

MYCOLOGICAL NOTES.

BY G. G. LLOYD.

No. 18.

CINCINNATI, O.

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285—THE GENUS TRICHASTER.

(Plate 17.)

This genus can be described in a few words as being a geaster with a deciduous endoperidium. The general appearance and shape of the plant, the spore mass, the spores and capillitium all are the same as a geaster. Indeed, the few times it has been collected in Germany it was taken for a geaster that had accidentally lost the endoperidium. The genus was described by Czerniaïev from the steppes of Russia in 1845 but he gave no figure of it and the plant was really unknown to modern compilers of books, who either put it among the doubtful genera as it is to be found in Engler & Prantl, or illustrated it as an abnormal form of a geaster as shown by Hollós, who was unaware that he was dealing with Czerniaïev's genus. Czerniaïev sent specimens abundantly to both Berkeley and Fries and when I first saw them at Upsala my impression was that it was a specimen of *Geaster fornicatus* that had lost its endoperidium by exposure to the hard winters of Russia. I have since changed my mind and I believe now that it is a valid genus and a good species.

The abundant specimens sent by Czerniaïev to Kew and Upsala and the three collections, one in the Museum at Berlin and two in the herbarium of Prof. Magnus all have the same character. The endoperidium is *caducous* and falls away as soon as the exoperidium opens. The exoperidium is not the same as *Geaster fornicatus*, not only being differently cut but never having the cup at the base which is the *main character* of *Geaster fornicatus*. I have seen five collections of *Trichaster* and many of *Geaster fornicatus* and have never seen them intermixed. If it were an abnormal form, occasionally this form would occur with the normal or vice-versa. In addition Czerniaïev gives the straightforward account of his plant a man does who *knows* what he is writing about. He states that it grows in groups in deep forests and gardens, and develops *on the top of the ground* which he points out "is different from the development of geasters," (as it is from all those that grow with him.)

The plant is evidently abundant on the steppes of Russia* but very rare elsewhere in Europe where only three collections are known. One specimen I found unlabeled in Link's herbarium, collected at Potsdam near Berlin. Two collections are in the herbarium of Prof. Magnus, one collected in the park at Magdeburg, Germany, by Reinhardt, the other in Unterengarten Valley Switzerland by Dr. Magnus.

* Ukraine, the region from which Czerniaïev wrote is in Southern Russia, east of the Carpathian mountains and north of the Black Sea.

Czerniaiev called his plant *Trichaster melanocephalus*. A somewhat similiar plant, but I believe not published, has been found in Texas by W. H. Long Jr.

286—LANOPILA BIGOLOR.

(Plate 18.)

The genus *Lanopila* was proposed by Fries from a specimen sent him by Wahlberg from South Africa. The type is not in Fries' herbarium, but the genus was well enough described to be easily recognized. It is characterized by the habits and papyraceous peridium of the genus *Bovista* from which it differs only in the capillitium. This forms a dense, homogeneous, elastic mass formed of long intertwining and branched threads. They are not attached to the peridium.

The genus *Bovista* typically has short separate threads that can be readily isolated, but that the threads of *Lanopila* are essentially different, except in being so long and intertwined that they cannot be separated, I think cannot be proved. It is therefore to me a very doubtful question whether the genus should be considered distinct from *Bovista*, especially as it consists of only one known species,* which is typically a *Bovista* as to peridium and habits, differing only in this one particular. *Lanopila bicolor* was described by L  veill   as *Bovista bicolor* † (Ann. Sci. Nat. 3-5-162) from specimens from India which are abundantly preserved to-day in a jar in the Museum at Paris. It is a very common species in warm countries and we have noted specimens in the Museums of Europe from Brazil, Argentina, Cuba, Guadeloupe, Ceylon, India and Africa.

DESCRIPTION :—The plant is usually 5 to 8 cm. in diameter and subglobose. Peridium is of a reddish brown color and smooth. When young the plant is white and furnished with a thin, smooth cortex which peels off when the plant ripens. The peridium is typically that of a *Bovista*, papery-cartilaginous and the plant is a typical "tumbler" detaching from the roots when ripe and rolling over the ground. The gleba is compact, homogeneous, reddish brown color, and composed of long intertwined branching capillitium threads. Spores globose, warted, 5-6 mic. without pedicels. The plant is distinguished from most "puff-balls" by the *reddish color* both of the peridium and gleba.

SYNONYMS.

Bovista bicolor (Ann. Sci. Nat. 3-5-162). *Bovista pannosa* (Jour. Bot. 88-131). *Bovista tosta* (Jour. Bot. 88-132), *Bovista argentea* (Ann. Nat. Hist. 3-400). The latter as to specimens now preserved at Kew as its type but they do not answer the description which I think was based on the plant since described as *Bovista dealbata*. Through a mistaken identification (cfr. Myc. Notes p. 118) this plant has been noticed (p. 118) and illustrated (plate 4, fig. 4, 5 & 6) under the erroneous name "*Bovista lateritia*". According to an authentic specimen in Museum of Paris *Lanopila Argentina* (Speg. Argent. 4-100) should also be referred here.

* *Lanopila Wahlbergii* (Fungi Natalenses p. 31) unknown. Although the spores are described as fuliginose it is possibly *L. bicolor* which occurs in Africa. *Lanopila stipitata* (Sacc. 7-95) = sterile base of *Bovistella Ohiensis* (cfr. Myc. Notes p. 180). *Lanopila tabacina* (Michelia 2-565) = *Bovista pila* (cfr. Myc. Notes, p. 117). *Lanopila Argentina* (Argent. 4-100) = *L. bicolor* (vide type at Paris Museum). *Lanopila guaranitica* is practically unknown.

† Leveille bases the name on the statement "The upper part of the plant is brown chestnut whilst the lower is color of leather." This "bicolor" is not usually noticeable and the plant is really misnamed.

Specimens in our Collection.

West Indies, St. Kitts, Wm. Lunt. a fine collection.

Mexico, Sanderson specimens from Prof. T. H. McBride.

Brazil, Rev. Johann Rick.

Ecuador, G. Lagerheim.

The plants received from Prof. Lagerheim and Rev. Rick are much larger than those from the West Indies and are not globose. The peridium is also separable (as the genus *Lasiosphaera*) but I think this is due to hard usage in the mails.

287—LASIOSPHAERA FENZLII.

(Plate 19.)

This is the "giant puff-ball" of India, the only species known to me that competes in size with the "giant-puff-ball" of the remainder of the world. *Calvatia gigantea*.*

The main character on which the genus *Lasiosphaera* rests is the *caducous peridium*. When the puff-ball ripens, the peridium loosens and falls away, and a mass of compact gleba remains, which rolls over the ground dispersing the spores. Such a mass was picked up thirty odd years ago on the voyage of the "Novara," country unknown, but supposed to be India. It was described in the "Reise der Novara" as *Lasiosphaera Fenzlii*,† and the specimen preserved in the Hofmuseum of Vienna.‡

Not another specimen has since been received in Europe until last summer when I received at Paris fine specimens from Hugh F. MacMillan, Ceylon and also Geo. H. Cave, British India. These specimens presented every stage from young specimens with the peridium attached, to old ones that had lost their peridia and were only a mass of gleba.

The peridium of the plant is double, both the exoperidium and the endoperidium being thin, the former peeling away from the inner peridium in patches as shown in the plate, and finally they both fall away leaving the spore mass. The inner peridium is very thin and papery, exactly the same nature as the inner peridium of the genus *Hypoblema*. It is of a rich, chocolate brown color. The gleba is compact, homogeneous, and consists of long, branched, intertwined threads, mixed with globose, rough, spores 5-6 mic. in diameter. It is of the same nature and has the same spores as that of *Lanopila bicolor*, but the color is not so reddish being rather a purplish umber.(§)

* The only other I have found mentioned is "*Lycoperdon horrendum mihi*" (Bull. Soc. Moscow 45-132), but I do not know where "mihi" published it, if he ever did, and it is probable from his incidental mention that it is *Calvatia gigantea*. The "mihi" writers are now mostly memories of the past, for the idea that a man owns a species because he describes it, was too preposterous to persist. The present system of attaching personal names to the names of plants, is however, a direct outgrowth from it, and its legitimate offspring.

