

MYCOLOGICAL NOTES.

BY C. G. LLOYD.

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NEW NOTES ON THE GEASTERS.

Among the first pamphlets we issued was "The Geastrae," which was published four years ago. At that time we had had no opportunity to study the history of Geasters in the museums of Europe, but depended chiefly on advice from Rev. G. Bresadola in our treatment of names and synonyms. We have since seen and studied practically all the "type" specimens of the genus that exist, and we have found very little that we would wish changed, and that little has been noted from time to time in Mycological Notes. Our pamphlet was naturally devoted to the most common species of Europe and America, and a few other forms have since come to our notice that should be recorded, also a few additional notes on the species already considered.

GEASTER TRIPLEX (Plate 94).—Unexpanded plant, acute.¹

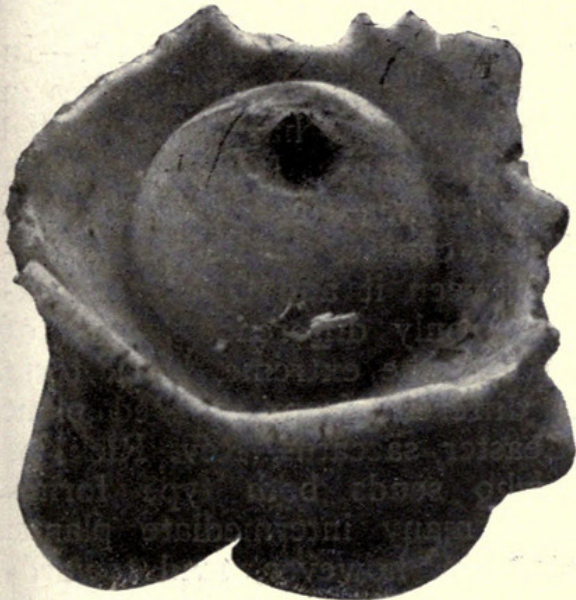


Fig. 144.

Exoperidium recurved, often the fleshy layer forming a kind of cup at the base of the endoperidium (see Fig. 144). Endoperidium sessile, globose, with a definite, even mouth. Columella prominent, persistent.

This plant is reddish brown, and is in our opinion the same as Geaster saccatus, only a giant form. Usually Geaster saccatus and Geaster triplex are very distinct (in size), but intermediate plants (such as Fig. 76 of the Geastrae pamphlet), are often hard to refer. At Cincinnati I have gathered Geaster saccatus many years and never found a form approaching Geaster triplex. In the woods of Michigan my experience is just the reverse, all Geaster triplex

and no Geaster saccatus. In Samoa both forms occur, and many intermediate specimens are hard to refer. Geaster triplex was figured from Java by Junghuhn.

¹Unexpanded plants of Geaster triplex are always acute in varying degrees as shown in our plate 94 and I do not feel it is practicable to separate those with a distinct "beak" under a separate name. Not only do they shade into each other in all degrees but the different forms can not be known from expanded specimens.

His figure has a large cup at the base, as shown in our figure (137, made in Samoa), hence the name *triplex*, having three peridiums. This cup is not a peridium, but the fleshy layer of the exoperidium, and while its occurrence is frequent in the tropics, it rarely occurs in the temperate regions. Under the influence of abundant warmth and moisture the plant expands rapidly, and the outer layer of the exoperidium breaks away from the inner fleshy layer, leaving it as a cup. In temperate regions it is never so pronounced and usually does not occur at all. In addition to the synonyms given in our pamphlet, *Geaster Michelianus* (Gard. Chron. 73-608) is a name given it in England. *Geaster Kalchbrenneri* (Zoo. bot. Wien., 76-220) and *Geaster cryptorhynchus* (Grev. 3-162) are also synonyms in the literature of Europe. Rabenhorst distributed the plant (No. 814) as *Geaster mammosus*, to which species it has about as much resemblance as it has to a cauliflower.

GEASTER VITTATUS (Fig. 145).—This name was based on a plant of Australia with the exoperidium marked with lines as shown



Fig. 145.

in our figure 145 (made from a fresh specimen in Samoa). It is only a form, or perhaps better stated, a condition of *Geaster saccatus*. As our photograph was made from a fresh plant, the lines are not due to the rupture of the surface in

drying as we had always supposed. On the contrary I think they are due to rapid growth. We gathered a number of specimens of *Geaster saccatus*, *Geaster triplex* and intermediate forms in Samoa, but very few so marked.

GEASTER ENGLERIANUS (Fig. 146 from the type).—In



Fig. 146.

the tropics *Geaster saccatus* takes a black form which has been called *Geaster Englerianus*. It has also been called *Geaster maurus*. Our illustration will, of course, not show the difference between it and *Geaster saccatus*, as the only difference is one of color. While the extreme, black form is quite different from the red plant called *Geaster saccatus*, Rev. Rick, of Brazil, who sends both type forms, sends also many intermediate plants. Most of them, however, tend towards the black form.

GEASTER VIOLACEUS. Rev. Rick has published this plant in *Broteria*. It is of a bright, violet color, and is peculiar in being the only *Geaster* I ever saw with a *distinctive color* departing from the ordinary black and reddish forms. Except as to color it corresponds to small specimens of *Geaster saccatus*, and Rev. Rick writes me that he notes connecting forms and doubts the validity of the species. It

will not do to begin casting doubts on the validity of Geaster "species" on the evidence of connecting forms. If you follow up that line of work you will soon have but one or at the best but two species left.

GEASTER PERUVIANUS (Plate 95).—This plant can be described in a few words as being a large, black Geaster minimus. The endoperidium is blacker than minimus as it grows in the United States. The plant corresponds to Geaster pectinatus, except that it has an even mouth. It was collected in Peru and is preserved at Kew.

GEASTER CALCEUS (Plate 95).—This also can be described as being a large Geaster minimus, with the *endoperidium densely covered with coarse, white, granular particles*. It only occurs as far as I know in South Africa. I first saw it in the museum at Berlin, labeled Geaster granulosus², and have received it (also from South Africa) from Professor Plöttner.

GEASTER MACOWANI (Plate 96).—This is the South African form of Geaster fornicatus. It differs from the type form only in having a furrowed mouth.

As is now well known, Geasters are divided into two sections, those with even and those with sulcate mouths. Geaster MacOwani really belongs to neither, being intermediate. I have seen the type specimens in the museum at Berlin, and have received specimens from Professor Plöttner. Both collections are from South Africa. Geaster fornicatus is usually a rare but widely distributed plant. (Cfr. Lyc. of Aus., p. 21.) It everywhere has an even mouth except in this South African form.

GEASTER HIERONYMII (Plate 97).—This is a black plant, very similar to Geaster limbatus. Its character is the rough, scurfy surface of the endoperidium, very similar to what is found on Geaster Berkeleyi. It is only known from Argentine, South America, and the types are at Berlin.

GEASTER AMBIGUUS. (Plate 98).—Exoperidium rigid, thick, hygroscopic, cut to 9 to 12 segments. Endoperidium *slightly* pedicellate, globose, *pale* color, minutely scurfy. Mouth concolorous, sulcate. The only collection known of this plant was made in Bolivia by D'Orbigny, and is preserved in Montagne's herbarium. It has been referred (by a gentleman who never saw it) to Geaster striatulus, from which it differs in its subpedicellate, larger, and scurfy endoperidium.

GEASTER HARIOTII (Plate 99).—Exoperidium rigid, with five to seven broad, oval segments. Endoperidium sessile, globose, *black*, with sulcate, concolorous mouth.

² Geaster granulosus is a European name for Geaster minimus. The type form in America has minute granules on the endoperidium and the European plant does not differ either in size or granules. The South African plant, while only a form, is a larger plant, and the dense coat of granules is the most marked feature of it.

