peck, *syn. of Pycnoprellus fibrillosus q. v.*

Polyporus brachypus Lév., *syn. of Coriolus brachypus q. v.*

Polyporus fragrans Peck, *syn. of Bjerkandera fragrans q. v.*

Polyporus fibrillosus Karst., *syn. of Pycnoporellus fibrillosus q. v.*

Polyporus flabellum Mont., *syn. of Polyporus* YABELLUM *q. v.*

Polyporus hirsutus Fr., *syn. of Coriolus nigromarginatus q. v.*

Polyporus hirsutulus Schw., *syn. of Coriolus hirsutulus q. v...*

Polyporus ilicincola B. & C., *syn. of Coriolus ilicincola q. v.*

Polyporus latissimus Fr., *syn. of Agaricus quercinus q. v.*

Polyporus obtusus Berk., *syn. of Trametes unicolor q. v.*

Polyporus planus Peck, *syn. of Coriolus planellus q. v.*

Polyporus polygrammus Mont., *syn. of Favolus tenuis q. v.*

Polyporus pubescens Fr., *syn. of Coriolus pubescens q. v.*

Polyporus sartwellii B. & C., *syn. of Coriolus sartwellii q. v.*

Polyporus sericeo-hirsutus Kl., *syn. of Coriolus sericeohirsutus q. v.*

Polyporus sobrius B. & C., *syn. of Coriolus sobrius q. v.*

Polyporus subluteus Ell. & Ev., *syn. of Coriolus subluteus q. v.*

Polyporus sullivantii Mont., *syn. of Coriolus sullivantii q. v.*

Polyporus tener Lév., *syn. of Coriolus tener q. v.*

Polyporus unicolor Fr., *syn. of Trametes unicolor q. v.*

Polyporus verae-crucis Berk., *syn. of Phaeolopsis verae-crucis q. v.*

Polystictus barbatulus Fr., *syn. of Coriolus sericeohirsutus q. v.*

Polystictus hirtellus Fr., *syn. of Corilus hirtellus q. v.*

Polystigma pusillum Syd. n. sp., in foliis vivis Andirae excelsae. [Quatemala.] Ann. Mycolog. 2:167. Mar. 1904.

PSATHYRA multipedata Peck n. sp., grassy ground. Bull. Torr. Bot. Club, 32:80. Feb. 1905.

PTERIS aquilina lanuginosa, host to Gloeosporium obtegens Syd. n. sp. Ann. Mycolog. 2:172. Mar. 1904.

PYCNOPORELLUS fibrillosus (Karst.) Murrill n. n. [Polyporus fibrillosus Karst., P. aurantiacus Peck, Inonotus fibrillosus Karst.] Bull. Torr. Bot. Club, 32:489. Sept. 1905.

PUCCINIA actinomeridis Magnus, [not on Actinomeris squarrosa as reported but on Verbesina occidentalis], a synonym of Puccinia verbesinae Schw. [Ricker.] Jour. Mycol. 11:113. May 1905.

PUCCINIA aequinoctialis Holway n. sp., on Bigonia aequinoctialis L. [Cuba.] Ann. Mycolog. 3:22. Feb. 1905.

PUCCINIA albiperidia Arth. [Cultures on Ribes uva-crispa. Klebahn.] Jour. Mycol. 12-14. Jan. 1906.

PUCCINIA albiperidia Arth. [Cultures on Ribes gracilis. Arthur.] Jour. Mycol. 12:14. Jan. 1906.

PUCCINIA ambicola E. & E., synonym of P. plumbaria Peck. [Holway.] Jour. Mycol. 11:268. Nov. 1905.

PUCCINIA amphigena Diet. [Cultures on Smilax hispida. Arthur.] Jour. Mycol. 12:16. Jan. 1906.

PUCCINIA anachoreta Hark. [Notes and description including the uredo. Dudley and Thompson.] Jour. Mycol. 10:52. Mar. 1904.

PUCCINIA arthuri Syd. n. sp., in foliis vivis Penniseti mexicani. [Mexico.] Monogr. Uredin. 1:775. 15 Oct. 1904.

PUCCINIA atro-fusca (Dudley & Thompson) Holway n. n. [Uromyces atro-fusca Dudley & Thompson.] Jour. Mycol. 10:228. Sept. 1904.

PUCCINIA badia Holway n. sp., on Salvia albicana Fernald, S. chrysantha Mart. & Gal., and Salvia sp. [Mexico.] Jour. Mycol. 11:158. July 1905.

PUCCINIA boutelouae (Jennings) Holway. [Diorchidium boutelouae Jennings, Bull. Tex. Agr. Sta. 9:25. 1890.] [Description and notes. Holway.] Ann. Mycolog. 3:20. Feb. 1905.

PUCCINIA buchloes Syd. Mon. Ured. non Schofield, *syn. of Puccinia kansensis q. v.*

PUCCINIA canaliculata (Schw.) Lagerh. [Cultures on Cyperus esculentus. Arthur.] Jour. Mycol. 12:23. Jan. 1906.

PUCCINIA caricis-solidaginis Arth. [Cultures on Solidago canadensis. Arthur.] Jour. Mycol. 12:15. Jan. 1906.

PUCCINIA caricis (Schum.) Reb. [Cultures on Urtica gracilis. Arthur.] Jour. Mycol. 12:15. Jan. 1906.

PUCCINIA distichlidis E. & E., *syn. of P. kelseyi q. v.*

PUCCINIA distorta Holway n. sp., on Mesosphaerum pectinatum (L.) Kunze, and Mesosphaerum sp. Ann. Myocolg. 3:22. Feb. 1905.

PUCCINIA dolochi Arthur n. sp., on Dolichos reticulatus Hockst., Aguacate. [Cuba.] Bull. Torr. Bot. Club, 33:28. Jan. 1906.

PUCCINIA eleocharidis Arth. [Cultures on Eupatorium perfoliatum. Arthur.] Jour. Mycol. 12:23. Jan. 1906.

PUCCINA exasperans Holway n. sp., on Bouteloua (Atheropogon) curtipendulus (Mx.) and B. pringlei Scrib. [Mexico.] Ann. Mycolog. 3:21. Feb. 1905.

PUCCINIA fimbristylidis Arthur n. sp., on Fimbrystilis polymorpha Breckl., F. holwayana Fernald, and Fimbrystilis sp. [Mexico.] Bull. Torr. Bot. Club, 33:28. Jan. 1906.

PUCCINIA fragilis Tracy & Gall. [In Baker, Tracy & Earle, Plants of So. Cal. 423 a are P. plumbaria Peck on Phlox (P. longifolia?). Holway.] Jour. Mycol. 11:268. Nov. 1905.

PUCCINIA fraxianta (Schw.) Arth. [Cultures on Fraxinus lanceolata. Arthur.] Jour. Mycol. 12:16. Jan. 1906.

PUCCINIA fumosa Holway n. sp., on Loeselia coccinea Don., L. glandulosa, and L. ciliata. [Mexico.] Ann. Mycolog. 3:23. Feb. 1905.

PUCCINIA gouaniae Holway n. sp., on Gouania tomentosa Jacq. [Cuba.] Ann. Mycolog. 3:21. Feb. 1905.

PUCCINIA grindeliae Pk. [Cultures on Gutierrezia sarothrae. Arthur.] Jour. Mycol. 12:21. Jan. 1906.

PUCCINIA guillemineae Diet. et Holw. [type had only teleutospores, collected in Mexico with uredo and aecidia; description. Holway.] Ann. Mlcolog. 3:22. Feb. 1905.

PUCCINIA helianthi Schw. [Cultures on Helianthus annuus and H. grosse-serratus. Arthur.] Jour. Mycol. 12:18. Jan. 1906.

PUCCINIA infrequens Holway n. sp., on Salvia cinnabarina Mart. & Gal. [Mexico.] Jour. Mycol. 11:158. July 1905.

PUCCINIA kansensis Ell. & Barthol. Eryth. 4:1. [P. buchloes Syd. Monogr. Ured. 1:740 non P. buchloes Schofield, Webber, App. Fl. Nebr.] Ann. Mycolog. 3:20. Feb. 1905.

PUCCINIA kelseyi Syd. n. n. [P. distichlidis E. & E.] In foliis vivis Spartinae gracilis, cynosuroidis. Monogr. Uredin. 1:806. 15 Oct. 1904.

PUCCINIA kreageri Ricker n. sp., on leaves of Festuca subulata Trin. (F. jonesii Vasey). Jour. Mycol. 11:114. May 1905.

PUCCINIA kuhniae Schw. [Cultures on Kuhnis eupatorioides. Arthur.] Jour. Mycol. 12:23. Jan. 1906.

Puccinia lateripes B. & Br. [Cultures on Ruellia ciliosa and R. strepens. Arthur.] Jour. Mycol. 12:18. Jan. 1906.

Puccinia leptospora Ricker n. sp., on Trisetum virletii Fourn. [Mexico.] Jour. Mycol. 11:114. May 1905.

Puccinia luxuriosa Syd. n. sp. [P. tosta var. luxurians Arth.] In foliis vivis Sporobolis airoidis. Monogr. Uredin. 1:812. 15 Oct. 1904.

Puccinia micromeriae Dudley & Thompson n. sp., on Micromeria chamissonis. Jour. Mycol. 10:54. Mar. 1904.

Puccinia monardellae Dudley & Thompson n. sp., on Monardella villosa, M. undulata; distributed under Puccinia menthae Pers. F. Columb. No. 1886.] Jour. Mycol. 10:53. Mar. 1904.

Puccinia moreniana Dudley and Thompson n. sp., on Brodiaea capitata. Jour. Mycol. 10:53. Mar. 1904.

Puccinia nivea Holway n. sp., on Salvia purpurea Cav. [Mexico.] Jour. Mycol. 11:158. July 1905.

Puccinia nodosa Ell. & Hark. [Description; aecidia and uredo not before reported on Brodiaea capitata. Dudley & Thompson.] Jour. Mycol. 10:52. Mar. 1904.

Puccinia oblicus B. & C., synonym of P. lateritia B. & C. [Holway.] Jour. Mycol. 11:268. Nov. 1905.

Puccinia pammelii (Trel.) Arth. [Cultures on Euphorbia corollata. Arthur.] Jour. Mycol. 12:16. Jan. 1906.

Puccinia paradoxica Ricker n. sp., on Melica smithii (Porter) Vasey. Jour. Mycol. 11:114. May 1905.

Puccinia pattersoniae Syd. n. sp., on foliis vaginisque Tripsaci dactyloidis. Monogr. Uredin. 1:820. 15 Oct. 1904.

Puccinia pattersoniana Arthur n. sp., on Agropyron spicatum (Pursh.) Rydb. Bull. Torr. Bot. Club, 33:29. Jan. 1906.

Puccinia peckii (DeT.) Kellerm. [Cultures on Onagra biennis. Arthur.] Jour. Mycol. 12:15. Jan. 1906.

Puccinia piperi Ricker n. sp., on Festuca pacifica Piper ined. Jour. Mycol. 11:114. May 1905.

Puccinia poculiformis (Jacq.) Wettst. [Cultures on Berberis vulgaris. Arthur.] Jour. Mycol. 12:17. Jan. 1906.

Puccinia polygoni-amphibii Pers. [Cultures on Geranium maculatum. Arthur.] Jour. Mycol. 12:18. Jan. 1906.

Puccinia pruni-spinosae Pers. [Cultures with aecidiospores (Aecidium hepaticatum Schw.) on Prunus serotina. Arthur.] Jour. Mycol. 12:18. Jan. 1906.

Puccinia purpusii P. Henn. [Reported on Arabis, is P. plumbaria Pk., on some Phlox or closely allied genus. Holway.] Jour. Mycol. 11:268. Nov. 1905.

PUCCINIA pustulata (Curt.) Arthur. [Cultures on Comandra umbellata. Arthur.] Jour. Mycol. 12:16. Jan. 1906.

PUCCINIA rubricans Holway, syn of Puccinia sanguinolenta P. Henn. [Holway.] Ann. Mycolog. 3:24. Feb. 1905.

PUCCINIA sambuci (Schw.) Arth. [Cultures on Sambucus canadensis. Arthur.] Jour. Mycol. 12:14. Jan. 1906.

PUCCINIA sanguinolenta P. Henn. [host said to be of Myrtaceae, S. Am.; syn.: *Puccinia rubricana* Holway, host one of Malpighiaceae, Heteropteris. Host of former is a Heteroptis. Holway.] Ann. Mycolog. 3:24. Feb. 1905.

PUCCINIA scandica Johans. [alpine regions of Sweden, now collected in Utah, alt. 8,900 ft., on Epilobium alpinum, and in Washington on E. clavatum. Holway.] Ann. Mycolog. 3:23. Feb. 1905.

PUCCINIA seymouriana Arth. [Cultures on Cephalanthus occidentalis. Arthur.] Jour. Mycol. 12:24. Jan. 1906.

PUCCINIA silphii Schw. [Cultures on Silphium integrifolium. Arthur.] Jour. Mycol. 12:21. Jan. 1906.

PUCCINIA solidaginis Pk. [Cultures on Solidago canadensis. Arthur.] Jour. Mycol. 12:22. Jan. 1906.

PUCCINIA sorghi. [Cultures on Oxalis. Kellerman.] Jour. Mycol. 12:10. Jan. 1906.

PUCCINIA sorghi, culture experiments, 1905, [Kellerman], *see Uredineous* . . . .

PUCCINI sorghi Schw. [Cultures on Oxalis cymosa. Arthur.] Jour. Mycol. 12:17. Jan. 1906.

PUCCINIA subnitens Diet. [Cultures on Erysinum asperum, Sophia incisa, Lepidium virginicum, and Bursa bursa-pastoris. Arthur.] Jour. Mycol. 12:17. Jan. 1906.

PUCCINIA substerilis E. & E. [Cultures of amphispores on Stipa viridula, failure of teleutospores on Aster ericoides, A. multiflorus, and A. novae-angliae, hence this rust not the same as P. stipae. Arthur.] Jour. Mycol. 12:24. Jan. 1906.

PUCCINIA tosta var. luxurians Arth., *syn. of P. luxuriosa q. v.*

PUCCINIA transformans E. & E. [Cultures on Stenolobium stans (Tecoma stans). Arthur.] Jour. Mycol. 12:22. Jan. 1906.

PUCCINIA traversiana Syd. n. sp., in foliis vivis Phellopteri purpurascentis. Mongr. Uredin. 1:889. 15 Oct. 1904.

PUCCINIA uniformis Pammel & Hume, synonym of P. bistortae (Sta.) DC. [Holway.] Jour. Mycol. 11:268. Nov. 1905.

PUCCINIA verbenicola (E. & K.) Arth. [Cultures on Verbena urticaefolia. Arthur.] Jour. Mycol. 12:16. Jan. 1906.

PUCCINIA xanthii Schw. [Cultures on Xanthium canadense. Arthur.] Jour. Mycol. 12:20. Jan. 1906.

SUMSTINE, D. R. Gomphidius Rhodoxanthus Once More. [Note and synonomy] Jour. Mycol. 11:165-166. July 1905.

SUMSTINE, D. R. Another Fly Agaric. [Amanita olitoria Bull.] Jour. Mycol. 11:267. Nov. 1905.

SYDOW, H. et P. Novae Fungorum species. [Nearly fifty species of which about half a dozen are North American.] Ann. Mycolog. 2:162-174. Mar. 1904.

SYMBIOSIS in the genus Lolium. E. M. Freeman. Minn. Bot. Studies, 3:329-334. 18 Oct. 1904.

SYNCHYTRIUM A New Species of [S. scripi.] J. J. Davis. Jour. Mycol. 11:154-6. July 1905.

SYNCHYTRIUM scirpi Davis n. sp., on leaves of Scirpus atrovirens Mühl. Jour. Mycol. 11:156. July 1905.

TERMINOLOGY of the spore-structures in the Uredinales. J. C. Arthur. Bot. Gaz. 39:219-222. March 1905.

TESTICULARIA leersiae Cornu, *syn. of Tolyposporium globuliferum q. v.*

THALICTRUM sp., dead stems, host to Sophaeropsis thalictri Ellis & Fairm. Jour. Mycol. 10:229. Sept. 1904.

THAXTER, Roland. A new American species of Wynnea. Bot. Gaz. 39:241-7. Pl. IV-V. April 1905.

THECAPHORA globulifera B. & Br., *syn. of Tolyposporium globuliferum q.* v.

THOM, Charles. Some Suggestions from the study of Dairy Fungi. [Plan for obtaining more definite knowledge of the forms.] Jour. Mycol. 11:177-124. May 1905.

THOMPSON, C. H. and Dudley, W. R., *see Dudley, W R. and . .*

THOUINIA acuminata, host to Melasmia thouiniae Syd. n. sp. [Mexico]. Ann. Mycolog. 2:171. Mar. 1904.

TILIA americana, wood, host to Lasiosphaeria ovina aureliana Fairman n. var. Jour. Mycol. 10:230. Sept. 1904.

TILLETIA eragostidis Clinton & Ricker n. sp., on Eragrostis glomerata (Walt.) Dewey. Jour. Mycol. 11:111. May 1905.

TOLYPOSPORIUM globuliferum (B. & Br.) Ricker n. n. [Theocaphora globulifera B. & Br., Testicularia leersiae Cornu, Ustilago leersiae Durieu.] Jour. Mycol. 11:112. May 1905.

TOMOPHAGUS Murrill n. n. [Dendrophagus Murrill]. Torreya, 5:197. Nov. 1905.

TOMOPHAGUS for Dendrophagus. William A. Murrill. Torreya, 5:197. Nov. 1905.

TOMOPHAGUS colossus (Fr.) Murrill n. n. [Dendrophagus colossus (Fr.) Murrill]. Torreya, 5:197. Nov. 1905.

TRAMETES, *see Polyporaceae of North America, XIII. The described species of. . . .*

Uredinopsis americana Syd., a synonym of U. mirabilis (Peck) P. Magn. [Magnus] Hedwigia, 43:122. 24 Mar. 1904.

Uredinopsis atkinsonii P. Magn. n. sp., on Aspidium thelypteris. Hedwigia, 43:123. 24 Mar. 1904.

Uredinopsis mirabilis (Peck) Magnus n. n. [Septoria mirabilis Pk.] Hedwigia, 43:21. 24 Mar. 1904.

Uredinopsis osmundae P. Magn. n. sp., on Osmunda cinnamomea. Hedwigia, 43:123. 24 Mar. 1904.

Uredo aeschynomenis Arthur n. sp., on Aeschynomene americana L., Merico. Bot. Gaz. 39:392. June 1905.

Uredo dichromenae Arthur n. sp., on Dichromena ciliata Vahl., and D. radicans Cham. & Schl. [Porto Rico]. Bull. Torr. Bot. Club, 33:31. Jan. 1906.

Uromyces acuminatus Arth. [Cultures on Steironema ciliatum. Arthur]. Jour. Mycol. 12:24. Jan. 1906.

Uromyces atro-fusca Dudley & Thompson, *syn. of Puccinia atro-fusca q. v.*

Uromyces bauhiniicola Arthur n. sp., on Bauhinia pringlei Wats., and Bauhinia sp., Mexico. Bot. Gaz. 39:389. June 1905.

Uromyces caricis Peck [is the amphisporic form of Puccinia caricis (Schum.) Reb. Arthur]. Jour. Mycol. 12:15. Jan. 1906.

Uromyces clingyi Pat. & Har., on Andropogon schotti Rupr., A hirtiflorus Kth., and A. liebmannii Hack. [New description. Rickr.] Jour. Mycol. 11:115. May 1905.

Uromyces clitorae Arthur n. sp., on Clitoria mexicana Link., Mexico. Bot. Gaz. 39:389. June 1905.

Uromyces cologaniae Arthur n. sp., on Cologania pulchella H. B. K., C congesta Rose, Cologania sp., Mexico. Bot. Gaz. 39:387. June 1905.

Uromyces dolicholi Arthur n. sp., on Dolicholus Texanus (T. & G.) Vail (Rhynchosia texana T. & G.) Bull. Torr. Club, 33:27. Jan. 1906.

Uromyces gentianae Arth. [type locality Decorah Iowa, on Gentiana quinquefolia occidentalis Hitchcock; collected in Mexico, on Gentiana acuta Mx., alt. 10000 ft., also on Gentiana Englm. in Colorado. Holway]. An. Mycolog. 3:22. Feb. 1905.

Uromyces hyperici (Schw.) Cart. [collected in Mexico on Hypericum sp. Holway]. Ann. Mycolog. 3:22. Feb. 1905.

Uromyces montanus Arthur n. sp., on Lupinus mexicanus H. B. K., Mexico. Bot. Gaz. 39:386. June 1905.

Uromyces oblonga Vize. [On Trifolium, not on "Burr Clover;" identical with U. minor Schroeter. Holway]. Jour. Mycol. 11:268. Nov. 1905.

UROMYCES rugosa Arthur n. sp., on Lupinus sp., Mexico. Bot. Gaz. 39:386. June 1905.

UROMYCES speciosus Holway n. sp., on Frasera macrophylla Greene. Ann. Mycolog. 3:23. Feb. 1905.

USTILAGINOIDEA strumosa (Cke.) Clint. n. n. [Ustilago strumosa Cke.] Jour. Mycol. 11:112. May 1905.

USTILAGO leersiae Durieu, *syn. of Tolyposporium globuliferum q. v.*

USTILAGO sieglingiae Ricker n. sp., on Sieglingia purpurea (Walt.) Kunze. Jour. Mycol. 11:112. May 1905.

USTILAGO strumosa Cke., *syn. of Ustiloginoidea strumosa q. v.* Proc. Rochester Acad. Sci. 4:189. 2 Sept. 1905.

VARIABILITY in our common species of Dictyophora. A. H. Christman. Jour. Mycol. 10:101-108. May 1904.

WASHINGTON Erysiphaceae, *see Notes on the Erysiphaceae . . .*

VITIS sp., stem, host to Dermatea puberula Durand n. sp. Jour. Mycol. 10:101. May 1904.

WYNNEA americana Thaxter n. sp., growing on the ground in rich woods. Bot. Gaz. 39:246. April 1905.

WYNNEA, A New American species of. Roland Thaxter. Bot. Gaz. 39:241-7. Pl. IV-V. April 1905.

XENOPARASITISM [a term to describe those cases where a form of a fungus which is specialized to certain host-species and confined to them under normal circumstances proves able to infect injured parts of a strange host. Ernest S. Salmon]. Ann. Mycolog. 3:11. Feb. 1905.

XYLARIA (Xylodactyla) longiana Rehm n. sp., ad lignum Quercus. Ann. Mycolog. 2:175. Mar. 1904.

NOTES FROM MYCOLOGICAL LITERATURE, XIX.

W. A. KELLERMAN.

FUNGI ESCULENTES PHILIPPINENSES, EDWIN BINGHAM COPELAND, Annales Mycologici, Feb. 1905 [3:25-9] contains Latin descriptions of a species of Lycoperdon, nine species of Coprinus, two species of Panaeolus, five species of Agaricus (Psalliota), and four species of Lepiota, all proposed as new by the author.

M. C. COOKE PUBLISHES AN EXTENDED ACCOUNT OF THE FUNGOID PESTS of Forest trees in the Journal of the Royal Horticultural Society, vol. XXIX, 1905, Part IV, pp. 361-391, Pl.

XIX-XXI. Popular descriptions are given, also notes and distribution. The three colored plates illustrate habit and spore characters of 54 species.

On a Fungus Disease of Euonymus Japonicus L.f., by Ernest S. Salmon. In this we find an interesting account, with two full-page illustrations of Oidium euonymi-japonici (Arc.) Sacc. which occurs in Italy, Austria, Hungary, France and England. Experiments by Mr. Salmon showed that the following sorts were susceptible: E. japonicus aureus, albo-marginatus, ovatus-aureus, microphyllus, Silver-Gem. The immune kinds were E. Japonicus carrierei, E. nanus, E. europaeus, E. chinensis and E. americanus. See Journal of the Royal Horticultural Society, vol. XXIX, part 4, Dec. 1905, pp. 434-442.

The Table of Contents of the Journal of Mycology for July 1905 (vol. 11) is as follows: Morgan, A New Species of Kalmusia, and Peziza Pubida B. & C.; Davis, A New Species of Synchytrium; Holway, North American Salvia-Rusts; Clevenger, Notes on Some North American Phyllachoras; Lawrence, Blackspot Canker and Blackspot Apple Rot; Sumstine, Gomphidius Rhodoxanthus Once More; Sherman, Host Plants of Panaeolus epimyces; Bessey, Yearbook of Information Concerning Diseases and Injuries of Cultivated and Wild Economic Plants; Kellerman, Notes from Mycological Literature XVI, and Index to North American Mycology; Editor's Notes.

The Ier Fascicule, tome XXI, Bulletin de la Société Mycologique de France, published 18 Feb. 1905, contains the following original articles: L. Rolland, Les champignons des iles Beleares (suite); F. Guéguen, Effet singulier de la croissance d'un champignon de couche; F. Guéguen, Sur l'emploi des bleus pour coton et pour laine dans la technique mycologique; L. Lutz, Sur les principaux modes de formation des hymeniums surnumeraires dans les champignons; Bourguelot et Herissey, Sur la trehalase, sa presence generale dans les champignons; Dr. Gillot, Empoisonnement par les champignons.

Uredineae Japonicae VI., von P. Dietel, in Eng. Bot. Jahrb. 37:97-109, 19 Sept. 1905, contains species (among which many are new), of Uromyces, Puccinia, Phragmidium, Ravenelia, Melampsora, Melampsoridium, Pucciniastrum, Klastopsora, Cronartium, Hyalopsora, Ochrosora, Coleosporium, Chrysomyxa, Aecidium, Peridermium, and Uredo. "Von besonderem Interesse sind ferner, wie wir schon früher hervorgehoben haben, solche Arten, die sich auch in anderen Erdteilen, namentlich in Nordamerika, teilweise in etwas anderen Formen wiederfinden. Hierzu wolle man unter die Bemerkungen über Uromyces brevipes und U. ovalis vergleichen." Extended notes on many species occur, e. g. on Puccinia lactucae Diet.; P. Lactucae denticulatae Diet.

n. sp. is given, host Lactuca denticulata, with spores smaller than the foregoing.

Fungi Africae orientalis IV, von P. Hennings, Eng. Bot. Jahrb. 37:102-118, 3 Okt. 1905, is an enumeration of collections made in 1903, with notes and localities. A large number of new species is described. A new genus, *Phragmidiella,* is proposed, placed between Phragmidium and Kühneola.

P. Hennings, Fungi camerunensis IV, Eng. Bot. Jahrb. 38:119-129, Okt. 1905, continues the annotated list begun in previous Nos. of the same Journal, describing a large number of new species.

Otto Jaap, Fungi Selecti Exsiccati. Serie VI. Ausgegeben im November 1905, consists of the following:

126. Urophlyctis Kriegeriana. Schweiz. 127. Taphridium umbelliferarum f. heraclei. Schweiz. 128. Coudonia Osterwaldii. *n. sp.* Mark. 129. Lachnum controversum f. caricincola. *n. f.* Mark. 130. Peizizella Jaapii. *n. sp.* Mark. 131. Belonium junci. *n. sp.* Mark. 132. Propolis rhodoleuca. n. matr. Dänemark. 133. Cucurbitaria pityophila. Mark. 134. Pleospora media. n. matr. Schleswig. 135. Melampsora reticulatae. Schweiz. 136. Uromyces alchimillae alpinae. Schweiz. 137. Uromyces sparsus. Holstein. 138. Puccinia moliniae. Mark. 139. Puccinia cruciferarum. Savoyen. 140. Pucciana gigantea. Schweiz. 141. Corticum typhae var. caricicola. Mary. 142. Hydnum fuligineo-album. Mark! 143. Hypholoma storea f. caespitosa. Mark! 144. Mutinus caninus. Holstein. 145. Mycogone Jaapii. *n. sp.* Mark. 146. Ramularia spiraeae arunci. Schwarzwald. 147. Ramularia evanida. Schweiz. 148. Ramularia prenanthis. *n. sp.* Schwarzwald. 149. Passalora bacilligera f. alnobetulae. *n. f.* Schweiz. 150. Fusicladium Schnablianum. n. matr. Schweiz.

Agricultural Bacteriology by H. W. Conn, published by P. Blakiston's Son & Co., pp. 1-412, 1901, is a study of the relation of bacteria to agriculture with special reference to bacteria in the soil, in water in the dairy, in miscellaneous farm products and in plants and domestic animals. The author does not attempt to confine himself strictly to bacteriology — as for instance he says "it has been a growing conviction that a considerable number of phenomena, hitherto attributed to Bacteria, are directly due to a class of chemical ferments called *enzymes.*" These are not therefore excluded from consideration in this book. In Part V parasitic bacteria are considered and the species causing some of the common diseases are considered. It is an admirable book for students and for general readers.

The Polyporaceae of North America, XIII. The described species of Bjerkandera, Trametes, and Coriolus. William Alphonso Murrill. Bull. Torr. Bot. Club, 32:633-656. Dec. 1905. The treatment of our species is similar in plan to that followed in the author's previous articles. New names are Bjerkandera fragrans (for Polyporus fragrans Peck), Trametes unicolor (for P. unicolor Fr., and P. obtusus Berk,), Coriolus hirsutulus (for

Polyporus hirsutulus Schw.), C. pubescens (for P. pubescens Fr.), C. subluteus (for P. subluteus Ell. & Ev.), C. sartwellii (for P. sartwellii B. & C.), C. ilicincola (for P. ilicincola B. & C.), C. flabellum (for P. flabellum Mont.), C. planellus (for P. planellus Peck), C. sobrius (for P. sobrius B. & C.), C. nigromarginatus (for P. hirsutus Fr., Boletus nigromarginatus, Schw.), C. sullivantii (for P. sullivantii Mont.), C. sericeo-hirsutus (for P. sericeo-hirsutus Kl., Hexagona sericea Fr.), C. arenicolor (for P. arenicolor B. & C.), C. hirtellus (for Polystictus hirtellus Fr.), C. tener (for Polyporus tener Lév.).

Fungi Utahensis, Fascicle one, collected and distributed by A. O. Garrett, [received in December 1904] consists of exsiccata with reprints of the original description for each species accompanied by the following announcement: "It is the intention to issue Fungi Utahensis in uniform sets of twenty-five specimens to the set, the fascicles to be distributed to subscribers as rapidly as material is acquired. An attempt will be made to have each fascicle contain specimens belonging to closely related groups. As will be seen from the accompanying list, all the numbers in this fascicle are representatives of the Uredineae. The plan pursued in the "make-up" of the sets will be similar to that of Professor Kellerman's Ohio Fungi."

The First Part of the First Volume of the Biographical Index of North American Fungi, by William G. Farlow, has been issued by the Carnegie Institution at Washington (1905), consisting of a preface (pp. I-IX), abbreviations of authors and publications cited (XI-XXIV), and the Index from Abrothallus to Badhamia (pp. 1-312). The author says it should be borne in mind that the Index does not purport to be a summary of all references to North American fungi, but it is limited to those which concern the systematic Mycologist, and does not include references to papers on fungicides and other technical and agricultural subjects as such, but cites them only when they also contain notes of interest to the systematists. The importance of the work is at once recognized and doubtless the remaining parts and volumes will soon appear. A sample will show the plan Dr. Farlow has adopted in carrying out his Index:

Aecidium Apocyni, S.

S. Syn. Car. 68 (42) no. 448. *d.* 1822.
Bon. Abh. Nat. Ges. Halle 5:208 (42). 1860.
M. A. Curtis, Bot. N. Car. 124. 1867.
Burrill, Bull. Ill. Lab. 2:236. 1885 and Rept. Ill. Ind. Univ. 12:147. 1885.
Kellerm. & Carl. Tr. Kans. Acad. 10:91. 1887.
De Toni in Sacc. Syll. 8:808. *d.* 28 Oct. 1888.
Webber, Bull. Nebr. Exp. Sta. 1:329 (59). 18 Dec. 1889.
Gall. Bull. U. S. Agr. Veg. Pathol. 8:55. 1889.
Webber, Rept. Nebr. Agr. 1889:209 (69). 1890.
Williams, Bull. S. Dak. Exp. Sta. 29:49. Dec. 1891.

Cheney, Tr. Wis. Acad. 10:69 Oct. 1895.
Tubeuf-Smith, Diseases of Plants, 411. 1897.
Ell. & Ev. Fung. Columb. *1295*. May 1898.
Barthol. Tr. Kans. Acad. 16:186. June 1899.
Patterson, Bull U. S. Agr. Pl. Industry 8:8. 3 Feb. 1902.

Two fungi growing in holes made by wood-boring insects, by Perley Spaulding, occupies pp. 73-77, plates 25-27, 15th Annual Report of the Missouri Botanical Garden. The species referred to are Flammula sapineus and Claudopus nidulans.

John L. Sheldon makes a Report on Plant Diseases of West Virginia [Bulletin 96, Agr. Exp. Sta. June 30, 1905]; giving in popular language short account of several diseases, with a half dozen half-tone plates.

From the Office of Experiment Stations, the U. S. Department of Agriculture issues as Farmers' Institute Lecture No 2, A Syllabus of Illustrated Lecture on Potato Diseases and their treatment, authors F. C. Steward and H. J. Eustace. The lecture is to be accompanied with 47 lantern views — marginal numbers on the page corresponding to the slides, the legends given in the Appendix.

In an article in Science, N. S., Vol. XX, No. 497, pp. 55-6, July 8, 1904, entitled Vitality of Pseudomonas campestris (Pam.) Smith on cabbage seed the writers say that they have found that *P. campestris* may live on dry cabbage seed for at least ten months.

C. A. J. A. Oudemans continues his Contributions à la Flore Mycoligique der Pays-bas (XX)-Overdr. Ned. Kr. Arch. 3e Ser. II, 4. Supplement, pp. 1077-1132, and pl. XI-XIII. Interesting new species are the following: Entyloma lini on Linum usitatissimum; Phyllosticta acoricola n. n. for Phoma acori Cooke; Rhabdospora phlogis on Phlox drummondi; Stilbospora robiniae on Rabinia pseudacacia; Stigmella atriplicis on Atriplex hortense.

Considering the wide distribution of the banana plant in tropical countries throughout the world, it is quite remarkable that it has so very few serious enemies in the form of insects and fungi says J. E. Higgins in Bulletin No. 7, Hawaii Agr. Exp. Station, Honolulu, 1904. Three fungi are given which prey upon this plant, 1st, Banana Anthracnose (Gloeosporium musarum Cke. & Massee); 2nd, Marasmius semiustus B. & C.; 3rd, Fusarium sp.

Preliminary Diagnosis of New species of Laboulbeniaceae, — VI, by Roland Thaxter, forms No. 11, Vol. XLI, Proceedings of the American Academy of Sciences, July 1905. "With the present contribution, which comprises such new forms of Laboulbeniaceae as have accumulated during the past two years, the writer proposes to close the series of preliminary diagnoses which he has issued from time to time since 1899." Dr. Thaxter has described about 500 species in all including about 48 genera. In this last paper about thirty new species are described. Nine of them are North American.

Annales Mycologici for Feb. 1906 (Vol. IV, No. 1) has the following table of contents: Blakeslee, Albert Francis, Zygospore Germinations in the Mucorineae; Sydow, H. et P., Neue und kritische Uredineen — IV; Freeman, E. M., The Affinities of the Fungus of Lolium Temulentum, L.; Oertel, G., Eine neue Rhabdospora-Art; Elenkin, A. A., Species novae lichenum in Sibiria arctica a cl. A. A. Birula-Bialynizki collectae (expeditio baronis Tol); Krieger, W., Einige neue Pilze aus Sachsen; Heinze, Barthold, Sind Pilze im Stande, den elementaren Stickstoff der Luft zu verarbeiten und den Boden an Gesamtstickstoff anzureichern?; Rehm, Ascomycetes exs. Fasc. 36; Saccardo, P. A., Mycetes aliquot congoenses novi; Neue Literatur; Referate und kritische Besprechungen.

H. et P. Sydow Neue und kritsche Uredineen — IV. in Annales Mycologici for Feb. 1906 (4:28-32) publish a dozen new species mostly from North America and the Philippines. The American species are Uromyces amoenus, U. amphidymus, U. fremonti, U. heterodermus, U. substriatus, Puccinia fuchsiae and P. aemulans.

A report of the investigation done under grants as research assistant of the Carnegie Institution, by Albert Francis Blakeslee, is published in the Annales Mycologici, 4:1-28, Feb. 1906. It consists of an exhaustive study of Zygospore Germinations in the Mucorineae. A lithographic plate accompanies the paper, illustrating Phycomyces nitens.

E. M. Freeman read a paper before the Mycological Society at New Orleans on the Affinities of the Fungus of Lolium temulentum L., which is published in Annales Mycologici, 4:32-4, Feb. 1906. In this he refers to the discovery in 1895-6 by Frank Maddox of Tasmania that in loose smut of wheat an infection of the grains could be produced by placing spores on the ovary at flowering time. The grains so infected were apparently normal, but from them smutted plants were produced in the following year. Brefeld, and also Hecke, in 1903-4, rediscovered the same method of infection in case of loose smut of wheat and of barley smut. The author has previously pointed out the strong probability that the fungus of Lolium temulentum was a smut. Now he suggests that the recent discoveries of the infection method as stated above strengthen considerably the theory of its smut origin.

Lichens—Stereocaulon, Pilophorus and Thamnolia, by Carolyn W. Harris, The Bryologist, 7:71-3, Sept. 1904, is a popular article with four illustrations in the text. Seven or eight species receive notice.

Bulletin 137, Ontario Agricultural College, is devoted to a Bacterial Disease of Cauliflower and Allied Plants, author F. C. Harrison. A brief introduction is followed by a consideration of the subject under the heads of Pathenogenesis, Pathological History, and Inoculation experiments.

A short article, with ten beautiful half-tone plates, on Abberant veil Remnants in some edible Agarics, by William Trelease, was published in the 15th Annual Report of the Missouri Botanical Garden. The species represented are Lepiota naucinus, Agaricus amygdalinus and Hypholoma appendiculatum.

Under the head of Tobacco Diseases and Tobacco Breeding, the Ohio Agricultural Experiment Station issued Bulletin 156, November 1904, by A. D. Selby. In the section giving account of diseases due to parasitic fungi and Bacteria we find the following listed: Root rot (Black Rot) [*Thielavia basicola* Zopf]; Bed Rot [Rhizoctonia]; Decay of Tobacco Seedlings [Alternaria-A. tenuis?]; the Granville Tobacco Wilt; Leaf Blight (Frog-eye) [Cercospora nicotiana E. & E.]; White speck and Brown spot [Macrosporium tabacinum E. & E., and M. longipes E. & E.]; Downy and Powdery Mildew.

An interesting lecture, largely historical, on the Study of Parasitic fungi in the United States, by G. P. Clinton, before the Massachusetts Horticultural Society, is printed in the Transactions, 1904, Part I, pp. 91-106.

O. Appel und R. Laubert: Die Konidienform des Kartofflepilzes Phellomyces sclerotiophorus Frank. Berichte der Deutschen Botanischen Gesellschaft, 1905 [23:218-220]. The authors succeeded in inducing the stromata of this fungus of which hitherto "neither in nature nor by culture, has any typical fungal fructification been observed," to develop and they obtained a form identical with *Spondycladium atrovirens* Harz. "Aus den in gekürzter Form hier vorläufig mitgeteilten Untersuchungen geht hervor, dass der Pilz, der von Frank als *Phellomyces sclerotiophorus* beschrieben und als Krankheitserreger in die phytopathologische Literatur eingeführt worden ist, nur ein noch steriler Entwicklungszustand des *Sponlycladium atrovirens* Harz ist und dass infolgedessen der "interimistische Name *Phellomyces sclerotiophorus* Frank" zu streichen und durch "*Spondycladium atrovirens* Harz" zu ersetzen ist."

The Agricultural Experiment Station issued a Bulletin, No. 64, (1904) on the Apple Scab in Western Washington by W.

H. Lawrence, of which this is his summary: Apple scab is abundant and destructive in Western Washington. The apple scab fungus has two stages — a summer, or parasitic stage [*Fusicladium dendriticum*], and a winter, or saprophytic stage [*Venturia aequalis*]. The summer stage infests the leaves, flowers and fruit; the winter stage lives in the dead leaves of the apple which fall off in autumn. The winter stage produces the spores that cause the infection of the flowers, leaves and fruit in spring. To destroy the fungus, destroy the fallen leaves in the fall or winter. To prevent the fungus attacking the apple in spring, spray with a properly prepared Bordeaux mixture.

ON A FUNGUS DISEASE OF EUONYMUS JAPONICUS LINN. F. by Ernest S. Salmon is reprinted from the Journal of the Royal Horticultural Society, Vol. XXIX, Part 4. The parasite in question is Oidium euonymi-japonicae (Arc.) Sacc. A half-tone illustration of affected leaves is given, also outline figures of conidia, appressoria and haustoria. It is stated that a peculiarity of this Mildew is the capacity it possesses of persisting by means of hibernation of its mycelium. As to its introduction the author says: It seems, then, more probable that the fungus may have been lately brought to Europe on diseased plants imported from Japan than that a European species of *Oidium* has of late years spread from its original host and attacked *E. japonicus* as a new host-plant. On the former theory we find an explanation of the fact mentioned above, viz. the epidemic character of the disease now beginning to be shown by the *Oidium* in Europe, since it is an established fact that a parasitic fungus on reaching a new country attacks its host-plant with exceptional virulence for several years after its arrival.