† The generic name *Eriosphaera*, which occurs in Saccardo was the original Mss. name, not published but changed to *Lasiosphaera* when it was found that *Eriosphaera* was preoccupied.

‡ I am indebted to Dr. A. Zahlbruckner of the Museum for a very liberal sample of the type gleba mass.

(§) Statement has been recently made that the plant is the same as the giant puff-ball of Europe but as the two plants have neither the same spores, gleba colors, nor peridia I am not strongly impressed with the truth of it and think the author was guessing.

Geographical Distribution.

The plant is only known from Ceylon and British India. The specimen sent me by Mr. Cave grew on a manure pile.

Specimens in our Collection.

Ceylon, Hugh F. MacMillan, *British India*, Geo. H. Cave.

288—THE GENUS SCHIZOSTOMA.

(Plate 20.)

A misunderstood genus from the day it was proposed by Ehrenberg, *I consider it a valid genus, certainly as distinct from *Tylostoma*, as the genus *Chlamydotus*. I do not take it in the sense it is found in Saccardo, as a section of *Tylostoma*, for it includes but a single species, *Schizostoma laceratum*. This plant, the type specimen of Ehrenberg[†] is found in the Museum at Berlin, also abundant specimens collected in recent years by Schweinfurth in Africa. It is in no other museum to my knowledge.

The genus *Schizostoma*, differs from *Tylostoma* in the nature of the peridium. This is very fragile, and dehisces in the manner of a *Calvatia* by an irregular breaking up of the upper portion. It is given in Saccardo as a section of *Tylostoma*, including the species with "irregular mouths" but the genus *Schizostoma* has no mouth.

Fries, who had seen Ehrenberg's plant, referred it to *Tylostoma*, and Lévillé who I think never saw it, had a mistaken idea of it. He restored the genus, and included all species of *Tylostoma* with irregular mouths. It is Lévillé's genus *Schizostoma*, that in Saccardo is classed as a section of *Tylostoma*.

SCHIZOSTOMA LACERATUM.

This plant which is the only species of the genus, is only known from Equatorial Africa, but has been collected abundantly in recent years by Schweinfurth, whose specimens are at Berlin. That it probably does not occur in Northern Africa I infer, from the fact that it is not found in the museum at Paris, especially rich in North African plants. The plant has a close resemblance to a *Tylostoma* and could be well classed with this genus.[‡] To my mind, the difference between it and *Tylostoma* is the same as between *Calvatia* and *Lycoperdon*. The upper portion of the peridium breaks away in pieces and does not open by a definite mouth.

The stem is long, cylindrical, and inserted into a socket at base of peridium as in a *Tylostoma*. While the plant certainly has a veil in the young condition, there are but few indications of it in the mature plant. The peridium is brown, very thin, the upper portion breaking irregularly away when the plant matures. The gleba is a rich *brown*

*I have not seen the original publication "*Nees Horae physicae berolinenses*," as cited by Fries, and I do not know whether it was published or was only a mss. name as stated in Saccardo.

†I neglected to note whether Ehrenberg gives a locality but think not.

‡There is no serious objection to classing it as a *Tylostoma*, as the amount of difference necessary to constitute a genus is entirely a matter of individual opinion and cannot be defined by rules. But there is a strong objection to classing it in the section with *Tylostoma volvulatum*, *granulosum*, etc., for (notwithstanding Hollós thinks it is the same as *volvulatum*) it differs from all these plants much more than they do from the other "section" of the genus.

color different from what is usually found in species of *Tylostoma* (excepting *T. volvulatum*).*

Capillitium long, tortuose intertwined, deeply colored, sparingly branched threads.† They are not septate and are about twice the thickness of spores. Spores globose, 4-5 mic. finely warted.

SYNONYMS.

Tylostoma laceratum (Fr. Syst. 3.44), *Tylostoma Schweinfurthii*, (Eng. Jahr. 14-359), *Tylostoma Kärnbackii*, (Mss. name).

289—BROOMEIA CONGREGATA.

(Plate 21.)

This is a very curious genus, known only from South Africa, and but one species.‡ It was well described by Berkeley (Hook. Jour. 44-185) and beautifully illustrated by Fitch. It has been collected a number of times in South Africa, always correctly determined owing to the splendid initial work accomplished, and fine specimens can be found at Kew, Berlin, British Museum and Upsala.

The little plants which are very numerous (sometimes 150 individuals in a cluster Berkeley states) are imbedded side by side about one-fourth their height, into a common stroma. This stroma is of a firm, corky nature and flesh color. It grows on rotten wood, and the clusters can be aptly compared to a water lily pad (*Nelumbium luteum*). We have seen no young specimens, or specimens on which any portions of the exoperidium remained § George Murray gives an excellent account of the outer peridium (Jour. Linn. 20-311) "It is a beautiful white color, joined to the stroma round the margin and reaches over the tops of the inner peridia. Each individual is not completely invested by it, at all points, but it extends over the tops as one continuous membrane, common to the whole mass fitting into the depressions between the inner peridia, and, in the cases of nearly mature individuals, easily separable from them."¶

*The color of gleba of *Schizostoma* is "castaneus" chestnut brown. That of *Tylostoma* is close to "isabellinus" tan color.

†The gleba nature of the genus is different from that of *Tylostoma*. The long, intertwined threads bind the mass together, as in *Calvatia craniiformis*, and in herbarium specimens, the gleba remains in place, although the peridium has broken away. In *Tylostoma* and most genera opening by a definite mouth the gleba is less cohesive.

‡Leveille described a *Broomeia guadalupensis* from the West Indies. No one else ever found the genus except in South Africa. The locality "Albany Amer. Bor." in Saccardo is an error for Albany a district of Cape Colony. *Diplocystis Wrightii*, a somewhat similiar plant (cfr. Myc. Notes, p. 141 and plate 15) is common in the West Indies, and known from Guadeloupe. Leveille's species, *Broomeia guadalupensis*, is almost certainly the same as *Diplocystis Wrightii* and an earlier name. It would be safe to say so anyhow as Leveille's specimens are lost and no one could prove to the contrary and it is an elegant opportunity for some name juggler. The specific name, *congregata*, is very appropriate but I do not know what Broom had to do with it. If Berkeley had named the plant "Fitchia" after the man who made the fine drawing of it which in reality made the plant known, it would have been far better. Whether "Broomeja" as found in Saccardo or "Broomeia" as originally spelled, is orthographically correct I do not know.

§On the herbarium sheet in British Museum is a memorandum "see specimens in a box." These specimens no doubt show the exoperidium. I intended to ask for them, but through neglect failed to do so.

¶We hope this article will reach the notice of some South African botanist, who will appreciate how anxious we are to have some specimens in our Museum and favor us by sending a nice collection. We especially hope for some young specimens showing the outer peridium before, or while it is breaking away, as we would wish to present a photograph to our readers.

The separate plants lie almost contiguous. The peridia are dark brown, in color, and strongly marked each with a determinate fimbriate mouth. The capillitia are colored, long, tortuose threads which are irregularly bent and thickened. They appear to me unbranched. Spores subglobose, finely echinulate, 6-7 mic.* The fresh plant according to Berkeley "exhales a strong scent of aniseed." That the odor is strong we judge from the collection notes of MacOwan "Non oculis sed *naso* detexi."

BROOMEIA AND DIPLOCYSTIS.

When we wrote on *Diplocystis* (p. 141) we had never seen *Broomeia* and really did not know the difference between them. When we became familiar with both plants it became evident that there is no great resemblance between them excepting that both consist of numerous individuals growing gregarious on a common stroma. The stroma of *Diplocystis* is flat, rather thin, and dark in color. That of *Broomeia* is thick, convex, and flesh colored. The exoperidium of *Broomeia* is universal to the cluster; that of *Diplocystis* individual to each plant. The mouth of *Broomeia* is strongly determinate; that of *Diplocystis* indeterminate. The capillitia of the two are quite different. The illustration in Engler and Prantl of *Broomeia*, from the drawing of Fitch is excellent. The "original" illustration of *Diplocystis* in the same work is inaccurate.