This plant seems to be fairly common in South America, and there are many collections in the museums (under various misnames) mostly from Chile and Brazil. In addition there is one collection at Kew, from Spain, and one at Berlin, from Martinique. I have received it from Rev. Rick, Brazil. It was sent abundantly to Montagne from South America, and referred to "*Geaster umbilicatus*, Fr." What *Geaster umbilicatus* is, no one knows, and the type is not at Upsala or at Lund.³ Many guesses as to the identity of *Geaster umbilicatus* have been made, and almost every one who has published it has decided it was a different plant. The "description" does fairly well cover the South American species, but can not be it, as this is a native of warm countries, and certainly never grew in Sweden. Although I am quite familiar with the plant, and have called it in my collection *Geaster Hariotii*, ever since I first saw it in the museum of Paris some three years ago, I did not recognize it when I first received specimens from Rev. Rick, Brazil, for his specimens had the exoperidium recurved and a different appearance from the usual specimens in the museums. On comparison now I think they are surely the same, notwithstanding the apparent difference in the photographs (see Plate 99). I published a reference to it (Letter No. 2) as unnamed, and Rev. Rick has since published the name, "*Geaster Lloydianus*" (Broteria, 1905, p. 27), based on this letter. He mistakes the plant, however, and gives a figure (T. 2, f. 10) which is not the species. I therefore feel that the name *Geaster Lloydianus* is not tenable, and I call the plant by the name it has borne in my collection for the past three years. I named it for Monsieur P. Hariot, the curator of the herbarium, where a fine collection of typical specimens can be found. As it is a common plant in South America, it has been probably "named" by Spegazzini, but no one in Europe has any way of knowing what Spegazzini "names."

GEASTER ELEGANS (Plate 99).—Our ideas of the name *Geaster elegans* are taken from Vittadini's figure. We have never seen his plants, for while most of Vittadini's specimens are found at Paris and at Kew, this one is not. It belongs to the reddish series and resembles the little *Geaster saccatus* excepting the mouth. *Geaster elegans* is only a small form of *Geaster Archeri*. They are practically the same plant excepting size. Dr. Hollós has recently discovered that this is *Geaster umbilicatus* of Fries, but as it is about the fifth or sixth time the identity of *Geaster umbilicatus* has been discovered and each one has found it to be a different plant, I am not disposed to place much stress on it. *Geaster elegans* is a rather rare form in Europe. Most all the museums have specimens of the plant, as it has been distributed (always misnamed) in several exsiccatae, but it reaches me very rarely, and I think I have but one collection, from Rev. H. Bourdot, France. I do not recall this little plant in the United States.

GEASTER STRIATULUS (Plate 98).—This is one of the few names of *Geasters* we have adopted, of whose correctness we do not feel certain. We first received it so named from Dr. Hollós, and while we have no reason to doubt the determination, we have never been

³I made a visit to Lund especially to find this "type" as I was informed that the herbarium of Retz where Fries saw the plant might be at Lund. I was told by Waldemar Bülow, who resides at Lund, and knows the local mycological matters, that the herbarium of Retz is not at Lund.

able to confirm it. It is not a frequent species, but is a widely spread one, and I have specimens from Europe, Australia, Africa and the United States. It is therefore improbable that Kalchbrenner should have been the first to receive it. I believe, in fact, that this is the original of *Geaster umbilicatus* of Fries, for of all of the plants that have been so referred this is the only one that I know certainly grows in Sweden. At the same time the peridium can not be described as "molli." Guessing on such subjects does no particular harm unless it is put forth as a "rule" for the adoption of the name, according to the "laws of priority."

EPIGEAN GEASTERS.

The genus *Geaster* could be divided into two sections. First, Epigean, those that develop on the top of the ground, logs, etc.; second, Hypogaeal, those that develop beneath the surface, coming to the surface to expand. The nature of the species can be told from an examination of the mature plant. Hypogaeal species are surrounded when young by a mycelial layer, which usually persists more or less on the mature plant, carrying along with it dirt, etc., and having a ragged appearance. In some species, especially the section *Rigidae*, the layer adheres closely to the ground, and is torn away when the plant emerges from the soil, leaving the outer surface of the exoperidium smooth. Plants of this nature can be readily distinguished, however, from Epigean species. Epigean geasters, on the contrary, are *developed* on the surface of the ground or on logs, and hence the mycelium is basal. The surface of the exoperidium is even, smooth or more often velutinate, and can be easily known on examination. Like all other rules, this has its intermediate forms, and certain species like *Geaster saccatus* seem to connect the two sections. Practically all the Geasters of Europe are hypogaeal, and I know of but a single collection of an epigean species made in Europe, viz., *Geaster Welwitchii*, by Welwitch in Spain. Most of our species in the United States are likewise hypogaeal, but we have one epigean species fairly common, viz., *Geaster velutinus*. Most epigean species grow in the tropics.

GEASTER MIRABILIS (Plate 100).—Plants small, epigean, growing *caespitose* on a dense mycelium, which spreads over logs, sticks, etc. Young plant globose, about 4 mm. in diameter. Endoperidium sessile. Mouth definite, lighter color than the remainder of the endoperidium. This little species is unique in its nature, growing always on a dense, mycelial subiculum which spreads over sticks and logs. It is a native of warm countries and wide in its distribution. Originally described from French Guiana, I have it from Rev. J. Rick, Brazil, and have collected it in Samoa. There are specimens in the museums from Ceylon, Cuba, Paraguay, Australia, Bonin Island, China and Africa.

HISTORY.—The original illustration was somewhat inaccurate, showing a beaked mouth that the plant does not have, as is evidenced by the original specimens. *Geaster lignicola* (Linn. Jour, 18-386) and *Geaster papyraceus* (Proc. Am. Acad., 4-124) appear to me to be the same plant, though the latter does have a thinner exoperidium than the normal form. *Geaster mirabilis* was determined by Spegazzini and distributed by Balansa as *Geaster saccatus*. De Toni based on this misdetermination *Geaster Spegazzinianus* var. *minor* (Sacc. 7-87).

FORMS.—*GEASTER SUBICULOSUS* (Plate 100).—This is for me only a larger form of the plant. Excepting size, I can note no other difference. It was named from Australia, but reaches me also from India and Florida. The type form of *Geaster mirabilis* is globose when young, but I noticed in Samoa that they become oval in drying. They undoubtedly vary as to form, for one collection has reached Europe that was called "var. *stipitatus*." The large form (*Geaster subiculosus*) is inclined to the same elongated shape (see our plate).



Fig. 148.

GEASTER (SP.) (Figs. 147 and 148, the latter enlarged four times).—Is really a form of *Geaster mirabilis*, but the exoperidium is strongly *strigose*, and the only geaster known that has this character. As I have sent a photograph of the plant to Rev. Rick and advised him that it is unnamed, I presume it has before this been christened. It is, I think, the plant Rev. Rick lists as *Geaster lignicola* (Brot. 1906), but *Geaster lignicola* is only a synonym for *Geaster mirabilis*, and does not have this strigose exoperidium. (Note—In letter since received, Rev. Rick names it *Geaster trichifer*.)



Fig 147.

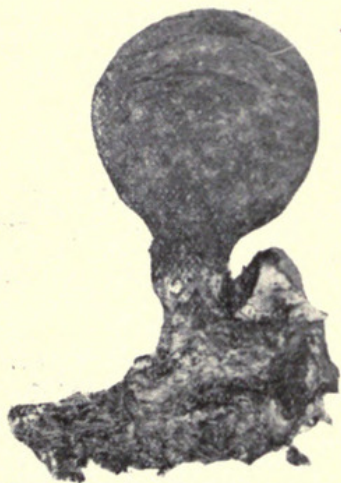


Fig. 149.

GEASTER STIPITATUS (Fig. 149).—While we have not seen the original specimens from Java, it appears to have been well illustrated. It is a large plant, 3 to 4 cm. high, and developed from a mycelial subiculum at the base. It differs from all other *Geasters* known in being decidedly stalked. Our figure (149) is from unopened specimens from Brazil that were called *Geaster Juruensis*. While there is a vast difference between *Geaster stipitatus* and *Geaster mirabilis*, it is only a difference of size and an intermediate form (*Geaster subiculosus*) is known. No doubt many connecting forms occur that are not known.

The following species of epigean geasters appear to me to be only forms of the same species. They all agree in the main characters. All are epigean, all are globose when young, all have sessile endoperidia, all have peculiar, velutinate exoperidia, all have strong, club-shaped columellae (rarely seen in any other geaster). They differ from each other chiefly in color, in degrees of development of the velutinate surfaces of the exoperidia, and one has an indefinite mouth.