NEW OR RARE PYRENOMYCETEAE FROM WESTERN NEW YORK, by Charles E. Fairman, Proc. Rochester Acad. Sci. 4:215-224, March 1906, containing Nos. 355-380, is supplementary to his list of Pyrenomyceteae of Orleans County, N. Y., printed in the same volume. Nos. 355-364 are new species by Fairman; Nos. 365-6 are new species by Rehm; notes and supplementary descriptions are given for Nos. 367-380. One full page illustration is devoted to Sporormia leguminosa Fairman n. sp. and one to Amphisphaeria aeruginosa Fairman n. sp., Sporidia and other parts of several of the new species occupy another plate.

CHARLES HORTON PECK, NEW SPECIES OF FUNGI, Bull. Torr. Bot. Club, 33:213-221, Apr. 1906, describes 22 species of the higher Fungi, mostly belonging to the following genera; Lepiota, Hygrophorus, Collybia, Russula, Lentinus, Annularia, Inocybe, Flammula, Psathyrella, Hydnum, Craterellus, Monilia, Marsonia, Haplosporella, Sarcoscypha, Poronia, Leptosphaeria, and Pleospora.

Journal of Mycology

A Periodical Devoted to North American Mycology. Issued Bi-monthly; January, March, May, July, September and November. Price, $2.00 per Year. To Foreign Subscribers, $2.25. Edited and Published by W. A. KELLERMAN, PH. D., COLUMBUS, OHIO.

EDITOR'S NOTES.

There seems to be a difference of opinion, at least a difference in practice, in regard to the proper mode of giving the *date* in a citation from a periodical publication — and therefore the editor is provoked to make a comment.

First, let the question be raised, as to where in the periodical the *actual date of issue* should be printed. Only one answer can, it seems to us, be given, namely, *at the bottom of the last page.* Most of the periodicals follow this plan; a few however give this date in the subsequent No., Part or Heft, a plan that is very objectionable. It precludes citing anything in the No. until the next No. appears; it adds to the labor of making a citation or of getting the exact date since it always requires consulting two Nos. instead of one.

If a periodical repeats on the first page of each of the issues its name, *date,* etc., that date (even if only the *month* and year) should appear in making the citation instead of the actual date of the issue which might be found on the last page or on the cover. Thus if Saccardo's article in the Feb. (1906) No. of Annales be cited, the date ought to be as here given, and not "5 April 1906", which was the actual date of issue. Citation is primarily for place to direct the reader. If one were referred to "5 April 1906" for the article he would hardly search for a *Feb. No.*— but rather for an "April No." (It might be desirable to give in parenthesis after the date-designation of the No., also the actual date of issue.) If, however, the citation, for example pertain to the article in Hedwigia, Band XLV., Heft 3, by Magnus, it would necessarily be as to date, "28 Mar. 1906." (No date other than that of the actual date of issue is printed.) This is given only on the cover — of course given at the end of the year or close of the volume in connection with the title-page, etc.

PRICE LIST.

Journal of Mycology, Vol. 8—1902	$2 00
" " " 9—1903	2 00
" " " 10—1904	2 00
" " " 11—1905	2 00
" " " Current Vol	2 00
Index to North American Mycology (authors, titles, subjects, new species and hosts, new names and synonyms) since Jan. 1, 1901. *Printed on one side of page.* Seven parts have been issued. Price per part	25
Index to Uredineous Infection Experiments with List of Species and Hosts for North America, *printed on one side of page*	50
Portraits of Mycologists, reprinted from the Journal of Mycology (Peck, Ellis, Arthur, Burrill, Farlow, Tracy, Earle, Atkinson, Holway, Thaxter, Clinton, Magnus, Oudemans, Patouillard, Hennings Rehm, Cooke, Saccardo,, Dietel, each	10
Ohio Fungi exsiccati. Though the set is designed primarily for exchange a few copies are for sale. Issued in fascicles of 20 specimens each. Ten fascicles now ready. Price per fascicle	1 00
Mycological Bulletin. A popular leaflet of 4 pages, illustrated, 24 Nos. per year. Vol. II, 1904, Vol. III, 1905, each 50 cents; bound in cloth, 75 cents. Current year	25
New Genera of Fungi. Published since 1900; the original descriptions reproduced with full citation. Annual Supplements are to follow. Printed on one side of page only. Price	75
First Supplement to New Genera of Fungi published since 1900, with the original descriptions	50
Index to Journal of Mycology, volumes 1-10	75
Mycological Glossary	25

Volume 12, No. 84 *July 1906*

Journal of Mycology

TABLE OF CONTENTS

W. A. KELLERMAN, PH. D.

Professor of Botany, Ohio State University, Columbus, Ohio

Entered as Second Class Matter, Postoffice at Columbus, Ohio.

PRESS OF F. J. HEER, COLUMBUS, OHIO.

Cost of Separates.

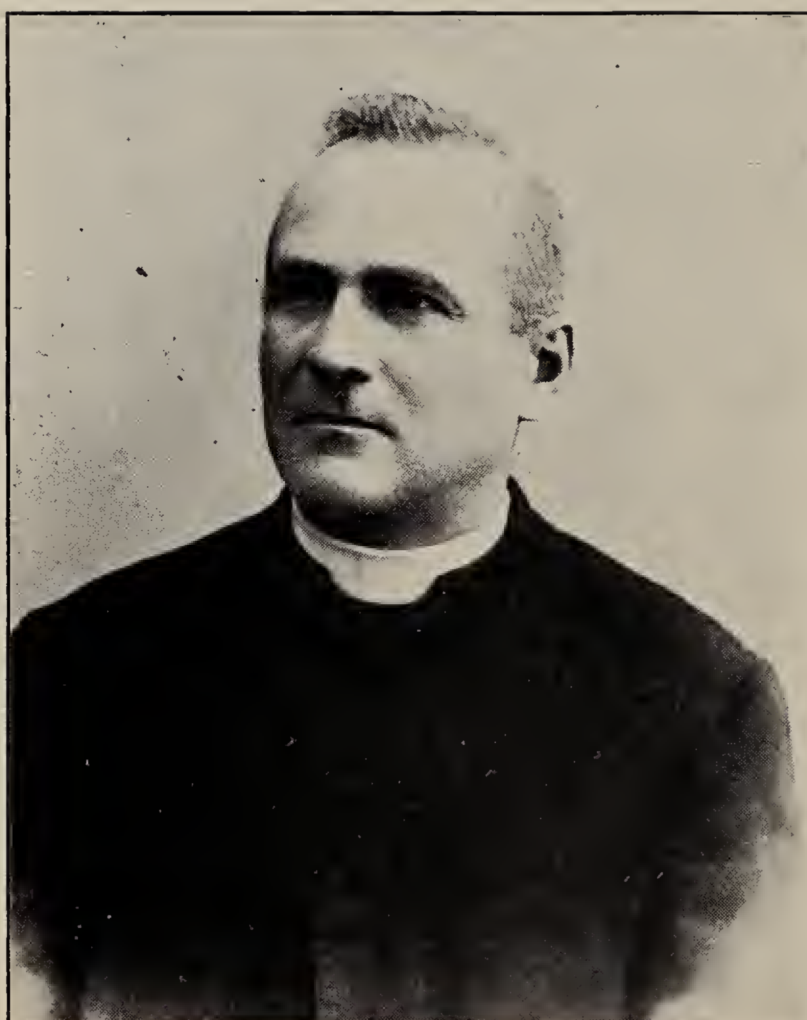
Contributors who desire separates of their articles will receive the same at cost, approximately as follows:

For 4 pages or less:	100 copies	$1 75	200 copies	$2 25
" 8 " "	100 "	2 50	200 "	3 25
" 16 " "	100 "	4 25	450 "	5 50

For more extended articles proportionately higher.

Plates not included in the above.

ADDRESS: EDITOR JOURNAL OF MYCOLOGY



G. Bresadola

Journal of Mycology Portraits with Facsimile Autographs.

Journal of Mycology

VOLUME 12—JULY 1906

TABLE OF CONTENTS

MYCOLOGICAL EXPEDITION TO GUATEMALA.*

W. A. KELLERMAN.

During the winter months of January, February and March, 1905, a botanical trip was made to Guatemala, Central America, for the purpose of collecting parasitic fungi. A trip for like purpose was again made in the corresponding months of 1906. A large amount of material was collected for study, the results of which may appear from time to time in future Nos. of the JOURNAL. The itinerary only will be given in this article, with some account of the general botanical character of the regions visited. Later, notes will be published on the fungi, and some of the more interesting, as well as rare or new species, will be illustrated by a distribution of selected exsiccata.

GENERAL TOPOGRAPHY.

Guatemala is situated between 13.8 and 17.8 degrees north latitude, and 88.3 and 92.2 degrees longitude west of Greenwich. It embraces an area of 60,000 square miles, being bounded on the north by Mexico, Yucatan and Belize (or British Honduras); on the East by Belize, Bay of Honduras and Spanish Honduras; on the South by Honduras, San Salvador and the Pacific Ocean; and on the West by the Pacific Ocean and Mex-

* Contributions to Guatemalan Mycology. I.

ico. The entire country is of volcanic origin, a large portion being mountainous. The Cordilleras, considered a continuation and connecting range of the Rocky Mountains and of the Andes, traverse the region in a northwesterly and southeasterly direction, the crest being 50 miles from the Pacific Ocean. The altitude is about 8,000 feet in the West or Northwest to about 5,000 or 4,000 at the Southern boundary line of the Republic. The numerous volcanoes are of course much higher, reaching in many cases an altitude of 11,000 to 12,000 feet. From this range of the Cordilleras there is a very considerable extension of the mountain chain eastward to the Bay of Honduras; the height is about 3,000 feet, but considerably less as it approaches the eastern coast of the country. Here it is conspicuous by reason of a comparatively lofty peak (called San Gil), probably an extinct volcano (but as yet unexplored) that rises to a height of at least 1,500 feet. The chain just mentioned is called the Sierra de las Minas; the extreme eastern portion however is called Sierra del Mico. The portion of the country bordering on Honduras is also mountainous, but no considerable altitude is anywhere attained; several extinct small volcanoes occur here.

The land near the coast is low — the low area on the Pacific side being rather narrow, then gradually ascending so that at a distance of 30 or 40 miles the altitude is 1,000 feet. From that line the slope is very steep to the general crest of the Cordilleras. On the Atlantic side the low land is much more extensive. A great tropical swamp lies back to Puerto Barrios. An altitude of 500 feet would not be reached up the valley of the Motagua, or Rio Grande, short of 1000 miles from the coast. Following westward from the mouth of the Rio Dulce an altitude of 500 feet would be attained when Lake Izabal was passed — and a point reached perhaps 80 miles from the Bay of Honduras. Then the country (in the Department of Alta Verapaz) becomes mountainous. An exceedingly interesting topographical region is the extreme northern section, this Department being called El Petén. It is not mountainous; it has the general character of Yucatan. But there are great rivers and many lakes in Petén. The country has not been thoroughly traversed by explorers and is practically a terra incognita. The itinerary neither year included this enticing region though it is hoped that in the near future its mycological flora may be subjected to some scrutiny. Before passing in review the particular places visited, and sketching their general features in order to elucidate to some extent the character and distribution of the fungi that subsequent notes may disclose, a few words on the climatology and hydrography will be given — these being supreme factors determining the character and distribution of the vegetation.

CLIMATE.

While it is a tropical climate the varying altitudes afford considerable variation in temperature — this being more pronounced than the variation from season to season (Winter to Summer) in any given locality. As to the latter, it may be said that the Winter temperature is but slightly below that of the Summer months — perhaps 10 or 12 degrees. The daily range is not great — the nights however being quite cool — invariably 10 (or even 20) degrees or more below that of noonday. Near the coast the temperature is often about 90 degrees Fahrenheit. At an altitude of 5,000 feet 70 to 80 degrees may be considered a fair estimate for midday temperatures. At 8,000 feet, the highest point for which records are available, Quezaltenango, the temperature is much lower. The monthly extremes as recorded by Rev. W. E. McBath, of that city, are given below. A self recording instrument was used and the readings for the year 1905 were as follows, — the highest and lowest record for morning and for evening being shown:

January,	A. M.,	26	and	49;	P. M.,	55	and	70°	F.
February,	"	30	"	49;	"	61	"	73°	"
March,	"	29	"	54;	"	70	"	79°	"
April,	"	41	"	56;	"	70	"	80°	"
May,	"	45	"	57;	"	70	"	78°	"
June,	"	47	"	56;	"	65	"	77°	"
July,	"	42	"	55;	"	62	"	74°	"
August,	"	42	"	55;	"	65	"	75°	"
September,	"	43	"	55;	"	63	"	75°	"
October,	"	38	"	56;	"	62	"	73°	"
November,	"	38	"	54;	"	66	"	72°	"
December,	"	29	"	49;	"	63	"	69°	"

While no records can be given for the very high volcanoes, it can be stated that no freezing temperatures were exprienced though the cold seemed very severe. No snow was seen during the winters of 1905 and '6. There is no snow line in the Republic of Guatemala, but the inhabitants state that at rare times snow is seen on the highest mountains.

HYDROGRAPHY.

Throughout the country there is an alternation of a rainy and a dry season. Abundant precipitation usually begins in May and ceases in October; the months between October and May constitute the dry season at which time no rains fall except in the low country near the coast and in the Department of Alta Verapaz. In the latter regions rains are common throughout the year but the precipitation is comparatively slight during the so-called dry season. Clouds are formed continuously in the highest mountain regions and especially about the cones of the volcanoes, but the rainfall does not seem to be excessive at these altitudes. There is an arid region supporting a purely xerophytic vegetation, in the central portion of the country, beginning at Gualan, 80 miles from Puerto Barrios, in the valley of the Motagua, extending to El Rancho 130 miles from the Port just named; thence westward and northwestward through Salamâ, in the Department of Baja Verapaz. Tree Cacti of the *Cereus Opuntia* and *Peireskia* types, and spinous *Leguminosae* are the characteristic forms. The grass and other vegetation seems to be absolutely dead during the dry season yet when the rains begin in the Spring everything becomes suddenly and intensely green, as if by magic. Here however the rainfall is less than in any other part of the Republic. This sharply marked seasonal change from extreme wet to extreme dry — each of the two seasons about the same length — accounts for the pronounced xerophytic aspect of the vegetation. The low-lying countries and the high peaks or crests of the mountains have however the usual character of moist tropical countries. Two of the mountain lakes are of considerable size; the largest Lake Atitlán, in the Department of Sololá, is about 8 or 10 miles in length and nearly as broad; it has a depth of 1,000 feet; there is no known outlet.

Lake Amatitlán, situated in the Department of Amatitlán, is about 7 or 8 miles long but only one to 3 miles wide; it is 75 to 100 feet deep, and is drained by the Rio Michatoya. The shore vegetation and that of the mountains forming the steep-sloping walls is strongly xerophytic in character. Some of the craters of the numerous extinct volcanoes are occupied by little lakes. Only two very large rivers, but with rather narrow valleys, drain the eastern side of the Republic — these being the Rio Grande, but usually called the Motagua, south of the Sierra de las Minas, and the Rio Dulce, called the Polochic above Lake Izabal, north of this mountain range. The Chixoy, further north called the Usumacinta, in the central part of the country, flows northward into Mexico. The rivers on the Pacific side are very numerous and need not be individually mentioned. For a correct account of the climate, rainfall, lakes and rivers of the Department of El Petén no sufficient data are at hand — besides, no mycological collections have as yet been made in that region.

PUERTO BARRIOS AND LIVINGSTON.

The places first visited for the purpose of making mycological collections in 1905 and 1906 were Puerto Barrios and Livingston on the Atlantic coast, that is to say on the Honduras Bay. Immediately back of the low mangrove-skirted coast at Puerto Barrios lies an extensive tropical swamp, covered by impenetrable vegetation of ferns, palms, lianes and large trees. The Northern Railroad running southward for a distance from the coast, has opened up a line through this interesting tract and collecting is thus abundantly facilitated. This rich tropical vegetation however did not furnish as many parasitic fungi as some other districts, though a fair amount of saprophytic species were noticed. The situation of Livingston, 12 miles north of Puerto Barrios, at the mouth of Rio Dulce, is wholly unlike the latter. The town is built on a rocky bluff 50 to 60 feet high fringed with shrubs and trees — the Cocoanut-palm everywhere planted in the low country being a conspicuous feature of the landscape. A small area outside of the town has been cleared — which affords opportunity for "weeds" — native and introduced — and thus a marked variation is noticeable from the dense jungle of tree-ferns, palms, hosts of *Melastomaceae,* climbing Panicums and numerous other interesting forms most of which are hosts to parasitic fungi.

TENADORES AND LOS AMATES.

At the point where the railroad touches the Rio Motagua the little village of Tenadores is situated in the midst of extensive Banana fields. Small clearings around have been made. The river is fringed with great areas of tall canes and grasses. The great Monaca Palm is everywhere conspicuous as also is the *Ceiba* [pron. say-eé-bah] the latter in many cases being of enormous size. A somewhat better mycological field for the collector is offered at Los Amates, a town on the Rio Motagua about 60 miles from the Port. The altitude is 160 feet; the river valley is wide and covered with a varied growth of plants. Northward a few miles the low mountain range of Sierra del Mico is encountered. Somewhat varied edaphic conditions are afforded and the region is a very rich one for the collector. A short distance above the town are some extensive pampas regions and further up the river are denuded forest areas formerly covered with Pines (Pinus caribaea) now turned into lumber and exported.

GUALAN AND ZACAPA.

On the Rio Motagua 80 miles from the Port (Barrios) is situated the Indian city of Gualân at which point the central semi-arid or desert region begins. Cactus trees of the *Cereus, Opuntia* and *Peireskia* types occur, but not in great abundance. Numerous other xerophytic plans occur in this region, which therefore is extremely interesting and rich in parasitic fungi. It is just beyond the very moist low country. The altitude is 420 feet. The valley proper varies from one mile to three or four times that width. The Sierra de las Minas range lies immediately to the north and hills or low mountains flank the southern side. At present this is the end of the first division of the Northern Railroad (Ferro-carril del Norte), and the location of the shops and offices — all of which however are to be moved immediately to Zacapa a town 20 miles farther up the river situated in the wider valley of the Zacapa River, a branch of the Motagua. Before passing, it is a pleasure to acknowledg the kindly assistance in our work afforded by Mr. G. F. Williamson the Manager of the Railroad. In his absence his first assistant Mr. Fox was equally polite and obliging to us. At Zacapa the vegetation has a more pronounced xerophytic type — the tree Cacti are more numerous, and the great wastes of Acacia and Mimosa bushes are impressive. Grasses are very numerous — in wet places tall forms occur, but over the dry areas short-stemmed species form a sparse layer, yet almost dense enough to be called sod. The mountains become gradually higher more sharply limiting the narrowing valley till El Rancho is reached.

EL RANCHO.

This place for years the terminus of the Northern Railroad, 130 miles from Puerto Barrios and almost half-way across the continent in an E. N. E. and W. S. W. line, is an interesting region to the traveler as well as to the botanist. The Sierra de las Minas immediately to the north lifts its peaks into the clouds, attaining an altitude of about 3,000 feet. The mountains to the south of the narrow valley are of insignificant height. The great river Motagua even at this dry winter season demands care from those who ford its waters. But the chief charm is in the peculiar vegetation — the numerous *Peireskiae* (Cacti) with leaves still attached or wholly discarded, in all cases loaded with the pomiform fruits suggesting at a short distance a real apple orchard; the giant Cereus trees and the equally abundant and striking Opuntias and their near relatives; the Ficus trees; the common Bastard Mahogany, the real Mahogany, the hosts of leguminosae and other thorny trees, — and yet other xerophytic forms too numerous to mention suggests the field afforded the exploring mycologist, making the sojourn at once a place extremely interesting and equally profitable. This semi-desert region extends still farther up the Motagua and again north westward to Salamá into regions to be explored on a future trip. From this place our route took a west southwesterly course passing through Sanarate, an important town of considerable altitude, across the rugged San Antonio Mountain by a rocky trail, by way of Agua Caliente, to the city of Guatemala.

GUATEMALA CITY.

At an altitude of about 5,000 feet the city of Guatamala is situated on a mesa surrounded by deep barrancas beyond which are mountains whose summits are 500 to 1,000 feet above the plateau. It is a beautiful site but no detailed account of the vegetation of the region need be given. That of the higher mountains is somewhat peculiar. Forests of pines are not uncommon. Intermediate between these but at very high altitudes the oaks are very numerous. The *Compositae,* the herbaceous, the half-shrubby, the fruiticose and arborescent forms, are abundant here as throughout the Republic. Labiatae are perhaps more abundant than in the very low country. The *Leguminosae* are conspicuous by their abundance and in this respect rival the *Compositae.* The arboreous species are common. Rusts were everywhere in evidence, and in fact the parasitic species of all groups of fungi were numerously represented. In the rainy season the saprophytic forms could doubtless be collected in great abundance.

PACIFIC COAST REGION.

The Central Railroad leads by a serpentine route 74 miles from Guatemala City to San José, a Pacific port 40 or 50 miles distant, the descent in this short distance being about 5,000 feet. Through the thoughtful courtesy of Mr. D. B. Hodgson, (Gen. Mgr.), and Mr. W. B. Tisdal, (Asst. Mgr.), facilities were kindly offered for transportation, including scientific paraphernalia, along this line and their yet more interesting western branch that parallels the coast at a distance of about 40 miles — this being a finished portion of the Pan-American Railway — traversing an exceedingly rich country at the foot of the Cordilleras, ending at present at the large city of Mazatenango. Still another Company operates a Railroad from the latter city to Ratalhuleu, thence southwrd to the Pacific Port of Champerico and northward to San Felipe. This whole region is extremely warm; the vegetation is dense and tropical, but very much extended areas have been cleared and now furnish splendid fields for sugar cane. Lagoons border the coast which is fringed as in all tropical regions with the Mangrove. The whole country is a paradise for the botanist, and fungi are everywhere plentiful enough. Large collections for future study were made at Escuintla, Santa Lucia, Patalúl and Mazatenango. From this region two trips were made northward to the crest of the Cordilleras to several interesting points as follows.

QUEZALTENANGO.

From San Felipe in the northern part of the Department of Retalhuleu, altitude 1,050 feet, a trip was made mule-back, between 20 and 30 miles to Quezaltenango in the Department of like name, altitude 8,000 feet. For a large part of the way the vegetation was tropical and the region was enchanting. Splendid coffee planatations were passed, and higher up vegetation, characteristic of mountainous regions, was encountered. Abundant collections were made. The trip to Lake Atitlán was made from Patalúl which proved to be a charming repetition in the main of the route before described to Quezaltenango. This may be described in connection with another considerable mountain-lake, namely Amatitlán.

LAKES ATITLAN AND AMATITLAN.

Besides the great Lake Izabal near the east coast in Department of same name and Lake San André or Petén in the middle of the Department of El Petén — neither included in the itinerary of 1905 and 1906 — the only other very large bodies of water in the interior of Guatemala are the mountain lakes of Amatitlán, in the Department of same name, and Atitlán, in the Department of Solalá. These lakes are 7 or 8 miles in length; Atitlán is 6 or 7 miles wide, but Amatitlán has a width of only one mile near the middle and about 3 miles exclusive of this narrow neck. They are alike in having for the most part walls of rather steep sloping mountains — yet the flat area on the north side of Amatitlán is very great — being the debris of ages brought down by the drainage from the north, finding its way into this mountain-hemmed basin mainly through the river emptying in the Lake at the middle and now greatly narrowed part. There is no visible outlet to Lake Atitlán; Rio Michatoya drains Lake Amatitlán Pacific-ward. This lake is only about one hundred feet deep, but some parts of Lake Atitlán are over 1,000 feet in depth. Much time was spent on Lake Amatitlán to which then the following more particularly applies. The marked xerophytic character of the shore vegetation, as well as that of the slopes, was striking. Cacti were rather abundant; Acaciae and Mimosae were common; the Agaves were not rare; and hosts of *Compositae, Leguminosae, Labiatae,* etc., were present. One species of fleshy Asclepias grew on the shore; some species of Ficus were common; a giant Equisetum was encountered; groves of Salix humboldtiana were conspicuous; and epiphytic orchids, cacti, and bromeliads abounded. The parasitic fungi in due quantity were at hand and later reports will show that many species were here collected.

THE VOLCANOES AGUA, ATITLAN AND SANTA MARIA.

Collections were made on three of the very high volcanoes, namely Agua, Atitlán and Santa Maria, also on Cerro Quemado and the lower part of Acatenango. The altitudes of the first three are 12,300, 11,500 and 11,360 feet respectively. Agua, situated in the Department Sacatepéquez, is clothed with vegetation to the very apex and on the interior of the rather small crater — coarse grasses, some shrubs and a few stunted trees. A heavy belt of timber encircles the cone reaching a line within perhaps 2,000 feet of the apex. Toward the base it has been denuded of the original vegetation and converted into farms. Clouds and mists keep the upper portion bathed in moisture and the vegetation is very luxuriant except near the top. The entire area of its flanks furnishes excellent opportunity for the botanical collector. The volcano Atitlán is in the Department of Solalá immediately south of Lake Atitlán, and in general appearance is much like Agua. It is not however clothed with vegetation to the extreme apex — the volcanic ash preventing plants from getting a foothold there. The forest covering which is very dense, beginning immediately below the line of loose material, has not been disturbed except very near the base. The volcano Santa Maria in the Department of Quezaltenango is likewise clothed with forest vegetation, which reaches the summit. The eruption that took place in 1902 completely destroyed the vegetation on the south and southwest side where a new crater of immense size was formed. Many parasitic fungi were obtained on these volcanoes, especially on the first named in the list, yet the collections must be materially augmented by future trips before a just estimate can be made as to abundance, distribution and character.

ACKNOWLEDGEMENTS.

By no means so much could have been accomplished without the cordial assistance and encouragement of many residents and citizens of that Republic. First of all thanks are due the officers of the Northern Railroad (Ferro-carril del Norte), and of the Central Railroad (Ferro-carril Central de Guatemala), for courtesies, previously mentioned in this article. The American Minister Plenipotentiary Mr. Combs, the Consul General Mr. Winslow, the Vice Consul Mr. Owen, and Rev. W. B. Allison a resident missionary, also assisted by kindly advice; the pleasures of the trip were greatly enhanced by the courteous and cordial reception by their families. It is a pleasure also to acknowledge the uniform courtesy of the officers of the Republic, and their interest in our explorations, which is at the same time a reflection of the liberal and advanced policy, and deep interest in scientific and industrial advancement, on the part of the President of Guatemala, Manuel Estrada Cabrera.

OCCURRENCE OF LASIODIPLODIA ON THEOBROMA CACAO AND MANGIFERA INDICA.

VERA K. CHARLES.

In the spring of the present year a consignment of diseased Theobroma material, which included wood and fruit was sent to the Department of Agriculture from Brazil for examination as to the cause of the disease. Unfortunately, no written description accompanied the specimens and as they were in alcohol there was no opportunity to trace the development of the disease to determine whether the disease on the pods was the same as that which produced the general abnormal branching of the twigs. *Colletotrichum* was definitely determined as present on the pods, but it was not in sufficient quantity to be the sole cause of the trouble. We inferred this only from the material which we had for examination, but of course it is possible that our limited amount of material was not typical of the disease in its natural place of occurrence. The beans were one mass of brown, many septate, knotted mycelia. As these beans were also in a preservative fluid no cultures could be started which would lead to the identification of this sterile mycelium. A second consignment of specimens of diseased Theobroma cacao consisting of pods and wood was received in August of this year from San Domingo. These pods showed the presence in great quantity of mycelium, similar to that just described, but in this case the fungus was fruiting and definitely identified as belonging to the genus Lasiodiplodia.

About three months ago two specimens of the fruit of Mangifera indica were sent to this Office by one of our plant introducers, who procured them from a local fruit stand, which had probably received them from Florida. Although badly rotted the fungus was isolated and proved to be Lasiodiplodia. Several transfers were made but all cultures, even the first, were remarkably pure.

The question whether this fungus is Lasiodiplodia tubericola E. & E. and not a new species, is yet to be determined. To all present appearances it is the same, but a series of inoculation experiments are in progress to determine if this may be a physiological species. Although the effect produced on these two hosts is not that of putrefaction, which is characteristic of this species, we are inclined to believe that the length of time which elapsed before the materal received our attention and the unusual condition to which it was subjected during that time, may be responsible for the somewhat softened condition of the fruits.

That this fungus may be connected with the Witches' Broom disease or "putrefaction" disease, as called by cacao planters, we cannot say until we complete our cultural experiments, and have more material for our examination together with field observations.

Bureau of Plant Industry,
U. S. Department of Agriculture.

A NEW METHOD OF MOUNTING FUNGI GROWN IN CULTURES FOR THE HERBARIUM.*

GEO. G. HEDGCOCK AND PERLEY SPAULDING.

The writers had occasion recently to mount specimens of some of the smaller fungi which are easily grown on artificial media for the purpose of preserving them for herbarium specimens. This so far as known has never been attempted and no such specimens have ever been seen which were satisfactorily put up for such purposes. All available methods which have been tried were so far as known considered, but none of them seemed to present a good solution of the difficulty. It was accordingly attempted to invent some method which would be easily and cheaply used on as extensive a scale as might be wanted by any one issuing sets of exsiccati, or wishing to have the imperfect fungi represented in an herbarium by pure cultures. It is believed that such a method has been discovered which is not only very satisfactory but is also cheap and easily used on any scale that it may be wished to prepare these fungi.

The fungi are separated and grown in pure cultures in Petri dishes upon a rather stiff agar agar made with some infusion suitable for the normal growth of the fungi. At the proper stage in their growth the plates are divided into square blocks of agar of a suitable size. Each of these blocks is placed right side up upon a stiff cardboard and allowed to dry down. The cardboards may be of almost any description, but it has been found that a good quality of index cards is most convenient for the purpose.

After the agar has become dry the mount is protected by pasting over the agar block a small, square or circular piece of cardboard which has been perforated with a gun-wad cutter, the perforation being of a size necessary to include the mounted block. These squares or circles of cardboard may be made of board of several thicknesses, varying from one to several millimeters, so that in selecting a protector the thickness may be adapted to the height of the filaments in the fungus.

This method of mounting has proven very convenient with specimens of Stilbum, Graphium, Ceratostomella, Hormodendron and other similar fungi; it is best, however, to poison the specimen after mounting, by spraying it with a strychnine solution.

Mississippi Valley Laboratory,
July 30, 1906.

---

*Published by permission of the Secretary of Agriculture.

A NEW SPECIES OF GALERA.

CHARLES H. PECK.

A species of this genus apparently undescribed has been brought to my notice recently of which the following account may be given.

Galera kellermani Peck sp. nov. — Pileus very thin, subovate or subconic, soon becoming plane or nearly so, striatulate nearly to the center when moist, more or less wavy and persistently striate on the margin when dry, minutely granulose or mealy when young, unpolished when mature, often with a few scattered floccose squamules when young, and sometimes with a few slight fragments of a veil adhering to the margin which appears as if finely notched by the projecting ends of the gills, watery brown when moist, grayish brown when dry, a little darker in the center, taste slight, odor faint, like that of decaying wood; lamellae thin, close, adnate, a delicate cinnamon brown becoming darker with age; stem slender, equal or slightly tapering upward, finely striate, minutely scurfy or mealy at least when young, hollow, white; spores brownish ferruginous with a faint pinkish tint in mass, elliptic, 8-12 x 6-7 μ.

Pileus 2-3 cm. broad; stem 2.5-4 cm. long, 1-2 mm. thick. Gregarious or subcespitose. Ground in a greenhouse, Columbus, Ohio, August, 1906. Number 4494. Dr. W. A. Kellerman.

The distinguishing characters of this species are its broadly expanded or plane grayish brown pileus with its minutely granulose or mealy surface, its persistently striate margin and its very narrow gills becoming brownish with age. The indication of a veil is also unusual.

The species is respectfully dedicated to its discoverer who has kindly sent copious notes, specimens, spore-prints and photograph from which the description has been prepared.

Explanation of Plate 89. — Galera kellermani Peck. A half tone illustration of several plants. A very young specimen shows the minutely granulose or mealy character of the cap. Fully grown plants are shown and in one case the fragments of a veil are distinctly seen attached to the margin.

GALERA KELLERMANI PECK.

REASONS FOR DESIRING A BETTER CLASSIFICATION OF THE UREDINALES.*

BY J. C. ARTHUR.

There are two especially prominent reasons for the consistent naming of the species of rusts, and for other plants as well. One is to be able to designate each particular kind as desired by using an authoritative name, and the other is to indicate the relationship which that kind holds to other kinds according to its recognized place in a natural system. If we examine the classification of the Uredinales now in use from these two standpoints, passing by for the present other points of view, many defects will be apparent, even to the verge of thorough confusion.

The methods by which an authoritative name may be selected, when more than one has been in use, have been much discussed of late and need not be taken up here. When the general rules of nomenclature are applied to the Uredinales, however, a complication arises in many cases due to the fact that some of the species possess partly or wholly independent phases of existence during their life cycle; and these different phases have such nearly equally prominent characteristics that they were at first inevitably placed in separate genera, as if they were autonomous organisms. When the different forms of a species are collected under one name, it would seem natural and logical that the several appellations previously in use for the different phases of the species should have consideration. Yet the view, that only names applied to the last or telial stage of the species are worthy of recognition, is held by many uredinologists. A discussion of this topic can not be taken up here, but it may be worth while to state the opinion of the writer that when the real significance of the several life phases of the rusts is better appreciated the opposition to a logical treatment of the Uredinales in conformity with the treatment of other plants will largely, if not wholly disappear. In support of this opinion let it be noted that those who would discredit the nomenclatorial standing of the aecial phase are in the anomalous position of ignoring the sexual stage of the species, if we are to accept recent cytological studies, which in the case of other plants is considered the pivotal basis of classification.

In passing to the second part of the subject it is worth bearing in mind that the desire for a stable nomenclature should never stand in the way of improvement in classification by segregation of genera to bring out more clearly the relationship of

---

* Read before the American Mycological Society, New Orleans Meeting, January 1, 1906.

groups of species. One of the impediments at the present time to an understanding of the interrelationship of rusts lies in the lack of reasonable segregation of genera. In support of this statement one need only recall the fact that the genus *Puccinia* as now consituted contains more than half of all known species of rusts, and what may not be so well known, that within this category are contained groups of the most diverse forms and affinities. To be assigned to this genus requires only that the rust shall possess a two-celled, stalked teliospore. No consideration need be given to the nature of the spore wall, whether homogeneous or differentiated into well marked layers, or to the number and position of the germ pores in each cell, or to the question of simple or compound stalks. It is also unnecessary to ask whether the life cycle of the rust possesses pycnia, aecia and uredinia, in addition to the telia, or whether one or more of these is wanting, or what may be the origin of sori in any or all of these four stages in relation to the substratum. Yet all these characters, and some others, should be kept in mind to rightly appreciate the validity of a genus in the *Uredinales.* In short the genus *Puccinia* is founded upon what is essentially a single character, which can not be shown to be correlated with other characters going to form a natural grouping of closely related organisms. A very similar genus is that of *Uromyces,* which differs from *Puccinia* apparently only in possessing one-celled instead of two-celled teliospores, and all that has been said of *Puccinia* aplies with equal force to *Uromyces.* These two genera are fine examples of the heterogeneous results of founding genera on a single technical character when it can not be shown to be also a representative character.

Let us now turn from the negative to the positive side of the discussion, and instead of insisting upon the artificial construction of the genera *Puccinia* and *Uromyces,* let us see what segregation can be made of the species to show more fully their affinities. First of all it will be necessary to study more fully than is usual both spores and sori of all the stages or phases of each species, including the pycnia. Our attention will soon be attracted to the fact that while the pycnia of the majority of species are flask shaped, and arise under the epidermis, some are conical or flat, and arise under the cuticle. We shall further find that these differences are correlated with characters in the other spore forms, especially in the spores and sori of the uredinia and the spores of the telia.

Removing now all species with subcuticular pycnia, and directing attention more particularly to the uredinia of this segregated group, we shall find species in which the urediniospores are distinctly different at apex and base, reminding one of the urediniospores of the genus *Ravenelia.* Correlated characters will be found to set aside a group of genera having beside the peculiar urediniospores also teliospores with verrucose, globoid cells and fascicled pedicels, for which *Puccinia Pruni-spinosae* is a good illustration, and still another group of genera having teliospores borne one or more on free pedicels, and the spores often flattened above and below, for which *Uromyces brevipes,* the rust on *Rhus,* is representative.

Having removed these groups of genera related to *Ravenelia* we shall still have left species with urediniospores of the usual appearance, but with sori surrounded by numerous paraphyses. Among these we shall find a group of genera with peculiarly tuberculate teliospores having lateral germ pores, clearly related to *Phragmidium,* and still another group of genera in which the teliospores possess a hygroscopic layer between the outer and inner parts of the wall, clearly related to *Uropyxis.* This latter group is still further separable into genera with lateral pores like *Uropyxis,* or with apical pores like species of *Puccinia* having subepidermal pycnia.

Having now removed a large number of species from the parallel genera *Puccinia* and *Uromyces,* and segregated them into groups of genera related variously to *Ravenelia, Phragmidium* and *Uropyxis,* let us look at what remain, all of which have flask-shaped pycnia arising from beneath the epidermis. We can easily discover here two groups of genera, one having indefinitely extended aecia and colorless teliospores, germinating in the sorus as a rule, of which *Puccinia evadens* found on *Baccharis* is a representative, and the group of genera having definite aecia and colored teliospores, embracing all that is left of the genera *Puccinia* and *Uromyces,* of which most grass and sedge rusts, *Puccinia Helianthi,* etc., are representatives.

Having now segregated the species usually placed under *Puccinia* and *Uromyces* into seven groups of genera with affinities extending through the whole length of the *Pucciniaceae,* let us resolve these several groups into their respective genera. In order to do this it is necessary to take a glance at the probable scope of the influences which have determined the development of the genera in the *Uredinales.* It seems highly probable that in general the influences which have acted to limit and shape the species and also the genera of higher plants, such as temperature, humidity, elevation, natural barriers, succession of seasons, etc., have also had similar effects upon the species of the rusts. In addition to these a set of influences have been brought to bear by virtue of their strict parasitism, which are scarcely to be paralleled in any other group of plants. This is shown in limiting the species to certain orders, genera, or even species of hosts. How far the host has reacted upon the rust to modify its form and structure is difficult to decide, but that such action has occurred there seems to be no occasion for doubt. This influence of the substratum in the case of parasitic plants, however, is doubtless largely comparable with the influence of the substratum in non-parasitic plants, only more pronounced.

But there is an influence which has helped to delimit both species and genera among the *Uredinales*, not found apparently in any other group of plants. This influence is difficult to define, but it is manifested in directing the phylogenic course of development within the group, by which the life-cycle is shortened.

There appears to be ample justification in assuming that at a comparatively early period in the evolution of the *Uredinales* all the rusts possessed four forms of spore-structures, pycnia, aecia, uredinia and telia. We need not go back of this period to inquire how they came to have the four kinds of spores, as it does not affect in the least our present contention. But during the universally four-spored condition for the order, some influence began to affect the relative production of the several spore-forms, which eventuated in the suppression of one or more of these from certain species or group of species. As a result of this influence we find that the *Uredinales* of the present day consist of groups of species in the several divisions of the order, generally regarded as genera, which in many cases can be again separated into at least four groups of species, according as they possess all spore-forms, all but aecia, all but uredinia, or finally only telia. In each of these four groups the pycnia are generally present, but in some species of the last named group even pycnia may fail.

Among the melampsoraceous rusts there has been an unpremeditated, and largely unrecognized tendency to regard the absence of certain spore-forms as among valid generic characters, but among the pucciniaceous rusts such a tendency is distinctly opposed. That this is, however, a generic character of importance among rusts generally, I not only venture to affirm, but believe that it will in many cases be found to be associated with other characters further indicating true generic grouping. It is among the genuine *Pucciniae* after other genera have been removed as indicated above, that this character for separating genera finds its most uniform and conspicuous application. This is in fact exactly what should be expected, for this group undoubtedly represents the highest and most complex development of the *Uredinales*.

In advocating the importance of recognizing the life-cycle in drawing generic distinctions it is well to forestall misapprehension by pointing out that the usual absence of a spore-form does not necessarily constitute an abbreviated life-cycle. Many species of rusts in northern regions especially have the habit of propagating themselves from year to year largely by the urediniospores which survive the winter, either as continuously produced spores on living leaves, as in the case of *Puccinia Poarum* and *P. rubigo-vera,* or as stray spores no longer connected with a living host, as in *P. Sorghi* and *P. graminis.* In such cases the uredinia are usually followed each season by a greater or less development of telia, which serve little or no purpose in the propagation of the species, as the proper host plants for the aecia may be rare or absent. Such a condition explains the great prevalence of such species as *Coleosporium Solidaginis* and *Melampsora Medusae* when suitable coniferous hosts do not occur within hundreds of miles, and their aecia are rarely or never collected. Again in warmer regions a species is maintained through its urediniospores alone, the other spore-forms rarely or never being seen. But these are not instances of abbreviated life-cycle within the meaning here implied. They are a form of extended conidial propagation, the full life-cycle, whenever circumstances permit it to be completed, showing all spore-forms. In other cases the completed life-cycle may show less than the full number of spore-forms, as in *Puccinia umbelliferarum,* where the aecia are wanting, etc.