293--BATTAREOPSIS ARTINI.

(Plate 22.)

This is one of the recent additions to the genera of *Gastromyces* described and figured by Dr Hennings in *Hedwigia* 1902. Only one specimen is known which grew under abnormal conditions and was probably modified by its surroundings. It was found at Alexandria, Egypt under an asphaltum pavement two inches thick which it had raised up by force, a circumstance so unusual that the specimen was put in alcohol and sent to Berlin. There it was found to belong to an undescribed genus. All that reached Berlin was the volva, stem, and cap covered with gleba. The peridium nature, if it possesses one, is unknown. The plant has a general resemblance to a *Battarreia* but it is quite different in the nature of the gleba. This is composed of cells filled with spores, somewhat of the nature of the gleba of a *Poly-saccum* but the cells seem to be formed of plates with partitions. The color of the gleba is similiar to *Battarreia* and the spores are similiar, but the plant has none of the "annulated cells" of that genus. The capillitium is scanty and appears to me to be part of the hyphae of the walls, rather than free threads mixed with the spores.

We present a photograph of the volva, stem, and cap (the latter two views). But we shall not attempt to reconstruct the plant. Dr. Hennings tells me the figure in *Hedwigia* was arranged according to a sketch sent with the plant, but there is no scar on the concave side of the cap, which I think would be the case if the stem were so attached. It is a most interesting plant and we hope additional specimens will be found in natural habitat so that more can be learned about it.

* These dimensions differ from those given in Saccardo.

291--GYROPHRAGMIUM AND POLYPLOCIUM

I think that anyone who will study the types of *Gyrophragmium Delilei* at Paris and *Polyplocium inquinans* at Kew will reach the conclusion that the two plants are co-generic. The only question to me is if they are not co-specific. They were published practically at the same time and I do not know how the question of priority of generic name will be decided. The plate of *Polyplocium inquinans* was published first, then came the description of *Gyrophragmium* and then the description of *Polyplocium*. I believe according to "rules" *Gyrophragmium* stands, but whether it does or not, I shall adopt it for several reasons.

1st. I think both authors thought their genera were practically the same, and each was hurried to get his name attached to it. Each labored to show that his genus was different from the other, and so well succeeded that the two genera have been carried in all compilations down to the present time.

2nd. My sympathies are with Montagne for he received his plant several years before Berkeley, but he lost time in sending his specimens to Fries* and Berkeley as soon as he received the plant issued a named plate. When Montagne saw Berkeley's plate, he came out at once with the description of the genus *Gyrophragmium* before Berkeley had a chance to publish his genus.

3rd. *Gyrophragmium Delilei* is not a rare plant in the Mediterranean countries and has been published and recorded a number of times under this name. Excepting a determination made by Harkness, the name *Polyplocium inquinans* has never been applied to a collection save the original specimen of South Africa, sixty years ago.

4th. I think the genus *Polyplocium* although well illustrated, was misdescribed as having capillitium mixed with the spores. I am unable to find any capillitium and think the character does not exist.†

RELATIONS:—To my mind the genus *Gyrophragmium* has no place in the *Gastromycetes*. Its relations are more close to the *Agarics*. It is a connecting link between the two passing on one hand through *Montagnites* to *Coprinus* and on the other through *Secotium* to the true *Gastromycetes*. *Montagnites* and *Gyrophragmium* are very close genera and sometimes confused. Both have dark, almost black spores, borne on basidia, and lining "tramal plates". In *Montagnites* the plates are radiately arranged as an *Agaric*, and can be well called gills. In *Gyrophragmium*, they are strongly, convolute and sinuate, forming by their sinuosity "pore-like" chambers.‡ These are pores not closed excepting imperfectly, the tramal plates lying close to each other at their lower extremities. They do not form true cells. Montagne's figure (copied in Engler & Prantl) shows the plates too regularly and serially arranged. Berkeley gives a much better figure of the plant.

* Attention of priorists is called to the fact that the plant was first published by Fries as *Montagnites Dunalii* (Epici '240) having been sent to him by Montagne under the name "*Agaricus ocreatus Delile Mss.*" This naturally provoked Montagne not a little, for the naming of a "new species" unasked, by one author from specimens received from another writer on the same subject is not held to be good form. Besides, Fries got the French names mixed, Dunal had nothing whatever to do with the plant.

† I am aware that Corda in his figure, plainly shows the capillitium, but I think he made up his drawing to suit his ideas of what he thought ought to be. Corda's figure is a copy of Berkeley's with the addition of a cut showing the "capillitium."

In Saccardo the character "*Capillitium filamentosum*" is given as the key character of the genus.

‡ Mr. L. A. Greata, Los Angeles, Cal. has favored me with an account of the structure of a young plant, from observations of a fresh specimen. "A cross section, at first sight would appear irregularly porous. A close examination however, shows lamellae densely crowded and pressed, much the same as you would obtain on a large scale by laying a number of thin damp cloths, one on top of the other and then holding them perpendicular and squeezing one end tightly into a circular form. There is only this difference, the lamellae are broken up into short pieces and do not seem to reach from the stem to the periphery."

GYROPHRAGMIUM.

There is little description needed for this plant other than the photographs on our plates. The gleba is described above.

The plant usually grows in sandy places. Its true home is the "sand-dunes" on the Mediterranean coasts. The young plants are enclosed in a volva (or peridium, if we call the plant a *gastromyces*). This breaks irregularly as the plant grows. In the European form it usually remains as kind of volva cup (see plate 24 fig. 3) at the base of the plant. In the American plant it generally breaks loose from the base of the plant, though fragments are sometimes attached to the stem as shown in our figure. The tramal plates and spores (gleba) are black. The flesh of the stem in dried specimens is yellow. We do not know the color when fresh but Mr. Greata writes me, "upon cutting, the flesh of the stalk rapidly *turns* a bright lemon yellow." The European plant is decidedly more yellow than the American plant.

All *Gyrophragmiums* that I have seen impress me as being forms of the same species, having practically the same gleba and spores and would probably all be better called *Gyrophragmium Delilei*. The European, American and South African plants present minor differences, chiefly stature, and it is perhaps well for the present at least to designate them by separate names which have principally a geographical significance.

292—GYROPHRAGMIUM DELILEI.

(Plate 24. Figs. 3 and 4.)

The original form from Montpellier France, has been found in Algiers, Sardinia and no doubt occurs in other Mediterranean countries. It is a brighter yellow than other forms and the volva usually (not always) persists as a cup at the base of the plant. Spores subglobose, 6-7 mic.

Specimens in our Collection.

Sardinia, F. Cavara, *France*, N. Patouillard.

293—GYROPHRAGMIUM DECIPIENS.

(Plate 23.)

The West American form, varies much in general stature, and we have seen specimens as slender as the European form. As it grows in the sand-dunes of the Pacific Coast it is a much more obese plant, with a thick stem. The volva does not usually form a cup but breaks away from the base of the plant. The spores 6-8 mic. are slightly larger than the European species.

HISTORY.

Originally collected by Harkness it was sent to Cooke and referred to the South African form, *Polyplocium inquinans*. Recently it was described (Bull. Tor. 95-492) from Southern California as *Secotium decipiens*. *Polyplocium Californicum* I think is a slender form of it.* *Podaxon strobilaceus* (Ann. Myc. .02-4) is probably a slender form of it.†

Specimens in our Collection.

Los Angeles, California, L. A. Greata (abundant), *San Bernardino*, S. B Parish.

294—GYROPHRAGMIUM TEXENSE.

(Plate 24, Fig 5.)