GEASTER VELUTINUS (Plate 101).—Unexpanded plants, globose, sometimes slightly pointed at the apex. Mycelium basal. Exoperidium rigid, membranaceous, firm, light-colored (white when fresh). Surface with short, dense, appressed velumen. The outer and inner layers of the exoperidium are very much the same texture and thickness and usually separate partially (sometimes entirely) from each other in the mature plant. Endoperidium globose, sessile, with a definite, even mouth. Columella clavate.

Geaster velutinus is not a rare plant in the United States, growing over leaf mould in rich woods. The mycelium at the base is strongly developed (See Plate 100, Fig. 1), but it does not, I think, ever form a matted layer as in *Geaster mirabilis*. The expanded plants have a general, similar appearance to *Geaster saccatus*, but can be readily distinguished by observing the surface of the exoperidium.⁵

FORMS.—As previously stated, I can not but consider all the following as forms of the same plant. All have the same general nature, but differ among themselves chiefly in color and development of the velumen.

GEASTER WELWITSCHII (Plate 101).—As *Geaster velutinus* occurs in the temperate portions of the United States, it is a saccate species. The two layers of the exoperidium are more or less adherent, separating only partially and at the tips of the segments. When the plant extends to Florida it takes a more highly developed form. The inner (fibrillose) layer of the exoperidium separates and arches up over the outer (mycelial) layer, and the plant takes the form known as fornicate. Otherwise the plants are the same, and I have seen the fornicate and saccate forms in the same collection from Florida.

History.—This plant was first collected in Spain by Welwitsch, and this is the only collection known from Europe, the normal form (*Geaster velutinus*) never having been found in Europe. These specimens came into Berkeley's hands, who determined them as *Geaster fimbriatus*,⁶ and sent a specimen to Montagne, who described it as *Geaster Welwitschii*. When the same fornicate form reached Berkeley from America, he called it *Geaster radicans*, under which name it appears in our *Geaster* pamphlet, page 31.

GEASTER CAESPITOSUS (Plate 100).—This for me is only a small, caespitose form of *Geaster velutinus*. I collected it originally near Cincinnati, and have received it but rarely from correspondents.

GEASTER JAVANICUS (Plate 101).—In temperate regions the plant is light-colored (*Geaster velutinus*), but it becomes dark in the tropics. *Geaster javanicus* is the same as *Geaster velutinus* excepting the dark color. It has

⁵ Dr. Hollós in his recent book has the two species badly confused. *Geaster velutinus* is much better called a synonym for *Geaster mirabilis* than it is a synonym for *Geaster saccatus*.

⁶ And Berkeley always determined the American saccate form (*Geaster velutinus*) as *Geaster fimbriatus* (Cfr. Myc. Notes, p. 155.)

the same fine velutinate surface to the exoperidium. The mouth is not so strongly definite, but on a dark endoperidium the contrast would not be so marked as on a light endoperidium.

History.—The plant was named by Lévillé (Ann. Sci. Nat. 3-5-161), and the only known example of his naming is now in the herbarium of Professor Patouillard. We have received beautiful specimens from Rev. Rick, Brazil (see Plate 101, Fig. 5).

GEASTER SCLERODERMA (Plate 101).—This is a form of the black form with the velutinate surface so strongly developed it was well described as being warty. It is only known from some young specimens (see Plate 101, Fig. 6), and as it is well known that the cortex of all young specimens (Lycoperdons and others) is strong in contrast to that of more mature plants, it is probable that mature specimens of Geaster Scleroderma would not be so strongly marked.

RÉSUMÉ.—All the above-mentioned plants are, in our opinion, forms of virtually the same species. You can call it what you please, but we prefer to call it Geaster velutinus, which carries the leading idea common to them all.⁷ The plant is widespread, especially in the tropics, and has received other names, viz: Geaster Lloydii, Geaster dubius, Geaster Dybowski, Geaster tonkensis. In addition, epigean Geasters in an unopened state, were not recognized as such by the early plant namers, and the following are all based on unopened, epigean Geasters, in my opinion all probably this same species: Lycoperdon tephrosporum, Lycoperdon Golungense, Lycoperdon tomentosum, Bovista velutinus, Cycloderma Ohiensis, Disciseda velutinus. The date dictionary man has, therefore, quite a job ahead of him.

RÉSUMÉ OF THE GEASTERS.

The literature of the Geasters is embarrassed with one hundred and twenty-seven names, all of them (except Geaster corollinum, which is pure jugglery) having been described as new species. I have seen and studied all the specimens in the principal museums of Europe and America, which embraces almost all the "type" specimens. In addition I have received from correspondents several times as many specimens as can be found in all the museums combined. I refer to forty-six names, all the specimens I have seen, and I would consider seventeen of these better designated as forms or varieties. While, of course, no man's opinion is final in these matters, and each man is entitled to his own opinion, I have been as liberal in considering species as possible, and have not refused to maintain any name, when I can note *any point of difference whatever*, on which to base it.

In the "species" of Geasters as in the "species" of all fungi the chief question is, "What is the difference?" In the end the new species work avails nothing unless it is based on some marked *point of difference*. Geasters, like all fungi, are in the main plants of *wide distribution*. Hence, a large portion of the work which is of a local nature is not of permanent value. But if the "type" specimens are preserved where they can be seen and studied it does no particular harm. It is easy to retain the good and put aside the bad. Of the Geasters that we know, and we have seen most of them (excepting those of Spegazzini which nobody knows) the following forty-six names are all that we feel should be preserved. Seventeen of these (marked with a star) present such slight differences that they are better called varieties or forms.

⁷ I presume a date dictionary expert might solve the question in another way.

TABLE OF THE SPECIES OF GEASTER.

SECTION RIGIDAE.

hygrometricus,
giganteus,*
simulans,

floriformis,
mammosus,
striatulus,

Drummondii,
ambiguus,

(All the following are non-rigidae):

ENDOPERIDIUM STIPITATE. MOUTH SULCATE.

pectinatus,
Bryantii,

asper,
Schmidellii,
plicatus,

Berkeleyi,
Smithii,

ENDOPERIDIUM SESSILE. MOUTH SULCATE.

Archeri,

elegans,

Hariotii,

FORNICATE SECTIONS.

fornicatus,
MacOwani,*

coronatus,
leptospermus.*

ENDOPERIDIUM STIPITATE. MOUTH EVEN.

limbatus,
Hieronymii,*
arenarius,

rufescens,
Readeri,*

minimus,
peruvianus,*
calceus.*

ENDOPERIDIUM SESSILE. MOUTH EVEN.

saccatus,
Englerianus,*
violaceus,*

triplex,
vittatus,*

fimbriatus,
infrequens.*

EPIGEAN SECTION.

mirabilis,
subiculosus,*
trichifer,*

velutinus,
caespitosus,*
Welwitschii,*

javanicus *
Scleroderma,*
stipitatus.

A GLOBOSE FORM OF LYCOPERDON GEMMATUM.

Mr. E. B. Sterling, Trenton, N. J., has at various times sent us some very interesting plants. He has a son at Dawson, Yukon, who has collected a number of "puff balls" for his father. Among these we find a globose form of *Lycoperdon gemmatum*, Fig. 150, and a number of the usual shape. *Lycoperdon gemmatum* is the most common species both in Europe and America, and it generally has a sterile base, well developed. That this species, which in the United States and Europe always has a stem-like base, should in the extreme north become globose with a very slight development of the sterile portion, is of interest as showing the influence that climate and conditions have on plants. This form has the same relation to the normal form of *Lycoperdon gemmatum* as the United States form *Lycoperdon cepæforme* has to the type form, *Lycoperdon polymorphum* of Europe.



Fig. 150.

LYCOPERDON PIRIFORME IN TASMANIA.

Mr. George K. Hinsby, who resides on the west coast of Tasmania, is a very fortunate man, mycologically speaking. He resides in a section where *it is too wet* to gather fungi. He writes me that it rains so often that he rarely gets a chance to go to the "bush," and that the rainfall is from nine to twelve feet per annum. What a harvest of fungi there must be in such a locality. If it is ever our good fortune to go to Australasia we will direct our footsteps immediately to Mr. Hinsby's house. And his letter may have some influence in taking us some day, as we have on two occasions been within a few days' steamer ride of Australasia and refrained from going on, as our impression was that the greater part of the country was *too dry* to find fungi unless we happened to strike a rainy season.