While every genus heading a large section of the *Uredinales,* like *Coleosporium, Melamspora,, Cronartium, Ravenelia, Phragmidium,* etc., is theoretically capable of division into four genera in accordance with the extent of the life-cycle, yet forms are not known in all cases to permit of such a division, and no uniformity exists in regard to the proportional number of species falling into each of the newly delimited genera. Moreover, in many cases other characters demand recognition, and altogether it will be found that the admission of the life-cycle as a generic character does not result in a mathematical regularity of genera, throughout the order, as at first sight might be assumed.

If we require that a genus should represent as fully as possible a group of organisms giving evidence of having been derived from the same ancestors, and therefore with species more closely related genetically to one another than to those of any other genus, it becomes necessary to explain a well known parallelism, brought to our attention by Fischer of Switzerland. He showed that in many cases the teliospores of a species having an extremely abbreviated life-cycle, *e. g. Puccinia Leucanthemi,* closely resemble in structure those of an autoecious species, *e. g. P. Aecidii-Leucanthemi,* in which the host of its aecia is the same or practically so as the host of the abbreviated species. Tranzschel has successfully applied this rule of parallelism in predicting the host of the unrecognized aecia in certain heteroecious species. In such cases of parallelism there can be no doubt that the forms in question have truly descended from a common ancestor, but dating a long way back, even to the early days when all the rusts had four spore-forms. Searching for an adequate cause to account for the breaking up of a primitive species into two or more modern parallel species with different lengths of life-cycle, I think it may be found in the augmented influence of parasitism. In the primitive times the rusts were doubtless but weakly parasitic, but in their onward development parasitism with its restricting and reducing effects became constantly more pronounced. To develop the theory here would extend this article beyond reasonable limits, but it is believed to fully account for the observed parallelism. It also accounts for the fact that essentially the same shortening of the life-cycle occurs or may be looked for in every group of the *Uredinales,* but is most extensive in the groups showing the greatest differentiation and highest development. And finally it does not militate in the opinion of the writer against the validity of genera whose ultimate distinction is that of the length of the life-cycle, but lends important aid in tracing their relationships.

The arguments in this article have in the main been directed against or received their support from the old-time genus *Puccinia* and its consort *Uromyces,* believing that whatever would prove acceptable to systematists in this connection can readily be extended to the whole order of the *Uredinales.* I have thus presented some of the reasons which appeal to me for desiring a better classification of the *Uredinales,* believing that when obtained it will promote the study of the order and facilitate an understanding of relationships.

NORTH AMERICAN SPECIES OF LEPIOTA.

A. P. MORGAN.

The name LEPIOTA was given by Persoon to the first section of his genus *Agaricus;* it had a wider application in the "Synopsis" than is assigned to it in the genus of the same name at the present time. Fries in the "'Systema" made of the term Lepiota a tribal designation, restricting it to the species of Agaricus about as understood at present. The species thus included are well worthy of generic distinction.

Fries in the Hymenomycetes Europaei enumerates 45 species of Lepiota. Since the publication of this volume (1874) European mycologists have increased the number to more than 100. The region most prolific in species of this genus so far discovered is the island of Ceylon where upward of 70 species were enumerated and described by Berkeley and Broome. Sacardo in the different volumes of the Sylloge Fungorum enumerates more than 300 species.

Schweinitz in the North American Fungi (1834) gives a list of 5 species of Lepiota. In Lea's Catalogue (1849) there is a list of 4 species. Sprague in one of his papers (1858) enumerates 5 species. The Amherst Catalogue (1875) contains 11 species. The Pacific Coast Catalogue (1850) 5 species. Comprehensive and critical work upon the Fungi of North America began with the publication (in 1870) of the 23d Report of the State Botanist of New York, Charles H. Peck. The series of Reports upon the Fungi of the State of New York issued annually from that year up to the present suggests the extent and richness of the Northern Fungal Flora.

There has been enumerated up to this time near 80 species of North American Lepiotas, plainly an inadequate number for the vast territory considered. Peck's monograph of the genus in the 35th New York Report (1882), appears to be still about all we have to work with; it describes only 18 species! It is therefore suggested that we endeavor to marshall the species known and described up to date into some sort of order that we may, first, make a more critical study of them, and secondly, bring to light such species as are not yet recognized. For this purpose we are applying to North American species a scheme of arrangement which we make use of to refer to the numerous species of Lepiota described in the Sylloge Fungorum.

LEPIOTA *Persoon, Synopsis 1801; Fries, Syst. Myc. 1821. Hym. Eur. 1874; Saccardo, Sylloge Fungorum, V, IX, XI, XIV, XVI, XVII.*

Pileus soft fleshy, rather dry; veil marginal. Stipe hollow or fibrous-stuffed, rarely solid, commonly tapering upward from a thickened base; volva none. Lamellae free, approximate or remote, rarely reaching the stipe; spores white, sometimes with a tinge of pink or yellow, in one species bright green.

Agarics varying in size from the largest to very small, growing usually in rich soil, a few species on old decaying wood. The surface of the pileus may be smooth and glabrous, more commonly the dermis is broken up into granules, warts and scales; in a few species the surface is viscid or glutinous. Fries invests the pileus in this genus with a universal veil concrete with the dermis. According to De Bary, Brefeld and others there is but a partial or *marginal veil.* This veil is a membrane joining the margin of the pileus to the surface of the stipe; it continues to grow along with the general growth of the pileus and stipe until the time of the hyponastic upward expansion of the former when it is torn away from the margin of the pileus and is left behind upon the stipe. The mode of development of the partial veil and the manner of its rupture occur in three different ways which are made use of to arrange the species of Lepiota into three different sections. These sections are defined in accordance with the views of De Bary as expressed in his Comparative Morphology.

§ I. *ANNULI INFERI. THE VEIL IN THIS SECTION HAS A TWO-FOLD ORIGIN; IT IS A CONTINUATION OF THE OUTERMOST ROW OF CELLS OF THE STIPE WHICH HAS GROWN FOR SOME TIME WITH THE STIPE BY INTERCALARY GROWTH AND PASSES INTO THE MARGIN OF THE PILEUS; AND CONVERSELY IT IS A CONTINUATION OF THE OUTERMOST HYPHAE OF THE PILEUS PASSING INTO THE SURFACE OF THE STIPE. THE SEPARATION TAKES PLACE AT THE MARGIN OF THE PILEUS, THE VEIL REMAINS ATTACHED TO THE STIPE AS A RING OR AS A SHEATH RUNNING DOWN ITS SURFACE OR SOMETIMES PORTIONS OF IT FORM A FRINGE OR APPENDAGE TO THE MARGIN OF THE PILEUS.*

I. MESOMORPHAE. *Dermis of the pileus entire, the surface of both pileus and stipe smooth and glabrous; the veil annulate, often evanescent.*

A tribe of small Agarics. More than a dozen species are enumerated in the Sylloge Fungorum.

1. LEPIOTA MESOMORPHA Bulliard, Herb. Fr. 1791.

Pileus a little fleshy, campanulate then expanded, dry, smooth and glabrous, whitish, ochraceous or yellowish. Stipe short, slender, hollow, smooth and glabrous, concolorous with the pileus; the annulus more or less persistent. Lamellae rather narrow, white, free, approximate; spores elliptic-ovoid, 4-5 x 3 mic.

Growing on the ground in woods. Preston, O. Pileus about 2 cm. in diameter, the stipe 5-7 cm. long and about 2 mm. thick.

2. LEPIOTA RUFIPES Morgan sp. nov.

Pileus a little fleshy, convex, smooth and glabrous, white. Stipe slender, smooth and glabrous, rufescent, paler at the summit; the annulus evanescent. Lamellae broad, close, white, free, approximate; spores oblong, 4-5 x 3 mic.

Growing on the ground in woods among old leaves; Preston, O. Pileus about a centimeter in diameter, the stipe 2-3 cm. long.

II. EUCONIATI. *Dermis of the pileus not lacerate, but the surface pruinose, finely pulverulent or minutely furfuraceous; the investment of the stipe usually similar to that of the pileus; the veil often appendiculate.*

These are mostly small Agarics easily recognized by the powdery surface of the pileus.

A. STIPE GLABROUS.

3. LEPIOTA CRISTATELLA Peck, 31st N. Y. Rep. 1878.

Pileus thin, convex, subumbonate, minutely mealy especially on the margin, white, the disk slightly tinged with pink; the veil lacerate, leaving fragments on the margin or evanescent.

Stipe slender, hollow, glabrous, whitish. Lamellae close, rounded behind, free, white; spores subelliptic, 5 mic. long.

Growing in mossy places in the woods. New York. *Peck.* Pileus 4-8 mm. in diameter, the stipe 2-3 cm. long and about 1 mm. thick.

B. STIPE PULVERULENT OR MINUTELY FURFURACEOUS.

4. LEPIOTA CHEIMONOCEPS B. & C. Fungi Cub. 1867.

Snow-white. Pileus thin, pulverulent; the margin here and there appendiculate. Stipe thickened downward, furfuraceous; the annulus lacerate. Lamellae rather broad, free, remote; spores subglobose, 8 x 6 mic.

Growing on logs. Cuba. *Wright.* Pileus 2-4- cm. in diameter, the stipe 2-3 cm. long. A very pretty species.

5. LEPIOTA NOSCITATA Britzelmayer, Derm. et Mel. App.

Pileus ovoid-conic then expanded, subumbonate, white, rufescent in the center, glabrous or very minutely flocculose; the margin faintly striate. Stipe elongated, hollow, tapering upward, very minutely flocculose, rufescent; the annulus minutely flocculose, evanescent. Lamellae white, rather broad, free; spores ovoid-oblong, 3.5-4.5 x 3 mic.

Growing in rich soil in woods, Preston, O. Pileus 2-3 cm. in diameter, the stipe 4-6 cm. long and 2-3 mm. thick.

6. LEPIOTA SEMINUDA Lasch, Linnaea III. 1828.

Pileus very thin, campanulate then expanded, umbonate, floccose-mealy, at length naked, whitish or pinkish; the margin appendiculate by the torn veil. Stipe hollow, slender, farinaceous. Lamellae rather narrow, white, reaching the stipe; spores ovoid, 3-4 x 2.5 mic.

Growing on the ground in woods. Preston, O. Pileus 2-3 cm. in diameter, the stipe 3-5 cm. long and about 2 mm. thick.

7. LEPIOTA PARVANULATA Lasch, Linnaea III, 1828.

Pileus a little fleshy, ovoid then campanulate and explanate, subumbonate, even, slightly silky or subpruinate, white with a tinge of ochre in drying. Stipe subequal, slender, hollow, white, below the annulus fibrillose. Lamellae broad, white, close, free, approximate; spores elliptic, 3-4 x 2.5 mic.

Growing on the ground in grassy places. Preston, O. Pileus about a centimeter in diameter, the stipe 2-3 cm. long and about 2 mm. thick.

8. LEPIOTA CYANOZONATA Longyear, 3 Rep. Mich. Ac. Sci. 1901.

Pileus a little fleshy, ovoid then campanulate and expanded, subumbonate, minutely fibrillose when young, soon glabrous, creamy or pinkish white with a narrow zone of light blue near the margin; the veil delicate, fibrous, evanescent. Stipe nearly equal, fistulose, whitish, minutely scaly, attached by an abundant strigose mycelium. Lamellae rather broad, whitish, free, approximate; spores subglobose, with a minute apiculus, 6-8 mic.

Growing on decaying sticks on the ground in woods; Michigan. *Longyear.* Pileus 1-2 cm. in diameter, the stipe 2-3 cm. long and about 2 mm. thick. The whole plant becomes brownish when bruised and in drying. "Its striking feature is the delicate blue marginal zone which is suggestive of the specific name."

9. LEPIOTA PURPUREOCONIA Atkinson, Journal Mycol. 1902.

Pileus thin, convex, the surface covered with a purplish powder; the marginal veil consisting of the same powdery substance. Stipe thick, solid, whitish within, below the annulus covered by the same purplish powder as the pileus. Lamellae broad, rather distant, white or yellowish, free, approximate; spores elliptic, 8-10 x 3-4 mic.

Growing on the ground in woods; New York. *Atkinson.* Pileus 1-2 cm. in diameter, the stipe 4-5 cm. long and 3-4 mm. in thickness.

10. LEPIOTA ECITODORA Atkinson, Journal Mycol. 1902.

Pileus thin, convex, pale lavender, minutely scaly or pruinose; the veil powdery and evanescent. Stipe tapering downward, white and pruinose above, dark brown to blackish below. Lamellae narrow, rounded behind, free, yellowish; spores cylindric, 9-11 x 2.0-2.5 mic.

Growing on the ground in woods. New York. *Atkinson.* Pileus 2 cm. in diameter, the stipe 4-5 cm. long and 2-3 mm. thick. "Odor foetid resembling that of Eciton ants."

11. LEPIOTA PULVERACEA Peck, 54th N. Y. Rep. 1900.

Pileus convex then expanded, pulverulent or minutely granulose, whitish or fulvescent; the veil evanescent. Stipe thick, hollow, granulose or squamulose below the annulus and colored as the pileus. Lamellae white or yellowish, adnexed; spores oval 4 x 3 mic.

Growing in woods on prostrate trunks of Spruce trees. New York. *Peck.* Pileus 2-3 cm. in diameter, the stipe 3-5 cm. long and 3-4 mm. in thickness.

12. LEPIOTA PUSILLOMYCES Peck, 28th N. Y. Rep. 1875.

Pileus ovoid then campanulate and expanded, subumbonate, whitish or dusky, flocculose-pulverulent; the margin appendiculate by the lacerate veil. Stipe slender, nearly equal, fibrous-stuffed, rufescent beneath the white pulverulence. Lamellae very broad, white, free, approximate; spores elliptic-oblong, 4-5 x 3 mic.

Growing in rich soil among old leaves in woods. New York. *Peck.* Plentiful about Preston, O. Pileus 10-15 mm. in diameter, the stipe 2-4 cm. long and 1-2 mm. thick. The pulverulence consists of thin-walled globular cells.

(To be continued.)

DESCRIPTIVE SYNOPSES OF MORGAN'S NORTH AMERICAN SPECIES OF MARASMUS.*

A. P. MORGAN.

MARASMIUS Fries. Gen. Hym. 1836.

Fungi tough and flexible, drying up and more or less persistant, not putrescent, reviving when moistened. Hymenophore continuous with the stipe but heterogenous, descending into the trama; veil none. Stipe cartilaginous or horny. Lamellae tough and flexible, subdistant, the edge acute and entire; spores white.

Agarics small or minute, growing for the most part upon wood or among the old leaves in woods.

§ 1. *COLLYBIA.—PILEUS TOUGH-FLESHY AT LENGTH SUBCORIACEOUS, COMMONLY SULCATE OR RUGULOSE, THE MARGIN AT FIRST INVOLUTE. STIPE SUBCARTILAGINOUS. LAMELLAE ADNATE OR NEARLY FREE.*

I. SCORTEI. *Stipe solid or medullate-stuffed, then hollow, fibrous within, externally a detersile villosity clothing the cartilaginous cuticle. Lamellae seceding-free.*

A. *STIPE WOOLLY OR STRIGOSE AT THE BASE.*

a. Lamellae subdistant. 1-7. [Species Numbers.]

b. Lamellae rather close. 8-14.

B. *STIPE NAKED AT THE BASE OFTEN COMPOSED OF TWISTED FIBRES.* 15-18.

II. TERGINI. *Stipe rooting, definitely tubular, not fibrous, but manifestly cartilaginous. Lamellae seceding-free. Pileus thinner than those of the former, hygrophanous*

---

* This should have immediately followed the article to which it pertains — these synoptic descriptions serving well for a key to the species. As a *separate* it can be placed with the *separate* of the monograph. — Editor.]

A. *STIPE WOOLLY BELOW OR AT THE BASE, GLABROUS ABOVE.*

a. Pileus even or only rugulose. 19-22.
b. Pileus striate or plicate-sulcate. 23-26.

B. *STIPE, AT LEAST WHEN DRY, EVERYWHERE PRUINATE-VELVETY.*

a. Pileus even or only rugulose. 27-32.
b. Pileus striate or plicate-sulcate. 33-37.

III. STYLOBATAE. *Pileus convex-involute, then plane and depressed. Stipe cartilaginous without a root, dilated at the base into a circular disk or floccose tubercle. Lamellae adnate. Growing on old wood, branchlets, sticks, etc.*

A. STIPE GLABROUS.

a. Lamellae colored. 38-41.
b. Lamellae white or pallid. 42-44.

B. STIPE VELVETY OR PRUINOSE.

a. Lamellae colored. 45-46.
b Lamellae white or pallid. 47-51.

IV. CALOPODES. *Pileus convex-involute, then plane, and depressed. Stipe short, insititious (i. e. ingrafted, the mycelium innate and not visible). Lamellae adnate.*
Growing on old wood, trunks, branches, etc.

A. STIPE GLABROUS.

a. Lamllae colored. 52-54.
b. Lamellae white or pallid.

á. Pileus colored. 55-58.
b′. Pileus white or pallid. 59-60.

B. STIPE VELVETY OR PRUINATE.

a. Lamellae colored. 61-62.
b. Lamellae white or pallid.

á. Pileus colored. 63-66.
b′ Pileus white or pallid.

a″. Stipe colored. 67-69.
b″. Stipe white or pallid. 70-74.

§ 2. *MYCENA. PILEUS FROM SUB-CARNOSE TO MEMBRANACEOUS, CONVEX OR CAMPANULATE, THE MARGIN AT FIRST STRAIGHT AND APPRESSED. STIPE CARTILAGINOUS, TOUGH, DRY, FISTULOUS. LAMELLAE FREE OR ADNEXED, NOT DECURRENT.*

I. LONGIPEDES. *Pileus a little fleshy or submembranaceous, convex or campanulate then expanded. Stipe elongated and rooting among old leaves or in rotten wood. Lamellae free or attached to the stipe.*

A. STIPE GLABROUS. 75-78.

B. STIPE PRUINATE OR VELVETY.

a. Lamellae free from the stipe. 79-80.
b. Lamellae attached to the stipe. 81-85.

II. SARMENTOSI. *Stipes arising from an ascending or prostrate common stem.*

A. STIPES GLABROUS. 86-87.

B. STIPES PUBESCENT. 88-89.

III. GLABELLI. *Pileus thin, membranaceous, convex or campanulate, commonly plicate-sulcate. Stipe slender, nearly always glabrous, arising from a floccose tubercle or from a circular disk. Lamellae few or distant, free or adnexed. Growing on old wood, sticks, leaves, etc.*

a. Lamellae free or subfree. 90-96.
b. Lamellae attached to the stipe.

á. Lamellae colored. 97-102.
b′. Lamellae white or pallid. 103-106.

IV. INSITITII. *PILEUS, THIN MEMBRANACEOUS, CONVEX OR CAMPANULATE, USUALLY PLICATE-SULCATE, STIPE FILIFORM, RIGID OR OFTEN FLACCID, MOSTLY GLABROUS, THE BASE INSITITIOUS. LAMELLAE EITHER ATTACHED TO THE STIPE OR FREE; IN THIS CASE THEY ARE ATTACHED TO A COLLAR WHICH ENCIRCLES THE APEX OF THE STIPE AND IS FREE FROM IT.*

Growing commonly on the petioles, midribs and principal veins of old leaves, sometimes on herbaceous stems, etc.

A. STIPE GLABROUS.

a. Lamellae attached to the stipe.

á. LAMELLAE COLORED. 107-108.
b′. LAMELLAE WHITE.

a″. Pileus colored. 109-114.
b″. *Pileus white or whitish.* 115-120.

b. Lamellae adnate to a free collar. 121-126.

B. STIPE VELVETY OR PRUINATE.

a. Pileus colored. 127-129.
b. Pileus white or whitish.

a′. Pileus plicate-sulcate. 130-131.
b′. Pileus even or only rugulose. 132-134.

§ 3. *OMPHALIA. PILEUS SUBMEMBRANACEOUS; THE STIPE CENTRAL, CARTILAGINOUS, FISTULOSE, SOMEWHAT THICKENED UPWARD; THE LAMELLAE TRULY DECURRENT.*

I. CYATHIFORMES. *Pileus submembranaceous, at length depressed, umbilicate or even infundibuliform.*

A. STIPE GLABROUS. 135-140.

B. STIPE VELVETY OR PRUINATE. 141-143.

II. CLAVIFORMES. *Pileus membranaceous, campanulate or convex, never depressed.*

A. STIPE GLABROUS. 144-145.

B. STIPE VELVETY OR PRUINATE. 146-148.

§ 4. *PLEUROTUS. PILEUS MORE OR LESS IRREGULAR; THE STIPE EXCENTRIC, LATERAL OR WANTING. COMMONLY GROWING ON WOOD.*

A. STIPE EXCENTRIC.

a. Lamellae colored. 149-151.
b. Lamellae white. 152-153.

B. STIPE LATERAL AND VERY SHORT.

a. Lamellae colored. 154-158.
b. Lamellae white or pallid. 159-162.

SYNOPSIS TO NORTH AMERICAN SPECIES OF HELIOMYCES.

HELIOMYCES Le'ville Champ. exot. Am. Sc. Nat. 1844.
Pileus coriaceous- or membranaceous-tremellose, plicate-sulcate or rugulose. Stipe central, tough, cylindric, fistulose. Lamellae similar in substance to the pileus, the edge acute; spores white.

Small Agarics which are tremelloid when fresh and growing, and when dry have the appearance of Marasmii.

A. STIPE GLABROUS.

a. Pileus colored from the first. 1-2.
b. Pileus at first white. 3-4.

B. STIPE PRUINOSE. 5-6.

FIELD NOTES ON THE UREDINEAE.

A. O. GARRETT.

The following notes refer to collections of rusts made during the past three years at the head of Big Cottonwood Canyon, about thirty miles from Salt Lake City. The altitudes for the following species range from 8,500 to 9,500 feet.

Puccinia scandica Johans. — On Aug. 13 the writer collected an aecidium on young plants of Epilobium alpinum which was determined both by Sydow and Holway as the aecidial stage of Puccinia epilobii-tetragoni (DC.) Winter. On the same host but in a different locality *Puccinia scandica* Johans. was collected three days later — the first American collection of this species. The opinion was then formed that the aecidia previously collected were connected with Puccinia scandica; and collecting in the same locality the two succeeding seasons has strengthened this opinion for the following reasons: 1, I have never found teleutosori of Puccinia epilobii-tetragoni in this region, nor in any other at so high an altitude; 2. The aecidia reach their greatest abundance some time before the teleutospores of P. scandica appear; 3. Several specimens were obtained this past season in which both aecidia and teleutosori were found on the same plant, and even on the same leaf. The aecidia have, however, been collected upon hosts upon which the teleutosori of P. scandica have not yet been found.

Puccinia caricis-asteris Arth. — Just about dark on August 11, 1905, a collection was made of the aecidia of this species on Aster adscendens. The following day another trip was made to the spot for the purpose of finding the teleutosori if possible. The Aster plants were growing among a profusion of *Carex festiva.* An Aster bearing defunct aecidia was soon found; and the surrounding Carex was well infected.

A few days later in another locality the aecidia were found on Aster Fremonti with abundant infection on the adjacent Carex festiva. A half mile or so away a collection had been made on July 11, of the aecidia on Aster ciliomarginatus Rydb. Inspection of the Carex festiva in this vicinity showed abundance of teleutosori.

Aecidium monoicum Peck. — A collection of this aecidium on *Arabis Drummondii* being made July 22, 1905, in a locality where there was a large number of the infected hosts, a return was made to the place on August 21 to search for the alternate form. A host plant bearing defunct aecidia was soon located, and the surrounding plants were carefully examined with the result that teleutosori were found on *Trisetum subspicatum.* The two host-plants were intimately associated in growth, and further examination revealed the fact that the Trisetum rust was found only on those plants that were immediately adjacent to infected Arabis plants. Specimens of the Trisetum rust have been sent to Dr. Arthur, and he believes it to be undescribed.

Caeoma confluens (Pers.) Schroeter. — On July 3, 1905, a collection of this rust was made on Ribes vallicola. The host-plants grow along the banks of the mountain streams, and the lowermost willow branches frequently touch the Ribes bushes as they are swayed by the wind. A collection was made of a Melampsora on Salix in August, 1903, and again each of the following Augusts. It is the belief of the writer that these two forms are connected for the following reasons: First, the two hosts are intimately associated in growth. Second, the appearance of the *Caeoma* antedates that of the *Melampsora*. Third, the Melampsora occurs on those willow branches low enough to brush against the Ribes bushes, or else to be easily infected by the wind. Fourth, during the latter part of the season of 1905, whenever an infected Salix was found, search was made for the Ribes bush and then for defunct aecidia, almost invariably with successful results. Fifth, the Salix goes to the mouth of the Canyon, but the Ribes accompany them less than half-way. When the Ribes stops, the Melampsora also stops.

NOTES FROM MYCOLOGICAL LITERATURE, XX.

W. A. KELLERMAN.

R. A. Harper's work on Sexual Reproduction and the Organization of the Nucleus in Certain Mildews is Publication No. 37 of the Carnegie Institution of Washington, pp. 1-104. Pl. I-VII, September 1905. Of this interesting and important investigation no brief summary can be made, but the author's conception as to alternation of generations in the higher fungi may be quoted in part. "In the rusts we have sexual reproduction by vegetative fertilization. The fusing cells are perhaps morphologically vegetative offshoots of an egg-cell. . . . In the Basidiomycetes by apogamy sexual cell fusion may have disappeared or we may have vegetative fertilization. . . . In the Ascomycetes we have sexual reproduction and alternation of generations, modified by the adaptation of the spore mother cell as an explosive organ for the dissemination of the spores and as a storage reservoir for the production of resting spores with a large supply of metaplasmic reserve products." . . .

C. L. Shear gives an account of some out-door inoculations made in the Spring of 1902, under the title of Peridermium cerebrum Peck and Cronartium quercuum (Berk,), pp. 89-92, Journal of Mycology, Volume 12, May 1906. On May 1st aecidiospores of Peridermium cerebrum (from Pinus virginiana) were successfully applied to Quercus coccinea — uredo sori appearing May 12. Shirai has by inoculation proven the connection between Cronartium gigantium (Mayr) Tubeuf and what he calls Cronartium quercuum (Cooke) Miyabe. Mr. Shear is of the opinion that Peridermium gigantium (Mayr) Tubeuf is the same as P. cerebrum Peck described many years earlier.

The North American Species of Heliomyces—6 in number—are grouped and diagnosed in the Journal of Mycology for

May 1906. These are small Agarics which are tremelloid when fresh and growing, and when dry have the appearance of Marasmii. Prof. Morgan affixes these to his Monograph of Marasmius (published in previous Nos. of the same Journal) to which genus in fact most of the species were originally referred. Both the Marasmius and the Heliomyces species are indexed together—and also issued as one pamphlet (*Separate*).

In Science for May 25, 1906, Charles J. Chamberlin points out that *Mega* as a prefix in such words as megaspore, megasporophyll, megasporocarp, megaphyllous, should be used rather than *macro* (macrospore, etc.), since *mega,* from the Greek *megas,* means big, great, large, — equivalent to the Latin *magnus,* and is the opposite of *micro.* But *macro* means long, is not the opposite of *micro,* but of the Greek *brachus* which means short. If the idea is that of great size rather than of great length the prefix *mega* not *macro* should be used.

Paraphyses in the Genus Glomerella, by John L. Sheldon, is reported in Science, N. S. 23:851-2, 1 June 1906. Allusion to the fact is made, that there is no evidence that those who studied *Gloeosporium* (Atkinson, Stoneman, Clinton, Spaulding and von Schrenk) saw anything suggesting paraphyses — in fact, Clinton says 'there was no sign of paraphyses,' and Spaulding and von Schrenk in describing the genus *Glomerella* say that it is 'aparaphysate.' The author found in cultures of G. rufomaculans isolated from a Baldwin apple, perithecia containing long slender paraphyses.

Fungi as related to weather and Fungi upon the Experiment Grounds — the former extracts from the weekly "Weather and Crop Bulletins;" the latter notes on the occurrence of a few parasitic fungi — are given on pp. 510-512 and 517 in the Report of the Botanist, [B. D. Halsted] N. J. Agr. Coll. Exp. Station Report for the year 1905, issued 1906.

A Cause of Freak Peas is given with one half-tone illustration of abnormal plants in Torreya for April, 1906. The cause is *Ascochyta pisi* Lib., a fungus that attacks not only the growing pea-stems and leaves, but also the pods and thence may grow into the seed.

A Key to the Agariceae of temperate North America is given by William A. Murrill in the Dec. No. (1905) of Torreya. The Agariceae here enumerated are not ordinary gill-fungi, but a subfamily of the Polyporaceae with furrowed hymenium. They are corky or woody, not fleshy. The genera included are Agaricus, Cerrena, Lenzites, Gloeophyllum and Cycloporus. The key is carried to the species in each case — gotten up on the dichotomal plan.

A DISCUSSION OF FUENFSTUECK'S AND ZAHLBRUCKNER'S TREATMENT OF LICHENS in the Pflanzenfamilien is given by Albert Schneider in the May Torreya (1905) under the title: The Classification of Lichens. They are not recognized as an autonomous group by all. There is great confusion with regard to the delimitation of lichen species. The number of good species (continues the author) is in all probability less than one-fifth of those actually described. The system of classification proposed by Zahlbruckner is excellent and should be generally adopted.

A LIST OF TWENTY ADDITIONAL SPECIES is given by G. A. Reichling in Torreya, May 1905, as Contributions to the recorded Fungi and Slime-Mould Flora of Long Island.

GEORGE MASSEE GIVES AN INTERESTING ACCOUNT OF A FUNGUS parasitic on a Moss, in Torreya, March 1906. It occurs on Weisia viridula, the capsule of the moss under normal conditions being usually erect and symmetrical, when attacked by the parasite however it becomes distinctly curved and unsymmetrical. The description is under the following name: Epicoccum torquens Massee n. sp.

FUNGI COLUMBIANI, CENTURY XXI, by Elam Bartholomew, is dated March 20, 1905. The following new species are included: Cladosporium nervale Ell. & Dearn. on living leaves of Rhus typhina; Diaporthe ostryigena Ell. & Dearn. on trunks and branches of Ostrya virginica; Haplosporella conmixta Barthol. on fallen limbs of Ulmus pubescens; Polystigma adenostomatis Farlow n. sp., on living leaves of Adenostoma fasciculatum; Dichromera prunicola Ell. & Dearn. on Prunus virginiana, and Sphaeropsis magnoliae Ell. & Dearn. on Magnolia (acuminata?). In this country the genus most largely represented is Puccinia with 26 pockets; there are 5 Uromyces, and 7 Septorias.

Some Factors in the color production in a species of Fusarium is discussed by Dr. J. B. Pollock, in Science N. S. 23:422-3, Mar. 16, 1906. The Fusarium taken from an ear of corn was under culture found to develop its bright salmon-pink only in bright sun light; moisture also is of significance — the moister the medium the less the color showed. Color varied on media of different constitutions — pale on cornstarch; on carrot, Hubbard squash and cornmeal the color was between roseous and testaceous (Sacc. Chrom.); on apple, onion and potato, almost exactly ochraceous; on wheat flour slightly paler than orange; on buckwheat flour it was darkest red, slightly redder than testaceous, on raw dahlia tubers bright red, but almost no color produced if the medium is steamed — and the fungus produced a green color.

In respect to the Parasitism of Neocosmospora, Howard S. Reed shows, in Science N. S. 23:751-2, May 11, 1906, that it is a weak parasite (as previously claimed by Atkinson) and only attacks plants which are first debilitated by the presence of another fungus. The var. *nivea* (apparently) of N. vasinfecta was found as a wilt disease in the ginseng gardens of Missouri. The entrance seems to depend upon an anthracnose caused by Vermicularia dematium.

The Society of American Bacteriologists held the seventh annual meeting at the University of Michigan, Dec. 28-29, 1905. The report of the secretary, F. P. Gorham in Science N. S. 23:205-221, Feb. 9, 1906, presents a long list of papers and abstracts of same — the following seeming to be of systematic trend: Lactic Acid Bacteria, W. M. Esten; The Microscopic Estimate of Bacteria in Milk, Francis H. Slack; Kinds of Bacteria Concerned in Souring Milk, P. G. Heinemann; Bacteria of the Root Nodules of the Leguminosae, Karl F. Kellerman and T. D. Beckwith.

Two Mycological articles were read before the Botanical Society of America at the New Orleans Meeting, according to the report of the Secretary, William Trelease, Science N. S. Vol. XXIII, Feb. 9, 1906, pp. 221-2. They were as follows: J. C. Arthur, Cultures of Uredineae in 1905; and G. F. Atkinson, The Development of Ithyphallus impudicus (L.) Fries, from France.

Dr. N. M. Glatfelter gives a Preliminary list of Higher Fungi collected in the vicinity of St. Louis, Mo., from 1898 to 1905 in the Transactions of the Academy of Science at St. Louis, Vol. XVI, No. 4. The locality, date of occurrence and miscellaneous observations, besides the spore measurements in all cases, are given. About 500 species are listed. Amanita has 12 representatives, Amanitopsis 6, Lepiota 25, Tricholoma 8, Clitocybe 16, Pleurotus 8, Collybia 14, Mycena 10, and many others are equally well represented.

The Secretary's Report (by Francis E. Lloyd) of Sec. G. [Botany] American Association for the Advancement of Science, New Orleans, gives the following mycological papers (see Science N. S. 23:201-4, Feb. 4, 1906): Development of Armillaria mellea, and of Agaricus campestris, Geo. F. Atkinson; North American Species of Peridermium, J. C. Arthur and F. D. Kern. The following were presented at a joint meeting of the Section and the American Mycological Society: Some reasons for desiring a better classification of the Uredinales, J. C. Arthur; Uredineae of the Gulf States, S. M. Tracy; North American Gill Fungi, F. S. Earle; Lichens and recent conception of Species, Bruce Fink; Cultures of Colletotrichum and Gloeosporium, P. H. Rolfs; The Affinities of the Fungus of Lolium temulentum, E. M. Freeman; Peridermium cerebrum Peck and Cronartium quercuum (Berk.), C. L. Shear; Ramularia: An Illustration of the Present Practice in Mycological Nomenclature, C. L. Shear; Notes on Pachyma cocos, P. H. Rolfs; Penicillium glaucum on Pineapple Fruits, P. H. Rolfs; Occurrence of Fusoma parasiticum Tubeuf in this Country, Perley Spaulding; Some Peculiar Fungi New to America, W. G. Farlow.

M. Prof. N. Patouillard describes many new species and one new genus in the Bulletin de la Société Mycologique de France, Tome XXII, Ier Fascicule, 28 Feb. 1906, pp. 45-62, under the title Champignons recueillis par M. Seurat dans la Polynésia française. The new genus is *Mapea* (Uredinaearum) — la désignation ist tirée du mot *Mape,* par laquel les indigènes Mangaréviens désignent *l'Inocarpus edulis.* The diagnosis is as follows: "Sori erumpentes, applanati, orbiculares, lati, ceracei, ambitu sinuoso-lobati, undique, fertiles. Sporae (uredosporae) fuscidulae, ovoideae, verruculosae, stipitae" . . . . . M. ratiata n. sp. . . . . . Hab. in fructibus Inocarpi edulis, Roruru, Ribitea.

Melanobasidium is the name of a new genus (Tuberculariees Dematiees) proposed by M. A. Maublanc in an article Sur quelques espèces nouvelles ou peu connues de Champignon inferieurs, Bulletin de la Société Mycologique de France, Tome XXII, Ier Fascicule, 28 Feb. 1906. The description of the genus is as follows: "Foliicolum, maculicolum, sporodochia minima, erumpentia, atra, ex hyphis ramosis, septatis, intricatis composita, sporophoris cylindracis, densis, septatis, concoloribis vestita; conidia solitaria, acrogena, ovoidea, hyalina" . . . . M. mali n. sp. . . . . . In foliis vivis Piri mali ad Sevillem, Hispaniae. About a dozen new species besides are described.

What to note in the Macroscopic study of Lichens under the subheads: Introductory statement, The Thallus, General forms of Thalli, Sizes of Thalli, The surfaces of Thalli, Colors of Thalli, is told in the Bryologist, July, 1905; by Bruce Fink.

The Bulletin de la Société Mycologique de France, Tome XXII, Ier Fascicule contains the following: Ch. Van Bambeke. — De la valeur de l'épispore pour la détermination et le groupement des especes du genre Lycoperdon; Corfec. — Excursion mycologique aux environs de Laval (Mayenne); Dr. Baret. — Note sur les Champignons vendus sur les marchés de Nantes en 1905; Em. Perrot. — Le Congrès international de Botanique a Vienne (1905); Peltereau — La Mycologie a l'Exposition de Vienne; Em. Boulanger — Note sur la Truffe; N. Patouillard. — Champignons recueillis par M. Seurat dans la Polynésie française. (Pl. I et II); A. Maublanc. — Sur quelques espèces nouvelles ou peu connues de Champignons inferieurs. A. Maublanc. — Quelques Champignons de l'Est africain. (Fig. texte);

F. Gueguen.—La moisissure des caves et des celliers; etude critique, morphologique et biologique sur le Rhacodium cellare Pers. (avec 3 planches,); L. Lutz.—Associations symbiotiques du Saccharomyces Radaisii Lutz; Bibliographie analytique.

M. le docteur Baret reports in the Bulletin de la Société Mycologique de France the following list of edible species sold in the market of Nantes during the year 1905: Amanita cæsarea, Lepiota procera, L. rachodes, L. excoriata, L. pudica, Psalliota campestris, P. ammophila, P. arvensis, P. pratensis, P. sylvatica, P. bernardii, Clitopilus orcella, Marasmius oreades, Lentinus tigrinus, Tricholoma personatum, Clitocybe laccata, Boletus edulis, B. aestivalis, B. aereus, B. scaber, B. scaber var. auranticus, B. luteus, Fistulina hepatica, Hydnum repandum, Craterellus cornucopioides, and Lycoperdon giganteum.

Bruce Fink's article in the March No. (1905) of the Bryologist on How to Collect and Study Lichens, deals fully with the subject under the following heads: Introductory, Collecting, Collecting Outfit, Where to Collect, Aids at Home, The Study at Home, and the Herbarium.

Further Notes on Cladonias, V, by Bruce Fink, the Bryologist, May 1905, deals with Cladonia gracilis (L.) Willd., widely distributed over North America, not occurring in the southern half of the United States. The varieties which are also fully described are *dilatata* (Hoffm.) Wainio *dilacerata* Flk., *chordalis* (Flk.) Shaer., *aspera* Flk., and *elongata* (Jacq.) Flk.

Lichenology for Beginners is the title of a very instructive article by Frederick Leroy Sargent in the May (1905) No. of the Bryologist. What these plants are is discussed, then their habits, distribution, etc., receive attention with suggestions for collecting and taking care of specimens. The second installment is found in the July No.; it is illustrated, fully explaining the characters of a Parmelia.

The Transactions of the British Mycological Society for the season 1904, published 13th May 1905, includes the following contents: Report of the Whitby Foray and complete list of Fungi and Mycetozoa gathered; Eriksson's recent researches on the vegetative life of the Cereal Rust Fungi, by Charles P. Plowright; Saccardo's De diagnostica et nomenclatura mycologica, admonita quaedam; Recent Researches on Parasitism, by R. H. Biffen; Corticium (Peniophora) chrysanthemi, by Charles B. Plowright, M. D.; Notes on three uncommon Fungi, by Cecil H. Sp. Percival; Fungi new to Britain, by Miss A. Lorrain Smith F. L. S. and Carleton Rea, B. C. L., M. A. & C.

An Index of the Mycological Writings of C. G. Lloyd, Vol. I, 1898-1905, [May 1905], Cincinnati, Ohio, U. S. A., is a pamphlet of 20 pages. Mr. Lloyd states: I have been working on the Gastromycetes for four or five years and have published the results as they appealed to me. This is an Index of the publications as far as the work has gone. As it is designated as Vol. I, "The intention is evident that others are expected to follow."

G. K. Merrill in Lichen Notes No. 2, see Bryologist for January 1906, refers (1) to the recent finding of *Umbilicaria pustulata papulosa* on a lower limb of a young spruce — very remarkable since the genus Umbilicaria is typically saxicoline; and (2) to the finding by Mrs. Agnes Ashworth, Central Point, Oregon, inmixed with Evernia vulpina; Mr. Merrill designates it Cetraria islandica (L) Ach. M. [modification] arborialis (conditional nomination).