This plant described (Grev. 2-34) as *Secotium Texense* is certainly only a small form of the Pacific Coast plant and probably grows continuously through the desert to lower California. The specimen we have received from Mr. Long is smaller, more scaly and the spores slightly smaller (5-6 mic.) than the western form.

Specimens in our Collection.

Texas, W. H. Long, Jr.

295—GYROPHRAGMIUM INQUINANS.

(Plate 24, Figs. 1 and 2.)

Only one specimen of the plant is known. It was collected in South Africa sixty years ago by Zeyher, described as *Polyplocium inquinans* and is preserved at Kew. It is more robust than the North African species and the tramal plates (of this specimen) are more twisted together, and separate from each other so that at first view it appears quite different. The structure however, is essentially the same. The spores are slightly more oval than the North African form, but the contrast is not very great as shown by our silhouettes and the spores of no species are truly globose.

296—ANTONY GEPP.

My apologies are due and are extended to Mr. Anthony Gepp of the British Museum for misspelling his name "Jepp" in our last issue. He was very kind to me and I am sorry to have made such a mess of his name. It is one of the features of the English language that one can never tell how to spell a name from the way it is pronounced. Leister should also have been Lister.

* Dr. Harkness was not very careful in distributing his specimens. The specimen in New York from him is a *Gyrophragmium*. The specimen at Berlin a *Montagnites*. On the strength of this specimen Dr. Hollós refers *Polyplocium Californicum* as a synonym for *Montagnites* but it is quite evident that Harkness' description does not refer to that genus.

† The author, E. B. Copeland, has apparently such a slight knowledge of the characters of the genera of these plants that it is difficult to tell from his description to what genus his "new species" belongs. From his figure and also his description of "pendant, hymenium coated plates" it is probable his plant is a *Gyrophragmium*. Certainly it is not a *Podaxon* and has not the most remote resemblance, or the slightest character belonging to this genus. It is a sad commentary on the competency of "new species" makers when their work shows such lack of elementary knowledge of the "old genera".

297—GEASTER BERKELEYI.

Those who express opinions second hand, regarding plants about which they really know nothing, are very apt to make mistakes. When we took up the subject of "puff-balls" we thought it a crime for a man to make a mistake and that he ought to be crucified for doing so. Our opinion has somewhat changed, first, because so many

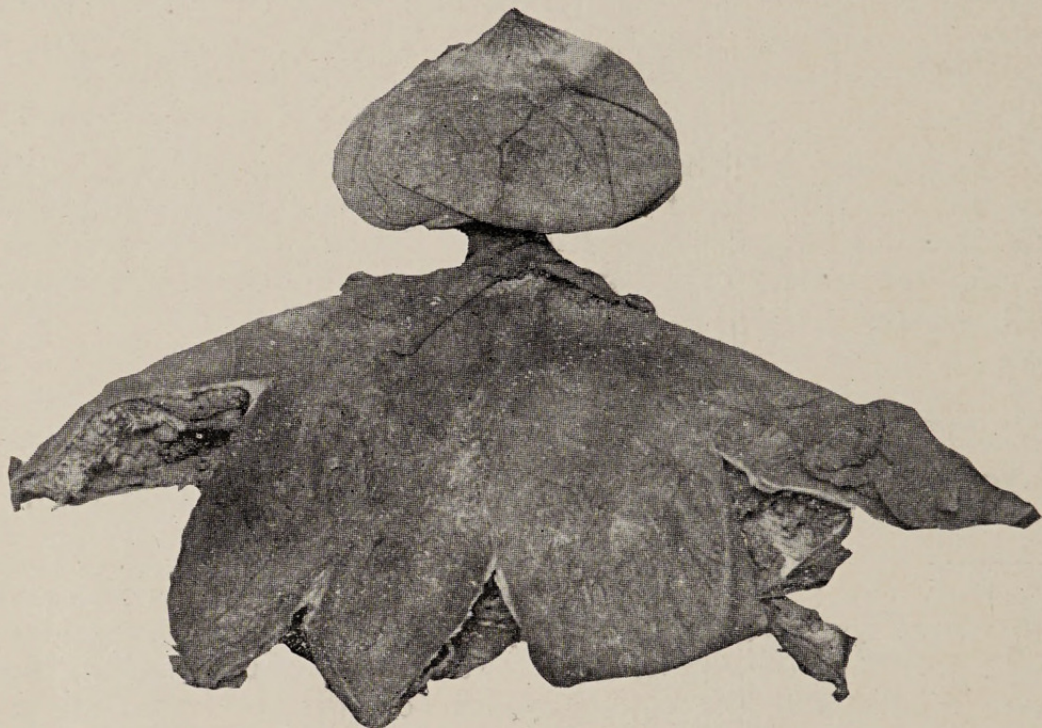


Fig. 78.
Geaster Berkeleyi.

mistakes are made, that were this plan adopted there would be very few mycologists left, and second, we are among those who make mistakes, and are not seeking that kind of a death. We think however, that there have been surprisingly few errors in *Mycological Notes*. The most serious one known to us is where we referred *Geaster Berkeleyi* to *Geaster asper* from our book studies of the plant. As soon as we saw the plant we noted our mistake, for the two have little resemblance.

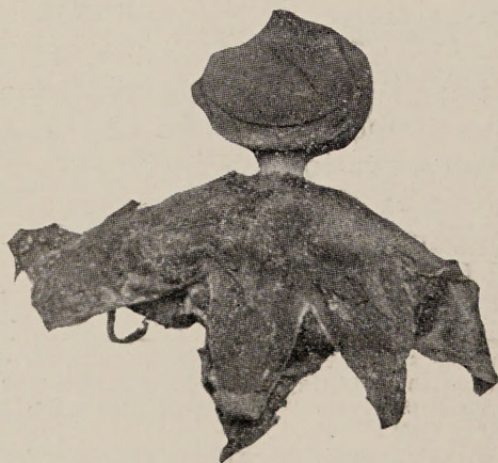


Fig. 79.

Geaster Berkeleyi (fig. 78) seems to be a very local plant. We have seen no specimens excepting from England and Australia. A small form of it (called *Geaster pseudo striatus**) [see fig. 79] grows in Hungary.

* Before we knew *Geaster Berkeleyi* we referred that little form to *Geaster asper*.

298--MINOR ERRORS.

Every line written in Mycological Notes is original. I do not compile or copy. Such mistakes as occur are my own. My aim is to first learn my subject and then write it off-hand. In so doing I not infrequently transpose names, and in looking over published work I sometimes notice errors of this nature. For example the following are to be cited: "*Geaster lageniformis*" *Geastrae* p. 11, for *Geaster floriformis*, "*Nidularia striatus*" *Gastromycetes*, p. 10 and fig. 19 for *Cyathus striatus*. "*Bovista debreceniensis*" p. 171 for *Globaria debreceniensis*. "*Geaster stellatum*" p. 171 for *Lycoperdon stellatum*. "*Diploderma indicum*" p. 181 for *Diploderma tuberosum*. These errors are all incidental in the text, and are self evident on their face. No doubt if I should compile my work from books in front of me, fewer mistakes of this kind would occur.

I published that the proper spelling was *Secotium rubigenum* not *Secotium nubigenum*. That was a mistake of mine, not an unintentional slip as the previous. In the New York Botanical Garden I read the label of Harkness' specimen *Secotium rubigenum*, and thought it correct, as I connected it with the word *rubus* and supposed it referred to the red color of the plant. I took Saccardo's spelling *Secotium nubigenum* as a typographical error. It is not as I have since learned. The plant was originally so published.

In the last issue there are a number of proof reader's errors as "*Schimidel*" for *Schmidel* and the expression "No less than sixteen different collections of the little pine-woods species *is* in the British Museum" should not have been overlooked.

299—A CONIDIAL SPORED GASTROMYCES.

A great many fungi under certain conditions or at certain stages develop conidial spores. It is very common in the *Tremellinae*, well known in the *Agaricineae*, the *Polyporae* etc. We believe, however, there is no record of conidial spores in the *Gastromycetes*.