Fig. 151.

Mr. Hinsby sends *Lycoperdon piriforme* (Fig. 151), a subglobose form, the same as we have often collected at Cincinnati. There is one slight difference, the spores are smaller, averaging about 3 mic., and they rarely measure less than 4 mic. in specimens from Europe or America.

These are the first specimens we have ever seen of *Lycoperdon piriforme* from Australasia (Cfr. *Lyc. of Aus.*, p. 32), but Mr. Hinsby writes me that he "found an acre of them and could have collected it by the Lushel." It illustrates how little relatively is known of what species occur in Australasia. We hope Mr. Hinsby will not be backward in sharing with us some of the harvest of other species that must occur in such a favored locality.

BROOMEIA CONGREGATA.



Fig. 152.

When we considered this plant on page 193, we expressed the hope that some one would favor us with a specimen for our museum. Our wish has at last been gratified. Dr. Kurt Dinter, of German S. W. Africa, has just sent us a small, but nice specimen (Fig. 152). *Broomeia congregata* is an exception to most puff balls. Its distribution is *relatively local*. It is known only from Southern Africa. Our best thanks are due to Dr. Dinter for this specimen.

THE MOUTH OF CATASTOMA ANOMALUM.

Having received from F. M. Reader, Australia, some fine specimens of *Catastoma anomalum*, we present a photograph (Fig 153, enlarged 3 times), to show the protruding mouth which no other species of *Catastoma* has. It also shows the *thin, brittle* exoperidium peculiar to this species. It might be said, and and truly said, that as the genus *Catastoma* (typically) has neither a protruding mouth nor a thin, brittle exoperidium, the plant could be made into a "new genus." While it could be done, it should not be done, in my opinion, for the plant nat-



Fig. 153.

urally falls into the genus in every other character. It is an easy matter to make "new genera," and one can make a new genus for almost every species if he wants to. It is only another form of name-juggling, having just about the same merit as the jugglers who look up so-called synonyms in a date dictionary and shuffle the specific names about.

LYCOPERDON PSEUDOGEMMATUM.

This is one of the very few of Spegazzini's "new species" that are known in Europe because Balansa sold sets, and this is found in several of the museums.

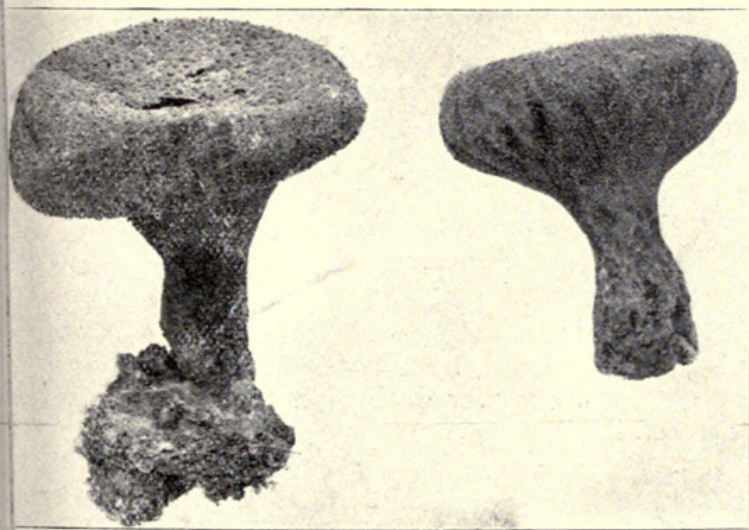


Fig. 154.

It is only a form of *Lycoperdon gemmatum*, not differing from the usual form more than dozens of others that occur in Europe and the United States. It has a constricted base and is grooved or wrinkled above as shown in our cut, Fig. 154. *Lycoperdon gemmatum* is at home in temperate regions. This form seems to me to be a poorly

developed state, due to growing under climatic conditions not congenial to it. We have noted somewhat similar forms in *hard, clayey soil* in the United States.

MYCETES ARGENTINENSES.

Carolo Spegazzini has kindly forwarded me a copy of his latest publication under the above title. It is entirely devoted to Gastromycetes, and therefore comes in the scope of my work and comment. I am most glad to see that it is well illustrated, and that some estimate can therefore be placed on the value of the species. Heretofore Spegazzini's work has been mostly vague, verbose descriptions from which no idea whatever can be gained as to the nature of the plants.

CYPELLOMYCES ARGENTINENSIS.—The first is a new genus which appears to me very good. Fig. 155 is a section of the plant, and fig. 156 represents a cluster of basidia. Spegazzini compares it to *Xylopodium* and *Dyctiomycetibus*. We do not know the latter (unless he means *Dictyocephalus*), but *Xylopodium* is obsolete. It has been proven to be co-generic if not co-specific with *Phellorina*. Spegazzini's new genus is very close to *Phellorina*, indeed it seems to be *Phellorina with a volva*. The basidial structure is also similar, for while it is hard for me to believe that any *Gastromycetes* has "chain-spores," it has been demonstrated by Patouillard that *Phellorina* has *clustered* basidia, very similar in general effect to the clusters shown in the figure. We have seen in Professor Underwood's collection a specimen collected in Texas by W. H. Long that seems to be exactly the same as Spegazzini's figure, except as to volva which may be absent by accident from this specimen.

PODAXON MACROSPORUS.—We do not pass judgment on descriptions of new species of *Podaxon*, except to state that we think there are about four times as many species now described as exist.

SCLERODERMA TUBEROIDEUM.—We are suspicious of *Sclerodermas* described as "subhypogaeal," for all *Sclerodermas* are hypogaeal when young, and if hypogaeal when mature they are not *Sclerodermas*. The habits and description point strongly to unopened *Geaster hygrometricus*.

ARACHNION? FOETENS.—The doubtful mark is well placed. *Arachnions* are not subterranean, and their spore characters and gleba structure are quite different from Spegazzini's plant. It is probably a genus of the *Hymenogasters*.

DICTYOPHORA LILLOI.—The figure and description are exactly that of *Phallus indusiatus*, better known now as *Dictyophora phalloidea*. Excepting the size, which is slightly smaller than usual, the figure does not differ from the usual form in the slightest detail.

PHALLUS CAMPANULATUS.—Spegazzini's figure agrees fairly with Berkeley's, which was originally from South America.

MUTINUS ARGENTINUS (Fig. 157).—Spegazzini states that it differs in no manner from *Mutinus Muelleri* named by Professor Fischer, and he produces a diagram to show that 1887 is an earlier date than 1888. On referring to our calendar we find he is correct.

SIMBLUM SPHAEROCEPHALUM.—Spegazzini reports it "most common," which is in keeping with usual reports from South America. He also states that "*Simblum australe*, Speg." and also "*Simblum Lorentzii*, Speg." are "most distinct." (Prof. Fischer has been unkind enough to refer them as synonyms to *Simblum sphaerocephalum*.) If they are distinct, we feel that Spegazzini should publish a photograph and show it. Neither have been illustrated, and an unillustrated phalloid is really undescribed. If Spegazzini will send us photographs we shall be glad to publish them.

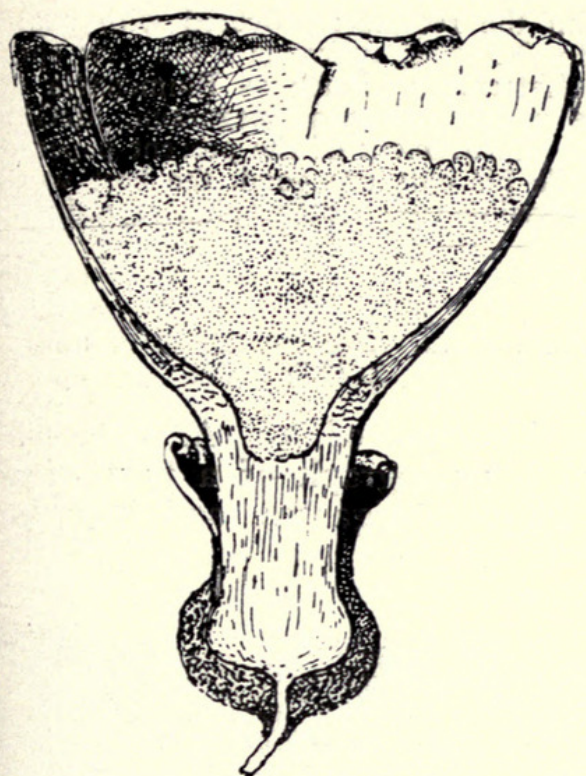


Fig. 155.