New Species of Edible Philippine Fungi by Edwin Bingham Copeland, No. 28, July, 1905, Department of the Interior, Bureau of Government Laboratories, is a paper with English descriptions of several new species of Agarics and a Lycoperdon, these being translations of the Latin descriptions of the species as published in Annales Mycologici, Vol. 3, No. 1. Two species are illustrated by half-tones. The Basidiomycete flora of that country is said to be a very rich one in species if not in individuals.

In Malpighia Anno. XVIII. Fasc. X-XII, 1904, we find the following mycological articles: Dott. Teodoro Ferraris, Enumerazione dei funghi della Valsesia (seri terza) — an extended annotated list including the descriptions of twenty-two new species, and one page of illustrations; L. Cufino, un secundo Contributo alla Flora Micologica della Provincia di Napoli — a list of 57 species; L. Cufino, Fungi Magnagutiani — 42 species collected in the vicinity of Mantua and Faenza by Count Magnaguti.

New species of Exoascaceae — diagnoses in English of Taphrina truncicola Kusano, on Prunus incisa; Taphrina piri Kusano, on Pirus miyabei Sargent; and Taphrina japonica, on Alnus japonica S. et Z.; by S. Kusano, in the Botanical Magazine, Vol. XIX, Jan. 20th, 1905.

Ernest S. Salmon reports on the present aspect of the Epidemic of the American Gooseberry-Mildew in Europe in the Journal of the Royal Horticultural Society, Vol. XXIX, parts 1, 2 and 3, 1905. This [Sphaerotheca mors-uvae (Schw.) B. & C.] was recorded from Ireland in 1900; now it is reported from nine localities in six countries: From Russia it is reported from ten widely separated districts. The writer calls attention to the widespread economic loss such a disease as the present one can cause. He refers to the history of the Vine-Mildew — appearing in Europe for the first time on hot-house vines at Margate in 1845, it spread the next year to hot-houses of that neighborhood. In 1847 it was reported from one locality in France; in 1848 from several localities in France and Belgium. It spread rapidly to other countries. By 1854 the vineyards in France were invaded to such an extent that the yield was reduced to one-tenth or one-twentieth. Similar to the early stages of this history are the circumstances attending the first outbreak of the American Gooseberry-Mildew, sec. Mr. Salmon.

Bulletin No. 85, Bureau of Plant Industry, U. S. Department of Agriculture, by B. M. Duggar, treats of the Principles of Mushroom Growing and Mushroom Spawn Making. The preface states that as an outcome of the work Dr. Duggar has already accomplished, spawn of pure-culture origin is now being produced on a very large scale by several growers and is giving excellent results. This method enables the grower to insure and maintain the most desirable varieties of mushroom.

Lichen Notes, No. 1, by G. K. Merrill, in the November No. of the Bryologist (1905), deals with Cladonia verticillata Hoffm., or Cladonia gracilis (L.) Nyl. var. verticillata Fr. The various North American forms receive extended comment.

Frederick LeRoy Sargent's IV and last installment of Lichenology for Beginners suggests an ecological study of these plants, and then outlines a mode of proceedure preparatory to identifying species with the aid of books on the North American species — a brief bibliography being given. The article closes with a sample Key for about three dozen species.

On the Nomenclature of Fungi having many fruit-forms, by J. C. Arthur, in the Plant World, Volume 8, No. 3, March, and No. 4, April, 1905, places in clear light the question of choosing a name from a number of synonyms. The three stages of Wheat Rust, each when first discovered receiving a scientific name at the hands of botanists, is taken as an example for illustration. A point of great significance is contained in the following quotation: "It was Linneaus' great contribution to nomenclature that he restricted names to two terms, one generic and the other specific. By this change he did not eliminate the descriptive idea embodied in the name, *but he did superpose the appellative idea.*" He then proceeds to show that a name applies to the whole species, to all its variation in aspect, to every member of the species, and to each individual in all its stages of development, and in all its structural parts. Issue is taken with Magnus and Saccardo, and the contention is fortified that there is no objection to placing the Uredineae, and all other fungi, under the same laws for nomenclature as are found serviceable for other plants, that is to say, the earliest name applied to a species is to be retained, even if given to an imperfect form or early stage in the cycle of development.

Professor George F. Atkinson gives in the Plant World for September and October, 1905, Outlines for the observation of some of the more common Fungi, such as Black Mould, Downy Mildews, White Rust, True Rusts, the Smuts, Puffballs, Earth-stars, Agarics, Ink-caps, Amanitas, Lepiotas, Polypori, Boleti, Clavarias, Helvellas, Powdery Mildews, and the Black Fungi.

Melville T. Cook gives a very full (popular) account of plant diseases caused by parasitic fungi (and insects) in Cuba for the past year in his Informe del Departmento de Patologia Vegetal, the article constituting pp. 147-207 inclusive of the Primer Informe Anual de la Estación Central Agronomica de Cuba, 1904-5. Some of the species especially mentioned are Colletotrichum gleosporioides Penzig, Cladosporium elegans Penzig, Ophionectria coccicola E. & E., Ustilago zeae (Beckm.) Ung., Puccinia sorghi Schw., Cercospora gossypina Cke. (está reconocido como el primer estado de Mycosphaerella gossypina [Cke.] Earle), Melanconium sacchari, Leptosphaeria sacchari, Cercospora personata (B. & C.) Ellis, Uromyces arachnidis P. Henn., Uredo fici Cast., Septoria licopersici Speg., Cladosporium fulvum Cke., Phyllosticta hortorum.

F. S. Earle, under the title Algunos Hongos Cubanos, in Primer Informe Anual de la Estación Central Agronomico de Cuba, I:225-246, I Junio 1906, gives diagnosis in Spanish of the following new Cuban species: Pocillaria [Lentinus] reflexa, Po. vestida, Po. cinnamomea, Po. palmeri, Po. simulans, Phyllotus [Pleurotus] imbricatus, Ph. hygrophanus, Geopetalum [Pleurotus] eugeniae, Ge. album, Ge. brunescens, Crepidotus [Pleurotus] lentinoides, Galera simulans, Ga. grisea, Ga. cubensis, Gymnochilus [Hypholoma] flocculosus, Gy. campestris, Gy. musae, Gy. roystoniae, Gy. caespitosus Stropharia cubensis, Str. floccosa, Pholiotina [Pholiota] musae, and Pholiota cubenses. These are preceded by half a dozen pages of general discussion of the group and particularly of the work on the Cuban Fungi to date. The first publication was by Montague in 1842, who noted 113 species. Charles Wright from 1856 to 1867 collected some fungi which were examined by Dr. M. A. Custer, who sent part of them to Rev. J. M. Berkley. This was the basis of the Fungi cubensis, 1859, in the Journal of the Linnaean Society. Late collectors named are L. M. Underwood, W. A. Murrill and F. S. Earle.

The Articles in Annales Mycologici, Vol. IV, No. 3, Juni 1906, are: Legarde, J., Contribution a l'Etude des Discomycetes charnus; Rehm, H., Zum Studium der Pyrenomyceten Deutschlands, Deutsch-Osterreichs und der Schweiz; Saccardo, P. A., Notae Mycologicae; Neger, F. W., Kleinere mycologische Beobachtungen; Hoehnel, Franz V. and Litschauer, Victor, Revision der Corticiceen in Dr. J. Schroter's "Pilze-Schlesiens" nach seiner Herbar examplaren; Schorstein, Josepf, Spörenkeimung in Sömete-lösing: Neue Literatur.

The Bulletin de la Société Mycologique de France, Tome XXII — 2er Fascicule, presents this sommaire: L. Dolland. — Observations sur le Mycenastrum Corium Desv. et sur le Bovista plumbea Pers. (Pl. VI); N. Patouillard et P. Hariot. — Fungorum novorum Decas secunda; A. de Jackzewski. — Notes phytopathologiques: Alternaria Grossulariae n. sp. et Colletotrichum Grossulariae n. sp.; Paul Vuillemin. — Un nouveau genre de Mucedinées: Hemispora stellata (Pl. VII); G. Bainier — Mycothèque de l'École de Pharmacie, III (Pl. VIII); Mycothèque de l'École de Pharmacie, IV (Pl. IX); Em. Boulanger. — Germination de la spore echinulee de la Truffe; F. Gueguen. — La moisissure des caves et des celiers; étude critique, morphologique et biologique sur le Rhacodium cellare Pers. (Fin); X. Gillot. — Nouveaux tableaux scolaires de Champignons. — Notes toximycologiques; M. Barbier. — Empoisonnement par l'Entoloma lividum. Ant. Magnin. — Les expositions mycologiques de Besancon. P. A. Saccardo. — Note sur les Herbiers mycologiques. Index bibliographique des travaux mycologiques parus en France et a l'etranger pendant l'annee 1904.

A. P. Morgan's North American Species of Marasmius, publishd in the Journal of Mycology for September and November 1905 (vol. 11) and January 1906 (vol. 12) "is an attempt at an orderly arrangement of the species thus far enumerated in North America, including the West India Islands. It is only an endeavor to get together the scattered species so that some critical study of them may be made; hence the descriptions of the different authors are given as written and there is no indication of the synonyms which undoubtedly occur to some extent." He says these are small or minute Agarics, growing for the most part upon wood or among the dead leaves in woods; they are easily dried in good shape and make elegant specimens for the herbarium. The species are numerous, especially abounding in the forests of tropical regions. More than 500 species are listed in Saccardo's Sylloge, and Prof. Morgan includes 162 species as North American in this preliminary monograph. They are grouped under sections; these again are ranged in divisions, under which usually one or more sets of synoptical descriptive head-lines are given, thus practically furnishing a useful key for convenience in identifying the species. The parts have been issued as a *Separate*, bound together as one pamphlet.

A Bulletin (No. 163, California Agricultural Experiment Station, Dec. 1904) by Ralph E. Smith is devoted to Pear Scab (Fusicladium pirinum Lib.), being an illustrated popular account, with economic notes.

A Rust-Resisting Cantaloupe forms Bulletin 104, Colorado Agricultural Experiment Station, November 1905. The "rust" referred to is Macrosporium cucumerinum E. & E.

B. O. Longyear published An Apple Rot due to an undescribed species of Alternaria as Bulletin 105, November 1905, Colorado Agr. Exp. Station. Besides the general account, the microscopical characters are given in detail and in figures.

D. R. Sumstine gives a brief Note on Wynnea Americana with new description of specimen collected at Ohio Pyle, Pa. See Journal of Mycology, March 1906.

Second Supplement to New Genera of Fungi published since the year 1900, with citation and original description is given by P. L. Ricker in Journal of Mycology, March and May, covering 14 pages. This, like the first installment of the compilation, gives the genera in alphabetical order under the eight large groups of fungi.

Plant Diseases in 1905, by W. A. Orton, Yearbook U. S. Dept. Agr. 1905; 602-611, 1906, is a résumé of plant disease compiled from reports of field observations by agents of the Department and officers of Experiment Stations. It indicates briefly the prevalence of the diseases in 1905 as compared with conditions in previous years. The diseases indicated by common names and the scientific name of the causative organism are grouped as heretofore under Pome Fruits; Stone Fruits; Small Fruits; Tropical Fruits; Vegetable and Field Crops; Cereals; Forage Crops; Fiber Plants; Nut, Forest, and Shade Trees; Greenhouse and Ornamental Plants.

The Verticillieae, and Gonatobotrytideae are finished and the Hyalodidymae begun by Prof. Dr. Lindau in Rabenhorst's Kryptogamen-Flora, Erster Band, VIII Abteilung, Pilze, 97. Lieferung, 20 June 1905.

In Rabenhorst's Kryptogamen-Flora, I. Bd., VIII Abt., Pilze, 98. Lieferung, 15 Juli 1905, the Hyalodidymae are completed, and the Hyalophragmiae are carried to the Genus Ramularia.

Two articles occupy the April No. (Vol. IV) of the Annales Mycologici, namely: Fr. Bubák, Neue oder Kritische Pilze [second instalment, mostly new species, nos. 15-57] and J. Lagarde, Contribution à l'Étude des Discomycètes charnus.

M. Paul Vuellimin gives the nouveau genre de Mucedinees: Hemispora stellata in the Bulletin trimestrial de la Société Mycologique de France, tome XXII, 2er Fascicule, 15 May 1906. The new species H. stellata was found on the inferior face of a crust of Aspergillus repens. The diagnosis of the genus is as follows: Hemispora n. g. — Mycelium de Mucidinée-Macronémée abondant, hyalin, fin, cloisonné, ramifié, Tubes fertiles, ramifiés à la base. Chaque rameau conidiophore se termine par une vésicule (protoconidie) précédée d'un étranglement annulaire à paroi épaissie, brune, rigide. La vésicule se transforme, en tout ou en partie, en une série de segments sporiformes (deuteroconidies). Parfois elle s'allonge en un nouveau conidiophore ou émet des ramifications susceptibles de se comporter de même.

A part of the Botrytideae is included in the 95th Lieferung of Rabenhorst's Kryptogamen-Flora, VIII Abt., Pilze, G. Lindau, issued 3 April 1905. The genera are numerous — Ovularia perhaps being the largest, having 50 or more species.

In Notae Mycologicae, Auctore P. A. Saccardo, Annales Mycologici, 4:273-8, Juni 1906, three new genera and many new species are described. The new genus *Endothiella* represents the pycnidium of Endothia; Endothiella gyrosa n. sp. is the type. *Muchmoria* represents a new genus Dematiacearum, the new species (M. portoricensis) occurs in rimis corticis arboris emortuae indet. pr. Signal Tower Hill, Ponce, Porto Rico (Rev. L. J. Muchmore). *Fairmania* belongs to the Sphaeroidaceae—"praecipue forma peculiari sporulae, soleae calcaneum exacte ornitantis, ab *Epithyrio* subgenere *Coniothyrii* dignoscitur.

In Lieferungen 96 (Rabenhorst's Kryptogamen-Flora, Pilze, G. Lindau, issued 10 May 1905), the Botrytideae are finished. There are enumerated between four and five dozen species of Botrytis. These are arranged under the sub-genera Eubotrytis, Polyactis, Phymatotrichum and Cristatella.

Hedwigia, Band XLV, Heft 3, 28 March 1906, contains two articles to be listed here, namely: Theodor Brandt, Beiträge zur Anatomischen Kenntnis der Flechtengattung Ramalina; and P. Magnus, Uropyxis rickiana P. Magn. und die von ihr hervorgebrachte Krebsgeschwulst.

P. Magnus gives an extended account of Uropyxis rickiana n. sp. und die von ihr hervorgebrachte Krebsgeschwulst, Hedwigia 45:173-177, Pl. IX, 28 Mar. 1906. The species was found in Brazil by Prof. J. Rick on some Bignoniaceae. "Die Gattung Uropyxis ist bisher in verhältnismässig wenigen Arten bekannt. . . . Mit Ausnahme der afrikanischen Uropyxis Steudneri P. Magn. und der asiatischen Ur. Fraxini (Kom.) P. Magn. stammen sie alle aus Amerika und treten dort zwei Gruppen von Uropxis-Arten auf Leguminoseen und auf Berberis auf. Zu ihnen tritt nun als dritte amerikanische Gruppe Uropyxis rickiana P. Magn. auf einer Bignoniaceae, und sicher werden sich noch mehr Uropyxis-Arten in Amerika nachweisen lassen. Das südlichere Amerika scheint ein Zentrum der Gattung Uropyxis zu sein."

A Contribution to a Revision of the North American Hydnaceae forms Vol. 12 of the Memoirs of the Torrey Botanical Club, issued 13 June 1906, author Howard James Banker. The area covered includes the continent of North America and its adjacent Islands north of the Isthmus of Panama. Of the 500 known species not more than 200 have been found in our region. Dr. Banker's synopsis of genera shows the following names: Hydnum, Hericium, Steccherinum, Echinodontium, Sarcodon, Hydnellum, Phellodon, Leaia, Auriscalpium, Grandinioodes. The monograph contains full descriptions, ample notes and keys. The new species here proposed are as follows: Hericium fimbriatum, Steccherinum morgani, St. adustulum, Sarcodon reticulatus, Sarcodon underwoodii, Hydnellum nuttallii, Hydnellum complicatum, Hydnellum earlianum, Phellodon ellisianus and Leaia piperata. Two new genera are *Leaia* (Hydnum stratosum Berkeley, 1845), and *Grandinioides* (Hydnum flavum [Swartz 1835] Berkeley 1843). This important monograph also includes a Bibliography of 11 pages.

A lengthy list of parasitic fungi collected near Triberg in August 1905 is given by Otto Jaap in the Botanische Zeitschrift, No. 7-8, August 1906, under the title Ein Kleiner Beitrag zur Pilzflora des Schwartzwaldes. He regards as of especial interest the following: Dothidella geranii, auf Geranium silvaticum, Melampsorella blechni, Puccinia chrysosplenii, auf chrysosplenium oppositifolium, Phoma sagittalis n. sp. auf Cytisus sagittalis, Actinomena podograriae, Ramularia prenanthis n. sp., Cercosporella magnusiana auf Geranium silvaticum, und Passalora bacilligera var. alnobetulae n. var. auf Alnus alnobetula.

A list of about 3 dozen species and description of Polyporus fagicola n. sp. is given by William A. Murrill in the February No. of Torreya (1906). The collections were made in August and September 1905. The new species was found on the top of a fallen decorticated beech log in heavy mixed woods on the slope of Boarstone Mountains, Piscataquis Co., Maine. It has the habit of Polyporus polyporus.

A study of the Development of Ascus and Spore Forms in Ascomycetes by J. Horace Faull is published in the Proceedings of the Boston Society of Natural History, vol. 32, No. 4, June 1905. No full report can here be given, but the eleventh item in this summary is as follows: The evidence points to the conclusion that while the ascus has probably not been derived from the sporangium of the Mucorineae, the phenomena of spore formation are not incompatible with the view that homologizes the ascus with the zoosporangium, nor with the view that the Ascomycetes have originated from some such Phycomycetous group as the Peronosporineae or Saprolegniineae, an affinity first suggested by de Bary on the basis of sexuality.

The VIII Abtheilung, Erster Band, Rabenhorst's Kryptogamen-Flora contains the first installment of Hyphymycetes by G. Lindau, issued May 16, 1904. The general system used by Saccardo is here followed and the first pages of descriptions (beginning with Sarcinomyces, pertain to the Chromosporieae, a section of the Hyalosporae of the family Mucedinaceae. The descriptions of the species are rather brief, some notes are added especially in case of important pathogenic species and occasional figures in the text are given. Greater convenience would accrue had the generic name, especially when the species are very numerous, been repeated in full instead of being indicated by the initial letter, or better yet the full name repeated at the top of successive pages.

Many genera, some with a large number of species, *e. g.* of Oidium (which are listed and described though noted in some cases as conidial forms of certain Ascomycetous species) are given by G. Lindau in 93. Lieferung, Ester Band, VIII Abtheilung of Rabenhorst's Kryptogamen-Flora (pp. 65-128), issued 30 June 1904. Cephalosporium charticolum is described as a new species, and *Eidamia* is established as a new genus of the Aspergilleae.

P. A. Saccardo gives Micromycetes americani novi — Mycetes boreali-americani a Doct. Fairman lecti (11 new species) and Mycetes Mexicana a Doct. S. Bonansea lecti (5 new species) — in the Journal of Mycology, March 1906. The diagnoses, notes, etc., are in Latin.

Prof. Dr. F. Bubak describes 11 new species of North American fungi and one new genus under the title of Einige Neue Pilze aus Nord America, Journal of Mycology, March 1906. The new genus is as follows: Pseudostegia Bubák n. g. Melanconiacearum. The type species is P. nubilosa, Lexington, Ky., on leaves of Carex sp. — "Ein sehr interessanter Pilz, welcher mit meiner neuen Gattung *Anaphysomene* (Annales Mycologici 1906) verwandt ist. . . . "Es ist möglich, dass er als Konidienstadium zu *Stegia caricis* Peck (welche aber mit *Stegia subvelata* Rehm identisch ist) gehört. Es scheint mir dann weiter, dass *Cryptosporium nubilosum* Ell. et Ev. mit meinem Pilze identisch ist, denn ich vermute, dass die Breite der sporen nur durch einen Druckfehler statt 2.5μ-8.5μ angegeben ist. Sollte meine Vermutung zutriffen, dann musste der vorliegende Pilz *Preudostegia nubilosa* (Ell. et Ev.) Bubák genannt werden."

Ernst A. Bessey notes, in the Jouurnal of Mycology for March 1906, the occurrence in this country of Dilophospora alopecuri (Fr.) Fr. It was found on leaves of Calamagrostis canadensis among galls caused by nematodes.

PLEUROTUS HOLLANDIANUS SP. NOV. BY D. R. SUMSTINE is diagnosed in Latin, in the March (1906) No. of the Journal of Mycology. It is P. petaloidei affnis sed forma tomento pilei, latitudine lamellarum differt; collected on rotten trunks, Latrobe, Pa.

RUST NOTES FOR 1905, RY J. M. BATES, Journal of Mycology, March 1906. Records of cultures are given — April 6, Puccinia subnitens on Monolepis nuttalliana (some ripe aecidia noticed on May 12 but more on accompanying Roripa sinuata and Bursa bursa-pastoris); cultures also made on Sophia incisa — Lepidium apetalum also a good host. Culture of Puccinia amphigena on Smilax hispida — the latter covered with aecidia June 10. An Oenothera biennis with ripe aecidia *covering the under side* (hence not Aec. Peckii) associated with Carex pennsylvanica with uredo; elsewhere same was secured also III "which looks like a pale weak uredo" — pointing toward genetic connection and a new species.

THE ARTICLES IN THE JOURNAL OF MYCOLOGY FOR MAY 1906 are the following: Shear, Peridermium cerebrum Peck and Cronartium Quercuum (Berk); Morgan, North Ameican Species of Heliomyces; Ricker, Second Supplement to New Genera (Concluded); Kellerman, Index to North American Mycology; Kellerman, Notes from Mycological Literature, XIX.

THE TABLE OF CONTENTS OF THE JOURNAL OF MYCOLOGY, March 1906, is as follows: Kellerman, Obituary, J. B. Ellis; Bates, Rust Notes for 1905; Saccardo, Micromycetes Americani Novi; Bubák, Neue Pilze aus Nord Amerika; Bessey, Dilophospora Alopecuri; Sumstine, Pleurotus Hollandianus Sp. Nov.; Sumstine, Note on Wynnea Americana; Ricker, Second Supplement to New Genera; Kellerman, Index to North American Mycology; Kellerman, Notes from Mycological Literature XVIII; Shear, American Mycology Society.

THE TYLOSTOMEAE BY C. G. LLOYD, Cincinnati, Ohio, U. S. A., February 1906, pp. 1-28, Plates 74-85. Descriptions and abundance of figures (half tones). As treated they embrace all Gastromycetes with dry spores, having peridia borne on distinct stalks that are not prolonged as axes. As thus defined [the author continues] it is a very natural tribe of Puffballs," differing from the Podaxineae which also have the peridia borne on stalks which, however, are continuous as axes of the gleba to the apices of the peridia. The genera he arranges as follows:

Peridium without definite mouth,
- Volva none .... Queletia.
- Volva thick, permanent .... Dictyocephalos.
- Volva not permanent..................... Schizostoma.

Peridium opening circumscissily,
  Gleba with capillitium and "annulated cells". Battarrea.
  Gleba without these charcters............ Battarreopsis.
Peridium with definite mouths,
  Peridium seated on the broad apex of the stipe .... Chlamydopus.
  Stipe inserted into a socket at base of peridium .... Tylostoma.

By the aid of grants from the Carnegie Institution of Washington, Edgar W. Olive carried on investigations which are published in the March and April Nos. of the Botanical Gazette, 1906, under the title Cytological Studies on the Entomophthoraceae: I. The Morphology and Development of Empusa [A new species is described, namely *Empusa sciarae* Olive n. sp.]; II. Nucleae and Cell Divisions of Empusa. Plate XIV, XV and XVI.

John L. Sheldon discusses The Ripe Rot or Mummy Disease of Guavas, as Bulletin 104, W. Va. Agr. Exp. Station, April 1, 1906. The disease was noticed in the greenhouses of the U. S. Department of Agriculture and a thorough study was made, also cultures and inoculations of apples and plums executed. The fungus proved to be Gloeosporium psidii G. Del. — a new species described by Delacroix a few months earlier. The ascigerous stage was found by Prof. Sheldon "corresponding in nearly every particular to the genus *Glomerella*." Accordingly the new name is given as follows: *Glomerella psidii* (G. Del.) Sheldon n. n.

Under the title of A Culture Medium for the Zygospores of Mucor stolonifer J. I. Hamaker, says (in Science, May 4, 1906 — N. S. Vol. 23, p. 710), that Zygospores may be readily secured with proper conditions of moisture and temperature, — using as a substratum corn muffin bread; the atmosphere should be saturated and the temperature about 70° F.

The 99. Lieferung (Fungi Imperfecti, Hyphomycetes) of Rabenhorst's Kryptogamen-Flora Erster Band, VIII Abteilung, by G. Lindau, 25 July 1906, pp. 433-512, continues but does not complete the species of Ramularia. The following are new species: R. dianthi Lindau on Dianthus carthusianorum, R. epilobii rosei Lindau on Epilobium roseum, R. imperatoriae Lindau on Imperatoria ostruthium, and R. tozziae Lindau on Tozzia alpina.

The Genera Aspergillus and Penicillum constitute the bulk of the 94th Lieferung of Rabenhorst's Krypogamen-Flora, VIII Abteilung, pp. 129-176, G. Lindau, 15 July 1904. Very full notes are given of some of the important species. The 33 species of Penicillium are divided into 4 sections according to color. As an appendix to these Dr. Lindau enumerates 23 additional species of Dierckx obtained by cultures but not fully coordinated with the previously published forms.

The articles in Bulletin de la Societe Mycologique de France, Tome XXI, 2er Fascicule are as follows: M. Boudier, nouvelles espèces de Chamignons de France (Pl. 3); P. Vuillemin, Seuratia pinicola, sp. nov. (Pl. 4); N. Patouillard, Rollandina, nouveau genre de Gymnoascées (Pl. 5); N. Patouillard et P. Hariot, Fungorum novorum Decas prima; Maublanc, Espèces nouvelles; Maublanc, Trichoseptoria fructigena; F. Gueguen. Homologie et évolution du Dictyosporium toruloides (pl. 8 et 9); V. Harlay, Empoisonnement par l'Amanita phalloides, a Flize (Ardennes).

Ralph E. Smith has prepared a Bulletin (California Agr. Exp. Station, Bulletin No. 165, pp. 1-99, January 1905) on Asparagus and Asparagus Rust in California which "represents primarily a report to certain asparagus growers, canners and dealers of San Francisco, Sacramento, and adjoining territory, who provided a fund of $2,500 for the support of an investigation of the *Asparagus Rust*, a disease which seriously threatened to destroy or greatly injure their industry." The main topics are: The Asparagus Rust; History of the Disease in California; Nature of the Rust; Cause; The Mycelium; Spore Forms; Nature of the Injury; Amount of Loss; Yearly Life-History; Relation of Natural Condition of the Rust; and the Prevention or Control of Asparagus Rust; Rust Parasites. Under the last topic are mentioned the *Darluca filum* Cast., *Tubercularia persicina* Ditt., *Cladosporium* sp. — "shows no structural difference from the ordinary Clad. herbarum Link, a very indefinite species."

Diseases of the Apple, Cherry, Peach, Pear and Plum, forms Bulletin No. 132, Alabama Agr. Exp. Station, April 1905, E. Mead Wilcox — popular accounts for fruit-growers.

An extended study of the Chemotropism of the Fungi by Harry R. Fulton, in the Botanical Laboratory of the University of Missouri, is publishd in the Feb. No. of the Botanical Gazette, 1906.

J. C. Arthur gives an extended review of Sydow's Monographia Uredinearum with notes upon the Ameican species in the January No. of the Journal of Mycology, 1905. "One is naturally surprised to find that just twice as many endemic species are credited to America as are found in Europe. One-fourth of all the species inhabit the *Compositae* and one-eighth of them occur on the Gramineae." We give a list of those that should be made synonyms:

Puccinia cornigera E. & E. should be made a synonym of P. actinellae (Webb.) Syd.

Puccinia longipes Lagh. should be made a synonym of P. vernoniae Schw.

Puccinia aplopappi Syd. should be made a synonym of P. tuberculans E. & E.

Puccinia similis E. & E. should be made a synonym of P. absinthii DC.

Puccinia recondita D. & H. should be made a synonym of P. conferta D. & H.

Puccinia magnoecia E. & E. should be made a synonym of P. asteris Duby.

Puccinia inclusa Syd. should be made a synonym of P. cirsii Lasch.

Puccinia californica Diet. should be made a synonym of P. cirsii Lasch.

Puccinia confluens Syd. should be made a synonym of P. erigerontis E. & E.

Puccinia gutierreziae E. & E. should be made a synonym of P. grindeliae Pk.

Puccinia lagophyllae D. & H. should be made a synonym of P. hemizoniae E. & T.

Puccinia nardosmiae E. & E. should be made a synonym of conglomerata (Str.) K. & S.

Puccinia tracyi Sacc. & Syd. should be made a synonym of P. solidaginis Pk.

Puccinia philibertiae E. & E. should be made a synonym of P. gonolobi Rav.

Puccinia cymopteri D. & H. should be made a synonym of P. jonesii Pk.

Puccinia asperior E. & E. should be made a synonym of P. jonesii Pk.

Puccinia microica Ellis should be made a synonym of P. cryptotaeniae Pk.

Puccinia lindrothii Syd. should be made a synonym of P. jonesii Pk.

Puccinia sphaelerocondra Lindr. should be made a synonym of P. jonesii Pk.

Puccinia thompsonii Hume should be made a synonym of P. sambuci (Schw.) Arth.

Puccinia omnivora E. & E. should be made a synonym of P. windsoriae Schw.

Puccinia procera D. & H. should be made a synonym of P. montanensis Ellis.

Puccinia substerilis E. & E. should be made a synonym of P. stipae Arth.

Puccinia bakeriana Arth. should be made a synonym of P. ellisii DeT.

Some of the contentions of Edward Read Memminger under the title of Agaricus amygdalinus M. A. C. (see Journal of Mycology, Jan. 1905) are as follows: "As far as our research shows, *Agaricus amygdalinus* has never been technically described, and the first appearance of the name in print was in Curtis's List of the Fungi in the Geological and Natural History Survey of North Carolina published in 1867. It is not surprising, therefore, that so little being known. . . We think it susceptible of proof, that this plant was first published by Curtis as *Agaricus fabaceus* Berk., then this determination not proving satisfactory, it was united by Ravenel with *Ag. campestris* Linn.; dissatisfaction still existing it was finally segregated as *Agaricus amygdalinus* by Curtis. . . . From the foregoing it would seem that the geographical distribution of *Ag. amygdalinus* would be from Massachusetts to Texas. . . . Until, therefore, it is conclusively proved that *Ag. amygdalinus* and *Ag. fabaceus* are one and the same species, it is proper to confine the description to *Ag. fabaceus* strictly to the words of Berkeley, and no argument for the identity of these species, based on similarity of taste and odor, drawn from Curtis's statement in Silliman's Journal, above quoted, can have any weight or force."

The Index to North American Mycology, which is an alphabetical list of articles, authors, subjects, new species and hosts, new names and synonyms, by W. A. Kellerman appeared in instalments in 1905 in the May, July, and September No.'s of the Journal of Mycology. This comprehensive index includes everything in its scope that has appeared since the end of the year 1900. Each instalment is printed as a separate — *on one side of the page only* so that it may be cut and pasted on cards making a convenient library card index.

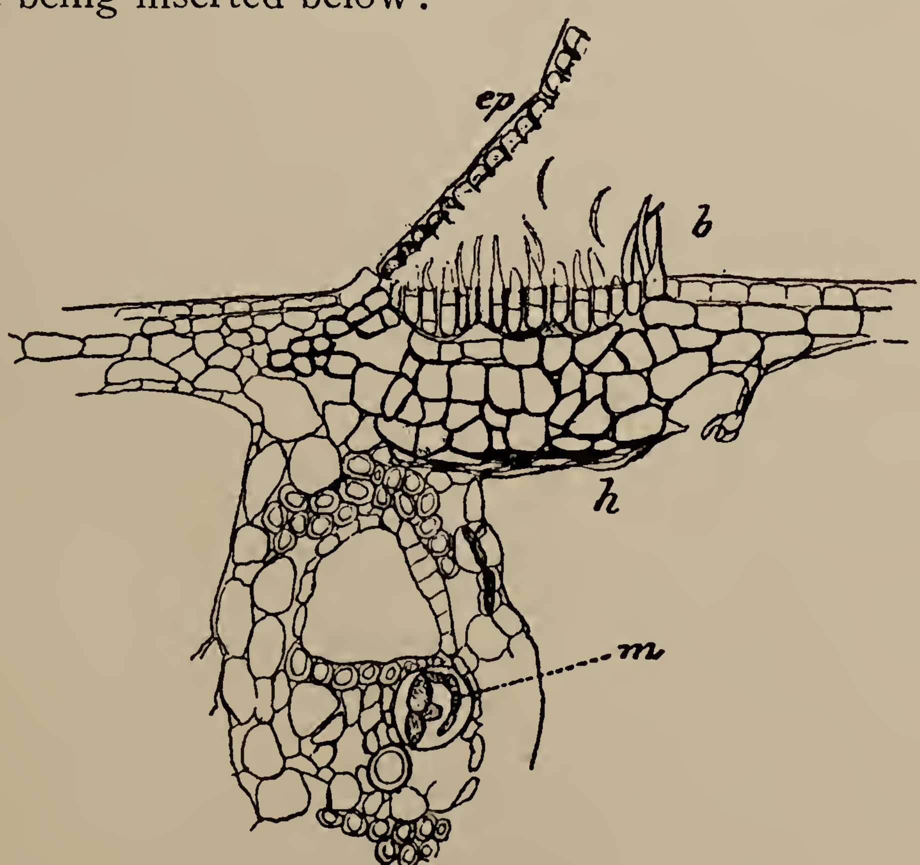
J. C. Arthur's Cultures of Uredineae in 1905, being the sixth of a series of reports by the author upon the cultures of plant rusts, gives (see Journal of Mycology, Jan. 1906) an account of 194 sowings of spores, representing 45 species of rusts, and for that purpose 100 species of hosts were utilized which were grown temporarily in pots in the greenhouse. The summary shows that 20 successful cultures were made with species previously reported, and 10 with species now reported for the first time. The latter are as follows: 1. Puccinia silphii Schw. — Resting teleutospores from *Silphium integrifolium* Michx. sown on same host; 2. Puccinia grindeliae Pk. — Resting teleutospores from *Gutierrezia sarothrae* (Pursh) B. & R. sown on same host; 3. Puccinia solidaginis Pk. — Resting teleutospores from *Solidago trinervata* Greene, sown on S. *Canadensis* L.; 4. Puccinia transformans E. & E. — Resting teleutospores from *Stenolobium Stans* (L.) Don. sown on same host; 5. Puccinia kuhniae Schw. — Teleutospores from *Kuhnia eupatorioides* L. sown on same host; 6. Puccinia canaliculata (Schw.) Lagerh. — Aecidiospores from Xanthium canadense Mill. sown on *Cyperus esculentis* L.; 7. Puccinia eleocharidis Arth. — Teleutospores from *Eleocharis palustris* (L.) R. & S. sown on *Eupa-*

torium perfoliatum L. 8. Puccinia substerilis E. & E. — Amphispores from *Stipa viridula* Trin. sown on the same host; 9. Puccinia seymouriana Arth. — Teleutospores from *Spartina* cynosuroides Willd. sown on *Cephalanthus occidentalis* L.; 10. Uromyces acuminatus Arth.—Teleutospores from Sp*artina cynosuroides* Willd. sown on *Steironema ciliatum* (L.) Raf.

Fred. J. Seaver describes a new species of Sphaerosoma [S. echinulatum] in the Journal of Mycology, Jan. 1905. The plant was collected on the surface of damp soil between the tufts of grass in an open place on the margin of the woods. It is illustrated by a full page plate.

A Disease of Black Oaks caused by Polyporus obtusus Berk. is presented by Perley Spaulding in the 16th Annual Report of the Missouri Botanical Garden, 1905. The species is American — not very generally known — and Mr. Spaulding has found it causing disease locally in Missouri and northern Arkansas. It is a true saprophyte. The rot extends up and down in the heart wood until the tree is so weakened that it breaks over or dies outright. It was found that the sporophores were growing out of the entrances of burrows made by some wood-boring insects. Three half-tone plates illustrate the species and two illustrate the insects burrows.

Through inadvertancy a cut to appear on p. 56 was omitted, the same being inserted below:



Pseudostegia nubilosa Bubák. — Radialer Schnitt: *ep*, deckelartig aufgehobene Epidermis mit den Scheiteln der dekapitierten Zelien; *b* Borsten; *h*, Hyphostroma; *m* Mycel. (240/1).

JOURNAL OF MYCOLOGY

A Periodical Devoted to North American Mycology. Issued Bi-monthly; January, March, May, July, September and November Price, $2.00 per Year. To Foreign Subscribers $2.25. Edited and Published by W. A. KELLERMAN, PH. D., COLUMBUS, OHIO.

EDITOR'S NOTES.

An inspection of a number of Botanical Periodicals reveals the fact that the exact date of issue is usually printed *in the same No.*, sometimes on the last page, in other cases on the cover; very few Journals fail to do this but instead give this date in the *next issue.* It would seem then generally feasible to have the date of issue accompany the No. to which it pertains. There could be no question as to the desirability, we might for practical purposes (at least for convenience) say the *necessity* of doing so.

Periodicals are intended, as indicated by their pagination, volume numbering, index, etc., to be bound at the close of certain periods; then the query comes why should the *number* of the issue be printed on the first page or any other page of the issue; according to our judgment this should be given on the *cover* only. It is a temporary convenience to the librarian or to the subscriber, and is no advantage when the No.'s, or parts, are bound into a volume. In fact it then is often a disadvantage, particularly in making a citation, because one must stop to determine whether that item needs to be given.

In order that a reader or indexer may orient himself readily and continuously, it is desirable that when the periodical is open at any and all parts he may see the *page* number (at the top, extreme left and extreme right), the name of the *Journal* (on the left), title of *article* (on right), the *volume* number and the *date-designation;* in addition some periodicals give the author of the article. Even if then a signature, or single leaf, becomes accidentally displaced, it can be restored quickly and without possible error.

An extremely small almost negligible fraction of even one per cent. of readers, desire the date of issue of any periodical as opposed to its ordinary date-designation, as January, March, 1st Quarter of 1906, etc. However, I would make this matter perhaps stronger than stated in the preceeding No., where I suggested that it "*might be desirable*" to give the date of issue in addition to the date-designation of the No., Part, Heft, Lieferung, etc. Thus for an example: Sydow, H. et P. Neue und kritische Uredineen — IV. Ann. Mycolog. 4:28-32, Feb. 1906. [Issued 5 Apr. 1906.]

PRICE LIST.

Journal of Mycology, Vol. 8—1902	$2 00
" " " 9—1903	2 00
" " " 10—1904	2 00
" " " 11—1905	2 00
" " " Current Vol.	2 00
Index to North American Mycology (authors, titles, subjects, new species and hosts, new names and synonyms) since Jan. 1, 1901. *Printed on one side of page.* Seven parts have been issued. Price per part	25
Index to Uredineous Infection Experiments with List of Species and Hosts for North America, *printed on one side of page*	50
Portraits of Mycologists, reprinted from the Journal of Mycology (Peck, Ellis, Arthur, Burrill, Farlow, Tracy, Earle, Atkinson, Holway, Thaxter, Clinton, Magnus, Oudemans, Patouillard, Hennings Rehm, Cooke, Saccardo, Dietel, Sydow, H., Sydow, P., Hollos, Bresadola, each	10
Ohio Fungi exsiccati. Though the set is designed primarily for exchange a few copies are for sale. Issued in fascicles of 20 specimens each. Ten fascicles now ready. Price per fascicle	1 00
Mycological Bulletin. A popular leaflet of 4 pages, illustrated, 24 Nos. per year. Vol. II, 1904, Vol. III, 1905, each 50 cents; bound in cloth, 75 cents. Current year	25
New Genera of Fungi. Published since 1900; the original descriptions reproduced with full citation. Annual Supplements are to follow. Printed on one side of page only. Price	75
First Supplement to New Genera of Fungi published since 1900, with the original descriptions	50
Index to Journal of Mycology, volumes 1-10	75
Mycological Glossary	25
North American Species of Marasmius; a monogram bq A. P. Morgan	25

Volume 12, No. 85 *September 1906*

Journal of Mycology

TABLE OF CONTENTS

W. A. KELLERMAN, PH. D.

Professor of Botany, Ohio State University, Columbus, Ohio

Entered as Second Class Matter, Postoffice at Columbus, Ohio.

PRESS OF F. J. HEER, COLUMBUS, OHIO.

Cost of Separates.

Contributors who desire separates of their articles will receive the same at cost, approximately as follows:

For 4 pages or less:	100 copies $1 75	200 copies $2 25
" 8 " "	100 " 2 50	200 " 3 25
" 16 " "	100 " 4 25	450 " 5 50

For more extended articles proportionately higher.