The perfect forms of all *Hymenomycetes* (and *Gastromycetes* are not exceptions) bear their spores on special organs called basidia. These are the normal spores of the plant.

Many fungi however, in addition to these basidia spores, produce spores which grow on the hyphae forming the tissue of the plant. These are called conidial spores.

There is in the Museum at Paris a small fragment of the type of *Catastoma juglandaeformis*.* As soon as I looked at the spores I noted that the long peculiar pedicels (fig. 80) were entirely different



Fig. 80.

from those of any other specimen of the genus I had ever seen. They are unusually long, they are colored, they are uniform in thickness, and blunt at the ends. They are in every respect similar to the capillitium threads with which they are mixed.

* *Bovista juglandaeformis* (*Jour. Bot.* 88-130).

When I went to Kew I took the matter up with Prof. Massee and told him there was "something wrong" with the spores of this plant. He made a microscopic mount and on the first slide he *found a spore in situ, articulated on to a thread of the capillitium*. This proved their nature without a question. I have since several times tried to make another mount but never succeeded, as the spores break off so easily, it is difficult to prepare a slide without breaking them off.

Catastoma juglandaeformis is known only from South Africa* and but two collections, one now at Kew, the other, locality unknown, at Berlin. We judge from the "picture" of *Bovista hungarica* recently described, that its spores are of the same nature.

300—THE LOGIC OF NAME JUGGLERS.

Dr. Hollós writes by the column on the "rights of priority" when he thinks he sees an opportunity to juggle up a new combination and add the word "Hollós" to it. *Secotium acuminatum* has been generally known under that name for many years and Dr. Hollós so published it several times and his specimens of the plant so labeled are found in Berlin to-day. It is the only name he ever knew for it before he began to look up dates of the synonym in Saccardo. Then he reached the conclusion that he could do a little juggling, and he got a little advertisement by calling it "*Secotium agaricoides* (Czern.) Hollós".

But he takes the strange stand, for one who uses "priority" as his chief excuse to juggle names, that *Secotium erythrocephalum*, which he claims is the same plant and an earlier name, cannot be used because it was based on young specimens of the plant. There is logic! Any kind of an old vague picture serves him as an excuse to change names, if he can write "Hollós" after the "new combination" but he holds that he must not use Tulasne's earlier name, because Tulasne had young specimens. So he conjures up a *subsequent* name, and devises a new combination, to which the word "Hollós" can be added. The editor of the "*Annales Mycologici*" mildly take the doctor to task for it because he takes Hollós' synonym as true and the editor knows that 1844 is an earlier date than 1845. The whole subject is a farce, especially in view of the fact that when Dr. Hollós states that *Secotium erythrocephalum* is a young form of the European species he is only guessing. He never saw the New Zealand plant. It has little more resemblance to the European and not a great deal more relationship than an elephant has to a rhinoceros. Why spoil good white paper and waste printer's ink discussing the proper plant name on such statements as these?

* The plant called *Discisceda Hollosiana* (Hedw. 02-62) which is exactly the same plant, to the most minute detail, was supposed to come from Mexico but that is probably an error, as we shall explain in detail when we come to consider the genus *Catastoma*.

301—MICRO-PHOTOGRAPHS.

The micro-photographs that we present in our plates are not good. Ordinary photography is simply mechanical and requires neither much skill nor experience, but in making high power micro-photographs of opaque objects difficulties are met that we have not as yet been able to overcome. We present them because they show *shape* and *size* exactly but they are little more than silhouettes and are of value only in contrast.

For example. Compare our micro-photograph of the spores of *Secotium macrosporum* (Plate 13, fig. 16) with that of *Secotium acuminatum* (Plate 13, fig. 11) and a contrast will be seen, that words cannot convey.

Besides they can be measured accurately as each *millimeter* represents a *micron* and there is little room for error. But the surface markings are an absolute failure.

We have taken this matter up with an authority who "wrote a book" on the subject. He kindly tried to help us out but his prints were not as good as our own. We also placed the subject in the hands of a firm in London that makes a business of micro-photography. They returned the material and acknowledged that they could not give us what we wanted. If any of our readers can make a micro-photograph of an opaque object, with a high power lens, an even magnification of a thousand, and show not only shape and size but *surface* we hope they will come to our aid.

302—MITREMYCES RAVENELII IN JAPAN.

We have received from T. Yoshinago, Kochi, Japan, two collections of *Mitremyces Ravenelii*, exactly the same plant we have in the United States (see *Myc. Notes*, p. 126, plate 9). Both collections were made at Mt. Ushioe, Tosa, one by M. Gōno, the other by K. Nakanishiki.

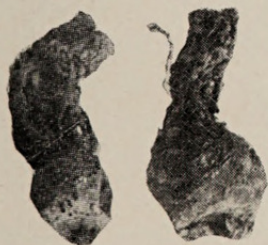


Fig. 80.

A record of this species in Japan was made in "Nature" within a year or two and the same plant from Japan has also been recently described as new species.* I found in the Museum at Berlin specimens that were collected at Nagasaki by Schottmiller in 1860 but they were undetermined until recently.

On comparing our cut herewith of the Japanese plant (Fig. 80) with the figure on plate 9 of the American plant it will appear that the plant is smaller and has less development of the root fibers.

Our figure on plate 9 was made from an unusually fine, large specimen, the figure herewith gives a better idea of the plant as it usually reaches me from my American correspondents. The type specimens at Kew are also about this size.

* *Calostoma japonica* (Eng. Jahr. 1902).

It seems to me some hair-splitting was done when "Calostoma microsporum, Atkinson, new species," was recently launched. The spores of all the elliptically spored species of *Mitremyces* vary in size even in the same specimen (see micro-photographs, plates 8 and 9). In figure 6, plate 9, are shown three spores side by side, one 15 mic. long, another 10, one $4\frac{1}{2}$ mic. thick, another 7. To base a new species on slight spore variation in a genus where no two spores in the same specimen are the same size, seems to me useless.

303—MITREMYCES "LUTESCENS" IN THE MUSEUMS OF EUROPE.

Although there are abundant specimens labeled "*Mitremyces lutescens*" in the museums at Upsala, Paris, Kew and the British Museum, in the entire lot I have found but a single specimen correctly labeled. Most of them came from Ravenel and Curtis who always labeled *cinnabarinus* and sometimes *Ravenelii* as *lutescens*. Berkeley in his early days had a correct idea of the characters of *lutescens*, as is evident in his remarks when he described *Mitremyces fuscus*, (*Ann. Nat. Hist.* 1839), but in the course of years the distinction passed from his mind and he placed in his herbarium during later years, unchallenged, the many misnamed specimens received from Curtis and Ravenel.

Finally, the matter became so confused in Europe that one author makes the statement "The remarkable diversity of appearance presented during different periods of development has been the cause of several mistakes; even Schweinitz did not know the plant in the young condition."

In the above quotation as well as in the foot note *Myc. Notes*, page 125, an injustice has been done to Schweinitz. In his writings as I have previously stated, Schweinitz is certainly clear as to the distinction between *Mitremyces lutescens* and *Mitremyces cinnabarinus*. It is the later writers who are confused. In Schweinitz' herbarium to-day *Mitremyces cinnabarinus* is labeled *Mitremyces lutescens* (cfr. foot note p. 125) but his collection was rearranged and mounted, some years ago, and it is probable I think that the labels were changed then. Schweinitz certainly knew the difference.

I found many specimens in the Museums of Europe labeled "*Mitremyces lutescens*" but only one is attributed to Schweinitz. This one is in Hooker's herbarium at Kew, and it is the only one of all the many specimens that I found in Europe that is *correctly labeled*. I feel an apology is due to Mister Schweinitz.

304—AN "ALBINO" GEASTER.