Fig. 156.

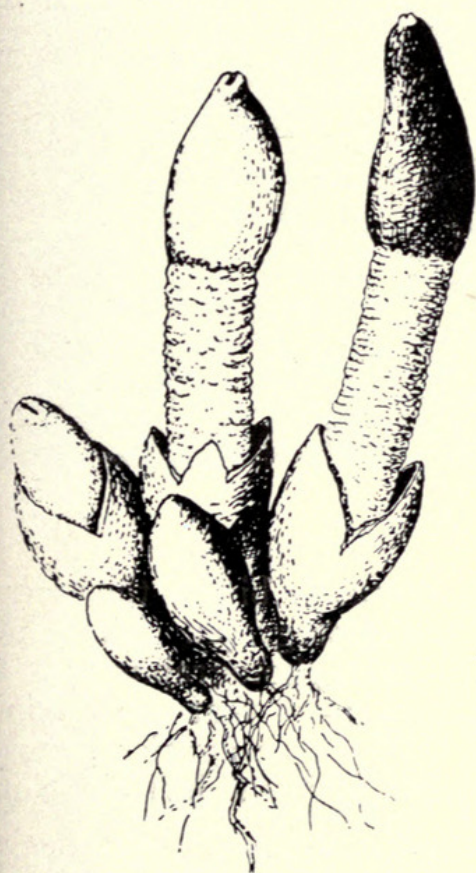


Fig. 157.

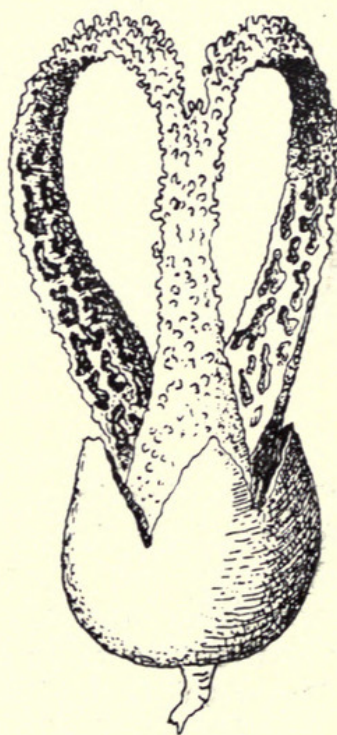


Fig. 158.

LATERNEA TRISCAPUS.—Under the name *Clathrus triscapus* Spegazzini presents a figure (158) that he refers to this species. If his figure is correct, and he has found a plant with the receptacle covered with papillate projections as shown (fig. 158), it is not *Laternea triscapus* but a new species, and even a new genus differing from *Laternea* as much as *Blumenavia* does. Professor McGinty proposes for it the name "*Laternea Spegazzini*, McGinty." We congratulate Spegazzini on the vast improvement of the present paper over what he has previously issued, and while his cuts are good, the best workers with the phalloids now (Möller and Penzig) use photographic reproductions, which are still better.

A FIELD OF PUFF BALLS.

We are enabled, through the kindness of W. A. Brewer, of Burlingame, California, to present a photograph of a field of puff balls. The species is evidently *Calvatia gigantea*, and how large



Fig 159.

they were we do not know, but they were certainly big or they would not be the prominent objects in a landscape photograph. These puff balls grew in a large circle, as shown in other photographs sent me by Mr. Brewer. We judge from the photographs that the circle is two or three hundred feet in diameter. When little agarics grow in circles they are often called "fairy-rings," but this puff ball circle was too large to be attributed to the fairies.

A NEW HOST.—Professor McGinty writes me that he has just found *Polyporus Polyporus* growing on *Sassafras Sassafras*.

DÉCOUVERTE D'UNE RARETÉ MYCOLOGIQUE.

M. Victor Dupain a trouvé dans le cours de la présente année (1906) le rare *Queletia mirabilis*. Un exposé détaillé, en anglais, de l'histoire de ce Champignon a été donné à la page 185 des *Mycological Notes*. Comme en Europe, le *Queletia* n'a été vu qu'en France, un résumé en français de son histoire pourra intéresser les lecteurs français.

Il fut d'abord recueilli au Pont de Sochaux (Doubs?) par Perdri-
zet de Vaudoncourt, et communiqué à Quelet qui l'envoya à Friès,
lequel le décrivit et lui donna son nom.

Il fut recueilli depuis par A. Le Breton en 1884 à Saint Saëns
(Seine-Inférieure) sous un gros tas de tan.

Il vient d'être trouvé par M. Dupain dans son jardin à la Mothe-
Saint-Héray (Deux-Sèvres) et encore sur un tas de tan. C'est la
troisième fois seulement que cette plante a été trouvée en France
depuis quarante ans.

En dehors de la France, la plante n'a été recueillie que deux fois :
une fois aux États-Unis sur de vieux tan, une autre fois en Angleterre
à Kew, obtenue d'une façon adventive, de Spores envoyées des États-
Unis.

Comme on le voit, presque toujours ce Champignon a été trouvé
sur de vieux tan provenant de tanneries. J'incline à croire que ses
spores ont été apportées avec des peaux de l'Amérique du Sud, bien
qu'il n'ait pas encore été signalé dans cette région. Les Champignons
de la partie tempérée de l'Amérique du Sud sont encore très peu
connus. Beaucoup d'espèces "nouvelles" ont été décrites par Spegaz-
zini; mais comme les Champignons du monde entier— les Gastéromy-
cètes du moins—sont relativement peu nombreux et doués d'une très
large dispersion géographique, il est probable que beaucoup des "nou-
velles espèces" de Spegazzini ne sont nouvelles que pour lui. Toute-
ois rien de ce qu'il a décrit ne peut s'appliquer au *Queletia mirabilis*.

SOME "OLD SPECIES" FROM SOUTH AMERICA.

We have just received from Rev. L. Mille, Quito, Ecuador, three
species which add to our knowledge of the distribution of puff balls.

BOVISTA NIGRESCENS.—This, a frequent species in Europe,
is never been collected in the United States, notwithstanding the
frequent (false) records in American literature. It is replaced in
our country by *Bovista pila*. Its occurrence in South America is
therefore of special interest, in view of its absence from the greater
portion of North America. I have, however, a specimen from Mexico.

CATASTOMA SUBTERRANEUM.—An abundant collection from Rev. Mille is exactly the same plant that grows in such great abundance in our western country. It is evidently a common species in South America. It was collected in Chile by Gaudichaud and determined and published by Montagne as *Lycoperdon pusillum*, afterwards described by Patouillard as *Bovista argillacea*. It was collected in Bolivia by Weddell and determined by Montagne as *Bovista plumbea*. It was brought from Patagonia by Darwin and called by Berkeley *Bovista cervina*. What name Spegazzini calls it I do not know, but he has undoubtedly discovered that it is a new species. I always feel like apologizing every time I use the specific name *subterraneum* as it is not subterranean, and it was the sixth specific name under which it was described. I am forced to use it, however, to avoid making a "new combination" (Cfr. Myc. Notes, p. 242).

LYCOPERDON WRIGHTII.—Rev. Mille sends us the same forms we have recorded from Africa (p. 271), with slightly rough spores. This species is now known from North and South America, Africa and Java, but has *never been collected in Europe*. We have also received a very similar (if not the same) species from British India.

NOTELETS.