Plates not included in the above.

ADDRESS: EDITOR JOURNAL OF MYCOLOGY

Journal of Mycology Portraits with Facsimile Autographs.

Journal of Mycology

VOLUME 12 – SEPTEMBER 1906

TABLE OF CONTENTS

A NEW PLOWRIGHTIA FROM GUATEMALA.*

W. A. KELLERMAN.

A conspicuous disease of the American Century plant, *Agave americana,* was noticed in Guatemala, C. A., the past two winters. The fungus attacks the living leaves at one or a few points, the infection then proceeding rapidly until the entire leaf may be involved. The clusters of the conspicuous fruiting bodies occupy suborbicular or oval spots which are very striking on account of their size and red or yellowish-red color, later turning brown and finally black.

Microscopic examiatnion reveals the presence of a conidial layer on the outer surface of the stromata, shown in Fig. 3, Plate 90. The conidial cells as well as the hyphae of the outer portion of each stroma, are a bright brownish or yellowish color, under the microscope nearly hyaline.

The stromata are arranged in concentric rows as shown in Fig. 1, the central ones rupturing the epidermis first, later others appearing, but the outermost incipient fruiting bodies never succeed in uplifting the epiderims, though discoloring it. New spots of infection or rather central points of rupture by the stromata may be very close to older ones, and thus there is an effused area occupied by the fruits. Often the entire leaf, most commonly the upper portion, or only spots here and there, especially toward the apex, are involved. Both sides of the leaf show the con-

* Contributions from the Botanical Laboratory of the Ohio State University. XXVI.
Contribution to Guatemalan Mycology. II.

spicuous stromata, but as a rule one side has fewer spots; sometimes it is the upper surface of the thick fleshy leaf, sometimes the lower that shows more conspicuous and abundant infection.

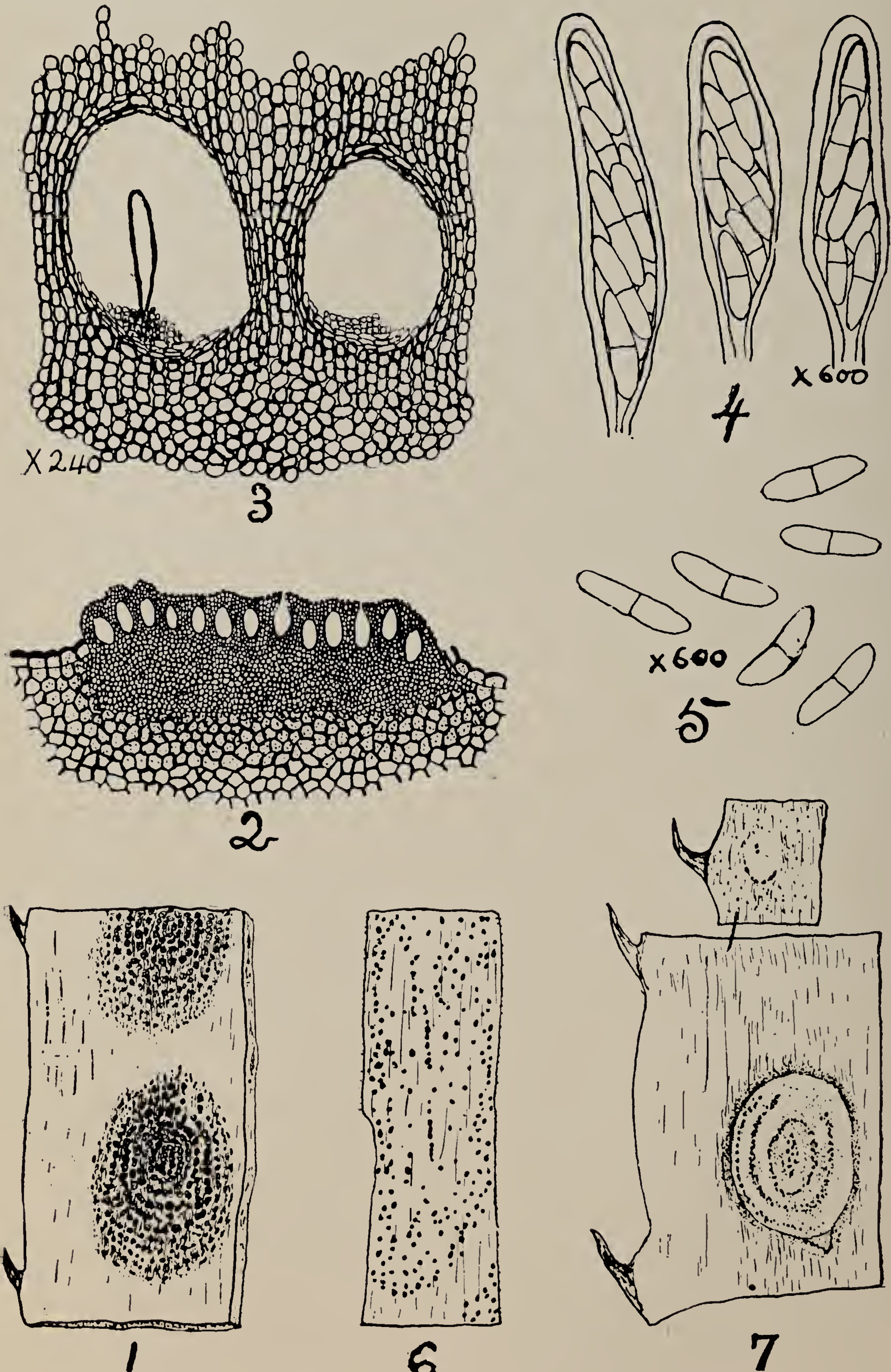
The fungus is a species of *Plowrightia* apparently undescribed. Tracy and Earle published, in the Bulletin of the Torrey Botanical Club, March 1901, p. 187, a species of this genus under the name of *Plowrightia circumscissa,* which they gave as occurring "on languishing leaves of some aloe (*Agave* sp. ?)," collected in Florida. When this was compiled by Saccardo for the Sylloge the host name "Aloe" was omitted and the entry was made as follows: "in foliis languidis Agaves spec." Some of the material from Tracy and Earle's type No. was kindly furnished me from the Missouri Botanical Garden where, Prof. Tracy informed me, his collections had been sent. After thus passing through Dr. Trelease's hands I find the host given on the label as Yucca gloriosa (Y. aloifolia). It seems certain therefore that Tracy and Earle's host is not an Agave as mine is. At any rate my Plowrightia is very different, both in microscopic characters and especially in the appearance and disposition of the stromata. Compare Fig. 1, which shows two spots of the fungus here in question, and Fig. 6, which presents a portion of a leaf affected by *Plowrightia circumscissa* Tracy & Earle. A specimen of my material sent to Prof. Tracy elicited the reply: "Very different from mine."

Another fungus somewhat similar in outward appearance to the Plowrightia, also collected in Guatemala, is shown in Fig. 7. It is *Colletotrichum agaves* Cav. No evidence was found to verify the suspicion at first entertained that the two might be forms of one and the same life cycle. Hedgecock reports (Annual Report of the Missouri Botanical Garden, 16:153-6. 1905) a study of this fungus, and he says "no ascigerous stage was found."

The technical description of the Plowrightia is given below. I have selected the specific name in honor of Mr. G. F. Williamson, of Guatemala, whose courtesies materially assisted in the botanical explorations both of 1905 and 1906. Mr. R. A. Young assisted in the study of the fungus and he and Mr. L. A. Hawkins prepared under my direction the illustrative drawings.

Plowrightia williamsoniana Kellerm. n. sp. Stromata rupturing the epidermis, prominent, globular to sub-quadrangular or oblong, $\frac{1}{4}$-$\frac{3}{4}$ mm. high, $\frac{1}{2}$-2 mm. long, arranged concentrically in five to ten (or more) somewhat irregular rows, the inner larger, the outermost poorly developed and scarcely lifting the epidermis, forming at first a definite suborbicular or oblong spot, but later fusing with adjacent affected areas, in many cases finally occupying nearly or quite the entire leaf.

The stromata are at first reddish yellow, becoming gradually brown, and finally black, the surface minutely papillate, the sub-



PLOWRIGHTIA WILLIAMSONIANA KELLERM. (figs. 1-5); P. CIRCUMSCISSA TR. & EARLE (fig. 6); COLLETOTRICHUM AGAVES CAV. (fig. 7).

stance somewhat brittle but not carbonaceous. The upper portion of the pseudoparenchyma is conidiiferous, producing an abundance of oblong to subglobular reddish or hyaline cells, 7-10x3-5 μ.

The perithecial cavities are numerous (sometimes 40 or more in a stroma), 110-125x90-120 μ; asci numerous, oblong or subovate-oblong, the basal part narrowed, 60-90x12-20 μ (mostly 80-85x14-16 μ), thick-walled, containing 8 subdistichous, subequal, 2-celled, oval-oblong, yellowish or hyaline spores, 20-26x5-7 μ (mostly 22-24x5-6 μ). No paraphyses were seen.

On living and languishing leaves of Agave americana, near Guatemala city, C. A., alt. 1200-1800 m. (Circ. 4,000-6,000 ft.) W. A. Kellerman Nos. 4629, 4630, 4631, January and February 1905.

Plowrightia williamsoniana Kellerm. n. sp.—Stromatibus epidermidem rumpentibus, prominentibus, globosis, vel sub-quadrangularis vel oblongis, ¼-¾ mm. altis, ½-2 mm. longis, in 5-10 (vel pluribus) lineis sub-irregulariter concentrice dispositis, intimis majoribus, extimis haud multum evolutis, epidermidem vix levantibus, primum maculam definitam sub-orbicularem vel oblongam efformantibus, dein cum adjacentibus areis affectis confluentibus, saepe folio partim vel omnino tandem infecto. Stromatibus primum fulvis, dein fuscis, denique nigris, superficie minute papillata, substancia subfragili non carbonacea, parte superiore parenchymatis conidiifera, cellulas numerosas oblongas vel sub-globulares rubentes vel hyalinas abscindente, 7-10 x 3-5 μ. Loculis perithecialibus numerosis (plerumque 40 vel pluribus uno in stromate), 110-125 x 90-120μ; ascis numerosis, oblongis vel subovato-oblongis, parte inferiore attenuata, 60-90 x 12-20 μ (saepissime 80-85 x 14-16 μ), parietibus crassis, octosporis, sporis subdistichis, sub-aequaliter bilocularibus, ovali-oblongis, subfulvis vel hyalinis, 20-26 x 5-7 μ (plerumque 22-24 x 5-6 μ). Paraphyses non apparent.

In foliis vivis languidisque Agaves americanae, prope urbem Guatemalam, Amer. cen., alt. 1,200-1,800 m., W. A. Kellerman, 4629, 4630, 4631, in mensibus Jan. et Feb. MCMV.

Explanation of Plate 90.—Plowrightia williamsoniana Kellerm. Fig. 1. An affected area of a leaf of Agave americana, showing the concentric arrangement of the stromata; fig. 2, diagram of a single stroma in vertical section; fig. 3, section of a portion of a stroma, showing two perithecial cavities and exhibiting the superficial conidiiferous layer; fig. 4, asci; fig. 5, spores; fig. 6, Plowrightia circumscissa Tr. & Earle on some Aloe; fig. 7, Colletotrichum agaves Cav. on Agave americana.

A NEW CLASSIFICATION OF THE UREDINALES.

BY J. C. ARTHUR.

Separates of the paper on *Eine Klassifikation der Uredineen,* read by the present writer before the International Botanical Congress at Vienna in July, 1905, were distributed early in August of the present year to many Journals and Libraries, and to a large number of mycologists. Some of the phylogenetic reasons which are made the basis of this latest attempt at a natural arrangement of the genera of rusts have been more or less fully stated in other communications already before the public. The present occasion may be seized to state some of the aids and difficulties that will beset the practical acceptance of the classification.

The simplicity of the old order of things disappears in this new arrangement, and herein will doubtless arise one of the strongest protests against it. When nine-tenths of all forms of rusts usually met with were easily assigned to the Uromyces-Puccinia group, and if they had one-celled teliospores were species of *Uromyces,* or two-celled teliospores were species of *Puccinia,* or if they happened to be aecia were species of *Aecidium,* the naming of rusts seemed an easy matter to the casual student. But in the new system it is essential that something of the life history be known, including the number of spore forms, and the structure of the sorus. Before, any species with a two-celled, stalked teliospore might be safely called a *Puccinia;* but now, such a species may rest in any one of thirteen genera. Before, it did not matter whether pycnia (spermogonia) accompanied the telia, or other spore stages, or not; but now such association is often of fundamental importance in the location of a species in the system. Heretofore, the structure of the urediniosorus has been of slight systematic value; now, examination of this feature alone may place the species in the correct genus, or within a small group of genera. Such requirements for the naming of collections necessitate a more intimate knowledge of the rusts as a whole, some insight into their life-history and some appreciation of their structure. For this reason the system may not for a time prove as acceptable as the one in present use.

There are, however, some short cuts to sufficient information to enable one to name his collections. Thus, telia associated with pycnia may be safely assumed to belong to a genus in which aecia and uredinia are wanting, or at most so little developed as to be of no taxonomic importance. In like manner pycnia associated with uredinia, the so-called primary uredinia, may be assumed to indicate a genus in which aecia are wanting. If aecia show telia arising within or about them from the same mycelium, it may safely be assumed that no uredinia belong to the life-cycle. Furthermore, it rarely or never happens that teliospores of the Uromyces-Puccinia type, germinating immediately upon maturity, belong to genera with other spore forms in the life cycle, excepting the largely tropical genera of *Eriosporangium* and *Argotelium.*

Short cuts are also available in other directions. All gramineous and cyperaceous hosts bear rusts that may be assumed to possess all spore forms and are heterœcious, only one exception being positively known at present. Rusts on rosaceous hosts largely belong to the genera of the sub-family *Phragmidiatae,* and on leguminous hosts largely to genera of the sub-families *Raveneliatae* and *Uropyxidatae,* and so on.

But probably one of the most efficient short cuts, and a wholly legitimate one, owing to the phylogenetically intimate relation of fungus and host among the rusts, will eventually be the consultation of a host index. In the present chaotic condition of taxonomic literature in this group no very comprehensive indexes exist, but they are likely to be provided in the early future. By this means it can be readily ascertained what species have been recognized upon the host in question, and from this list, usually small, not much difficulty will be experienced as a rule in locating the particular rust.

Another difficulty in using the new system will probably be felt in the much larger number of genera to be recognized. Some of these genera have been long known, but only partially accepted, and consequently little used, like *Pileolaria, Uropyxis, Trachyspora, Gymnoconia, Kuehneola, Eriosporangium,* and *Dasyspora* Not being well understood, they have remained monotypic, or with only a few species each, although every one of these genera really contains more than one and some many species. Other genera have been established to recieve species which show relationships quite different from those usually assumed for them. Thus, *Transzschelia* and its closely associated genera have many characters showing their close relationship with the Ravenelia group, and have only superficial resemblances to the Puccinia-Uromyces group in which they have heretofore been submerged. But probably the most striking innovation is the placing of like species under different genera, according as they possess all or part of the spore forms in their life cycle. At first thought this seems to be an appropriation of the Schroeterian biological classes, into which every genus was considered to be potentially divisible, *i. e.,* heteroforms, auteuforms, opsisforms, brachyforms, hemiforms, microforms, and leptoforms, and calling these classes genera. But in reality the basis of the segregates which I have recognized, for example, *Dasyspora* with teliospores, *Bullaria,* with urediniospores and teliospores, *Allodus* with aeciospores and teliospores, and *Dicaeoma* with all spore forms which take the place of the genus *Puccinia* as now commonly used, rests upon a wholly different consideration, having to do fundamentally with the progressive evolution of the rusts, and not with adaptations. While space does not permit the presentation of an argument sufficiently full to demonstrate this proposition and carry conviction, yet it may be pointed out that while the genus *Dasyspora* includes species, all of which have progressed in their evolution to the stage where the aeciospores and urediniospores have been effectively suppressed from the life cycle, yet it includes both leptoforms and microforms, according to their adaptations to the requirements of the environment, some species exhibiting only one or the other adaptation, and some assuming either form, now one, now the other, in accordance with conditions affecting growth not yet made clear. In the same way autoecism and heteroecism are regarded as adaptations, and not as an evolutionary development of generic rank. Having set up this principle, it becomes logical to separate *Gallowaya* from *Coleosporium*, *Chrysomyxa* from *Melampsoropsis*, *Macalpinia* from *Uromycladium*, *Dendroecia* from *Ravenelia*, *Calliospora* from *Uropyxis*, *Nyssopsora* from *Triphragmium*, *Telospora* from *Nigredo*, etc. But it would be a wholly false impression to assume that this character of the suppression of spore forms is the only one separating the genus from the others of its group. It is the most prominent and the most easily stated, but in most cases will be found associated with other characters of acceptable value.

There is another argument beside that based upon phylogeny for the separation of species into genera as indicated above, and that is, convenience. It will lead, it is believed, to a better recognition of the various forms that go to make up each species, particularly valuable in the exploration of new or old floral regions, and also will permit clearer concepts in discussions relating to phylogeny, ecology, distribution, cytology, and a host of other problems. Even if there are those who do not admit the validity of the claim for true generic characters underlying the genera in question, they must accord the right to establish among the rusts, a group of organisms where parasitism of the most obligatory nature has constantly reduced the number of chances for displaying diversified characters, while increasing the physiological sensitiveness of the fungus to variations in the host, genera of this kind so long as they are as useful for the genuine increase of knowledge as have been the genera *Puccinia* and *Uromyces*, which are separated upon no better grounds than those advocated for the genera in question, if in fact as good, and no one, so far as the writer knows, has seriously insisted upon merging these two genera.

A few words may be said in regard to the nomenclature. The generic names have been chosen, such as are not new, in accordance with the American doctrine of types as applied in the Philadelphia code. This course will doubtless be accepted as natural, whether considered best or not, seeing that the author was a member of the committee that drafted the code, and that he has on several subsequent occasions affirmed his belief in the essential validity of the principles which underlie the code. Granting the method of procedure, there is no need in this place to take up the question of the correct application of the several names; that may for the present be left to others. There are two names, that the establishment of types and application of the rule of priority have brought uppermost, *i. e., Uredo* and *Aecidium,* which may lead to some confusion and inconvenience. Yet the number of species in the true genus *Uredo* and true genus *Aecidum* as distinguished from the form genera of these names, are so few, that the little inconvenience may be endured for the sake of correct method and final result. It is noteworthy that *Aecidium* as a genus name, supplied the basis, according to many authors, for the name of the order, while *Uredo* since 1825 has been chiefly employed in this way, and is now firmly established as the genus on which the order *Uredinales* is founded.

A word may be said by way of explanation regarding the method of citation. The manuscript was prepared in accordance with the American method, but the printed proof submitted showed an evident editorial intention to have it changed to the German method, an intention most imperfectly carried out by the compositor. The typographical errors may be ascribed to the intricacies of this transformation, which diverted attention belonging to legitimate proof reading.

There is one question which is likely to come up in the mind of the reader, which finds no answer in the published article, that is, regarding the status of such forms as are too imperfectly known to be placed with much confidence in any of the recognized genera. The author proposes in his own work to retain such names as *Peridermium, Caeoma, Roestelia, Uromyces* and *Puccinia* as form genera for imperfectly understood species, and even *Uredo* and *Aecidium* in their customary acceptance as form genera, if a better course does not become evident. These will constitute an *Anhang* for recording undistributed and imperfectly known forms.

Purdue University, Lafayette, Indiana.

A NEW ANTHRACNOSE OF ALFALFA AND RED CLOVER.

SAMUEL M. BAIN AND SAMUEL H. ESSARY.

In a preliminary note on clover diseases in Tennessee [Science, N. S. 17:503, 1905], we announced the discovery of a new clover disease in this State; caused by an undescribed species of Colletotrichum. Experiments have been under way for some time with a view to working out the life history of the fungus, as well as to the breeding of a resistant strain of clover. We have apparently succeeded in our effort to secure resistance, while our work on the life history of the fungus is as yet incomplete. This necessitates the publication of a Bulletin on the breeding experiments and economic aspects of the disease before the final publication on the biological relations of the parasite producing it; hence, we thought best to publish here a description of the species.

After the publication of the above mentioned preliminary note, we had opportunity to compare notes and specimens with Mrs. Flora W. Patterson of the U. S. Department of Agriculture, to whom a similar species occurring on alfalfa had been submitted by Mr. J. M. Westgate. The two forms appeared to be taxonomically identical, and our further field observations during the summer of 1906 support this view. Our knowledge of its injury to alfalfa is quite limited, though the disease occurred rather abundantly on this plant here this year. In Virginia, where the disease was first found on alfalfa by Mr. Westgate, it is said to have caused serious damage to the crop. There has been considerable complaint on the part of the farmers in Tennessee of the difficulty of securing a stand of alfalfa, and it is quite probable that this disease is at least partly responsible for the trouble.

The devastation caused in clover fields by the disease here in Tennessee is remarkable. It occurs over the entire state, but appears to be much worse where clover has been cultivated for many years. In fact, our observations thus far would justify the statement that it is the most serious plant disease occurring in this State.

The geographical extent of this anthracnose will be a matter of interest. We have observed it at one point each in Arkansas (Clarendon) and Kentucky (Hopkinsville). Its occurence in Ohio and West Virginia is stated in the Yearbook of the Department for 1905; hence, it is probably widespread over the country.

There appear to be in the case of clover two critical periods when it is especially susceptible to the disease. The first is when seedlings of the previous spring's sowing encounter the first prolonged hot spells of summer. At this time the disease usually attacks the petioles. This appears to be the period of greatest injury. The other period of special susceptibility is during the ripening of the seed, when the severest attacks are on the stems just at or slightly below the surface of the ground. Many flower heads are also killed about flowering time by attacks just below, but the host plant as a whole appears usually to survive. These statements are only general in character, however, for the plant may succumb to the disease at any time during the summer or early fall.

We have named the species Colletotrichum trifolii, and append the following description:

Colletotrichum trifolii Bain sp. nov.—Maculis atris vel fuscis, saepe depressis; acervulis erumpentibus, sparsis vel gregariis; basidiis hyalinis, cylindricis vel fusoideis, conidiis prope aequalibus; conidiis hyalinis, rectis, utrinque rotundatis, 3-4 x 11-13μ; setulis cum conidiis, continuis vel uniseptatis, paucis vel numerosis, fuligineis, ad apicem pallidioribus, 4-7 x 39-62μ, saepe sinuosis vel nodulosis.

Habitat in vivis caulibus et petiolis, rarissime in foliis Trifolii pratensis et Medicaginis sativae, Tennessee, Kentucky, Arkansas; Virginia (J. M. Westgate); West Virginia, Ohio (Yearbook U. S. Department of Agriculture, 1905, p. 609).

University of Tennessee, Knoxville.

TWO NEW SPECIES BELONGING TO NAUCORIA AND STROPHARIA.

GEO. F. ATKINSON.

Material received from Prof. W. A. Kellerman and Supt. M. E. Hard, Central Ohio, prove to be undescribed species of fungi. The diagnoses of these two forms are given below; the first is also illustrated by a half-tone from photograph made by the collector.

Naucoria paludosella Atkinson n. sp.

20076. Photographed Coll.

Growing on living sphagnum, other mosses and on rotten wood, Sphagnum moor, Buckeye Lake (Cranberry Island), Ohio, W. A. Kellerman 4464, Sept. 1905, and M. E. Hard and W. A. Kellerman, Oct. 1906. (4916, W. A. K.)

Plants 6-8 cm. high; pileus 2½-3 cm. broad; stems 3-4 mm. thick.

Pileus viscid when moist, convex to expanded, in age somewhat depressed, clay color, darker over center, often with appressed clay brown scales with a darker color.

Gills raw umber to Mars brown (R), emarginate, adnate, sometimes with a decurrent tooth, easily becoming free.

Cystidia on sides of gills none, edge of gills with large hyaline thin-walled cells, subventricose, sometimes nearly cylindrical, abruptly narrowed at each end with a slight sinus around the middle.

Spores subovate to subelliptical, subinequilateral, smooth, 7-9x4-5 μ, fuscous ferruginous, dull ochraceous under microscope.

Stem same color as pileus but paler, cartilaginous, floccose from loose threads or in some cases abundant threads over the surface, becoming hollow, base bulbous, the extreme base covered with whitish mycelium.

Veil rather thick, floccose, disappearing leaving remnants on stem and margin of pileus when fresh.

Stropharia hardii Atkinson n. sp.

20118. Photographed G. F. A.

Chillicothe, Ohio, received October 17, 1906, M. E. Hard No. 8.

Plant 10 cm. high; pileus 9 cm. broad; stem 1½ cm. thick.

Pileus pale bright ochraceous; gills brownish near Prout's brown (R); stem pale yellow tinge.

Pileus convex to expanded, thick at the center, thin toward the margin, smooth; flesh tinged yellow.

Gills subelliptical to subventricose behind, broadly emarginate, adnexed.

Basidia 4-spored.

Spores suboblong, smooth, 5-9x3-5 μ, purple brown under the microscope.

Cystidia not very numerous on sides of gills, varying from clavate to subventricose to sublanceolate, the free end more or less irregular when narrow, rarely branching below the apex and usually with a prominent broad apiculus or with two or several short processes. Similar cells on edge of gills, but somewhat smaller and more regular.

Stem even at the base, tapering to a short root, transversely floccose scaly both above and below the ring. The ring membraneous, not prominent but still evident, about 2 cm. from the apex.

Explanation of Plate 91. — Photograph of fresh specimens of Naucoria paludosella Atkinson. Young specimens with the pileus unexpended to the left below; above older plants with upturned cap; the plant over the black background shows the conspicuous clay brown scales of the pileus.

NAUCORIA PALUDOSELLA Atkinson.

NORTH AMERICAN SPECIES OF LEPIOTA.

A. P. MORGAN.

(Continued from p. 159).

III. GRANULOSAE. *Dermis of the pileus or at least its outer layer composed of granules, minute warts or furfuraceous particles; the investment of the stipe similar to that of the pileus; the veil of like structure, lacerate and appendiculate.*

The species of this tribe are mostly small Agarics growing on the ground in rich soils or on rotted wood. The granules form a loose, easily detached investment. Many species are enumerated.

a. Lamellae adnate to the stipe.

13. LEPIOTA AMIANTHINA Scopoli. Fl. Carn. 1772.

Pileus ovoid then campanulate and explanate, subumbonate; the flesh thin, yellowish; the dermis furfuraceous-granulose, ochraceous; the veil lacerate and more or less appendiculate. Stipe subequal, slender, fistulous, scaly below the annulus and colored as the pileus. Lamellae rather broad, close, white becoming yellowish, adnate; spores elliptic, 5-7 x 4 mic.

Growing on the ground in mountain woods. New York, *Peck;* Vermont, *Morgan.* Pileus 2-4 cm. in diameter, the stipe 4-8 cm. long and 2-4 mm. thick.

14. LEPIOTA RUGOSO-RECTICULATA Lorinser, Oest. bot. Zeitschr. 1879.

This species is not described further than the statement that it is related to L. amianthina; it differs from it in the surface of the pileus being rugose-reticulate, and in the odor being strong and almost acrid.

Growing in mossy places in woods. New York, *Peck.*

15. LEPIOTA ADNATIFOLIA Peck, 55 N. Y. Report. 1901.

Pileus broadly convex or nearly plane; the flesh thin, white; the dermis minutely granulose or squamulose, varying in color from alutaceous to fulvous; the margin usually appendiculate with the fragments of the veil. Stipe short, thick, solid then stuffed or hollow, glabrous or slightly scaly below the annulus, pallid or rufescent. Lamellae adnate, white; spores 5-6 x 4-5 mic.

Growing on the ground under Pine trees. New York, *Peck.* Pileus 3-6 cm. in diameter, the stipe 2-4 cm. long and 4-8 mm. thick.

16. LEPIOTA GRANOSA MORGAN, JOURN. CIN. SOC. N. H. 1883.

Pileus fleshy, ovoid then convex and expanded, subumbonate, more or less irregular and wavy in outline; the flesh thick, whitish or subochraceous, the dermis thick, furfuraceous-granulose, ochraceous to fulvous; the veil of like substance. Stipe tapering upward from a thickened base, fistulous, fibrous-stuffed, whitish or subochraceous above the annulus, below clothed and colored as the pileus. Lamellae rather narrow, close, adnate, tapering outward, whitish or subochraceous; the spores subelliptic, 5 x 3 mic.

Gregarious or subcaespitose; growing on or near rotten stumps and logs in woods. Cincinnati, O.; New York, *Peck;* W. Virginia, *Lloyd.* Pileus 5-9 cm. in diameter, the stipe 5-10 cm. long and 10-15 mm. thick. This is a rare plant with me; I have not seen it for many years.

b. Lamellae free from the stipe or merely reaching it.

17. LEPIOTA CARCHARIAS PERSOON. DISP. FUNG. 1797.

Pileus fleshy, ovoid then campanulate and explanate, umbonate; the flesh thin, white; the dermis granulose, whitish, pinkish to flesh-color; the veil of similar substance and continuous downward with the dermis of the stipe. Stipe tapering upward from a thickened base, fistulous, fibrous-stuffed, below the annulus clothed and colored as the pileus. Lamellae rather broad, close, white, tapering inward and reaching the stipe; spores subelliptic, 3-4 x 2.5-3.0 mic.

Growing on the ground in woods, Dayton, O. Pileus 3-5 cm. in diameter, the stipe 4-5 cm. long and 4-6 mm. thick. The taste and odor disagreeable according to Persoon.

18. LEPIOTA GRANULOSA BATSCH, EL. FUNG. 1783.

Pileus fleshy, ovoid then convex and explanate, subumbonate, often radiately wrinkled; the flesh thin, white, rufescent; the dermis furfuraceous-granulate, ferruginous or fulvous to dark-rufous; the veil similar, lacerate and appendiculate. Stipe more or less elongated, subequal, fistulous, fibrous-stuffed, below the annulus clothed and colored as the pileus. Lamellae rather broad, close, white, rounded behind and slightly adnexed; spores elliptic 4-5 x 3-4 mic.

Growing in open woods and waste places. Atlantic coast states, *Schweinitz, Curtis, Peck,* etc. Pileus 3-5 cm. in diameter, the stipe 3-7 cm. long and 3-5 mm. thick.

19. LEPIOTA CULTORUM B. & C., N. A. FUNGI NO. 3. 1853.

Pileus hemispheric, umbonate, the border sometimes repand, clothed with very numerous, brown, granular scales. Stipe short, furfuraceous; the annulus nearly central. Lamellae broad, ventricose, free, remote; spores cymbiform, rather acute at either extremity, about 12 mic. in length.

Growing among pumpkins in cultivated lands. S. Carolina, *Curtis*. Pileus 2-3 cm. in diameter, the stipe 2-3 cm. high and 2 mm. thick.

20. LEPIOTA REPANDA, MASTOCEPHALUS REPANDUS CLEMENTS, BOT. SURVEY NEB. IV. 1896.

Pileus fleshy, convex with a wavy outline, umbonate, the surface covered with minute crowded granular scales, incarnate-ochraceous. Stipe slender, equal, hollow, white above the annulus, below minutely floccose farinaceous and pinkish-ochraceous. Lamellae ventricose, free, white; spores globose or oval, 5-7 x 5 mic.

Growing on rich soil, Nebraska, *Clements*. Pileus 1-2 cm. in diameter, the stipe 2-3 cm. long and 1-2 mm. thick.

IV. CLYPEOLARIAE. *Dermis of the pileus a thin membrane, radiately fibrillose, the cuticle at first continuous but sooner or later broken up and drawn apart by the growth of the pileus, this at length presenting a white-fibrillose surface sprinkled with colored scales; the veil lacerate, part of it appendiculate, continuous downward with the floccose-fibrillose investment of the stipe.'*

Agarics mostly of small size, comprising altogether many species.

21. LEPIOTA CLYPEOLARIA, AGARICUS CLYPEOLARIUS BULLIARD, HERB. FR. 1788, FRIES. ICONES, SEL. 1867; LEPIOTA CLYPEOLARIA, PECK, 54 N. Y. REP. 1900.

Pileus fleshy, ovoid then campanulate and explanate, subumbonate; the flesh thin, white; the dermis radiately-fibrillose and white or yellowish beneath the cuticle; the cuticle thin, at first continuous and fulvous or rufous, soon broken up except in the center and drawn apart into small scales; the margain appendiculate by fragments of the veil. Stipe tapering upward from a slightly thickened base, fistulous, fibrous-stuffed, fibrous-floccose below the annulus and white or yellowish. Lamellae rather broad, close, free, white or yellowish; spores oblong or subfusiform; 15-20 x 5-7 mic.

Solitary or gregarious; growing in the woods of hilly and mountainous regions. New York, *Peck*. Pileus 3-7 cm. in diameter, the stipe 5-8 cm. long and 3-6 mm. thick. I give the species as figured by Fries and figured and described by the state botanist of New York. I am diposed to think the plant has a limited range, but the name has been widely used and no doubt generally applied to two or three of the following species.

22. LEPIOTA METULISPORA, AGARICUS METULAESPORUS B. & Br., Fungi of Ceylon, 1870.

Pileus fleshy, ovoid then campanulate and explanate, subumbonate; the flesh very thin and fragile, white or yellowish; the dermis radiately fibrillose, at length rimulose-sulcate; the cuticle thin, at first continuous, pale ochraceous to fulvous and rufous, soon lacerate into small scales; the veil lacerate; appendiculate. Stipe slender, hollow, fragile, tapering slightly upward, with a white or yellowish, floccose-fibrillose cuticle below the annulus. Lamellae rather narrow, close, free, white or yellowish; spores oblanceolate, 9-12 x 3-4 mic.

Solitary or gregarious; growing among old leaves in woods. Southern U. S. Common about Preston, O. Pileus 2-4 cm. in diameter, the stipe 5-7 cm. long and 3-5 mm. thick. This seems to be a more delicate and fragile plant than L. clypeolaria; it is considered a "form" of the Ceylon species; it certainly does not strictly agree with the figures or the descriptions of the Ceylon or English species.

23. LEPIOTA SPANISTA MORGAN, SP. NOV.

Pileus fleshy, ovoid then campanulate and expanded, subumbonate; the flesh thin, white; the dermis radiately fibrillose, at first continuous, alutaceous to pale umber, the cuticle at length separating into appressed scales; the veil lacerate, appendiculate. Stipe tapering upward from a thickened base, fistulous, fibrous-stuffed, squamulose below the annulus and colored as the pileus. Lamellae rather broad, close, white, approximate; spores elliptic-oblong, 8-11 x 5 mic.

Growing amongst rotten wood in woods. Preston, Ohio. Pileus 3-5 cm. in diameter, the stipe 4-6 cm. in length and 5-8 mm. thick. A plant of firmer texture than L. metulispora. Apparently more closely related to L. helveola Bresadola, Fungi Tridentini.

24. LEPIOTA SUBLILACEA PECK, BULL. TORR. CLUB. 1897.

Pileus fleshy, convex, obtuse or umbonate; the flesh thin white; the dermis brownish tinged with lilac, separating into small floccose scales; the veil slight, evanescent. Stipe short, solid, colored as the pileus below the annulus. Lamellae rather broad, subdistant, free, whitish; the spores elliptic, 10 x 5 mic. uniguttulate.

Growing on bare ground in pastures. Kansas, *Bartholomew*. Pileus 1-2.5 cm. in diameter, the stipe 1-2.5 cm. long and 2-4 mm., thick. This plant appears to have some resemblance to L. lilacea Bresadola.

25. LEPIOTA FLORALIS B. & RAV., N. A. FUNGI NO. 4. 1853.

Pileus fleshy, convex then explanate; the flesh very thin, white; the dermis radiately fibrillose and striate around the margin; the cuticle separated into brownish, floccose scales. Stipe slender, attenuated downwards, brown like the pileus; the annulus persistent about the middle of the stipe. Lamellae broad, distant, ventricose, free; the spores about 10 mic. long.

Gregarious; growing on rich soil in gardens. S. Carolina, *Ravenel.* Pileus 1-2 cm. in diameter, the stipe 2-2.5 cm. in length and not 1 mm. thick. It is desirable that the species be identified and better described.

26. LEPIOTA UMBROSA Morgan, sp. nov.

Pileus fleshy, ovoid then campanulate and expanded, subumbonate; the flesh thin, white; the dermis radiately fibrillose, white beneath the cuticle, cuticle tawny-brown, darker in the center, at maturity slightly parted into minute scales, the fibers on the umbo often acutely convergent; the veil flocculose, partly appendiculate. Stipe subequal above the mycelial bulb, fistulous, fibrous-stuffed, white and smooth above the annulus, below floccose-fibrillose and rufescent, with scattered tawny scales. Lamellae rather narrow, close, white, rounded behind, free, approximate; spores elliptic-oblong, obliquely apiculate, 5-6 x 3 mic.

Growing on the ground in woods, Preston, Ohio. Pileus 1.5-2.5 cm. in diameter, the stipe 4-5 cm. long and 2-4 mm. thick.

27. LEPIOTA GRACILIS Peck, Bull. Torr. Club. 1900.

Pileus fleshy, ovoid then convex and expanded, subumbonate, the flesh thin, white; the dermis white beneath the brown or blackish cuticle, which is soon broken up and drawn apart into small scales. Stipe long, slender fibrillose-floccose, brown or blackish; the annulus membranaceous, persistent, blackish on the under side. Lamellae close, ventricose, free whitish; the spores broadly elliptical, 6-7 x 4 mic.

Growing in rich soil in woods, Canada, *Dearness.* Pileus 6-10 mm. in diameter, the stipe 2-3 cm. long and about 1 mm. thick.

28. LEPIOTA FELINA Persoon, Synopsis 1801; Cooke. Illustrations. Pl. 943.

Pileus fleshy, ovoid then campanulate and explanate, subumbonate; the flesh thin, white; the dermis radiately fibrillose, white beneath the black cuticle; the cuticle at first continuous soon broken up and drawn apart into small scales. Stipe tapering upward from a clavate base, fistulous, the cuticle whitish above, blackened and scaly below; the annulus thin membranaceous, deciduous. Lamellae rather narrow, close, free, white; spores elliptic-ovoid, 6-8 x 4-5 mic.

Growing on the ground in woods. New York, *Peck;* Wisconsin, *Denniston;* Preston, O. Pileus 3-5 cm. in diameter; the stipe 5-8 cm. long, 2-3 mm. thick at apex, 3-6 mm. at the base.

V. ASPERAE. *Dermis of the pileus or at least its superficial layer fibrillose-scaly from the first, the scales reflexed and squarrose or the fibres fasciculate and convergent into pointed warts; the veil and the cuticle of the stipe may be of similar texture or the stipe may be nearly glabrous.*

A tribe of many species among which are some of rather large size.

29. LEPIOTA ASPERA, AMANITA ASPERA PERSOON, SYNOPSIS, 1801. AGARICUS ACUTESQUAMOSUS Weinman, Sylloge I. 70. Stevenson, Br. Fungi I. 16. Cooke Illust. Pl. 14.

Pileus fleshy, hemispherical, then expanded and convex, obtuse; the flesh moderately thick, white; the dermis appressedly tomentose, pale ferruginous, sprinkled with minute, sharp-pointed, brownish, easily separating warts; veil large, membranaceous, persistent, adherent in places to the margin of the pileus and annulate upon the stipe. Stipe tapering upward from a bulbous base, thick, fistulous, fibrous-stuffed, white above the annulus, below fibrillose-scaly and ferruginous. Lamellae rather narrow, closely crowded, white, tapering inward, free, approximate; spores 6-10 x 2-3 mic.

Pileus 10-15 cm. in diameter; the stipe 8-12 cm. in length, 8-12 mm. thick at the apex, 18-25 mm. at the bulbous base. This plant and Lepiota Friesii are considered by Fries to be varieties of a single species. In Europe they grow in grassy grounds and gardens. In this country the plants reported under the name Lepiota acutesquamosa undoubtedly belong to several different species.

30 LEPIOTA ASPRATA Berkeley. HOOOKER'S JOURNAL, 1847. LEPIOTA ECHINODERMATA CKE. & MASS. GREVILLEA XVI. 30.

Pileus fleshy, convex then explanate; the flesh thin, white, the dermis a dense fibrillose-floccose layer, the fibers convergent into erect, conic warts, pale yellow to orange in color, the veil lacerate, appendiculate. Stipe slender, nearly equal, floccose-scaly below the annulus and colored as the pileus. Lamellae close, ventricose, white, slightly adnexed; spores sub-elliptic 8-10 x 6 mic.

Growing on the ground and on rotten wood. S. Carolina, *Curtis;* Alabama, *Atkinson.* Pileus 2-4 cm. in diameter, the stipe 4-5 cm. long and 3-4 mm. thick. Fries in the Novae Symbolae and also in the Hym. Eur. identifies this species with Pholiota muricata Fr.