Among a number of species sent me by James Fletcher, Ottawa, Canada, was a fine lot of *Geaster triplex*. It is a species very common in the northern portion of the United States and Canada (cfr. p. 104) and when we received the specimens we noticed nothing peculiar about them. Mr. Fletcher calls to our attention that the spores of some are almost white. We find that to be the case, not only the spores but the

inner peridium. The light colored peridium probably would not have attracted our attention for the inner peridia of many Geasters bleach out on exposure to the weather. But the color of spores does not bleach. We can offer no explanation of it other than to advance the theory that they tend toward albino forms. They grew with ordinary forms of *Geaster triplex* with the usual reddish peridium and sooty spores. They are the first "albinos" we have ever noticed in the puff-ball world.

305—*CALVATIA SCULPTUM*.

Several years ago while calling on the late Dr. Harkness at the rooms of the California Academy of Sciences, San Francisco, I was shown a specimen of the remarkable plant he described as "*Lycoperdon sculptum*."

It was so strongly marked and such a fine species that I have always wanted to own a specimen. At last my desire has been gratified, through the kindness of Prof. Walter C. Blasdale, who sent me a small but very fine example (fig. 81). It reached me during my stay at Paris, and I was pleased to show it to my friends Patouillard and Hariot. I think they were both desirous of it, but of course I could not spare it.

This plant is covered with large pyramidal warts known to no other "puff-ball." It was described as a *Lycoperdon* but its generic position is not assured. It seems to me to more closely approximate *Calvatia* in modern classification but will probably be made in time the type of a separate genus.* The method of dehiscence is I think not surely known. Prof. Blasdale writes me:—"I do not recollect the

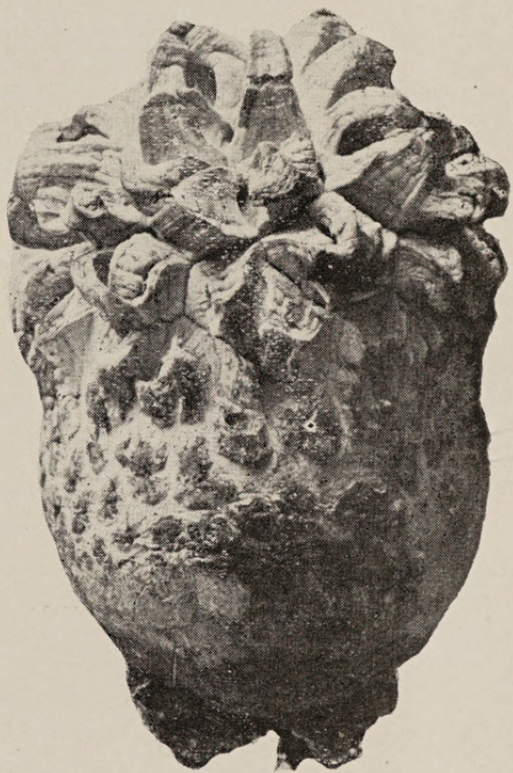


Fig. 81.

manner of dehiscence but am sure that the peridium breaks into pieces and the spines peel off as it dries."

There is at Kew some ripe gleba sent by Dr. Harkness. It is unusually bright yellow in color. The small, smooth spores and thick, deeply colored capillitium threads are very similar to those of *Calvatia caelata*. The plant does not grow near the coast, we understand, but is only found in the Sierra Nevada Mountains. Prof. Blasdale collected it at Lake Tahoe. We hope some one who is fortunate enough to live in these mountains will collect it more abundantly for us. The specimen received is a small one. The one in the Museum in San Francisco is five or six inches in diameter.

* This is a hint to some one ambitious of the "honor" of proposing new genera. The genus "*Areolaria*," to which it has been suggested this plant belongs, is a bad mixture made up in Saccardo of a *Calvatia* a *Phellorina* and a *Scleroderma*.

306—"LYCOPERDON" KAKAVA.

Just sixty years ago this plant was "described" but in the intervening time not a word of additional information has been added to it. There is a specimen in the Museum of Paris from which our figure 82



Fig. 82.

has been made. Without regard to the collector's notes the plant would not now be called a *Lycoperdon*, differing in the gleba and in its mode of dehiscence. The latter appears to be similar to a *Calvatia*. The gleba is olive-brown and differs from *Lycoperdon* in the almost entire absence of capillitium. The spores are small 3 mic., very rough, angular, globose.

The specimen was collected at Mount Gede, Java, by Zippelius who states: "The peduncle is furnished with a red membrane which encloses a viscid, lead-colored mass."

If this is true, of course, the plant is no *Lycoperdon*. No trace of this "membrane" is

found on the specimen as it exists to-day. The botanists of Java are quite active these latter days, and some one should look out for this plant and give a good account of it. It is undoubtedly a "new genus."

307—MITREMYCES CINNABARINUS.

Probably the first specimen that ever reached Europe is found to-day in the herbarium of Desvaux in Museum of Paris. Except the "hab. Am. Bor." there is nothing to show the source of it. Persoon first described it and his figure is so perfect of Desvaux's specimen, that there is no doubt it is the identical plant he described. The next man to consider it juggled Persoon's name off of it, and since although the plant has been several times named and juggled, poor old Persoon never got any further advertising out of it. Persoon made a guess about the plant that is worth repeating as a curiosity. "This plant has its orifice colored a beautiful vermilion. One notes this color also though feeble in the roots. This makes one think that this vegetable grows in the neighborhood of cinnabar mines."



Fig. 1.



Fig. 2.

TRICHAETER MELANOCEPHALUS.



Fig. 3.

Explanation of Figures.

Figs. 1 and 2. Plants collected at Magdeburg, Germany, in herbarium of Dr. Magnus, Berlin. Fig. 3. Type specimen from Czerniaïev at Kew.

TRICHAETER MELANOCEPHALUS.



Fig. 1.

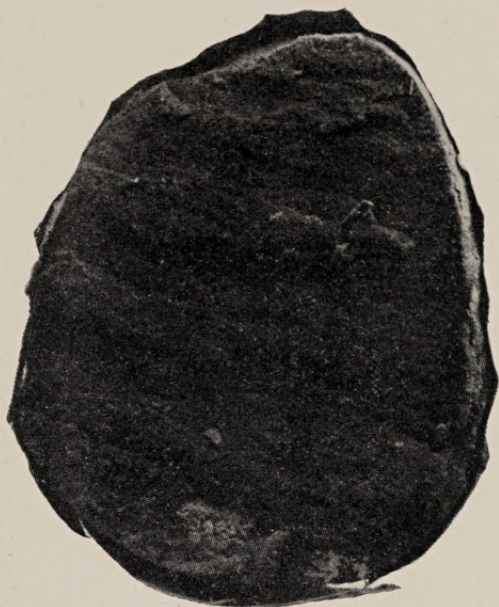


Fig. 2.

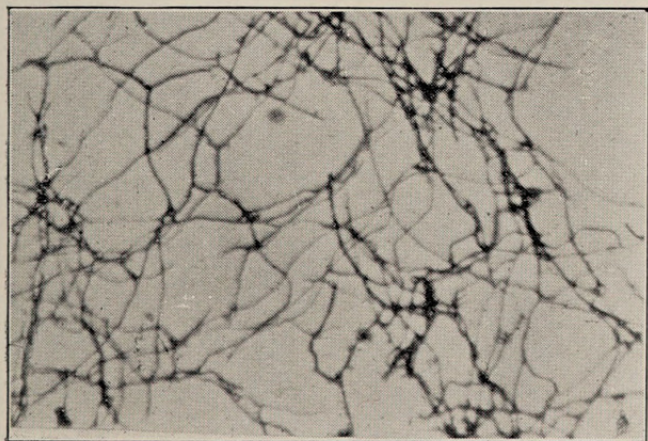


Fig. 3.

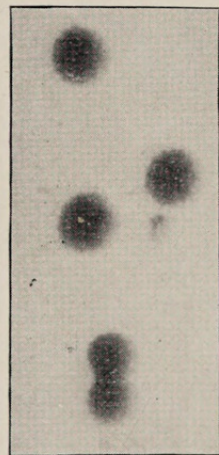


Fig. 4.

Explanation of Figures.

Fig. 1. Type specimen in Museum at Paris. Fig. 2. Section. Fig 3. Capillitium (x 100). Fig. 4. Spores (x 1000).