REDISCOVERY OF MITREMYCES ORIRUBER.—Monsieur P. Hariot, the curator of the museum at Paris, has submitted to me some specimens collected by R. P. Farges at Tshen-Keon-Tin, China, which I find to be *Mitremyces oriruber*. This is the second collection known, the original from the Straits Settlement is at Kew. The species is known by the coarse, wart-like scales (cfr. Plate 69) and the *globose* spores. The Chinese form has spores about 12 mic. in diameter, which are smaller than in the type (15 to 17 mic.), but as the plants are otherwise exactly the same I do not feel like basing a new name on this spore variation. *Mitremyces Ravenelii* is also known from China.

MYCENASTRUM CORIUM.—J'ai commis une erreur (page 267) en annonçant la redécouverte du *Mycenastrum Corium* à Neuilly (France). C'est en réalité M. Rolland qui trouva la plante et non M. Patouillard qui était alors dans le Jura. C'est ce dernier qui m'avait annoncé cette découverte: n'étant pas aussi familier que je le voudrais avec la langue française parlée, je n'ai pas bien compris ses paroles et les ai inexactement rapportées.

Je profite de l'occasion pour annoncer que M. Ludwig a également trouvé le *Mycenastrum Corium* dans le Bois de Boulogne près de Paris.

MYCENASTRUM CORIUM AT WASHINGTON.—Fred J. Braendle has recently sent to the museum at Paris some specimens of *Mycenastrum Corium* from Washington, D. C. This species is quite common west of the Mississippi, but rare east. I think this is the fifth station east of the Mississippi that has come to my notice. It is a species that grows in many countries, Australia, Africa, Europe, South America, and has received names by local workers in most of these countries, but no man can find a character to distinguish one from another, and the species are all the same. Mr. Braendle sends it under the name *Mycenastrum spinulosum*, which is a local name for it in the United States.



Fig. 1.



Fig. 2.



Fig. 3.

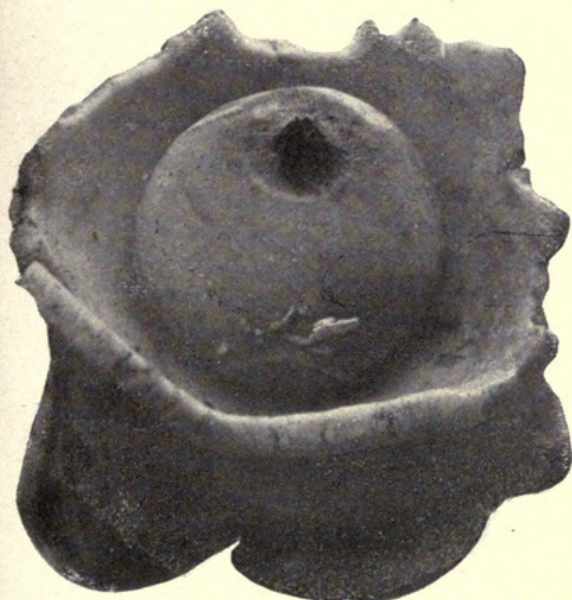


Fig. 4.

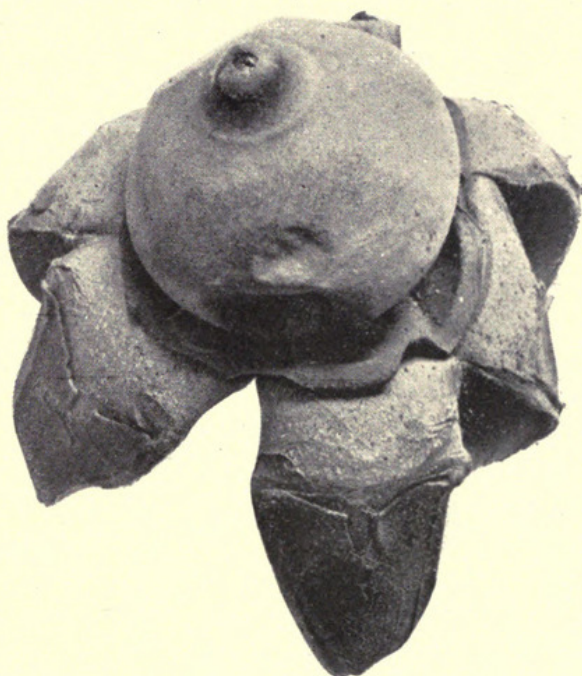


Fig. 5.

Figs. 1 and 2, small specimens, unexpanded. Fig. 3, section of same. Fig. 4, fresh plant photographed in Samoa. Fig. 5, specimen (dry) from A. P. Morgan, Ohio.

GEASTER TRIPLEX.



Fig. 6.



Fig. 7.

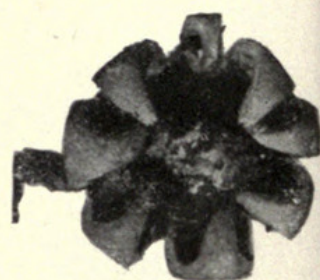


Fig. 8.



Fig. 9.



Fig. 10.



Fig. 11.



Fig. 12

Figs. 6, 7, and 8, fresh plants, the small typical form. Figs. 9 and 10, dried specimens from Australia. Fig. 11, from Europe. (This is a type of *G. lageniformis*.) Fig. 12, a large specimen, tending toward *G. triplex*.

GEASTER SACCATUS.



Fig. 1.

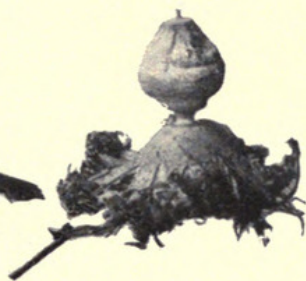


Fig. 2.



Fig. 3.



Fig. 4.



Fig. 5.



Fig. 6.

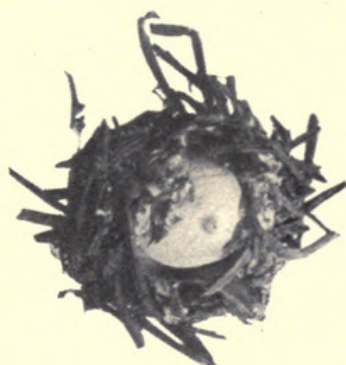


Fig. 7.

Figs. 1, 2, 3, and 4, dried specimens from the United States. Fig. 5, from J. G. O. Tepper, Australia. Figs. 6 and 7, fresh specimens, showing that it becomes "pedicellate" in drying.

GEASTER MINIMUS.

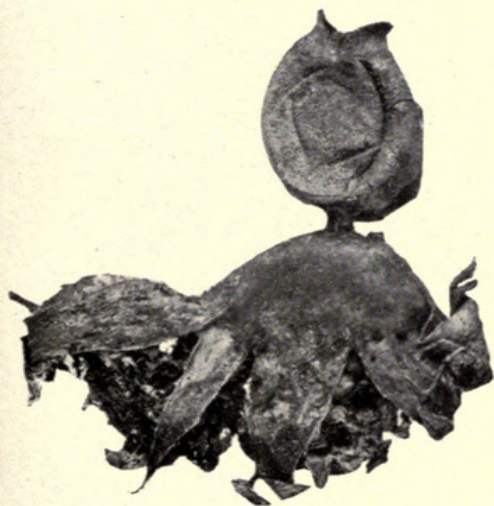


Fig. 8.

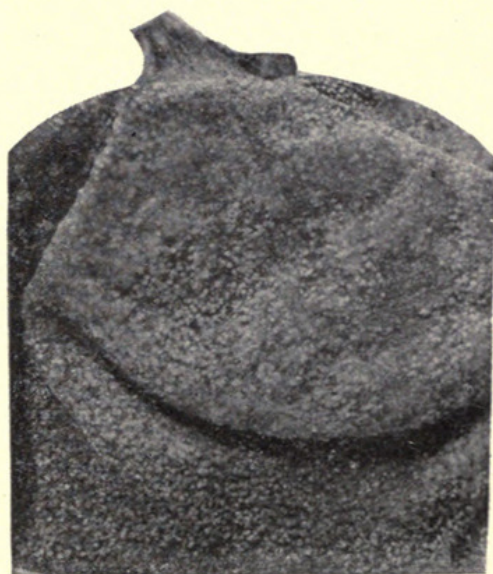


Fig. 9.

Fig. 8, specimen from South Africa from Professor Plöttner. Fig. 9, endoperidium enlarged to show the calcareous grains.