31. LEPIOTA HEMISCLERA B. & C. FUNGI CUB. 1867.

Pileus fleshy, ovoid then convex and explanate; the flesh thin, white; the dermis a dense fibrous coat, alutaceous to umber, the ends of the fibers curling up and convergent into small pointed warts; the veil ample, irregularly lacerate, continuous downward with the fibrillose cuticle of the stipe. Stipe fistulous, fibrous-stuffed, white above the irregular annulus, below white-fibrillose, with or without some colored scales, arising from a bulbous base; the bulb depressed and marginate. Lamellae narrow, closely crowded, white, some of them forked, obtuse behind and tapering outward, free; spores obtuse or truncate at one end, pointed at the other, 5-8 x 3 mic.

Growing about old stumps and the base of trees in woods. Cuba. *Wright;* Preston, O. Pileus 5-9 cm. in diameter, the stipe 5-10 cm. long and 6-10 mm. thick above the marginate bulb.

32. LEPIOTA ASPERULA Atkinson, Mushrooms. 1901. Lepiota eriophora Peck. Bull. Torr. Club. 1903.

Pileus fleshy, convex then expanded and explanate; the flesh thin, white; the dermis a thick fibrous coat, alutaceous to umber, at first densely scaly, the scales at length erected into pointed warts; the veil lacerate; appendiculate. Stipe subequal above the bulbous base, fistulous, fibrous-stuffed, below the annulus floccose-fibrillose and colored as the pileus. Lamellae rather narrow, white, tapering inward, free; spores oblong, obliquely apiculate, 3-5 x 2-3 mic.

Growing in rich soil in woods. New York, *Atkinson;* W. Virginia, *Lloyd;* Preston, O. Pileus 3-5 cm. in diameter, the stipe 4-6 cm. long and 3-5 mm. thick. The bulb at the base seems larger on account of the adherent soil and mycelium. I have heretofore called this species Lepiota hispida Lasch.

33. LEPIOTA FUSCOSQUAMEA Peck, 26 N. Y. Report 1873 and 35 N. Y. Report.

Pileus fleshy, hemispherical or convex subumbonate; the flesh thin, white; the dermis consisting of numerous, substrigose, erect or reflexed, blackish-brown scales; the veil slight, evanescent. Stipe short, equal above the bulbous base, fistulous, fibrous-stuffed, floccose-fibrillose and colored as the pileus. Lamellae close, free, white; the spores elliptic-oblong, 6-8 x 3-4 mic.

Growing in Pine and Hemlock woods. New York, *Peck.* Pileus 4-6 cm. in diameter, the stipe 5-7 cm. long and 6-8 mm. thick. A rare plant!

34. LEPIOTA ACERINA Peck. 51 N. Y. Rep. 1897.

Pileus subglobose, then convex and expanded; the flesh thin, white; the dermis at first a thin, dense, fibrous coat, tawny, darker in the center, separating at length into fibrillose scales; the veil lacerate appendiculate. Stipe short fibrous-stuffed, fibrillose-scaly, rufescent, the base bulbous. Lamellae rather broad, white, obtuse behind, approximate; spores pointed at one end, obtuse or truncate at the other, 8-10 x 3-4 mic.

Growing on rotten wood in woods. New York, *Peck,* Preston, O. Pileus 1.5-2.5 cm. in diameter, the stipe 2-4 cm. long and 2-4 mm. thick. Apparently much resembling L. Boudieri Bres., especially as to the spores.

35. LEPIOTA GEMMATA MORGAN, SP. NOV.

Pileus fleshy, at first globose then convex and expanded; the flesh thick, white; the dermis rather thick, white, its surface from the first divided up into minute, erect, pointed warts, which grow dusky with age; the veil appendiculate. Stipe tapering upward, fistulous, fibrous-stuffed, white, flocculose-scaly up to the annulus, the scales becoming dusky. Lamellae broad, close white, inwardly obtuse and approximate; spores oblong, obliquely apiculate, 4-6 x 2.5-3.0 mic.

Growing in rich soil or rotten wood. Preston, O. Pileus 2-4 cm. in diameter, the stipe 3-5 cm. long, and 3-5 mm. thick. Before the expansion of the pileus it looks like a young Lycoperdon gemmatum. After maturity the superficial pointed warts sometimes disappear leaving the surface pulverulent.

VI. GLIODERMATA. *Dermis of the pileus continuous, never separating into scales, but the surface invested by a more or less thickened layer of gluten, pellucid or colored. Stipe commonly dry and squamulose or subglabrous, in a few species with a viscid cuticle like the pileus.*

36. LEPIOTA CANDIDA MORGAN SP. NOV.

Pileus fleshy, ovoid then convex and explanate, subumbonate; the flesh thin, white; the dermis radiately fibrillose, smooth, pure white, covered by a very thin viscous epidermal layer, at first continuous, but with the growth of the pileus drawn apart and left as minute scales upon the surface. Stipe long, tapering upward from a clavate base, fistulous, silky-fibrillose or quite smooth, pure white; the annulus thin, membranaceous, persistent. Lamellae narrow, close, free and rather remote, pure white; spores elliptic-oblong, obliquely apiculate, 5-7 x 3-4 mic.

Growing on the ground among old leaves in woods. Preston, O. Pileus 1-3 cm. in diameter; the stipe 5-7 cm. long, 5-6 mm. thick at the base, tapering to 2-3 mm. at the apex. The surface of the pileus sticks to the fingers and to the paper in which it is folded.

37. LEPIOTA DELICATA FRIES. SYST. MYC. I, 1821. ICONES SEL. TAB. 15. COOKE, ILLUST. PL. 118.

Pileus fleshy, globose, then convex and explanate; the flesh thin white; the dermis smooth and glabrous, yellowish or rufescent, furnished with a viscid cuticle. Stipe tapering slightly upward, fistulous, fibrous-stuffed, white above the annulus, below densely floccose and colored as the pileus, the annulus membranaceous. Lamellae broad, close, white, free, approximate, spores ———.

Growing on the ground in woods. N. Carolina, *Schweinitz*. Pileus 2-3 cm. in diameter, the stipe 2-3 cm. high and 3-5 mm. thick.

38. LEPIOTA OBLITA PECK. 26 N. Y. REP. 1873 AND 35 N. Y. REP.

Pileus fleshy, convex and expanded, subumbonate; smooth or obscurely spotted or scaly, viscid, alutaceous inclining to tawny, the umbo generally darker. Stipe equal or slightly tapering upward, smooth at the top, floccose and viscid elsewhere, fistulous, fibrous-stuffed. Lamellae crowded, free, whitish or yellowish, some of them forked; spores elliptic 5-6 x 3-4 mic.

Growing in frondose woods. New York, *Peck.* Pileus 5-7 cm. in diameter, the stipe 5-7 cm. long and about 6 mm. thick.

39. LEPIOTA GLISCHRA MORGAN SP. NOV. AGARICUS OBLITUS MORGAN, MYC. FLORA M. V.

Pileus fleshy, subovoid then convex and expanded; the flesh rather thin, white; the epidermis a thin layer of brown gluten, thickest at the center rendering it darker colored; this glutinous layer continuous with the marginal veil and running down and enveloping the stipe. Stipe tapering upward, solid, whitish-fibrillose beneath the brown gluten. Lamellae broad, close, white, rounded behind, free, approximate; spores globose or ovoid, apiculate, 4-5 x 4 mic.

Growing in rich soil in woods. Preston, O. Pileus 3-4 cm. in diameter, the stipe 4-6 cm. long and 3-4 mm. thick.

40. LEPIOTA FULVODISCA PECK. BULL TORR. CLUB. 1895.

Pileus thin, convex or nearly plane, obtuse or umbonate, viscid, white, the umbo fulvous. Stipe slender, flexuous, viscid, hollow, white or whitish, abruptly bulbous at the base; the annulus thin, membranaceous, white. Lamellae narrow, close, free, white; spores elliptic-ovoid, 8-10 x 4-5 mic. uniguttulate.

Growing on the ground among old leaves in woods. California, *M. Clatchie.* Pileus 2-4 cm. in diameter, the stipe 5-8 cm. long and 2-3 mm. thick.

41. LEPIOTA ILLINITA FRIES. OBS. MYC. *II.* 1818. ICONES SEL. TAB. 16.

Pileus fleshy, ovoid then campanulate and expanded subumbonate; the white pileus invested by a thick glutinous layer, pellucid or scarcely colored, which is at first continuous downward upon the stipe. Stipe slender, equal, fistulous, fibrous-stuffed, white beneath the glutinous cuticle. Lamellae broad, close, free, white; spores broadly elliptic, 5-6 x 4 mic.

Growing on the ground in grassy woods and fields. New York, *Peck;* Vermont, *Morgan;* Pacific Coast. Pileus 4-7 cm. in diameter, the stipe 5-8 cm. long and 4-6 mm. thick.

(To be continued.)

SOME WOOD STAINING FUNGI FROM VARIOUS LOCALITIES IN THE UNITED STATES.[1]

GEO. G. HEDGCOCK.

(*Condensed from the original notes and from descriptions of the cultural characters in the report of the Missouri Botanical Garden.**)

The following species of fungi are described from artificial cultures grown under similar conditions, on similar agar media, and in most cases compared with measurements made from natural growths on wood or other substances.

Ceratostomella in all the species studied has at first a hyaline conidial stage of short duration which soon changes in color and developes dark colored, beaked perithecia, with hyaline ascospores borne in fugacious asci.

Graphium in artificial cultures has two quite distinct conidial stages; the first form of conidia is borne on simple, hyaline, erect hyphae, and disappears later, as the stalks or stromatal outgrowths bearing the heads with the second form are developed. The conidia of the first form, on account of their temporary nature, are called secondary conidia, and those borne in the mucilaginous heads primary conidia, because they are considered the most important conidial stage.

1. CERATOSTOMELLA PILIFERA (Fr.) Wint., Kryptogamenfl. 2:252, *Sphaeria pilifera* Fr. Syst. Myc. 2:472, *Sphaeria rosstrata* Schum. Enum Fl. Saell. p 128, *Cerotostoma piliferum* Fuckl. Symb. p. 128. Emended, Hedgcock, Mo. Bot. Gard. Rept. 17:64-67, pl. 4, fig. 5-7. Colonies white in condial stage, changing to gray or brown, with the formation of perithecia; filaments, 3μ to 4μ, hyaline to brown or black; conidia, 8μ to 12μ by 2μ to 4μ, hyaline elliptical to cylindrical, borne terminally in whorls of short, branching chains from upright, hyaline hyphae; perithecia, usually superficial, carbonaceous, globose to pyriform, smooth or sparsely hirsute below, 50μ to 200μ in diameter, with a long, slender beak, 600μ to 1,050μ by 20μ, terminated by a ring of hyaline bristles, 20μ by 2μ average; asci, fugacious, hyaline, pyriform to ovate, 10μ to 15μ by 8μ to 10μ; ascospores, 8, biseriate, hyaline, elliptical, often curved slightly, 5.5μ to 2.5μ average, exuded in a mucous mass.

On the wood of *Pinus ponderosa* Laws, staining it a blue-black color. Collector, H. von Schrenk, Sheridan, Wyoming, January, 1903.

---

(1) Published by permission of the Secretary of Agriculture.

* Hedgcock, G. G. Studies upon some chromogenic fungi which discolor wood. Mo. Bot. Gar. Rep. 17: 59-114. Pl. 4-12; 1906, issued as a separate, Sep. 27, 1906.

2. CERATOSTOMELLA SCHRENKIANA Hedgcock. Mo. Bot. Gard. Rept. *17*:67-69, pl. 4, fig. 1-4. Colonies with conidia white, changing to gray with the formation of perithecia; filaments hyaline to brown, 3μ to 7μ; conidia, hyaline, often guttulate when old, elliptical to cylindrical, 3μ to 7μ by 1μ to 2μ, borne terminally on upright hyphae in short, branching chains; perithecia, globose, 120μ to 200μ, black, carbonaceous, often slightly hirsute below, or with numerous globular outgrowths, with a beak 8 mm. to 1.2 mm. by 10μ to 25μ, surmounted at maturity with a ring of short, hyaline, spreading bristles, 10μ to 15μ by 2μ; asci, fugacious, ovate to pyriform; ascospores, hyaline, elliptical, often slightly curved, 2.5μ to 4μ by 1μ to 1.5μ.

On the wood of *Pinus echinata* Mill., staining it a blue-black color. Collector H. von Schrenk, Grandin, Mo., July, 1905.

3. CERATOSTOMELLA ECHINELLA E. & E. N. A. Pyr. 195 (1892). Emended, Hedgcock, Mo. Bot. Gard. Rept. *17*:69-71, pl 6, fig. 1. Colonies with conidia, white, changing to brown with perithecia; hyphae, hyaline to brown, 4μ to 7μ in diam.; conidia obovate to elliptical, 4μ to 6.5μ by 2μ to 3.5μ, borne in whorls of short, branching chains, from upright, hyaline hyphae; perithecia, globose or slightly flattened, 50μ to 100μ, glandular-pubescent, membranaceo-carbonaceous, with a long, slightly curved, striate beak, 1mm. to 1.7mm. by 15μ to 25μ, terminated with a ring of hyaline bristles, averaging 15μ to 25μ by 1.5μ to 2μ; glandular hairs on perithecium 10μ to 32μ in length, tapering from 1.5μ to 2.1μ in diam., with glandular, globose tip, 2μ to 3μ in diam.; asci, elliptical to clavate; ascospores, hyaline, cylindrical or slightly curved, biseriate, 4μ to 6μ by 1.2μ to 1.6μ, cream colored in mass.

On wood of *Fagus atropunicea* (Marsh.) Sud., staining it blue or brown. Collector H. von Schrenk, Kirbyville, Texas, July, 1906.

4. CERATOSTOMELLA CAPILLIFERA Hedgcock. Mo. Bot. Gard. Rept. *17*:71, 72, pl. 6, fig. 2, 3. Colonies with conidia white, changing to gray or brown, with perithecia; filaments, hyaline to brown 2μ to 6μ in diam.; conidia, hyaline, elliptical to cylindrical, 4μ to 8μ by 1.5μ to 2μ, borne in short branching chains, terminal from upright hyphae; perithecia, globose, often flattened, black, carbonaceous, slightly hirsute below, 90μ to 200μ, with a slong, slender beak, 1.5 mm. by 25μ, terminated in a ring of long slender, hyaline filaments, 80μ by 1μ; asci, fugacious, obovate; ascospores, 8, elliptic to reniform, 4.5μ to 1.5μ average.

On the wood of *Liquidambar styraciflua* L., staining it black. Collector H. von Schrenk, Marianna, Arkansas, July. 1905.

5. CERATOSTOMELLA PLURIANNULATA Hedgcock. Mo. Bot. Gard. Rept. *17*:72-74, pl. 5, fig. 2. Colonies with conidia white,

changing to black with perithecia; filaments hyaline to brown; conidia, hyaline elliptical or obovate, 5μ to 8μ by 2μ to 3μ, borne terminally on erect hyphae in short, branching chains finally falling together in clusters; perithecia globose 90μ to 120μ in diam. black, carbonaceous, slightly hirsute below, with a smooth beak, .9 mm. to 2.1 mm. by 10μ to 30μ, adorned by one or more rings of short, spiny bristles, one of which is terminal; asci, obovate; ascospores, hyaline, reniform to elliptical, 4μ to 5μ by 1.5μ to 1.7μ.

On the wood of *Quercus rubra* L., discoloring it. Collector P. Spaulding, southern Indiana, August, 1905.

6. CERATOSTOMELLA MINOR Hedgcock. Mo. Bot. Gard. Rept. 17:74-76, pl. 5, fig. 6, 7. Colonies with conidia, white, changing to black with perithecia; filaments, hyaline to dark brown, 1.5μ to 4μ in diam., often coarsely rugose in wood cells; conidia, hyaline, 4μ to 5.5μ by 1.8μ to 2μ average, oval to elliptical, borne terminally on upright hyphae in short, branching chains; perithecia solitary, numerous, spherical, black, carbonaceous, rugose, sparsely hirsute at the base, 40μ to 70μ in diam.; with a beak 120μ to 160μ by 6μ to 12μ surmounted at maturity by a ring of thick hyaline bristles; asci, fugacious, round to oval or pyriform; ascospores, 8, hyaline, 3.1μ to 4.2μ by .9μ to 1.9μ, usually in four.

On the wood of *Pinus arizonica* Eng., staining it blueish-black. Collector J. L. Webb, Flagstaff, Arizona, July, 1904.

7. CERATOSTOMELLA EXIGUA Hedgcock. Mo. Bot. Gard. Rept. *17*:76-78, pl. 6, fig. 4-7. Colonies with conidia white, changing to intense black with perithecia; filaments, hyaline to dark brown, often finely rugose in wood, 2μ to 6μ in diameter, conidia 3.5μ to 4.5μ by 1.6μ to 2.2μ, oval to elliptical, borne terminally on upright hyphae in short, branching chains falling together in rounded masses; perithecia, often gregarious, usually superficial, sparsely hirsute at base, black, carbonaceous, rugose, globose, 60μ to 80μ in diameter with a beak 150μ to 200μ by 8μ to 18μ, terminating in a ring of slender hyaline bristles; asci, fugacious, hyaline, pyriform to elliptical; ascospores, 8, often in fours, hyaline, elliptical to reniform, 2.1μ to 2.8μ by 0.8μ to 1.1μ.

On wood of *Pinus virginiana* Mill., staining it dark blue or black. Collector A. D. Hopkins, Kanawha, W. Va., Sept., 1904.

8. CERATOSTOMELLA MONILIFORMIS Hedgcock. Mo. Bot. Gard. Rept. *17*:78-80, pl. 5, fig. 3-5. Colonies with conidia, gray, changing to black, with the formation of perithecia; filaments, hyaline, 2μ to 8μ in diam., often granular, later brown or black; conidia, hyaline, 6μ to 8μ by 1.8μ to 2.2μ, elliptical to cylindrical, moniliform, collecting in masses, borne on simple or branching erect hyphae; perithecia brown or black, often membranaceous,

globose, 90μ to 180μ in diam., covered sparsely with conical spines, 12μ to 20μ in length by 1μ at the apex, and 6μ at the base; the beak is brown or black, .6 mm. to 1 mm. by 10μ to 30μ, striate, surmounted by thick, hyaline bristles, 12μ to 18μ by 2μ; asci, oval, 20μ by 10μ, fugacious; ascospores, 8, hyaline gray in mass, oval to elliptical often flattened on one side, 4μ to 5μ by 3μ to 4μ.

On the wood of *Liquidambar styraciflua* L., staining it brown. Collector H. von Schrenk, Kirbyville, Texas, July, 1906.

9. GRAPHIUM EUMORPHUM Sacc., Syll. Fung. 4:611, *Sporocybe eumorpha* Sacc. Fung. It. n. 942. (1881). Emended, Boulanger, Rev. Gén. de Bot. *7*:97-102, 166-170. (1895)., pl. 2-5. Hedgcock, Mo. Bot. Gard. Rept. *17*:87-88, pl. 7, fig. 1-5. Colonies white or gray, changing to light, or even dark green in the stromata; hyphae, 1μ to 2μ in diameter, hyaline to light green; secondary conidia, 7.8μ by 3.4μ, hyaline, often greenish yellow, borne singly or in whorled clusters on upright hyphae; primary conidia, 7.7μ by 3.4μ, hyaline, tinged with green, borne terminally on alternately branched hyphae in mucoid, stromatal heads; heads, spherical with mucous sheath, oval without, 30μ to 100μ in diameter, gray to iridescent green; stalks, simple or gregarious, dark to light green, or even yellow green, 300μ to 500μ in length, 10μ to 40μ in diameter; *Anthina*-like forms present.

On wood of *Rubus strigosus* L., staining it a dirty color. Missouri Botanical Garden, June, 1905. G. G. Hedgcock, collector.

10. GRAPHIUM ATROVIRENS Hedgcock, Mo. Bot. Gard. Rept. *17*:88-90, pl. 8, fig. 1-3. Colonies white, changing to dark green in the stromata; filaments, 3μ to 4μ, hyaline, changing to gray, green or olive; secondary conidia, 4μ to 5.5μ by 1.6μ to 2μ, hyaline, obovate to elliptical, guttulate when old, borne on simple hyphae in short, branching moniliform chains, finally adhering in masses; primary conidia, 3.5μ to 4.5μ by 1.4μ to 2μ, hyaline, obovate to ellipical, borne in flattened, oval, white to gray heads, which with mucous sheath measure 40μ to 600μ in diameter; stromatal stalks, usually solitary, slender hyaline to dark green, 1.5mm to 3mm. by 8μ to 80μ, base often slightly enlarged; tall, sterile, *Anthina*-like stalks often form.

On the wood of *Liquidambar styraciflua* L., Marianna, Ark., staining it black. Collected by H. von Schrenk, July, 1905.

11. GRAPHIUM SMARAGDINUM (A. & S.) Sacc. Syll. Fung. 4:618. Emended, Hedgcock, Mo. Bot. Garden Rep. 17:91, 92, pl. 9, fig. 8-10. Colonies white to gray-green or olive in stromata; filaments hyaline to dark green, 2μ to 4μ in diameter; secondary conidia 3.6μ by 1.8μ, hyaline, elliptical, borne continuously from the ends of simple or branched upright hyphae, collecting in mucoid masses; primary conidia, 3.2μ to 4.2μ by 1.7μ

to 2μ, hyaline, elliptical, borne from the ends of alternately branched hyphae in the stromatal heads; heads with mucous sheath, spherical, 40μ to 600μ, without sheath, fungiform, often with the edges recurved; stalks simple and gregarious, 1mm. to 2mm. by 8μ to 90μ, often enlarged in the center, sterile *Anthina*-like outgrowths of the stroma often present.

On the wood of *Liquidambar styraciflua* L., Marianna, Ark., staining it black. Collected by H. von Schrenk, July, 1905.

12. Graphium rigidum (Pers.) Sacc. Syll. Fung. 4:610, *Stilbum rigidum* Pers. Uster Annal. 1:32. Emended, Hedgcock, Mo. Bot. Gard. Rept. *17*:92-94, pl. 7, fig. 6-10. Colonies white, changing to brown or black in stromata; hyphae, 2μ to 4μ in diam., hyaline to gray or olive; secondary conidia, 3μ to 4.5μ by 1μ to 1.5μ, hyaline, elliptical, borne continuously and terminally from erect simple or branched hyphae, falling at once into mucoid masses; primary conidia, 3.5μ to 1.5μ, elliptical to cylindrical, hyaline, borne on alternately branched hyphae in stromatal heads; heads spherical, with mucous sheath, 20μ to 500μ in diam., white to a dingy yellow; stalks, 1 mm. to 2mm. by 10μ to 40μ, gray to brown or black, solitary or gregarious, rigid, not expanded.

On the sapwood of *Quercus rubra* L., staining the wood brown. Collector, P. Spaulding, Indiana, Sept., 1905.

13. Graphium aureum Hedgcock, Mo. Bot. Gard. Rept. *17*:94-96, pl. 9, fig. 5-7. Colonies white, changing to pale yellow or light brown in the stromata; filaments, 2μ to 3μ, hyaline to light brown; secondary conidia, 4μ to 8μ by 1μ to 2μ, obovate to clavate, hyaline, guttulate when old, borne in short, branching moniliform chains or in clusters of simple conidia; primary conidia, 4μ to 5μ by 1μ to 2μ, hyaline, obovate, borne terminally on filaments of the flattened, oval head; head with mucous white to yellow, spherical, 15μ to 240μ in diameter; stromatal stalks, simple or gregarious, 50μ to 750μ by 10μ to 90μ; sterile, *Anthina*-like stalks are often present.

On sapwood of *Pinus strobus* L., Ashland, Wisconsin, staining it a dirty color. Collected by H. von Schrenk, April, 1905.

14. Graphium album (Corda) Sacc. Syll. Fung. 4:618, *Ceratopodium album* Corda Ic. Fung. 1:20. Emended, Hedgcock, Mo. Bot. Gard. Rept. *17*:96-97, pl. 9, fig. 1-4. Colonies white, changing to light yellow or orange in the stromata; filaments hyaline to yellow or light brown, 2μ to 3μ in diameter; secondary conidia, 4μ to 6μ by 1μ to 2μ, hyaline, obovate to clavate, guttulate when old, borne in short, branching moniliform chains terminally from erect hyphae; primary conidia 3μ to 5μ by 1μ to 1.5μ, hyaline, obovate, borne terminally on the filaments of the stromatal heads; heads white to creamy yellow, or even a light brown when old and dry, spherical with mucous, 20μ to 600μ in diameter, without mucous a flattened oval to fungi-

form, stalks .3mm. to 2mm. by 30μ to 300μ, varying from yellow to dark brown at the base; *Anthina*-like, stromatal forms present.

Found on sapwood of *Fagus atropunicea* (Marsh.) Sud., staining it brown. Collected by P. Spaulding, Arkansas, Sept., 1905.

15. GRAPHIUM AMBROSIIGERUM Hedgcock, Mo. Bot. Gard. Rept. *17*:85-86, pl. 8, fig. 4-7. Colonies white, changing to brown in stromata; filaments 1.5μ to 2.5μ, hyaline to brown; secondary conidia 3.7μ by 1.3μ, hyaline, oval to elliptical, borne in whorled clusters of simple conidia on upright hyphae; primary conidia 5μ by 3μ, borne on filaments in stromatal heads; heads oval without mucous sheath, white to dark brown, with sheath, spherical, 30μ to 300μ; stalks black or brown, 500μ to 900μ by 10μ to 40μ, simple or gregarious.

On the sapwood of *Pinus arizonica* Eng. in beetle holes staining it black. Collected by J. L. Webb, Flagstaff, Arizona, July, 1904.

16. FUSARIUM ROSEUM Link Sp. Pl. Fungi 2:105. *Fusidium roseum* Link Obs. 2:31. Colonies white, changing to pink, red, or lilac; microconidia one- to two-celled, hyaline, oval to elliptical, 8μ to 14μ by 3μ to 6μ, often uninucleate; macroconidia, 19μ to 30μ by 3.5μ to 6μ, straight or slightly curved, fusiform, two- to four-celled; chlamydospores, spherical, or slightly flattened, granular, yellow to dark brown, 10μ to 14μ in diameter; dark green or brown sclerotia present in cultures on boiled potato; staining pine sapwood pink to lilac.

On the sapwood of *Pinus strobus* L., Ashland, Wisconsin. Collected by H. von Schrenk, April, 1905.

Saccardo gives several varieties of *Fusarium roseum*, most of which differ greatly in the size of the microconidia. Those of our fungus are smaller than most of the measurements given by Saccardo, making it a little doubtful if the species is *F. roseum*.

17. HORMODENDRON CLADOSPORIOIDES (Fres.) Sacc. Mich. 2:148. *Penicillium cladosporioides* Fres. Beitr. 3:22. Colonies, gray or greenish yellow, changing to velvety brown or black; filaments, gray to olive, 2μ to 8μ; sporophores, 100μ to 400μ by 3μ to 4μ, with branches one to three-septate, measuring 6μ to 15μ by 3μ to 5μ; conidia, 3μ to 7μ by 2μ to 4μ, usually unicellular, oval, olive, or brown, in short, branched chains of two to six, staining sapwood black.

On the sapwood of pine, elm, gum and oak, Missouri and Arkansas. Collected by H. von Schrenk and Geo. G. Hedgcock.

18. HORMODENDRON GRISEUM Hedgcock, Mo. Bot. Gard. Rept. *17*:100, 101, pl. 10, fig. 2. Colonies gray, changing to dingy black, furry; filaments, granular, hyaline to gray or black, 3μ to 10μ in diameter; sporophores, 20μ to 800μ by

3μ to 4μ, with branches one to three-septate, measuring 6μ to 14μ by 3μ to 4μ; conidia 3μ to 6μ by 2μ to 4μ, usually unicellular, pointed oval, gray to sooty, borne in short, branched chains of 2 to 10; staining sapwood black.

On the wood of *Liquidambar styraciflua* L., from various points in Arkansas. Collected by H. von Schrenk, July, 1905.

19. HORMISCIUM GELATINOSUM Hedgcock, Mo. Bot. Gard. Rept. *17*:101-103, pl. 11, fig. 4-8. Colonies yeast-like at first, creamy, changing to brown or black, finally becoming fimbriate or toruloid; filaments, often toruloid or beaded, cylindrical cells 5μ to 10μ in diameter, and spherical cells 2μ to 8μ; conidia borne both on prostrate and upright hyphae, dimorphus, the form on prostrate hyphae is of two types, the one hyaline, elliptical, thin-walled, fugacious, 8μ to 12μ by 3μ to 5μ, the other brown, elliptical, thick-walled, 10μ to 14μ ; the form on short, upright hyphae, globose dark olive, 7μ to 12μ in diameter, borne in chains which do not break apart readily; staining sapwood black.

On the sapwood of pine, elm and gum, from various points in Arkansas and Missouri, collected by H. von Schrenk and Geo. G. Hedgcock, 1905.

20. PENICILLIUM AUREUM Corda, Prachtfl. 18:38, Sacc. Syll. Fung. 4:82. Emended, Hedgcock, Mo. Bot. Gard. Rept. *17*:105-107, pl. 11, fig. 1-3. Colonies, gray, or sometimes blue green, changing to lemon yellow, or orange red; mycelium, dimorphus, filaments, 3μ to 8μ in diameter, cells sometimes swollen or beaded; sterile hyphae, curled and distorted, lemon yellow on acid media, orange red on alkaline, bearing exuded granules of a soluble pigment which is yellow with acid, and red with alkali; fertile hyphae, erect, 100μ to 500μ by 3μ, often with two sets of whorled branches, each branch averaging 12μ by 2μ; conidia blue green, pointed oval 3μ to 4μ by 1.5μ to 2μ, borne in simple chains of 40 to 80, containing a soluble blue green pigment, not changed in color by acids or alkalis; staining pine sapwood yellow or red. *Coremium* forms often present on rich agar media.

On the sapwood of *Pinus strobus* L., Ashland, Wisconsin, collected by H. von Schrenk, April, 1905.

NOTES FROM MYCOLOGICAL LITERATURE. XXI.

W. A. KELLERMAN.

Durand, Elias J.

Elias J. Durand gives in the Jan. No. of the Journal of Mycology (1906) his conclusions from an extended study of Peziza fusicarpa Ger. and Peziza semitosta B. & C. He says these observations are based on about 50 separate collections, besides numerous ungathered plants in the field. He says: "My conclusions based upon a study of the material indicated may be stated briefly as follows: *Peziza fusicarpa* Ger. (1873), P. *pubida* B. & C. (1875), and P. *morgani* Mass. (1902) are specifically identical and synonymous; P. *semitosta* B. & C., while closely allied to P. *pubida* B. & C., is not identical with it, but is specifically distinct; P. *hainesii* Ell. (1881) is identical with P. *semitosta* B. & C. (1875), as recently stated by Ellis himself. (Jour. Mycol. 10:170.)"

Kellerman, W. A.

Notes from Mycological Literature XIII-XVII, were given by W. A. Kellerman, in 1905, in the January, March, May, July and November Nos. of the Journal of Mycology. The gist of each article noted is stated in a single short paragraph, and every mycological paper published in this country, and the important ones in foreign journals, are included.

Kellerman, W. A.

Uredinous Culture Experiments with Puccinia sorghi, 1905, W. A. Kellerman, Journal of Mycology, Jan. 1906, notes experiments in April and May 1905, using teleutospores from sweet corn and obtaining Aecidia on Oxalis. An outline of previous work with this Rust is given, — inoculation of the maize plant with material from teleutosporic pustules then was probably due to the fact that a few uredospores viable were harbored by these sori. "Doubtless then the Rust of Maize is carried over from year to year in part by means of surviving uredospores."

Missouri Botanical Garden, 16th Annual Report, 1905.

The sixteenth Annual Report of the Missouri Botanical Garden (1905) contains the following mycological articles: Perley Spaulding, A Disease of Black Oaks caused by Polyporus obtusus; Herman von Schrenck, On the Occurrence of Peronospora parasitica on Cauliflower; George Grant Hedgcock, A Disease of Caulflower and Cabbage caused by Sclerotinia; George Grant Hedgcock, A Disease of Cultivated Agaves due to Colletotrichum.

Missouri Botanical Garden, 15th Annual Report, 1904.

Two mycological articles appeared in the 15th Annual Report of the Missouri Botanical Garden, 1904, namely: Perley Spaulding, Two fungi growing in holes made by wood-boring insects; and Wm. Trelease, Aberrant veil Remnants in some Edible Fungi.

Missouri Botanical Garden, earlier Reports.

In earlier volumes of the Reports of the Missouri Botanical Garden mycological articles appeared as follows [12th Report, 1901] Hermann von Schrenk, A Disease of the Black Locust (Robinia Pseudacacia L); [11th Report, 1900] Hermann von Schrenk, A Disease of Taxodium distichum known as Peckiness, also a similar disease of Libocedrus decurrens known as Pinrot; [10th Report, 1899] Hermann von Schrenk, A sclerotoid Disease of Beech Roots; [9th Report] Wm. Trelease, A new Disease of Cultivated Palms.

Arthur, J. C.

J. C. Arthur's Cultures of Uredineae in 1904, see Journal of Mycology, March 1905, involved 264 sowings of spores representing 40 species of rusts for which purpose were required 119 species of hosts temporarily grown in pots in the greenhouse. A new description of Melampsora bigelowii Thüm. is furnished — this rust occurring on Salix amygdaloides Anderss. and many other species of Salix throughout the United States and Canada. A description of Aecidium clematitis Schw. is given, also of Puccinia stipae Arth., for which heretofore the aecidium had not been characterized (on Aster multiflorus Ait., A. ericoides L. & A. novae-angliae L). The summary gives a list of the successful cultures, 16 species previously reported and 5 reported now for the first time. The latter are quoted: "I. Melampsora bigelowii Thuem. — Teleutospores on *Salix amygdaloides* Anders. sown on *Larix decidua* Mill.; 2. Puccinia tomipara Trel. — Teleutospores on *Bromus ciliatus* L. sown on *Clematis Virginiana* L.; 3. Puccinia stipae Arth. — Teleutospores on *Stipa spartea* Trin. sown on *Aster multiflorus* Ait., A. *ericoides* L., and A. *Novae-Angliae* L.; 4. Puccinia sorghi Schw. — Aecidiospores on *Oxalis cymosa* Small sown on *Zea Mays* L.; 5. Puccinia podophylli Schw. — Aecidiospores on *Podophyllum peltatum* L. sown on same host."

Kellerman, W. A. and Ricker, P. L.

The First Supplement to New Genera of Fungi Published Since the Year 1900, with Citation and Original Descriptions, compiled by W. A. Kellerman and P. L. Ricker, gives the citation and reproduces the descriptions of nearly 100 genera most of which were published in 1904. The alphabetical arrangements under large groups is the same in style as the first paper published the preceding year. See Journal of Mycology, March 1905.

Kellerman, W. A.

THE UREDINEOUS INFECTION EXPERIMENTS IN 1904 by W. A. Kellerman, Journal of Mycology, Jan. 1905, deals with cultures made with Puccinia sorghi Schw., on the six 'agricultural species' of maize and on Puccinia helianthi Schw., on many species of Helianthus, Peridermium pini on Campanula americana, and Puccinia thompsonii on Sambucus candensis.

Kellerman, W. A.

OHIO FUNGI, FASCICLE X, W. A. KELLERMAN, Journal of Mycology, Jan. 1905, gives (as in case of the nine preceding fascicles) the labels used for exsiccata. These indicate the host, locality, date, collector, and reproduce verbatim et literatim the original description in each case. This set carries the serial No. up to 200.

Morgan, A. P.

A. P. MORGAN GIVES A BRIEF NOTE ON THE GENUS GIBELLULA CAVARA in the March No. of the Journal of Mycology (1905), conjecturing the final disposition of the same, then adds a new species, namely, Gibellula capillaris Morgan n. sp., growing out of very small dead insects among the old leaves in woods. There are as many as a dozen growing out of one small insect, curved and coiled about it like a bundle of hairs.

Schrenk, Herman von.

HERMAN VON SCHRENK REPORTS ON THE OCCURRENCE OF PERONOSPORA PARASITICA ON CAULIFLOWER, in the 16th Annual Report of the Missouri Botanical Garden, 1906. The interest centers in the fact of the very local and sporadic appearance of the Mildew on this host. Three half-tone plates illustrate diseased leaves.

Hedgcock, George Grant.

GEO. GRANT HEDGCOCK PUBLISHES IN THE 16TH ANNUAL REPORT of the Missouri Botanical Garden (1905) a brief but interesting account of A Disease of Cauliflower and Cabbage caused by Sclerotinia. "Cultures carefully taken from the interior of decaying cauliflower stems, quite uniformly produced colonies of a fungus with a white fluffy mycelium. These were transferred and the fungus studied in all its stages and identified as Sclerotinia libertiana Fckl." Three plates illustrate the species — showing apothecia, sclerotia, and pure cultures on agar slant tubes.

Magnus, P.

In "Notwendige Umänderung des Names der Pilzgattung Marssonia Fisch," von P. Magnus, Hedwigia, Band XLV, Heft 2, 16 Jan. 1906, it is noted that Marssonia is a phanerogamic genus instituted by H. Karsten in his Flora Columbia I (1858-1861), which antedates Fischer's name Marssonia (1874) and that the correct spelling is with two *s's,* instead of only one as given by Saccardo — the genus having been named for Th. Fr. Marsson, Apotheker in Greifswald. Magnus has accordingly changed the named of the genus of fungi from Marssonia to *Marssonina.* About two dozen American and all the other species are renamed.

Beardslee, H. C.

The "Amanitas of Sweden," H. C. Beardslee, Journal of Mycology, Sept. 1905, is a report of observations of the previous summer. They are notes outlining some of the impressions of an American mycologist, gained from a study of the Amanitas with which Fries and his associates were familiar. Nine species are included, viz., A. verna, muscaria, pantherina, spissa, rubescens, porphyria, mappa, strangulata, and vaginata.

Atkinson, Geo. F.

Geo. F. Atkinson gave in the November No. of the Journal of Mycology, 1905, an extended account of the "Genera Balansia and Dothicloe in the United States with a consideration of their Economic Importance." It is based on a thorough study of the species; some descriptions and new names are given. The paper is illustrated by eight full page plates.

Sydow, H. et P.

The "Novae Fungorum species — III," auctoribus H. et P. Sydow, includes eight species, three being from North America, one from the Philippines, one from Germany and three from South America. The following new genus is proposed: Botryoconis Syd. nov. gen. Melanconiacearum — Acervuli primo subcutaeni (ut videtur), demum erumpentes, pulvinato-effusi. Conidia in capitula unita vel botryosoaggregata, colorata, continua. — Drepanoconi Schroet. et P. Henn. vedetur affinis.

Hoehnel, Franz v.

"Mycologische Fragmente" von Prof. Dr. Franz v. Hoehnel in Wien, pertains to about eight species all of which have been critically studied. A new genus is proposed, namely, *Unguicularia* which unterscheidet sich von Pezizella und Dasyscypha, denen die Gattung am nächsten steht, durch die sehr dickwandigen scharf spitzen Haare der Apothecien.

Vuillemin, P.

The "Recherches sur les Champignons parasites de feuilles de Tilleul" (Cercospora, Phyllosticta, Helminthosporium) par le Prof. P. Vuillemin, in Annales Mycologici, October 1905, notes a number of species which attack the Lindens. Cercospora microsora Sacc. (C. tiliae Peck) and Helminthosporium tiliae Fries are more fully discussed and text figures are given. Also a new species, from France is discussed: Phyllosticta bacteroides Vuill. n. sp. on living leaves of Tilia silvestris associated with Cercospora microsora.

Sumstine, D. R.

"Another Fly Agaric" is the title of a note by D. R. Sumstine in the November No. of the Journal of Mycology, 1905. The author states that flies which had remained on plants of Amanita olitaria Bull. for a short time fell over dead. "After two hours the box was again examined, but the flies which once were dead were now alive and had departed with no more serious results possibly than a severe headache from their mycological 'booze.' "

Dietel, P.

In P. Dietel's "Beschreibungen einiger neuer Uredineen," total fourteen species, we find the following pertaining to North America: Puccinia caricis-polystachyae Diet. n. sp. on Carex polystachya Wahl., Mexico, and P. solidaginis-mollis Diet. n. sp. on leaves of Solidago mollis Bartl., Utah.

Rick.

Rick, Fungi austro-americani Fasc. III u IV. 43-80." Annales Mycologici, August. 1906. New species are: Nectria follax Rick n. sp.; Erinella subcervina Bres. n. sp.; Rosellinia rickii Bres. n. sp.; Chlorosplenium atroviride Bres. n. sp.; Lembosia pachyasca Bres. n. sp.

Fairman, Charles E.

The "Pyrenomycetae novae in leguminibus Robiniae" by Charles E. Fairman, includes descriptions of the following new species: Leptosphaeria lyndonville; L. eustoma f. leguminosa; Metasphaeria lyndonvillae; M. leguminosa; and Pleospora aureliana.

Maire, René.

The interesting article by René Maire in the August No. of Annales Mycologi, 1906, entitled "Notes Mycologique," deals with about a dozen species. One that should be noted here perhaps is the parasite of Lactarius deliciosus given in Saccardo's Sylloge as Hypomyces deformans, but is Peckiella lateritia (Fr.)