LANOPILA BICOLOR.

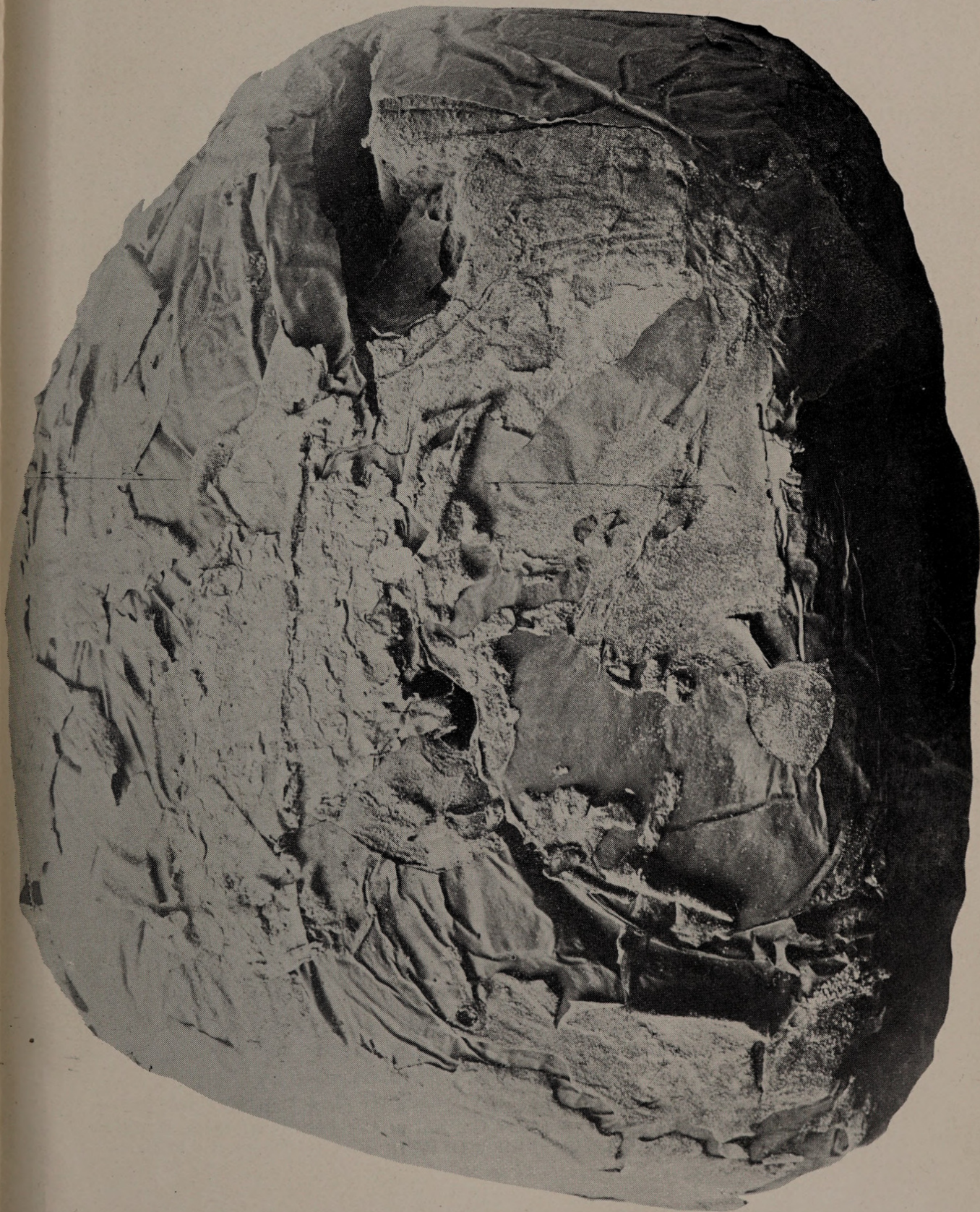


Fig. 1.

LASIOSPHAERA FENZLII.



Fig. 2.

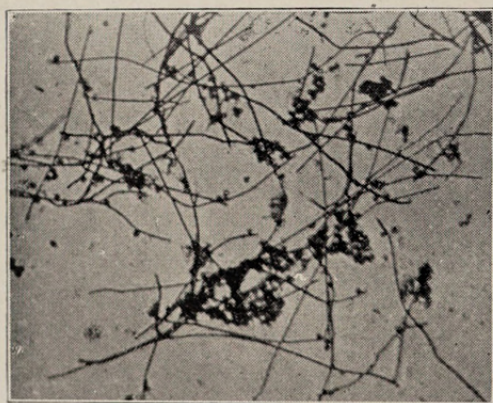


Fig. 3.

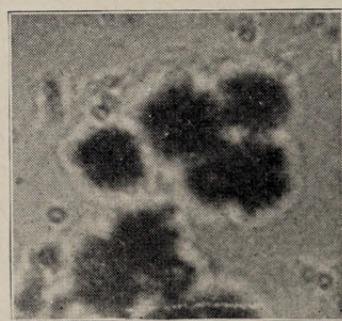


Fig. 4.

Explanation of Figures.

Fig. 1. A plant (reduced to one-quarter size) from Geo. H. Cave, British India. Fig. 2. The gleba mass (after the fall of the peridium) from Hugh F. MacMillan, Ceylon. Fig. 3. Capillitium ($\times 100$). Fig. 4. Spores ($\times 1000$).

LASIOSPHAERA FENZLII.



Fig. 1.

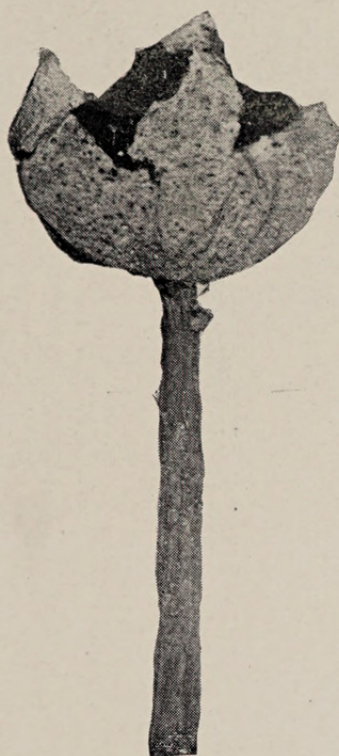


Fig. 2.



Fig. 3.



Fig. 4.



Fig. 5.

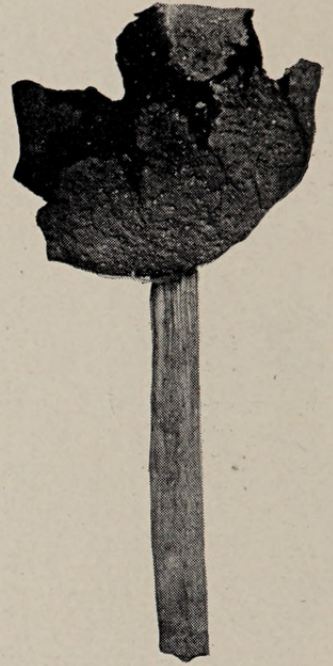


Fig. 6.

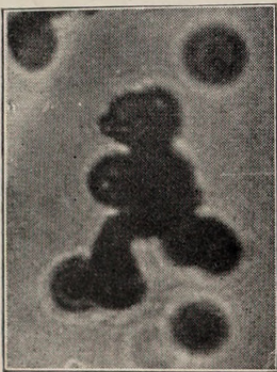


Fig. 7.

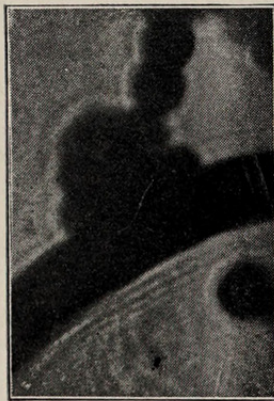


Fig. 8.