GEASTER CALCEUS.



Fig. 10



Fig. 11.

Figs. 10 and 11, from type specimens at Kew.

GEASTER PERUVIANUS.



Fig. 12.



Fig. 13.



Fig. 14.



Fig. 15.

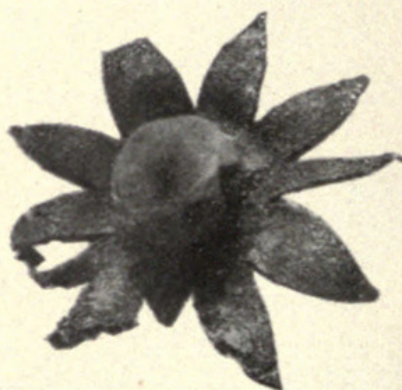


Fig. 16.

Figs. 12, 13, 14, 15, and 16, from type specimens, all collected in the sand at Jupiter, Florida.

GEASTER ARENARIUS.



Fig. 1.

Fig. 1, a very large specimen, received from Carleton Rea, England.

GEASTER FORNICATUS.



Fig. 2.



Fig. 3.

Fig. 2, from Dr. L. Hollós, Hungary. Fig. 3, from W. H. Long, Jr., Texas.

GEASTER FORNICATUS.



Fig. 4.



Fig. 5.



Fig. 6.

Figs. 4 and 5, from Professor Plöttner, from South Africa. Fig. 6, the mouth enlarged five times.

GEASTER MACOWANI.

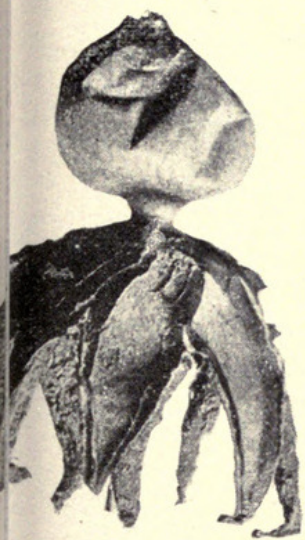


Fig. 1.

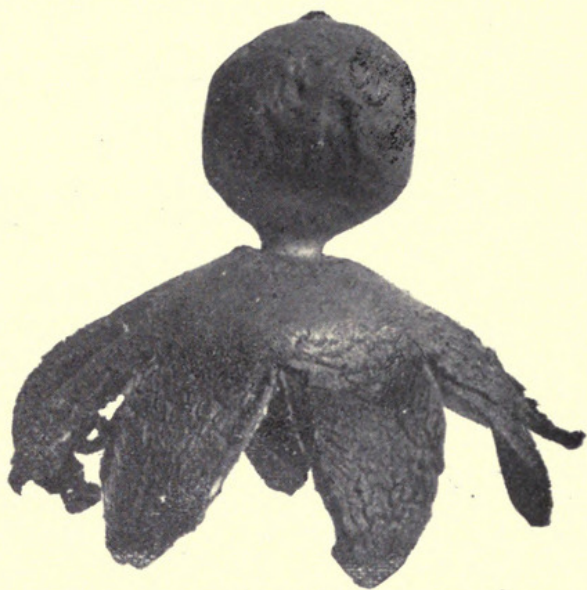


Fig. 2.

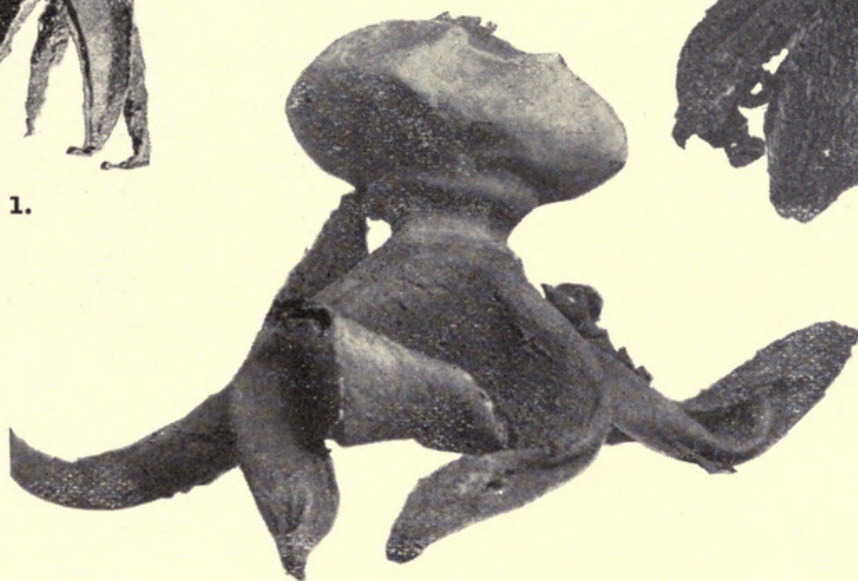


Fig. 3.

Fig. 1, from F. LeRoy Sargent, Massachusetts. Fig. 2, from Dr. L. Hollós, Hungary. Fig. 3, Professor T. H. McBride, Iowa.

GEASTER LIMBATUS.

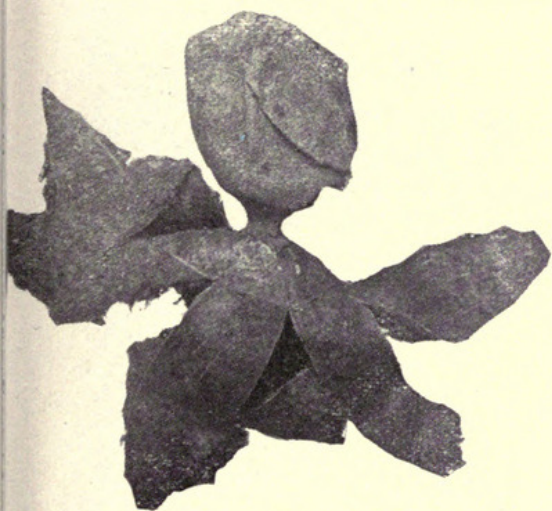


Fig. 4.

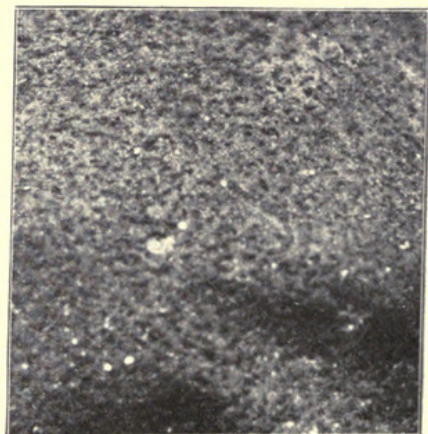


Fig. 5.

Fig. 4, type in Museum of Berlin. Fig. 5, endoperidium surface enlarged five times.

GEASTER HIERONYMII.

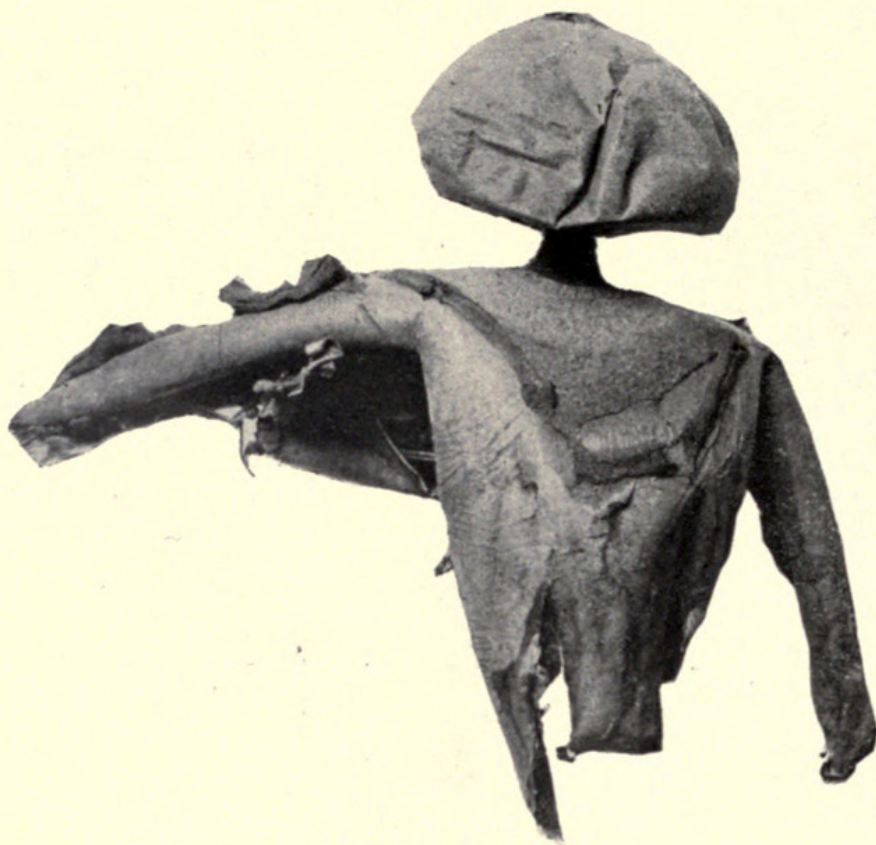


Fig. 6.