R. Maire. The author found that the spores are verrucose but the cavity not divided, not septate as stated in the description. This species therefore is referred to the genus Peckiella. He gives the synonomy as follows. Sphaeria lateritia Fr. ; Hypomyces lateritius Tul.; Hyp. vuilleminianus R. Maire; Peckiella vuilleminiana Sacc. et Syd.; Sphaeria deformans Lagg.; Hypomyces deformans Sacc. Syll. "Il est probable qu'un certain nombre d'autres *Hypomyces* devront aussi être rangés dans le genre *Peckiella* lorque leurs spores auront été mieux etudiées."

Morgan, A. P.

A. P. Morgan gives in the January No. of the Journal of Mycology, 1905, a note on "Sphaeria Calva Tode," and furnishes a new description of the plant under the name of Rossellinia (Coniochaeta) calva Tode.

Morgan, A. P.

"A new Chaetosphaeria" (C. ludens Morgan n. sp.) is described in the May No. of the Journal of Mycology by A. P. Morgan. The plant was growing on old wood of Acer.

Lawrence, W. H.

W. H. Lawrence in "Notes on the Erysiphaceae" of Washington, furnishes an annotated list of 17 species.

Ellis, E. and Bartholomew, E.

"Two new Haplosporellas" — H. diatrypoides E. & B. and H. cercidis E. & B. — both collected by Mr. Bartholomew at Natoma, Kansas, are described by J. B. Ellis and E. Bartholomew, in the Journal of Mycology, May 1905.

Beardslee, H. C.

H. C. Beardslee furnishes a brief account of the genus Clitopilus, a key to the common species. Two full-page plates and some notes on C. noveboracensis, C. abortivus, C. prunulus, and C. orcella, in the Journal of Mycology, May, 1905. The title of the article is "The Rosy spored Agarics or Rhodosporae."

Ricker, P. L.

P. L. Ricker in "Notes on Fungi — II, With new species from various localities," gives a description of new species as follows: Phyllosticta amphipterigii Ricker n. sp., Tilletia eragrostidis Clinton & Ricker, n. sp., Ustilago duthiei Ricker, n. sp., U. sieglingiae Ricker, n. sp., Puccinia aeluropi Ricker, n. sp., P. kreageri Ricker, n. sp., P. paradoxica Ricker, n. sp., P. piperi Ricker, n. sp., & P. leptospora n. sp. Puccinia actinomeridis Magnus is P. verbesinae Schw. and the type host is not Actinomeris squarrosa but Vebesina occidentalis. See Journal of Mycology, May 1905.

Hedgcock, George Grant.

"A Disease of Cultivated Agaves due to Colletotrichum," namely *C. agaves* Cav., is reported by George Grant Hedgcock (see 16th Rep. Mo. Bot. Gar. 1905) as occurring on leaves of A. americana, A. atrovirens, A. horrida, A. marmorota, A. potatorum, A. utahensis, and A. spp. — often causing the death of younger plants. No ascigerous stage was found. A half-tone plate shows a plant killed, and one partially killed by the fungus; another shows typical diseased areas with acervuli; and a third illustrates acervuli young and older, setae, conidiophores and conidia.

Hasselbring, Heinrich.

An experimental study has been made by Heinrich Hasselfring of the "Appressoria of the Anthracnoses," published in the August No. of the Botanical Gazette, 1906. These peculiar spore-like organs, produced by the germ tubes of spores, were recognized by Frank in 1883, who observed that they acted as holdfasts. They were regarded by some investigators as "secondary spores," but Frank first recognized the true nature of these bodies, and gave to all organs of this class the name *appressoria* or adhesion organs. American writers on the bitter rot seem not to have regarded the work done by the foreign investigators and in order to clear up the uncertainty expressed in the literature experiments and observations were made by Mr. Hasselbring whose summary affirms that these spore-like organs formed by the germ tubes of the anthracnose, are adhesion organs, by means of which the fungus is attached to the surface of its host during the early stage of infection. They are not suited for dissemination and therefore are not to be regarded as spores. The adhesion discs are formed as a result of stimuli from mechanical contact acting on the germ tubes.

Bates, J. M.

The "Rust notes for 1904" by J. M. Bates in the Journal of Mycology for May, 1905, deals principally with Puccinia on Distichlis stricta, a cosmopolitan rust, the aecidia on Chenopodium, Cleome and Lepidium. Reference is also made to Uromyces astragali on Astragalus lotiflorus nebraskensis Bates, A. plattensis and A. crassicarpus.

Thom, Charles.

Charles Thom gives "Some Suggestions from the study of Dairy Fungi" in the Journal of Mycology, May 1905. The paper attempts to present a plan for obtaining more definite knowledge of these forms by the dairy student in the use of his own methods.

Morgan, A. P.

"A New Species of Kalmusia" by A. P. Morgan, Kalmusia aspera Morgan n. sp. is described in the July No. of the Journal of Mycology, 1905. The plant occurred on the hard wood of a prostrate trunk of Gleditsia.

Morgan, A. P.

A. P. Morgan gives a short note on "Peziza pubida B. & C." in the Journal of Mycology, July 1905.

Davis, J. J.

J. J. Davis publishes "A New Species of Synchytrium" — S. scirpi Davis n. sp. on leaves of Scirpus atrovirens Muhl, Kenosha Co., Wisconsin. See Journal of Mycology, 11:154. Pl. 78, July 1905.

Holway, E. W. D.

E. W. D. Holway gives "Notes on North American Salvia Rusts" as follows: Puccinia verti-septa Tracy and Gal., P. caulicola Tracy and Gal., P. mitrata Syd., P. griseola Lagh. Also new species, namely, Puccinia infrequens Holway n. sp. on Salvia albicans and S. chrysantha; and P. nivea Holway n. sp., on Salvia purpurea.

Clevenger, Joseph F.

The "Notes on some North American Phyllachoras" by Joseph F. Clevenger in Journal of Mycology, July 1905, pertains to Ph. trifolii, Ph. ambrosiae, Ph. diplocarpi, Ph. graminis, Ph. lespedezae, Ph. cornuospora, P. junci, illustrated by twenty-four outline drawings.

Lawrence, W. H.

"Blackspot Canker and Blackspot Apple Rot," Macrophoma curvispora Peck, Gloeosporium malicorticis, Myxosporium curvisporium (Peck) Sacc. in Litt., occurring in British Columbia, Western Oregon, and Western Washington where it is prevalent, also descriptive notes are given. See W. H. Lawrence in Journal of Mycology, July 1905.

Sumstine, D. R.

Under the caption of "Gomphidius Rhodanthus Once More," D. R. Sumtsine, in July No. of the Tournal of Mycology, 1905, gives the synonomy as follows: Clitocybe pelletieri Lév., Paxillus paradoxus Cooke, Flammula paradoxa Kalch., Flammula Tammii Fr. And this is the proposed new name: Boletinus rhodanthus (Schw.) Sumstine n. n.

Hedwigia, Band XLIV, Heft 4, Apr. 1905.

In this No. of Hedwegia we find a single article to note, viz., Lichenologisches, von Max Britzelmayer. The subheads of the article are: I. Lichenen vom Hochfelln und Hochgern; II. Cladonia gracilis L.; III. Cladonia rangiformis Hoff.; IV. Secidella goniophila Flk.

Rabenhorst's Kryptogamen-flora, Pilze, 100. Liferung, 30 Aug. 1906.

The 100 Lieferung of Rabenhorst's Kryptogamen-flora (by Dr. G. Lindau) issued 30 Aug. 1906, completes the genus Ramularia; also the Abteilung Hyalohelicosporaeae and Hyalostaurosporae. The family Dematiaceae is then taken up, the Unterabteilung Coniosporeae completed and the Unterabteilung Toruleae begun. New species described are: Ramularia helvetica on hieracium albidum; R. hamburgensis on Hieracium vulgatum; Coniosporium caricis-montanae on Carex montana, C. papyricola; Fusella typhae on dead leaves of typha latifolia.

Annales Mycologici, vol. IV. No. 4. Aug. 1906

The contents of Annales Mycologici, Aug. 1906, are: Dietel, P., Beschreibungen einiger neuer Uredineen; Rick, Fungi austro-americani Fasc. III. u. IV; Fitch, Ruby, The Action of Insoluble Substances in Modifying the Effect of Deleterious Agents upon the Fungi; McAlpine, D., Australian Acacia Rusts with their specific Hosts; McAlpine, D., A new Aecidium on Acacia; Fairman, Charles E., Pyrenomycetae novae in leguminibus Robiniae; Maire, René, Notes mycologiques; Rehm, H., Ascomycetes novi; Rehm. Zum Gedächtnis an J. B. Ellis; Sydow, H. et P., Novae Fungorum species — III; Neue Literatur; Referate und Kritische Besprechungen.

Rehm, H.

Under "Ascomycetes novi" H. Rehm describes in Annales Mycologici, August 1906, (1) Ascomycetes Americae borealis, seven species; (2) Ascomycetes hungarici, three species; (3) Discomyces gallicus, one species; (4) Discomyces graecus, one species; (5) Pyrenomyces Africae autralis, one species.

Fink, Bruce.

In an article in the Bryologist for March 1906 (9:21-4), Bruce Fink gives "Further Notes on Cladonias VI," discussing Cladonia cariosa, Cladonia cariosa corticata Wainio, and Cladonia squammulosa (Mull.) Wainio.

VanHook, J. M.

"Ascochyti pisi, a Disease of seed peas," published in the Ohio Naturalist for April 1906 (6:507-512) by J. M. Van Hook, reports the exceptional blighting of peas throughout Ohio during the season of 1904 and 1905. It is noted as the most important thing in connection with the life history of the fungus, that it grows through the husk into the seed. Frequently, when the pod contains no seed, the mycelium will grow through, forming similar spots on both sides of the pod. When the mycelium passes into the seeds brown spots are formed on the surface. Pycnidia are formed on the dead areas of the stems, leaves, pods, and seed, and even on the dead stems and branches. Cultures are reported; also seed treatment with mercuric chloride and with formalin, the results for the most part not only unsuccessful but negative. As hosts are named all the examined varieties of the common pea; but the reported hosts Medicago sativum, Cicer arietinum, Phaseolus vulgaris and Vicia villosa were here free.

Holway, E. W. D.

E. W. D. Holway gives in the Journal of Mycology, Nov. 1905, "Notes on Uredineae IV," these being Puccinia uniformis Pam. & Hume; P. oblicus B. & C.; P. fragilis Tracy & Gal.; P. purpusii P. Hen.; P. arabicola E. & E.; and Uromyces oblonga Vize.

Sturgis, W. C.

W. C. Sturgis, under the title "Remarkable occurrence of Morchella escalenta (L.) Pers," says: "On September 11th the writer was skirting the precipitous side of a mountain at an altitude of about 7,000 feet, and while passing through what had been a fairly good growth of aspens and small spruces, a few fine specimens of *Morchella* were noticed. Further search revealed the presence of these plants literally in hundreds. A fire had passed across the mountain in June, 1904, leaving only skeletons of the trees standing and charring the ground to such a depth that no trace of green vegetation had since appeared. Yet under these unfavorable circumstances and at a season when snow had already fallen not far from the locality, a bushel of *Morchellas* might have been gathered within a radius of one hundred yards." See Journal of Mycology, November 1905.

Sherman, Helen.

Helen Sherman gives the "Host plants of Panaeolus epimyces Peck," in the Journal of Mycology, July 1905, with a full page illustration, showing a well-developed plant attached to its host, a later stage of the same, also very young carpaphore.

INDEX TO NORTH AMERICAN MYCOLOGY.

Alphabetical List of Articles, Authors, Subjects, New Species and Hosts, New Names and Synonyms.

W. A. KELLERMAN.

(Continued from page 128.)

AMERICAN Mycological Society, New Orleans meeting, January 1, 1906. Report of the Secretary, C. L. Shear. Jour. Mycol. 12:85-6. Mar. 1906.

AMPHISPHAERIA abietina Fairman n. sp., on bark of some fallen tree in the woods. Proc. Rochester Acad. Sci. 4:219. March 1906.

AMPHISPHAERIA aeruginosa Fairman n. sp., on old board (Tilia) lying on the ground. Proc. Rochester Acad. Sci. 4:221. March 1906.

AMPHISPHAERIA bertiana Fairman n. sp., in moist cavities in the end of a rotten log. Proc. Rochester Acad. Sci. 4:217. March 1906.

AMPHISPHAERIA polymorpha Rehm n. sp., on bark of fallen log, probably Ulmus. Proc. Rochester Acad. Sci. 4:222. March 1906.

ANEMONE tetonensis, host to Pyrenophora ampla Syd. n. sp. Ann. Mycolog. 4:343. Aug. 1906.

ANONA cherimolia, host to Bonanseja mexicana Sacc. n. sp. Jour. Mycol. 12:51. Mar. 1906.

ANTHROCNOSES, see *Appressoria of . . .*

ANNULARIA sphaerospora Peck, n. sp., decaying wood of elm. Bull. Torr. Bot. Club, 33:216. Apr. 1906.

APPLE Rot, A New [Alternaria sp. indescr.] Col. Agr. Exp. Sta. Bull. 105:1-12. Nov. 1905.

APPRESSORIA of the Anthracnoses. Heinrich Hasselbring. Bot. Gaz. 42:135-142. August 1906.

AQUILEGIA leptocera, host to Excipula rostrata Syd. n. sp. Ann. Mycolog. 4:344. Aug. 1906.

ARCTOSTAPHYLUS tomentosa, Madrona de arbol, host to Gloeosporium apiosporium Sacc. n. sp. Jour. Mycol. 12:51. Mar. 1906.

ARTHUR, J. C. On the Nomenclature of Fungi Having Many Fruit-forms. Plant World, 8:71-76, 99-103. Mar. & Apr. 1905.

ARTHUR, Joseph Charles & Kern, Frank Dunn. North American Species of Peridermium. Bull. Torr. Bot. Club, 33:403-438. Aug. 1906.

ARTHUR, J. C. & Kern, F. D. North American Species of Peridermium [Abstract]. Science N. S. 23:203. 9 Feb. 1906.

ARMILLARIA mellea, see *Development of [abstract] . . .*

ASCLEPIAS verticillata, host to Rhabdospora demetriana Bubák n. sp. Jour. Mycol. 12:55. Mar. 1906.

ASCOCHYTA pisi — a disease of Seed Peas. J. M. Van Hook. Ohio Naturalist, 6:507-512. Apr. 1906.

Cobb, N. A. Gumming of the Sugar Cane [Pseudomonas vascularum]. Rep. Exp. Sta. of the Hawaiian Sugar Planters' Assoc. Division of Pathology and Physiology, Bull. 3:1-46. Honolulu 1905.

Colletotrichum Agaves, Disease, see *Disease of cultivated* . . .

Collybia brunnescens Peck, n. sp., in open places or in thin woods. Bull. Torr. Bot. Club, 33:214. Apr. 1906.

Color production, Some Factors concerned in the, in a species of Fusarium. J. B. Pollock. Science, N. S. 23:422-3. 16 Mar. 1906.

Coniothyrium olivaceum Bon. apud Fuck. var. tecomae Sacc. n. var., in ramis morientibus Tecomae radicantis. Ann. Mycolog. 4:276. 5 June 1906.

Contributions to the recorded Fungus and Slime-Mould Flora of Long Island. [List of 20 species.] G. A. Reichling. Torreya, 5:85-7. May 1905.

Cook, Melville T., Informe del Departamento de Patologia Vegetal [general account in Spanish of a few parasitic fungi and insects]. Primer Informe An. Estacion Cen. Agronom. Cuba, 1:147-207. 1 June 1906.

Cook, Melville Thurston and Horne, William Titus. Fungous Diseases [of Coffee in Cuba]. Estacion Cen. Agr. de Cuba, Bull. 3:16-19. Pl. V. Sept. 1905.

Coriolellus Murrill n. gen. Polyporaceae, type Trametes sepium Berk. Bull. Torr. Bot. Club, 32:481. Sept. 1905.

Coriolellus sepium (Berk.) Murrill n. n. [Trametes sepium Berk.] Bull. Torr. Bot. Club, 32:481. Sept. 1905.

Coriolopsis Murrill n. gen. Polyporaceae, type Polyporus occidentalis Kl. Bull. Torr. Bot. Club, 32:358. July 1905.

Coriolopsis crocata (Fr.) Murrill n. n. [Polyporus crocatus Fr., P. byrsinus Mont., Polystictus crocatus Fr.] Bull. Torr. Bot. Club, 32:358. July 1905.

Coriolopsis gibberulosa (Lev.) Murrill n. n. [Polyporus gibberulosus Lev., Polystictus extensus Cooke.] Bull. Torr. Bot. Club, 32:359. July 1905.

Coriolopsis occidentalis (Kl.) Murrill n. n. [Polyporus occidentalis Kl., P. lenis Lev., Polystictus cyclodes Fr.] Bull. Torr. Bot. Club, 32:358. July 1905.

Craterellus pogonati Peck, n. sp., on moss, Pogonatum alpinum Roehl. Bull. Torr. Bot. Club, 33:218. Apr. 1906.

Crepidotus (Nees) S. F. Gray, not Crepidotus (Fr.) Quél., Pleurotus (Clytocybarii & Eu-Pleurotus) Sacc. Syll. Informe An. Estac. Agronom. Cuba, 1:235. 1 June 1906.

Crepidotus lentinoides Earle n. sp. [Cuba.] Informe An. Estac. Agronom. Cuba, 1:236. 1 June 1906.

DIDYMELLA arthoniaespora Rehm n. sp., on bark of some fallen tree in the woods. Proc. Rochester Acad. Sci. 4:221. March 1906.

DILOPHOSPHORA alopecuri. [Notes on Dilophospora alopecuri (Fr.) Fr. on Calamagrostis canadensis, in Wisconsin]. Ernst A. Bessey. Jour. Mycol. 12:57-8. Mar. 1906.

DIPLODINA anomala Sacc. n. sp., in cortice atrato Aceris sp. Ann. Mycolog. 4:277. 5 June 1906.

DISEASE of Black Oaks caused by Polyorus obtusus Berk. Perley Spaulding. An. Rep. Mo. Bot. Gard. 16:109-116. Pl. 13-19. 1905.

DISEASE of Cauliflower and Cabbage caused by Sclerotinia. George Grant Hedgcock. An. Rep. Mo. Bot. Gard. 16:149-151. Pl. 32-4. 1905.

DISEASE of Cultivated Agaves due to Colletotrichum. George Grant Hedgcock. An. Rep. Mo. Bot. Gar. 16:153-6. Pl. 35-37. 1905.

DISEASE of Seed Peas, see *Ascochyta a Disease of* . . .

DISEASE Resistance of Potatoes [experiments; not taxonomic]. Wm. Stuart, Vt. Agr. Exp. Sta. Bull. 122:107-136. Apr. 1906.

DISEASES of the Apple, Cherry, Peach, Pear and Plum. E. Mead Wilcox. Ala. Agr. Exp. Sta. Bull. 132:75-142. Pl. I-IX. Apr. 1905.

DISEASES, Three Fungous, of the Cultivated Ginseng [Vermicularia dematium; Pestalozzia funera; Neocosmospora vasinfecta.] Howard S. Reed. Mo. Agr. Exp. Sta. Bull 69:43-65. Oct. 1905.

DISEASES, Tomato, in California, see *Tomato Diseases*. . . .

DOUGLAS, Gertrude E. The Rate of Growth of Panaeolus retirugis. Torreya, 6:157-165. Aug. 1905.

DOWNY Mildew, or Blight. Peronoplasmopara cubensis (B. & C.) Clint. of Musk Melons and Cucumbers. G. P. Clinton. Conn. Agr. Exp. Sta. Report 1904:329-362. Pl. XXIX-XXXI. May 1905.

DOWNY Mildew, or Blight, Phytophthora infestans (Mont.) DeBy., of Potatoes. G. P. Clinton. Conn. Agr. Exp. Sta. Rep. 1904:363-384. Pl. XXXII-XXXVII. May 1905.

DRYMOCALLIS glandulosa (Lindl.) Rydb. host to Marssonia potentillae helleri Peck, n. var., Bull. Torr. Bot. Club, 33:219. Apr. 1906.

EARLE, F. S. Algunos Hongos Cubanos [about two dozen new species, diagnoses in Spanish language]. Informe An. Estac. Cen. Agronom. Cuba, 1:225-242. Pl. XXXI-XLII. 1 June 1906.

FAULL, J. Horace. A Preliminary Note on Ascus and Spore Formation in the Laboulbeniaceae. Science, N. S. 23:152-3. 26 Jan. 1906.

FAULL, J. Horace. Development of Ascus and Spore Formation in Ascomycetes. Proc. Boston Soc. Nat. Hist. 32:77-113. Pl. 7-11. June 1905.

FAVOLUS villosus Fr., *syn. of Funalia villosa q. v.*

FERMENTATION, Contribution to the Study of. E. H. Twight and Charles S. Ash. Calif. Agr. Exp. Sta. Bull. 159:1-26. June 1904.

FINK, Bruce. Further Notes on Cladonias, V, Cladonia gracilis. Bryologist, 8:37-41. May 1905.

FINK, Bruce. Further Notes on Cladonias, VI. The Bryologist, 9:21-4. Mar. 1906.

FINK, Bruce. How to Collect and Study Lichens. Bryologist, 8:22-7. March 1905.

FINK, Bruce. What to Note in the Macroscopic Study of Lichens. Bryologist, 8:73-6. July 1905.

FITCH, Ruby. The Action of Insoluble Substances on Modifying the Effect of Deleterious Agents upon the Fungi. Ann. Mycolog. 4:313-322. Aug. 1906.

Flammula condense Peck, n. sp., in clearings in pine woods and on stony hills. Bull. Torr. Bot. Club, 33:217. Apr. 1906.

FLAVIPORELLUS Murrill n. g. Polyporaceae, type Polyporus splitgerberi Mont. Bull. Torr. Bot. Club, 32:485. Sept. 1905.

FLAVIPORELLUS splitgerberi (Mont.), Murrill n. n. [Polyporus splitgerberi Mont., P. sulphuratus Fr., P. rheicolor B. & C.] Bull. Torr. Bot. Club, 32:486. Sept. 1905.

FLAVIPORUS Murrill n. gen. Polyporaceae, type Polyporus rufoflavus B. & C. Bull. Torr. Bot. Club, 32:360. July 1905.

FLAVIPORUS crocitinctus (B. & C.) Murrill n. n. [Polyporus crocitinctus B. & C.] Bull. Torr. Bot. Club, 32:360. July 1905.

Flaviporus rufoflavus (B. & C.) Murrill n. n. [Polyporus rufoflavus B. & C., Polyporus braunii Ranh.] Bull. Torr. Bot. Club, 32:360. July 1905.

FOMITELLA Murrill n. gen. Polyporaceae, type Fomitella supina (Lev.) Murr. (Boletus supinus Sw.) Bull. Torr. Bot. Club, 32:365. July 1905.

FOMITELLA supina (Sw.) Murrill n. n. [Boletus resupinatus Sw. non Fl. Dan., B. supinus Sw., Polyporus valenzuelianus Mont., P. guadelupensis Lev., P. hemileucus B. & C., P. plebeius cubensis B. & C.] Bull. Torr. Bot. Club, 32:365. July 1905.

FOMES abietis Karst., *syn. of Porodaedalea pini q. v.*

(To be continued.)

JOURNAL OF MYCOLOGY

A Periodical Devoted to North American Mycology. Issued Bi-monthly; January, March, May, July, September and November Price, $2.00 per Year. To Foreign Subscribers $2.25. Edited and Published by *W. A. KELLERMAN, PH. D., COLUMBUS, OHIO.*

EDITOR'S NOTES.

The proposition that the diagnosis of new species shall be in Latin has been discussed by many of the American botanists—and the verdict seems to be favorable. How it could be otherwise is not clear. And yet it is almost ludicrous if not appalling to contemplate the quality of 'Latin' that henceforth will be inflicted upon the botanical world; remembering that a few members of the profession admit their ill knowledge of this idiom, and we suspect that some besides may presently betray noticeable ignorance.

It is not an unmitigated reflection to say that only a few scientific men in this country are latin scholars, or are so familiar with this language that they are able to dash off a Latin description as quickly as they would indite an English diagnosis of the species. Many have earned a reputation as botanists—in spite of ignorance in other directions of which possibly they might be accused.

Why should the worker not then write what he has to say, with the necessary exactness and conciseness, using his mother tongue; let the world have this product, but at the same time accompany the diagnosis with the Latin translation which the author himself makes or at least supervises. This would seem to be feasible so far as original publication of species in periodicals is concerned. In extensive compilations, monographs, etc., the Latin alone would be used.

We make a slight innovation in the JOURNAL by way of employing **black type** for names of new species and for sub-heads (**authors' names**) in the Notes from Mycological Literature, a plan to be followed in the future.

PRICE LIST.

Journal of Mycology, Vol. 8—1902	$2 00
" " " 9—1903	2 00
" " " 10—1904	2 00
" " " 11—1905	2 00
" " " Current Vol.	2 00
Index to North American Mycology (authors, titles, subjects, new species and hosts, new names and synonyms) since Jan. 1, 1901. *Printed on one side of page.* Seven parts have been issued. Price per part	25
Index to Uredineous Infection Experiments with List of Species and Hosts for North America, *printed on one side of page*	50
Portraits of Mycologists, reprinted from the Journal of Mycology (Peck, Ellis, Arthur, Burrill, Farlow, Tracy, Earle, Atkinson, Holway, Thaxter, Clinton, Magnus, Oudemans, Patouillard, Hennings Rehm, Cooke, Saccardo, Dietel, Sydow, H., Sydow, P., Hollos, Bresadola, each	10
Ohio Fungi exsiccati. Though the set is designed primarily for exchange a few copies are for sale. Issued in fascicles of 20 specimens each. Ten fascicles now ready. Price per fascicle	1 00
Mycological Bulletin. A popular leaflet of 4 pages, illustrated, 24 Nos. per year. Vol. II, 1904, Vol. III, 1905, each 50 cents; bound in cloth, 75 cents. Current year	25
New Genera of Fungi. Published since 1900; the original descriptions reproduced with full citation. Annual Supplements are to follow. Printed on one side of page only. Price	75
First Supplement to New Genera of Fungi published since 1900, with the original descriptions	50
Index to Journal of Mycology, volumes 1-10	75
Mycological Glossary	25
North American Species of Marasmius; a monograph by A. P. Morgan	25

Volume 12, No. 86 *November 1906*

Journal of Mycology

TABLE OF CONTENTS

W. A. KELLERMAN, PH. D.

Professor of Botany, Ohio State University, Columbus, Ohio

Entered as Second Class Matter, Postoffice at Columbus, Ohio.

PRESS OF F. J. HEER, COLUMBUS, OHIO.

Cost of Separates.

Contributors who desire separates of their articles will receive the same at cost, approximately as follows:

For 4 pages or less:	100 copies	$1 75	200 copies	$2 25
" 8 " "	100 "	2 50	200 "	3 25
" 16 " "	100 "	4 25	450 "	5 50

For more extended articles proportionately higher.

Plates not included in the above.

ADDRESS: EDITOR JOURNAL OF MYCOLOGY

Journal of Mycology

VOLUME 12—NOVEMBER 1906

TABLE OF CONTENTS

NOTES ON NEW OR RARE SPECIES OF RAVENELIA.

W. H. LONG.

In the study of the genus Ravenelia the following characters have been found of much importance. Some of them are often omitted from descriptions, hence attention is called to them: 1. The position of the sori, whether sub-epidermal or sub-cuticular. 2. The number and position of the germ pores of the uredospores. 3. The position and number of the cysts. These are all constant characters for any given species and can surely be determined from the usual herbarium material, as drying does not destroy them. The first must be determined by sectioning the host; the germ pores by boiling in a solution of 50 per cent. lactic acid, and the cyst characters by glycerine and lactic acid mounts.

Uredospores of the globose or sub-globose type have germ pores many and scattered, while those that are distinctly longer than broad have few (4-8) germ pores in one or two definite rows.

The position, shape and number of the cysts are of vital importance and should be carefully noted.

A good means of studying this character is to mount the specimen in a mixture of equal parts of 95 per cent. alcohol and 100 per cent. glycerine. In this the cysts will swell very slowly, thus giving time for observation. Often a drop of 50 per cent. lactic acid will have to be added to produce the desired result, *viz.*, a slow swelling of the cysts, thus revealing their shape and position; or even boiling may have to be resorted to in order to clear up the heads and swell the cysts ready for high power study.

Cysts that are *appressed* to the under surface of the head will not show in the *first* mount of glycerine and alcohol, while cysts that are pendent can easily be seen; pendent cysts are beneath the entire head, while appressed or pulvinate cysts are peripheral; a third type of cysts is seen in thoose heads with *many* spheroid cysts beneath the surface, but *not* pendent. *Ravenelia microcystis* is an example of this class. Many of the appressed type of cysts will appear as if pendent when mounted in water or in a lactic acid solution, for they then swell up and hang down around the stipe like truly pendent cysts.

Two new species are here described, one from Florida and the other from Jamaica. Also emendations and remarks on several Mexican and Texan species heretofore described.

Ravenelia piscidiae Long n. sp. — Sori sub-epidermal, II sori mainly hypophyllous, III sori usually epiphyllous. II sori small, punctiform, on pallid spots that show markedly on the upper surface of the leaves; II sori cinnamon brown, scattered or in irregular groups. II spores sub-globose, somewhat angular, strongly and closely verrucose, germ pores scattered, about 8, fulvous, walls unifom, 17-20 x 20-23 μ, usual size, 20 x 20 μ. Paraphyses sparingly present, hyphoid to sub-clavate, often curved like a golf club, fulvous, 10 x 30-35 μ, bases semi-hyaline and collapsed. III sori on different leaves, epiphyllous, small, orbicular, black-brown, firm, well scattered over entire surface of leaf. III heads chestnut brown, smooth pulvinate, 65-80μ, 4-5 spores in cross section, many heads only ten-spored, 6 peripheral and 4 central ones; paraphyses sparingly present in III sori, cysts hyaline, flat, appressed, peripheral, coherent into stipe, swelling and bursting in water; pedicel short, deciduous, hyaline.

On *Piscidia erythrina,* Miami, Fla., March 25, 1903. Coll. E. W. D. Holway.

This species is close to *R. uleana,* but differs in its pedicel being short and its cysts being flat and in all its gross characters.

Ravenelia arthuri Long n. sp. — Sori sub-epidermal, epiphyllous; II sori not present. II spores intermixed with III spores. II spores fulvous, walls thick, uniform, spinulose, oval to globose, germ pores scattered, more than 6, 20 x 20-26 μ, paraphyses not present. III sori linear to elliptical, small, surrounded by the very prominent ruptured epidermis, black brown. III heads pulvinate,chestnut brown, smooth, 75-100 x 40-45 μ thick, 4-8 spores across, heads often irregular, cysts very many, pendent, beneath entire head, globose, hyaline, with a brown, finger-like projection from base into center of cyst, swelling and finally bursting in water; pedicel short, compound, hyaline, deciduous, cysts often separating from heads.

On unknown plant, Jamaica, W. I., Feb., 1891. Coll. Thaxter from Herbarium of Dr. Farlow.

This species differs from *R. uleana* in all its gross characters and in its short deciduous pedicel.

Ravenelia australis. Sori sub-epidermal, epiphyllous; II sori not present; II spores intermixed with III spores; II spores faintly echinulate to smooth, walls uniform, elliptic to slightly fusiform, fulvous, germ pores four, equatorial, large, 10-16 x 27-32 μ, paraphyses sparingly present, clavate to sub-capitate, fulvous, darker at apex, 30-40 μ long, heads 10-15 μ thick, base of stipe hyaline. III sori scattered, epiphyllous, black brown, orbicular, small, naked or rarely surrounded by the ruptured epidermis, from 3 to many heads in a sorus. III heads chestnut brown to black brown, smooth pulvinate, 6-8 cells across, 70-100 μ, cysts appressed coherent, peripheral, hyaline; pedicel compound, hyaline, short, deciduous, cysts bursting very easily in water.

On *Leucaena microphylla* Igualla Mex., Nov. 2, 1903, No. 5314 of E. W. D. Holway.

This species was reported by Dr. J. C. Arthur as *R. verrucosa* in his "Leguminous Rusts from Mexico," Bot. Gazette 39:392, June, 1905. There are two points of difference in this and in the description of *R. australis* as originally published, *viz.*, the cysts are reported as *many* and pedicel not compound. If this is correct then the Mexican plant here described is not *R. australis* but is a new species. The other characters coincide so fully that the writer has placed it as *R. australis* in spite of the differences noted.

Ravenelia mexicana Transz. was collected by Pringle, Sept. 12, 1889, in Mexico on *Calliandra grandiflora*, and has not since been reported, notwithstanding the many collections of Mexican species by Mr. Holway; that the plant was not rediscovered seemed strange, so a careful study of the Mexican species was made, with the result that the writer is fully convinced that *R. mexicana* Transcz. and *R. mimosae-sensitivae* P. Henn. are the same species. A careful comparison of the *types* of the two species, with subsequent collection of one of them, was made, and the above opinion confirmed. The II heads of both plants have one very marked character, viz., the papillae on the heads are longer and more prominent around and near the base of the head than those at the top, being often reduced at top to warts. This is an unusual character and determined the identity of the two plants. No II spores of *R mexicana* were seen, but the described shape and size agrees with those given for *R. mimosae-sensitivae;* also the recently described species, *R. inconspicua* Arthur, is the same plant as *R. mimosae-sensitivae,* with slightly smaller uredospores

(3-4 μ difference). As the writer sees it, *R mexicana, R. mimosae-sensitivae* and *R. inconspicua* are all one and the same plant.

There are four other species so closely related that they should be considered as one species, viz., *R. expansa,* Diet. & Holw., *R. fragrans* Long, *R. humphreyana* P. Henn., and *R. pulcherrima* Arthur, while the last two are undoubtedly identical, even to the peculiar colored paraphyses.

R. expansa and *R. fragrans* differ mainly in the shape of their paraphyses, but the writer has found varying shades of these on the different hosts in Holway's collection; the other characters of the two are practically identical; the papillae on some heads of *R. fragrans* are more pronounced than on *R. expansa,* while on others they are of the same size; *R. humphreyana* differs from both in the intense wine-colored heads of its paraphyses, but the shape is the same as *R. expansa;* this color is probably due to the host; the III heads of *R. humphreyana* have slightly less prominent papillae or warts; if the paraphyses are disregarded, then the four species are the same. No. 5359 of E. W. D. Holway is *R. indica* and not *R. cassiaecola;* Nos. 5324, 5328, 5326, 5263 are *R. expansa* all of Holway's collection, "Leguminous Rusts from Mexico," Bot. Gazette 39:392, June, 1905.

Denton, Texas.

A NEW ENTOLOMA FROM CENTRAL OHIO.

BY GEORGE F. ATKINSON.

Specimens, notes and photograph of a fungus that proves to be new were received from Prof. W. A. Kellerman. The following diagnosis is given:

Entoloma subcostatum Atkinson n. sp.

21542. Photogr. Coll.

On grassy ground, Campus, Ohio State University, Columbus, Ohio. Coll., R. A. Young, Com. W. A. Kellerman. No. 4930. Received Nov. 1, 1906.

Plants gregarious or in troops or clusters, 6-8 cm high; pileus 4-8 cm. broad; stems 1-1.5 cm. thick.

Pileus dark gray to hair brown or olive brown, often subvirgate with darker lines; gills light salmon color, becoming dull;

ENTOLOMA SUBCOSTATUM Atkinson.

stem same color as pileus but paler, in drying the stems usually becoming as dark as the pileus.

Pileus subviscid when moist, convex to expanded, plane or subgibbous, not umbonate, irregular, repand, margin incurved, flesh white, rather thin, very thin toward the margin.

Gills broad, 1-1½ cm broad, narrowed toward the margin of the pileus, deeply sinuate the angles usually rounded, adnexed, easily becoming free, edge usually plane, sometimes connected by veins, sometimes costate, especially toward the margin of the pileus.

Basidia 4-spored.

Spores subglobose, about six angles 8-10 μ in diameter, some slightly longer in the direction of the apiculus, pale rose under the microscope.

Stems even, fibrous striate, outer bark subcartilaginous, flesh white, stuffed, becoming fistulose.

Odor somewhat of old meal and nutty, not pleasant; taste similar.

Related to E. prunuloides Fr. and E. clypeatum Linn. Differs from the former in dark stem and uneven pileus, differs from the latter in being subviscid, even stem and pileus not umbonate and much more irregular, and differs from both in subcostate gills.

Explanation of Plate 92. — Entoloma subcostatum Atkinson. Mature plants; the lower specimen in section shows the broad gills and vrey thin flesh.

FUNGI SELECTI GUATEMALENSES. EXSICCATI DECADE I.*

W. A. KELLERMAN.

It is proposed to issue from time to time small sets of Guatemalan fungi which may be of some interest. There will be a number of new species included, and many peculiar tropical forms, and others to illustrate new hosts, variations or extended distribution. The sets will not be offered for sale, but it is intended that the edition may be ample for the larger herbaria in case the specimens are desired. The first decade includes the following:

1. Graphiola phoenicis (Moug.) Poit., on Thrinax sp. indet.
2. Melampsora bigelowii Thüm., on Salix humboldtiana H. B. K.
3. Puccinia cannae (Wint.) P. Henn., on Canna indica L.
4. Puccinia cognita Syd., on Senecio fraseri Hemsl.
5. Puccinia cynanchi Lagerh., on Philibertiella crassifolia Hemsl.
6. Puccinia heterospora B. & C., on Sida cordifolia L.
7. Puccinia rosea (D. & H.) Arthur, on Ageratum conyzoides L.
8. Ravenelia humphreyana Diet., on Poinciana pulcherrima L.
9. Ravenelia spinulosa Diet. et Holw., on Cassia biflora L.
10. Ustilago panici-leucophaei Bref., on Panicum leucophaeum H. B. K.

---

1. Graphiola phoenicis (Moug.) Poit.

On Thrinax sp. indet.

Gualan (alt. 122 m., 400 ft.) Dept. Zacapa, Guatemala, Central America. Jan. 15, 1905.

W. A. Kellerman, No. 4633.

This fungus of doubtful affinity is common in green houses the world over occurring on different species of Palms. In Guatemala the parasite was found in only one locality but it was very abundant, practically all the plants in the low, wet ground where the host occurred being affected.

* Contributions to Guatemalan Mycology. III.

2. Melampsora bigelowii Thuem.

On Salix humboldtiana H.B.K.

Near Patalúl, Dept. Sololá, Guatemala, C. A. Feb. 11, 1906.

W. A. Kellerman, No. 5418.

The host determined by R. F. Griggs and the fungus by J. C. Arthur. The salix occurs very commonly throughout Guatemala, and in very many of the localities the Rust was observed.

3. Puccinia cannae (Winter) P. Henn. Uredospores.

On Canna indica L.

Mazatenango, Guatemala, C. A. Feb. 28, 1905.

W. A. Kellerman, No. 5357.

The teleutospores were reported by P. Hennings on material collected in Brazil, and hence the name as above; but only Uredospores were seen on the Guatemalan host, corresponding to the *Uredo cannae* Winter. Unfortunately the specimens are badly parasitized, as is commonly the case with tropical Uredineae.

4. Puccinia cognita Syd.

On Verbesina fraseri Hemsl.

Guatemala City (alt. 1465 m. 4810 ft.), Guatemala. Feb. 1, 1905.

W. A. Kellerman, No. 4324.

The host was determined by B. L. Robinson. Our determination of the fungus was verified by J. C. Arthur. This is a common Rust on a host plant quite widely distributed and abundant.

5. Puccinia cynanchi Lagerh.

On Philibertiella crassifolia Hemsl.

(Host det. John Donnell Smith.)

Laguna (Lake Amatitlán), alt. 1200 m. (3950 ft.) Depart. Amatitlán, Guatemala, C. A. Feb. 11, 1905.

W. A. Kellerman, No. 4348.

There is close morphological resemblance between Puccinia gonolobi Rav. and Puccinia cynanchi Lagerh., and they occur on many hosts. Not willing to call my material by either of these names, and temporarily designating this rust as Puccinia philibertiellicola I referred the matter to Dr. J. C. Arthur who gave the name as used on this label, stating in a letter dated August 14, 1906, as follows: "I have it on the same host collected by Pringle in Oaxaca, Mex. There is considerable difference in the habit and appearance of the different collections and on different hosts, but I find no constant morphological characters with which to separate them. I have provisionally, however, assorted my material under two names P. Gonolobi, where the fungus is in small groups, and P. Cynanchi, where it spreads evenly over the surface, often extending along the young shoots as they grow, and sometimes forming witches' brooms. I have the former on five, and the latter on nine different hosts." (J. C. Arthur.)

6. Puccinia heterospora B. & C.

On Sida cordifolia L.

Gualán (alt. 122 m. 400 ft.) Dept. Zacapa, Guatemala, Central America. March 12, 1905.
W. A. Kellerman, No. 4323.