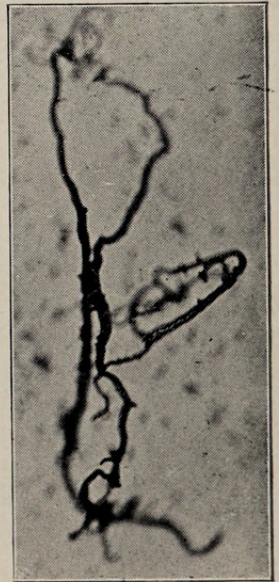


Fig. 9.

Explanation of Figures.

Figs. 1, 2, 3, 4, 5, 6. Plants in Museum at Berlin collected by Schweinfurth in Equatorial Africa. Fig. 7. Spores ($\times 1000$). Fig. 8. Spores and Thread ($\times 1000$). Fig. 9. Capillitium ($\times 100$).

SCHIZOSTOMA LACERATUM.

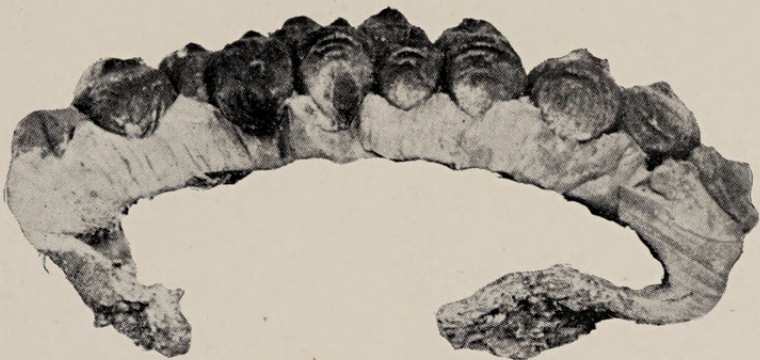


Fig. 1.

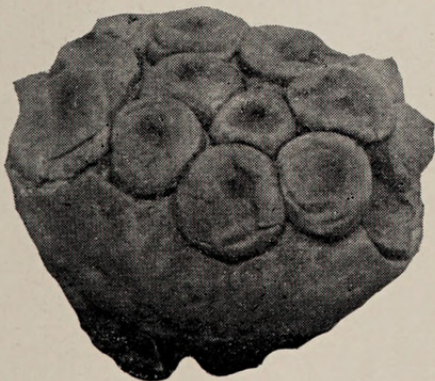


Fig. 2.

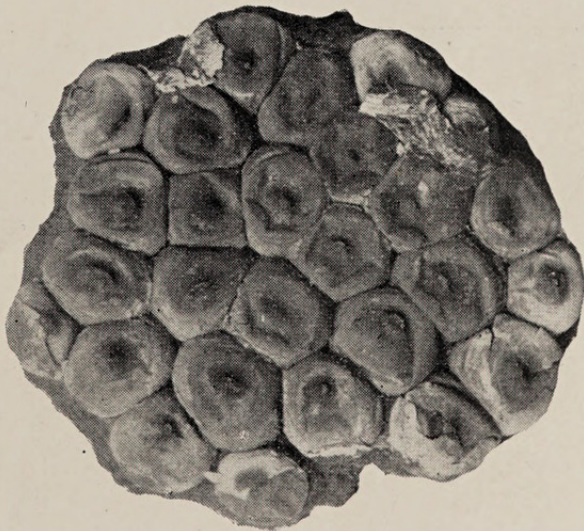


Fig. 3.

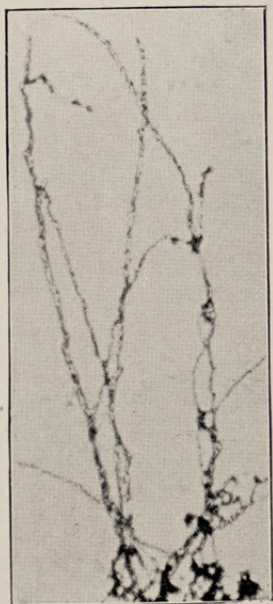


Fig. 4.

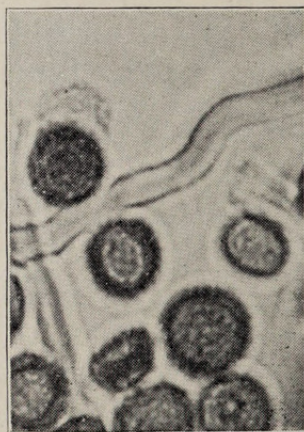


Fig. 5.

Explanation of Figures.

Figs. 1, 2, 3. Plants in Museum at Berlin collected by MacOwan in South Africa. Fig. 4. Capillitium (x 100). Fig. 5. Spores (x 1000).

BROOMEIA CONGREGATA.



Fig. 1.

BATTAREOPSIS ARTINI.



Fig. 2.

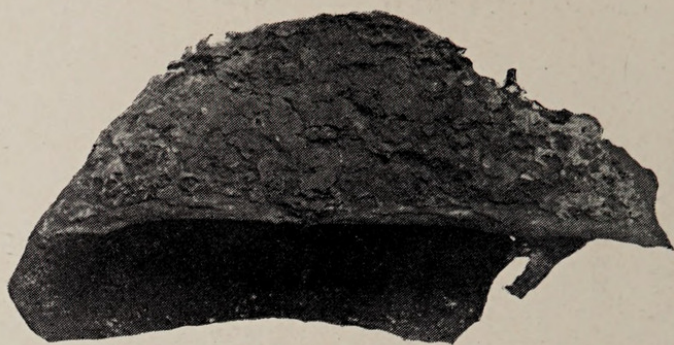


Fig. 3.



Fig. 4.

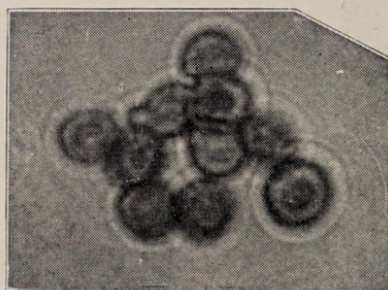


Fig. 5.

Explanation of Figures.

Fig 1. Stem. Fig. 2. Volva. Fig. 3. Cap. Fig. 4. Another view of same. Fig. 5. Spores (x 1000). All from type specimen in Museum at Berlin.

BATTAREOPSIS ARTINI.



Fig. 1.

GYROPHRAGMIUM DECIPIENS.



Fig. 2.



Fig. 3.

Explanation of Figures.

Fig. 1. A large specimen and one partly expanded. Fig. 2. A small plant (without volva). Fig. 3. Section. All from L. A. Greata, Los Angeles, California.

GYROPHRAGMIUM DECIPIENS.



Fig. 1.

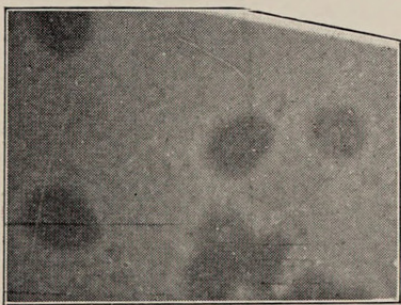


Fig. 2.

Explanation of Figures.

Fig. 1. Type at Kew. Fig. 2. Spores (x 1000).

GYROPHRAGMIUM INQUINANS.

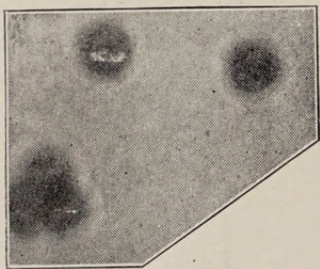


Fig. 3.

GYROPHRAGMIUM DELILEI.
(From type specimen in Museum at Paris)



Fig. 4.



Fig. 5.

GYROPHRAGMIUM TEXENSE.
(Specimen from W. H. Long, Jr., Texas.)



Lloyd, C. G. 1904. "Mycological Notes, No. 18 (285-307)." *Mycological writings of C. G. Lloyd* 1, 189–204.

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