The host was identified by John Donnell Smith, and the determination of the fungus verified by J. C. Arthur. This is a widely distributed species in warm, temperate and tropical countries, occurring in Africa, India, China, Australia, the Philippines as well as in the American continent. Reported hosts are numerous. The variations are considerable; "Man ist leicht geneigt, wenn man die extremen Habitusformen vor sich hat, dieselbe darauf hin in mehrere Arten zu zerlegen; dass Pucc. heterospora veilleicht auf Grund von Kulturversuchen noch in mehrere Species zu trennen wäre, möchten wir eher verneinen als bejahen" (Sydow. Monogr. Ured.)

7. Puccinia rosea (D. & H.) Arthur.

On Ageratum conyzoides L.

San Felipe (alt. 615 m., 2050 ft.), Dept. Retalhuleu, Guatemala, C. A. Feb. 4, 1906.
W. A. Kellerman, No. 5446.

The host species was observed at several places in Guatemala, on the Pacific slope. The plants were abundantly affected with this Rust, which has been identified by Arthur and Kern as given above. The vitality of the host is more or less impaired by the parasite. The Rust has been collected heretofore by E. W. D. Holway in southern Mexico, on several species of Eupatorium and on Ageratum corymbosum and Ageratum strictum.

8. Ravenelia humphreyana P. Henn.

On Poinciana pulcherrima L.

Gualán (alt. 122 m. 400 ft.) Dept. Zacapa, Guatemala, Central America. Dec. 27, 1905.
W. A. Kellerman, No. 5727.

The host was determined by R. F. Griggs and the fungus by J. C. Arthur. The host is a common plant in many parts of Guatemala and it was found usually to be abundantly affected, though no effect on the vitality or vigor of the host could be detected.

9. Ravenelia spinulosa Diet. et Holw.

On Cassia biflora L.

Gualán (alt. 122 m., 400 ft.), Depart. Zacapa, Guatemala, Central America. Dec. 30, 1905.
W. A. Kellerman, No. 5441.

The host was determined by J. M. Greenman and the fungus by J. C. Arthur. This Cassia is common and very abundant at Gualán and many other places in Guatemala; scarcely a plant was found uninfected by the Ravenelia which however did not appreciably distort the host or check its growth.

10. Ustilago panici=leucophaei Bref.

On Panicum leucophaeum H.B.K.

Zacapa (alt. 137 m., 457 ft.) Depart. Zacapa, Guatemala, Central America. Jan. 25, 1905.
W. A. Kellerman, No. 4301.

The identification was made by Dr. G. P. Clinton. The smut was very abundant at this locality, infecting most of the plants found on the alluvial bottom where the material was obtained. The smut was seen also in abundance on the Pacific side of the country near Lake Amatitlan, alt. 1200 m. (3950 ft.). It has been reported from Mexico and from Cuba and Jamaica. Ustilago insularis P. Henn. regarded by Dr. G. P. Clinton as the same species, is from Rio de Janeiro, Brazil.

NORTH AMERICAN SPECIES OF LEPIOTA

BY A. P. MORGAN.

(*Continued from page* 203.)

§ 2. *ANNULI MOBILES. THE VEIL IN THIS SECTION IS MARGINAL AND INFERIOR AS IN THE FIRST SECTION, BUT THE DERMIS OF THE PILEUS AND THAT OF THE STIPE ARE DISSIMILAR, THE COLORED CUTICLE OF THE PILEUS NOT BEING CONTINUED DOWNWARD UPON THE STIPE, RARELY COLORING EVEN THE UPPER MARGIN OF THE VEIL. THE VEIL IS ANNULATE UPON THE STIPE AND IS COMMONLY A THIN MEMBRANACEOUS BAND, THOUGH SOMETIMES IT IS THICKENED AND SUBCORIACEOUS; IT IS CONTINUOUS DOWNWARD WITH THE DERMIS OF THE STIPE, AND BY ITS UPPER BORDER CONNECTS WITH THE DERMIS OF THE PILEUS. SOMETIMES THE VEIL IS FIRST TORN AWAY FROM THE STIPE AND DRAWN UPWARD TO SOME EXTENT UNTIL THE EXPANSION OF THE PILEUS BEGINS, THUS GIVING RISE TO THE TYPICAL "ANNULUS MOBILIS."*

VII. SUBCLYPEOLARIAE. *Dermis of the pileus a thin membrane, radiately fibrillose; the cuticle at first continuous, at length separating into small or minute scales, which are drawn apart and scattered over the white fibrillose surface. The cuticle of the stipe commonly white, smooth and even or only appressedly fibrillose; the annulus thin and membranaceous, usually persistent.*

This is a large tribe of mostly small Agarics; they differ from the Clypeolariae in having a smooth, white stipe, free from the colored scales of the pileus.

a. Scales of the pileus white, cinereous, yellowish.

42. LEPIOTA MIAMENSIS Morgan, Myc. Flora M. V. 1883.

Pileus fleshy, ovoid then convex and explanate, subumbonate; the flesh thin, white; the dermis radiately fibrillose, all white or a little dusky in the center, the cuticle soon separating into small concentric scales; the veil thin and delicate, subappendiculate. Stipe slender, tapering slightly upward, fistulous, glabrous, all white; the annulus lacerate, subpersistent. Lamellae rather broad, white, free approximate; the spores oblong-ovoid, obliquely apiculate, 5-7 x 3 mic.

Growing in the woods among the old leaves. New York, *Peck;* Preston, O. Pileus 2-4 cm. in diameter, the stipe 4-5 cm. long and 3-5 mm. thick. A rare plant.

43. LEPIOTA ARENICOLA Peck, 41 N. Y. Report, 1887. Syll. IX, 6.

Pileus at first broadly conical, then convex or nearly plane; the surface obscurely punctate with minute granular scales, whitish or cinereous; the margin substriate and crenulate; the veil thin and fragile, evanescent. Stripe arising from a mycelial bulb, slender, equal, stuffed, glabrous, whitish. Lamellae broad, distant, free, white; spores oblong or subfusiform, acute at one end, 12-15 x 5-6 mic.

Growing in sandy ground, New York, *Peck.* Pileus 6-12 mm. in diameter, the stipe 16-24 mm. in length, and about 1 mm. in thickness. The species is apparently rare.

44. LEPIOTA MUTATA Peck, Bull. Torr. Club, 1895, Sylloge XIV. 66.

Pileus fleshy, convex, subumbonate; the flesh thin and white; the dermis slightly scabrous in the center, white, brown in the dried plant. Stipe slender, equal, hollow, white; the annulus small, sometimes evanescent. Lamellae close, thin; subventricose, free, white; spores elliptic, 8-11 x 5-6 mic.

Growing on the ground in woods, Kansas, *Bartholomew.* Pileus 2-4 cm. in diameter, the stipe 2-3 cm. long and 2-5 mm. in thickness.

45. LEPIOTA ALLUVIINA Peck, 35 N. Y. Rep. 1882.

Pileus fleshy, convex or plane, sometimes reflexed on the margin; the flesh thin, white; the dermis radiately fibrillose, separating into minute, pale yellow scales. Stipe slender, tapering upward from a slightly thickened base, whitish or pallid, the cuticle fibrillose; annulus thin, membranaceous, subpersistent, often near the middle of the stipe. Lamellae close, free, white or yellowish; spores elliptic, 6-8 x 4-5 mic.

Growing in alluvial soil among weeds. New York, *Peck;* Michigan, *Longyear.* Pileus 12-25 mm. in diameter, the stipe 3-5 cm. long and 2-3 mm. thick. In drying the whole plant assumes a rich yellow hue.

b. Scales of the pileus red, rufous, fulvous.

46. LEPIOTA CONSPURCATA, Agaricus conspurcatus Willdenow, Prodr. Fl. Berl. 1787. Agaricus cristatus Bolton, Hist. Fung. 1788.

Odor strong, taste very disagreeable. Pileus fleshy, ovoid then campanulate and explanate, umbonate; the flesh very thin, white; the dermis radiately fibrillose, whitish beneath the cuticle; cuticle at first continuous, alutaceous to rufous, soon separating into numerous small scales which are drawn apart and concentrically arranged around the umbo. Stipe slender, tapering slightly upward, fistulous, rufescent beneath the white silky-fibrillose cuticle; annulus membranaceous lacerate, deciduous. Lamellae moderately broad, close, white, free and rather remote; spores ellipsoid, 7-8 x 4-5 mic.

Growing in grassy ground in fields, gardens, etc. Pileus 2-4 cm. in diameter, the stipe 3-5 cm. long and 2-4 mm. thick. This species has been reported from various parts of the country, but evidently several of the species of the tribe have been erroneously referred to it; my specimens so referred in the Myc. Flora M. V. are inodorous and belong to the following species.

47. LEPIOTA ANGUSTANA Britzelmayer, Derm. et Mel. App. 1884.

Inodorous. Pileus fleshy, subovoid then convex and explanate; the flesh thin, white, subrufescent; the dermis radiately fibrillose, white beneath the rufous cuticle, which is soon drawn apart into small concentric scales. Stipe slender, tapering slightly upward, fistulous, rufescent beneath the white-fibrillose cuticle; the annulus membranaceous, lacerate, subpersistent. Lamellae rather broad, close, obtuse behind, free, white; spores pointed at one end and obtuse of truncate at the other, 5-7 x 3 mic.

Growing on the ground among old leaves in woods. Probably common throughout the country east and south, and known as Lepiota cristata A. & S. Pileus 1.5-3 cm. in diameter, the stipe 3-5 cm. long and 2-3 mm. thick. It has no disagreeable odor and is readily distinguished from L. conspurcata by its peculiar spores.

48. LEPIOTA FULVASTER B. & C., Ann. & Mag. N. H. 1853.

Pileus fleshy, convex then explanate, subumbonate; the flesh thin, white; the dermis radiately fibrillose, rimulose-sulcate around the margin, white beneath the cuticle; the cuticle fulvous, soon separating into small scales, which are drawn apart and spot the white surface. Stipe slender, tapering upward from a slightly thickened base, fistulous, fibrous-stuffed, white and smooth; the annulus membranaceous, fulvous, subpersistent. Lamellae ventricose, not crowded, attached to a distinct collar, which is not, however, separate from the stipe, rather thick, of a pure white; spores ————.

Growing amongst grass in sandy soil. S. Carolina, *Curtis.* Pileus 6-12 mm. in diameter, the stipe 2-3 cm. long and scarcely

1 mm. thick. "A small but extremely elegant species;" it is desirable that the spores be known.

49. LEPIOTA RUBROTINCTA Peck, 35 N. Y. Rep. 1882. Mastocephalus carneo-annulatus Clements, Bot. Neb. IV. 1896. Lepiota Erythrella Spegazzini, Fungi, Arg. 1899. Sylloge XVI. 10.

Pileus fleshy, ovoid then campanulate and explanate, subumbonate; the flesh thin, white; the dermis radiately fibrillose; the cuticle at first continuous, orange-red to red and rufous or darker in the center, at length rimulose-sulcate and becoming scaly nearly to the umbo. Stipe tapering upward from a clavate base, fistulous, pure white, the cuticle silky-fibrillose or quite smooth; annulus a thin persistent membranaceous band, the border often colored as the pileus. Lamellae rather narrow, close, ventricose, white, free and sub-remote; spores elliptic-oblong, obliquely apiculate, 7-10 x 4-6 mic., uni-guttulate.

Growing on the ground among old leaves in woods, New England westward to Kansas and Nebraska. Pileus 3-7 cm. in diameter; the stipe 4-10 cm. long, 3-5 mm. thick at the apex and 5-10 mm. thick at the base. Spegazzini gives a most elaborate account of this species in all its forms; the form *e. virescens* however, seems to me distinct enough to constitute a species.

50. LEPIOTA INCARNATA, Mastocephalus incarnatus Clements, Bot. Neb. IV. 1896.

Pileus fleshy, conical, at length campanulate, rarely convex; the flesh very thin, white; the dermis radiately fibrillose, striate around the margin, pale incarnate beneath the darker cuticle, which at length separates into numerous small scales, the umbo becoming black. Stipe slender, equal, fibrous-stuffed, glabrous, rarely silky, pallid or pinkish; the annulus thin, membranaceous, persistent. Lamellae subdistant, white, free and remote; spores elliptic-ovoid, apiculate, 5-6 x 3 mic. uniguttulate.

Growing on the ground among old leaves in woods. Nebraska, *Clements*. Pileus 2-4 cm. in diameter, the stipe 3-6 cm. long and 2-5 mm. thick.

51. LEPIOTA VIRESCENS, Lepiota erythrella e. virescens Spegazzini, Fungi Arg. 1899. Lepiota caerulescens Peck, Bull. Torr. Club, 1899.

Pileus fleshy, ovoid then campanulate and explanate, subumbonate; the flesh very thin, at first white, the whole plant exhibiting tints of red, green and blue when handled; the dermis radiately fibrillose, becoming rimulose-sulcate nearly to the center; the cuticle at first testaceous to umber, soon separating into minute reflexed scales. Stipe tapering upward from a clavate base, fistulous silky-fibrillose or nearly glabrous, at first white; the annulus membranaceous, subpersistent. Lamellae broad rather distant, at first white, free, sub-remote; spores elliptic-oblong, obliquely apiculate, 7-9 x 4-5 mic. uniguttulate.

Growing among old leaves in woods. W. Virginia, *Lloyd;* Preston, O. Pileus 1-3 cm. in diameter, the stipe 3-5 cm. long and 2-3 mm. in thickness. The peculiarity of the plant is that when handled it exhibits changing tints of red, green and blue; finally when dried it takes on a permanent bluish color.

52. LEPIOTA RUFESCENS MORGAN sp. nov., AGARICUS FUSCOSQUAMEUS MORGAN, MYC. FLORA M. V.

Pileus fleshy, ovoid then convex and expanded, subumbonate; the flesh thin, white, reddening when cut; the dermis radiately fibrillose, whitish beneath the cuticle; cuticle continuous till near maturity, whitish, pinkish and rufescent, at length separating into minute scales. Stipe tapering upward, fistulous, fibrous-stuffed, rufescent beneath the white-fibrillose cuticle; the annulus thin, membranaceous. Lamellae rather broad, close, white, rufescent, free, approximate; spores elliptic-ovoid, obliquely apiculate, 6-8 x 4-5 mic.

Growing among old leaves and rotten wood in woods. Preston, O. Pileus 3-5 cm. in diameter; the stipe 5-7 cm. in length, 4-6 mm. thick at the apex and 7-10 mm. at the base. The whole plant when handled changes gradually to a reddish-brown color, when completely dried it is black. This may be the plant Lloyd doubtfully referred to Lepiota meleagris.

c. Scales of the pileus brown or blackish.

53. LEPIOTA SUBCLYPEOLARIA B. & C., FUNGI CUB. 1867 COOKE, AUSTRALIAN FUNGI, and GREVILLEA, XIX. PL. 180.

Pileus fleshy, at first ovoid then convex and explanate, umbonate; the flesh thin, white, the dermis radiately fibrillose, white beneath the cuticle, striate around the margin; the cuticle at first continuous, rufous or fuscous, soon broken pu and drawn apart as small scattered scales, except upon the umbo. Stipe tapering upward, fistulous, white and smooth; the annulus thin, membranaceous, persistent. Lamellae rather narrow, distant, white, free and remote from the stipe; spores elliptic, 7-8 mic. long.

Growing about the roots of trees or rotten wood. Cuba, *Wright.* Pileus 3-5 cm. in diameter, the stipe 5-8 cm. in length and 3-6 mm. in thickness. The description is based mostly on Cooke's figures.

54. LEPIOTA SORDESCENS B. & C. Fungi Cub. 1867.

The flesh of the pileus thin, white; the dermis radiately fibrillose, white beneath the cuticle, the margin striate; the cuticle brown, separating into scales, which are deciduous except in the center. Stipe slender, glabrous, white, brownish when dry. Lamellae narrow, at first white, remote.

Growing on logs in woods. Cuba, *Wright.* Pileus 2-3 cm. in diameter, the stipe 3-5 cm. long and 2 mm. thick. This is all that can be inferred from the meager description.

55. LEPIOTA FELINOIDES Peck, Bull. Torr. Club, 1900, Sylloge XVI, 9.

Pileus fleshy, ovoid then campanulate and explanate, subumbonate; the flesh thin, white; the dermis radiately fibrillose, at length rimulose; the cuticle at first continuous, pale to dark umber, separating into small scales, which are gradually drawn apart nearly to the umbo. Stipe tapering upward from a clavate base, fistulous, pure white, the cuticle silky-fibrillose, annulus a thin membranaceous band, quite persistent. Lamellae rather broad, close, white, ventricose, free and subremote; spores elliptic-ovoid, 6-8 x 4-5 mic.

Growing on the ground among old leaves in woods. Missouri, *Glatfelter;* Preston, O. Pileus 3-6 cm. in diameter; the stipe 5-8 cm. long, 3-5 mm. thick at the apex and 5-10 mm. thick at the base. The species differs from Lepiota rubrotincta in no other way than in the color of the pileus; both grow together indiscriminately.

56. LEPIOTA BRUNNESCENS Peck, Bull. Torr. Club, 1904; Sylloge XVII. 6.

Pileus fleshy, convex or nearly plane, obtuse or umbonate; the flesh thin, white; the dermis radiately fibrillose, whitish beneath the cuticle, sometimes rimulose around the margin; the cuticle at first continuous and brownish, soon breaking up into scales and granules, except in the center. Stipe equal or slightly thickened toward the base, hollow, fibrous, white; the annulus small, persistent about the middle. Lamellae close, ventricose, free, white, spores elliptic, 6-8 x 4-5 mic.

Growing in open woods and grassy places. Missouri, *Glatfelter.* Pileus 2-3 cm. in diameter, the stipe 3-5 cm. long and 2-4 mm. thick.

57. LEPIOTA GLATFELTERI PECK, BULL. TORR. CLUB, 1904; SYLLOGE XVII. 7.

Pileus fleshy, convex or nearly plane, obtuse or slightly umbonate; the flesh thin, white; the dermis minutely innate-fibrillose, gray, gray-brown, sometimes purple tinged, the center often darker, the margin sometimes radiately rimose. Stipe subequal, firm, stuffed or hollow, whitish; the annulus thin, persistent. Lamellae close, lanceolate, free, white or whitish; spores elliptic, 6-8 x 4-5 mic.

Growing on the ground in woods. Missouri, *Glatfelter*. Pileus 2.5-5 cm. in diameter, the stipe 4-5 cm. long and 2-4 mm. thick.

58. LEPIOTA PHAEOSTICTA MORGAN sp. nov.

Pileus fleshy, sub-ovoid with a blunt apex, expanded and explanate; the flesh very thin, white; the dermis radiately fibrillose, the cuticle soon separating into very minute dark scales, which are visible as minute black points on the white surface. Stipe tapering upward from a clavate base, white, solid, glabrous; the annulus membranaceous, persistent. Lamellae close, white, tapering inward, free and rather remote; spores elliptic-oblong, obliquely apiculate, 5-6 x 3.0-3.5 mic.

Subcaespitose; growing out of rotten logs in woods. Preston, O. Pileus 10-15 mm. in diameter, the stipe 15-20 mm. long and 1-2 mm. thick.

59. LEPIOTA NEOPHANA MORGAN sp. nov.

Pileus fleshy, ovoid then campanulate and expanded, subumbonate, the flesh thin, firm, white; the dermis thin, tough, the surface smooth and glabrous, buff to pale umber, dark brown in the center, the cuticle contiuous or at maturity sometimes cracking into irregular areolae. Stipe slender, subequal, tough, fistulous, white above the annulus, pale umber below, with a white-fibrillose cuticle. Lamellae broad, close, white, obtuse behind, free, approximate; spore oblong, obliquely apiculate, 4-5 x 3 mic.

Growing on the ground in woods. Preston, O. Pileus 2-3 cm. in diameter; the stipe 3-4 cm. long and 2-3 mm. thick. The peculiarity of the plant is its toughness in all parts, its subcoreaceous texture. It belongs more properly in Tribe I.

(*To be continued.*)

INDEX TO NORTH AMERICAN MYCOLOGY.

Alphabetical List of Articles, Authors, Subjects, New Species and Hosts, New Names and Synonyms.

W. A. KELLERMAN.

(Continued from page 231.)

LEPTOSPHAERIA perplexa Sacc. et Fairm. n. sp., in caulibus emortuis Solidaginis sp. Jour. Mycol. 12:49. Mar. 1906.

LEPTOSPHAERIA physostegiae Fairman n. sp., on dead stems of Physostegia virginiana Benth. Proc. Rochester Acad. Sci. 4:216. March 1906.

LEPTOSPORA sparsa Sacc. et Fairm. n. sp., ad ligna putrida in silvis. Jour. Mycol. 12:49. Mar. 1906.

LEPTOSPORA stictochaetophora Fairman n. sp., on hard surface of decorticated maple twig, on ground in woods. Proc. Rochester Acad. Sci. 4:218. March 1906.

LEPTOTHYRIUM californicum Bubák n. sp., auf lebenden Blättern von Quercus morehus. Jour. Mycol. 12:55. Mar. 1906.

LEPTOTHYRIUM dryadearum Desm., *syn. of Marssonina potentillae q. v.*

LEPTOTHYRIUM juglandis Lib., *syn. of Marssonina juglandis q. v.*

LEPTOTHYRIUM juglandis Lib., *syn. of Marssonina potentillae q. v.*

LEPTOTHYRIUM kellermanni Bubák n. sp., auf Blättern von Sassafras officinalis. Jour. Mycol. 12:55. Mar. 1906.

LEPTOTHYRIUM pazschkeanum Bubák n. sp., auf toten Stengeln und Aesten von Asclepias verticillata. Jour. Mycol. 12:55. Mar. 1906.

LICHEN flora of Long Island, Additions to [List of 18 species.] G. C. Wood. Bryologist, 8:51. May 1905.

LICHEN Notes, No. 1. G. K. Merrill. Bryologist, 8:110-112. Nov. 1905.

LICHEN Notes, No. 2 G. K. Merrill, The Bryologist, 9:3-4. January 1906.

LICHENOLOGY for Beginners. Frederick LeRoy Sargent. Bryologist, 8:45-8. May 1905.

LICHENOLOGY for Beginners, II. Frederick LeRoy Sargent. Bryologist, 8:66-9. July 1905.

LICHENOLOGY for Beginners, IV. Frederick LeRoy Sargent. Bryologist, 8:98-106. Nov. 1905.

LICHENS, Classification see *Classification of . . .*

LICHENS, How to Collect and Study. Bruce Fink. Bryologist, 8:22-7. March 1905.

LICHENS, What to Note in the Macroscopic Study of. Bruce Fink. Bryologist, 8:73-76. July 1905.

MARSONIA graminicola Sacc. Syll., Gloeosporium graminicolum, Ell. & Ev., *syn. of Marssonina graminicola q. v.*

MARSONIA juglandis (Lib.) Sacc., *syn. of Marssonina juglandis q. v.*

MARSONIA martini Sacc. & Ell., *syn. of Marssonina martinii q. v.*

MARSONIA melitoti Trel., *syn. of Marssonina meltoti q. v.*

MARSONIA neilliae Harkn., *syn. of Marssonina neilliae q. v.*

MARSONIA nigricans Ell. & Kellerm., *syn. of Marssonina nigricans q. v.*

MARSONIA potentillae Sacc. Syll., *syn. of Marsonnina potentillae q. v.*

MARSONIA potentillae helleri Peck, n. var., on living leaves of Drymocallis glandulosa (Lindl.) Rydb. Bull. Torr. Bot. Club, 33:219. Apr. 1906.

MARSONIA potentillae helleri Peck, *syn. of Marssonina potentillae helleri (Peck) Kellerm.*

MARSONIA quercus Sacc. Syll., *syn. of Marssonina quercus q. v.*

MARSONIA rhabdospora Ell. & Kellerm., *syn. of Marssonina rhabdospora q. v.*

MARSONIA rhamni Ell. & Ev., *syn. of Marssonina rhamni q. v.*

MARSONIA ribicola Ell. & Ev., *syn. of Marssonina ribicola q. v.*

MARSONIA rubiginosa Ell. & Kellerm., *syn. of Marssonina rubiginosa q. v.*

MARSONIA stenospora Sacc. Syll.; Gloeosporium stenosporum Ell. & Kellerm., *syn. of Marssonina stenospora q. v.*

MARSONIA toxicodendri Sacc. Syll., *syn. of Marssonina toxicodendri q. v.*

MARSONIA veratri Ell. & Ev., *syn. of Marsonnina veratri q. v.*

MARSONIA wyethiae Ell. & Ev., *syn. of Marssonina wyethiae q. v.*

MARSSONIA Fischer, *syn. of Marssonina P. Mag. q. v.*

MARSSONINA P. Mag. n. n. [Marssonia Fischer.] Hedwigia, 45:89. 19 Jan. 1906.

MARSSONINA apicalis (Ell. & Ev.) P. Mag. n. n. [Marsonia apicalis E. & E.] Hedwigia, 45:89. 16 Jan. 1906.

MARSSONINA baptisiae (Ell. & Ev.) P. Mag. n. n. [Marsonia baptisiae Ell. & Ev.] Hedwigia, 45:91. 16 Jan. 1906.

MARSSONINA brunnea (Ell. & Ev.) P. Mag. n. n. [Marsonia brunnea Sacc. Syll., Gloeosporium brunneum Ell. & Ev.] Hedwigia, 45:89. 19 Jan. 1906.

MARSSONINA californica (Ell. & Ev.) P. Mag. n. n. [Marsonia californica E. & E.] Hedwigia, 45:90. 16 Jan. 1906.

MARSSONINA delastrei (DeLacr.) P. Mag. n. n. [Gloeosporium delastrei DeLacr.; Marsonia delastrei Sacc. Syll.] Hedwigia, 45:90. 16 Jan. 1906.

MARSSONINA fraserae (Ell. & Ev.) P. Mag. n. n. [Marsonia fraserae Ell. & Ev.] Hedwigia, 45:91. 16 Jan. 1906.

MARSSONINA graminicola (Ell. & Ev.) P. Mag. n. n. [Gloeosporium graminicolum Ell. & Ev.; Marsonia graminicola Sacc. Syll.] Hedwigia, 45:91. 16 Jan. 1906.

MARSSONINA juglandis (Lib.) P. Mag. n. n. [Marsonia juglandis Sacc. Syll.; Leptothyrium juglandis Lib.; Gloeosporium juglandis (Lib.) Mont.] Hedwigia, 45:90. 16 Jan. 1906.

MARSSONINA martini (Sacc. & Ell.) P. Mag. n. n. [Marsonia martini Sacc. & Ell.] Hedwigia, 45:90. 16 Jan. 1906.

MARSSONINA meliloti (Trel.) P. Mag. n. n. [Marsonia meliloti Trel.] Hedwigia, 45:91. 16 Jan. 1906.

MARSSONINA necans (Ell. & Ev.) P. Mag. n. n. [Marsonia necans Ell. & Ev.] Hedwigia, 45:91. 16 Jan. 1906.

MARSSONINA neilliae (Hark.) P. Mag. n. n. [Marsonia neilliae Hark.] Hedwigia, 45:90. 16 Jan. 1906.

MARSSONINA nigricans (Ell. & Ev.) P. Mag. n. n. [Marsonia nigricans E. & E..] Hedwigia, 45:89. 16 Jan. 1906.

MARSSONINA potentillae (Desm.) P. Mag. n. n. [Gloeosporium potentillae (Resm.) Oud.; Phyllosticta potentillae Desm.; Leptothyrium dryadearum Desm.; Septoria potentillarum Fuck. ; Marsonia potentillae var. fragariae Sacc. Syll.] Hedwigia, 45:90. 16 Jan. 1906.

Marssonina potentillae helleri (Peck) Kellerm. n. n. [Marsonia potentillae helleri Peck.]

MARSSONINA quercus (Peck) P. Mag. n. n. [Marsonia quercus Peck.] Hedwigia, 45:90. 16 Jan. 1906.

MARSSONINA rhamni (Ell. & Ev.) P. Mag. n. n. [Marsonia rhamni Ell. & Ev.] Hedwigia, 45:90. 16 Jan. 1906.

MARSSONINA rhabdospora (Ell. & Ev.) P. Mag. n. n. [Marsonia rhabdospora E. & E.] Hedwigia, 45:89. 16 Jan. 1906.

MARSSONINA ribicola (Ell. & Ev.) P. Mag. n. n. [Marsonia ribicola Ell. & Ev.] Hedwigia, 45:90. 16 Jan. 1906.

MARSSONINA rubiginosa (Ell. & Ev.) P. Mag. n. n. [Marsonia rubiginosa E. & E.] Hedwigia, 45:89. 16 Jan. 1906.

MARSSONINA stenospora (Ell. & Kellerm.) P. Mag. n. n. [Gloeosporium stenosporum Ell. & Kellerm. ; Marsonia stenospora Sacc. Syll.] Hedwigia, 45:89. 16 Jan. 1906.

MARSSONINA toxicodendri (Ell. & Mart.) P. Mag. n. n. [Marsonia toxicodendri Ell. & Mart.] Hedwigia, 45:90. 16 Jan. 1906.

MARSSONINA veratri (Ell. & Ev.) P. Mag. n. n. [Marsonia veratri Ell. & Ev.] Hedwigia, 45:91. 16 Jan. 1906.

MARSSONINA wyethiae (Ell. & Ev.) P. Mag. n. n.]Marsonia wyethiae Ell. & Ev.[Hedwigia, 45:91. 16 Jan. 1906.

MASSARIA platanoides Rehm. n. sp., on bark of dead prostrate trunks of trees. Ann. Mycolog. 4:336. Aug. 1906.

MASSEE, George. A fungus parasite on a moss [Epicoccum torquens Massee n. sp.] Torreya, 6:48-50. Mar. 1906.

MEGAPTERTIUM fremonti, host to Uromyces fremonti Syd., n. sp. Ann. Mycolog. 4:29. Feb. 1906.

MEGASPORE or Macrospore [*Mega,* Gr. *megas,* great or large is the opposite of *micro; Macro,* Gr. *macros,* means long, not the opposite of *micro,* but of *brachus* meaning short.] Charles J. Chamberlain, Science N. S. 23:819. 25 May 1906.

METASPHAERIA leguminosa Fairman n. sp., on inner surface of pods of Robinia pseudacacia. Ann. Mycolog. 4:328. Aug. 1906.

METASPHAERIA lyndonvillae Fairman n. sp., on inner surfaces of pods of Robinia pseudacacia. Ann. Mycolog. 4:328. Aug. 1906.

MERRILL, G. K. Lichen Notes, No. 1. Bryologist, 8:110-112. Nov. 1905.

MERRILL, G. K. Lichen Notes, No. 2. The Bryologist, 9:3-4. January 1906.

MILDEWS, Powdery, of Washington. W. H. Lawrence. Wash. State Agr. Exp. Sta. Bull. 70:1-16. 1905.

MILDEWS, sexual reproduction and organization of the nucleus in certain, see *Sexual Reproduction and . . .*

MICROMYCETES Americani Novi. P. A. Saccardo. Jour. Mycol. 12:47-52. Mar. 1906.

MICROPERA ampelina Sacc. et Fairm. n. sp., in ramulis nondum emortuis Vitis viniferae. Jour. Mycol. 12:49. Mar. 1906.

MONILIA avenae Peck n. sp., on living or languishing leaves of some unidentified species of Avena. Bull. Torr. Bot. Club, 33:219. Apr. 1906.

PERONOSPORA cubensis B. & C. *syn of Peronoplasmopara cubensis q. v.*

PERONOSPORA parasitica on Cauliflower, On the Occurrence of. Hermann von Schrenk. An. Rep. Mo. Bot. Gar. 16:121-4. Pl. 22-4. 1905.

PERSEA gratissima, Aguacate, host of Hendersonia mexicana Sacc. n. sp. [Mexico.] Jour. Mycol. 12:51. Mar. 1906.

PERSICA vulgaris, host to Haplosporella missouriensis Babák n. sp. Jour. Mycol. 12:54. Mar. 1906.

PEZIZA nyssaegena Ellis, syn. *of Sclerotinia nysssaegena q. v.*

PHLEOSPORA hanseni Bubák n. sp., auf lebenden Blättern von Quercus morehus. Jour. Mycol. 12:54. Mar. 1906.

PHLOX, dead stems, host to Pleospora magnifica Peck n. sp., Bull. Torr. Bot. Club, 33:221. Apr. 1906.

PHLOX drummondii, host to Ophiobolus sceliscophorus Fairman n. sp. Proc. Rochester Acad. Sci. 4:215. March 1906.

PHOLIOTA cubensis Earle n. sp. [Cuba.] Informe An. Estac. Agronom. Cuba, 1:242. 1 June 1906.

PHOLIOTINIA Fayod, Pholiota (Hygrophanae) Sacc. [Earle.] Informe An. Estac. Agronom. Cuba, 1:241. 1 June 1906.

PHOLIOTINIA musae Earle n. sp. [Cuba.] Informe An. Estac. Agronom. Cuba, 1:241. 1 June 1906.

PHOMA lophanthi Bubák n. sp. [Septoria lophanthi Ellis ined., not Septoria lophanthi Winter], auf toten Stengeln von Lophanthus nepetoides. Jour. Mycol. 12:53. Mar. 1906.

PHOMOPSIS majuscula Sacc. n. sp., in ramis emortius Tecomae radicantis. Ann. Mycolog. 4:275. 5 June 1906.

PHOMOPSIS missouriensis Bubák n. sp., auf toten Stengeln von Asclepias verticillata. Jour. Mycol. 12:53. Mar. 1906.

PHYLLOSTICTA consors Sacc. n. sp., in maculis ochraceo-brunneis Phleosporae ad folia Mori albae cultae [Mexico]. Jour. Mycol. 12:51. Mar. 1906.

PHYLLOSTICTA convexula Bubák n. sp., auf Blättern von Carya tomentosa. Jour. Mycol. 12:52. Mar. 1906.

PHYLLOSTICTA potentillae Desm., *syn. of Marssonina potentillae q. v.*

PHYLLOTUS hygrophanus Earle n. sp. [Cuba.] Informe An. Estac. Cen. Agronom. Cuba, 1:233. 1 June 1906.

PHYLLOTUS imbricatus Earle n. sp. [Cuba.] Informe An. Estac. Cen. Agronom. Cuba, 1:233. 1 June 1906.

PHYLLOTUS Karst. [(Pleurotus) Resupinati, 1. parte] Sacc. Syll. [Earle] Informe An. Estac. Cen. Agronom. Cuba, 1:233. 1 June 1906.

PHYSOSTEGIA virginiana Benth., host to Leptosphaeria physostegia Fairman n. sp. Proc. Rochester Acad. Sci. 4:216. March 1906.

PHYTOPHTHORA infestans (Mont.) DeBy. [Clinton.], see *Downy Mildew*. . .

PICEA parryana (André) Parry (P. pungens Englm.) host to Peridermium boreale Arth. & Kern n. sp. Bull. Torr. Bot. Club, 33:425. Aug. 1906.

PILEATE Polyporaceae of Central Maine [a list of about three dozen species; and description of Polyporus fagicola n. sp.] William A. Murrill. Torreya, 6:34-7. Feb. 1906.

PINUS echinata Mill. (P. mitis Mx.), host to Peridermium intermedium Arth & Kern n. sp. Bull. Torr. Bot. Club, 33:416. Aug. 1906.

PINUS filifolia Lindl., host to Peridermium gracile Arth. & Kern n. sp. Bull. Torr. Bot. Club, 33:418. Aug. 1906.

PINUS jeffreyi Oreg. Com., host to Peridermium stalactiforme Arth. & Kern n. sp. Bull. Torr. Bot. Club, 33:419. Aug. 1906.

PINUS mitis Mx., see *Pinus echinata Mill.* . .

PINUS murrayana Oreg. Com. host to Peridermium stalactiforme Arth. & Kern n. sp. Bull. Torr. Bot. Club, 33:419. Aug. 1906.

PINUS murrayana Oreg Com. (Englm.) Lemm., host to Peridermium montanum Arth. & Kern n. sp. Bull. Torr. Bot. Club, 33:413. Aug. 1906.

PINUS oocarpa Schiede, host to Peridermium mexicanum Arth. & Kern. n. sp. Bull. Torr. Bot. Club, 33:423. Aug. 1906.

PINUS palustris Mill., host to Peridermium fusiforme Arth. & Kern. n. sp. Bull. Torr. Bot. Club, 33:422. Aug. 1906.

PINUS patula Schiede & Deppe, host to Peridermium mexicanum Arth. & Kern n. sp. Bull. Torr. Bot. Club, 33:423. Aug. 1906.

PINUS scopulorum (Englm.) Lemm., host to Peridermium montanum Arth. & Kern n. sp. Bull. Torr. Bot. Club, 33:413. Aug. 1906.

PINUS strobus L., see *Strobus strobus (L.) Small.* . .

PINUS taeda L., host to Peridermium fusiforme Arth. & Kern n. sp. Bull. Torr. Bot. Club, 33:422. Aug. 1906.

PYRENOMYCETEAE novae in leguminibus Robiniae. Charles E. Fairman. Ann. Mycolog. 4:326-8. Aug. 1906.

PYRENOPHORA ampla Syd. n. sp., in foliis petiolisque emortuis Anemones totonensis. Ann. Mycolog. 4:343. Aug. 1906.

QUERCUS morehus, host to Leptothyrium californicum Bubák n. sp. Jour. Mycol. 12:55. Mar. 1906.

QUERCUS morehus, host to Phelospora hanseni Bubák n. sp. Jour. Mycol. 12:54. Mar. 1906.

RATE of Growth of Panaeolus retirugis, see *Panaeolus*. . .

REED, George M. Infection Experiments with Erysiphe graminis DC. Trans. Wisc. Acad. Sci. Arts & Let. 15:135-162. 1904 issued 1905.

REED, Howard S. Parasitism of Neocosmospora [weak parasite on ginseng.] Science N. S. 23:751-2. 11 May 1906.

REED, Howard J. Three Fungous Diseases of the Cultivated Ginseng [Vermicularia dematium, Pestalozzia funera, Neocosmospora vasinfecta.] Mo. Agr. Exp. Sta. Bull. 69:43-65. Oct. 1905.

REICHLING, G. A. Contributions to the recorded Fungus and Slime-Mould Flora of Long Island [list of 20 species]. Torreya, 5:85-7. May 1905.

REPORT of the Botanist. G. P. Clinton. Conn. Agr. Ex. Sta. Report, 1904:311-384. Pl. XVIII-XXXVII. May 1905.

REPORT of the Botanist [N. J. Exp. Sta. 1905] Fungi as related to Weather and Fungi upon the Experiment Grounds [in report of Botanical Department. Extracts from "Weather and Crop Bulletin" and notes on the occurrences of a few parasitic fungi]. Byron D. Halsted, Earle J. Owen, and Jacob H. Shaw. Rep. N. J. Agr. Coll. Exp. Sta. 1905:510-517. 1906.

REPRODUCTION, sexual, in certain Mildews, see *Sexual*. . .

RHABDOSPORA demetriana Bubák n. sp., auf trockenen Stengeln und Aesten von Aesclepias verticillata. Jour. Mycol. 12:54. Mar. 1906.

RICKER, P. L. Second Supplement to New Genera of Fungi published since the year 1900, with citation and the original descriptions. Jour. Mycol. 12:60-67, 95-102. March and May 1906.

RIDDLE, Lincoln Ware. On the Cytology of the Entomophthoraceae. Proc. Am. Acad. Arts and Sci. 42:177-198. Pl. 1-3. August 1906.

INDEX TO VOLUME 12.

INDEX TO DESCRIBED SPECIES.

(The new species are in black type.)

INDEX TO HOSTS.

PRICE LIST.

Journal of Mycology, Vol. 8—1902	....	$2 00
" " " 9—1903	....	2 00
" " " 10—1904	....	2 00
" " " 11—1905	....	2 00
" " " Current Vol	....	2 00
Index to North American Mycology (authors, titles, subjects, new species and hosts, new names and synonyms) since Jan. 1, 1901. *Printed on one side of page.* Seven parts have been issued. Price per part	....	25
Index to Uredineous Infection Experiments with List of Species and Hosts for North America, *printed on one side of page*	....	50
Portraits of Mycologists, reprinted from the Journal of Mycology (Peck, Ellis, Arthur, Burrill, Farlow, Tracy, Earle, Atkinson, Holway, Thaxter, Clinton, Magnus, Oudemans, Patouillard, Hennings Rehm, Cooke, Saccardo, Dietel, Sydow, H., Sydow, P., Hollos, Bresadoia, each		10
Ohio Fungi exsiccati. Though the set is designed primarily for exchange a few copies are for sale. Issued in fascicles of 20 specimens each. Ten fascicles now ready. Price per fascicle	....	1 00
Mycological Bulletin. A popular leaflet of 4 pages, illustrated, 24 Nos. per year. Vol. II, 1904, Vol. III, 1905, each 50 cents; bound in cloth, 75 cents. Current year	....	25
New Genera of Fungi. Published since 1900; the original descriptions reproduced with full citation. Annual Supplements are to follow. Printed on one side of page only. Price	......	75
First Supplement to New Genera of Fungi published since 1900, with the original descriptions	......	50
Index to Journal of Mycology, volumes 1-10	....	75
Mycological Glossary	....	25
North American Species of Marasmius; a monograph by A. P. Morgan	....	25