Fig. 7.



Fig. 8.

Fig. 6, from Frank R. Rathbun, New York (Cfr. Myc. Notes, p. 144). Fig. 7, from A. P. Morgan, Ohio. Fig. 8, an unexpanded plant from Dr. H. L. True, Ohio.

GEASTER RUFESCENS.

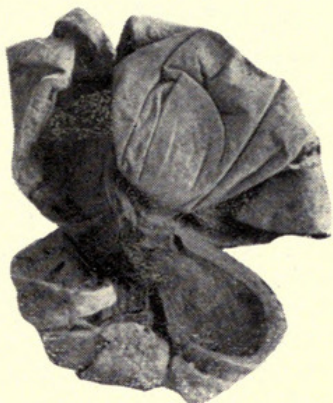


Fig. 1.

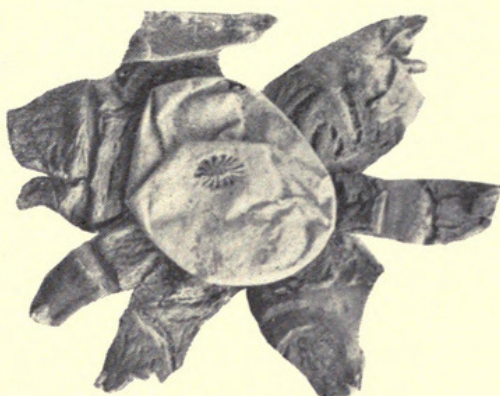


Fig. 2.

Figs. 1 and 2, type specimens in Montagne's Herbarium.

GEASTER AMBIGUUS.

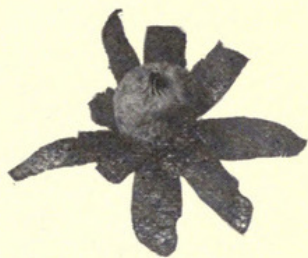


Fig. 3.



Fig. 4.

Figs. 3 and 4, specimens from Dr. L. Hollós.

GEASTER STRIATULUS.

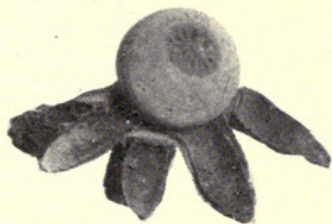


Fig. 5.



Fig. 6.

Figs. 5 and 6, type specimens at Kew.

GEASTER DRUMMONDII.



Fig. 7.



Fig. 8.



Fig. 9.



Fig. 10



Fig. 11.

Figs. 7, 8, and 9, from Charles Crossland, England. Figs. 10 and 11, from J. Dearness, Canada.

GEASTER MAMMOSUS.



Fig. 12.



Fig. 13.



Fig. 14.



Fig. 15.



Fig. 16.



Fig. 17.



Fig. 18.

Figs. 12, 13, 15, and 16, from A. P. Morgan (type of *G. delicatus*). Fig. 14, Museum of Berlin, (type of *G. Pazschkeanus*). Fig. 17, Museum of Paris (type of *G. floriformis*). Fig. 18, from Dr. Hollós, Hungary. (Very rarely specimens show such a protruding mouth.)

GEASTER FLORIFORMIS.



Fig. 1.



Fig. 2.

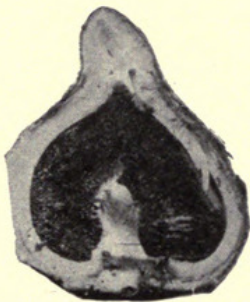


Fig. 3.



Fig. 4.

Figs. 1 and 4, expanded plants. Figs. 2 and 3, unexpanded and section. All at Cincinnati.

GEASTER ARCHERI.

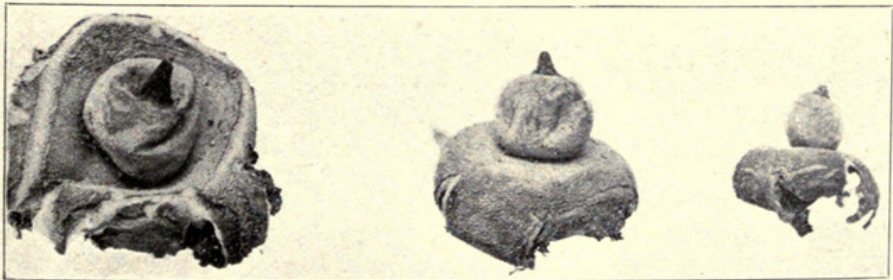


Fig. 5.



Fig. 6.

Fig. 5, specimens from Rev. Bourdot, France. Fig. 6, a mouth enlarged.

GEASTER ELEGANS.



Fig. 7.



Fig. 8.



Fig. 9.

Figs. 7 and 8, type specimens in the Museum at Paris. Fig. 9, from Rev. J. Rick, Brazil.

GEASTER HARIOTII.

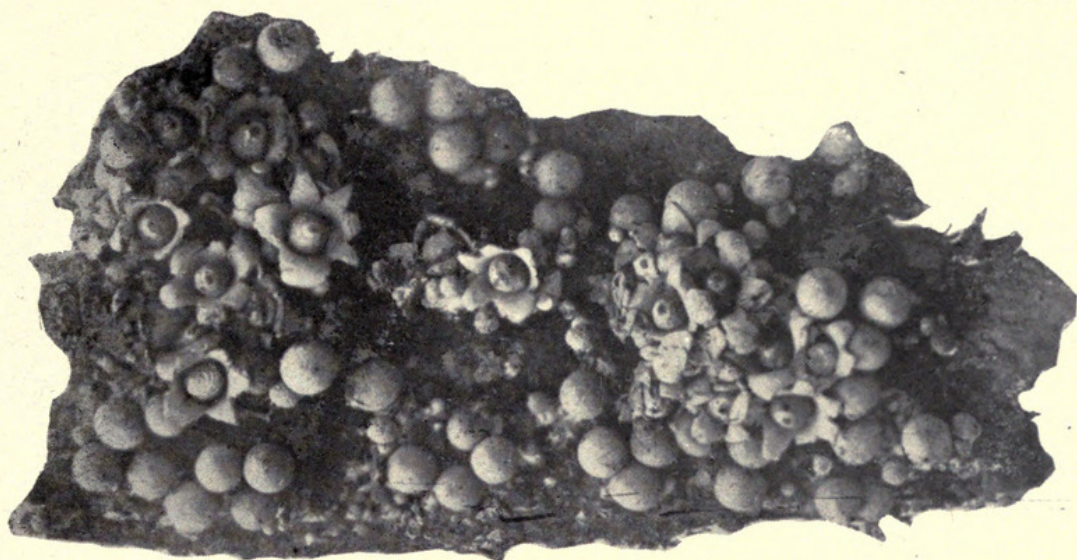


Fig. 1.



Fig. 2.



Fig. 3.

Fig. 1, photograph from fresh specimens in Samoa. Fig. 2, from Rev. J. Rick, Brazil. Fig. 3, type specimens in Museum at Paris.

GEASTER MIRABILIS.

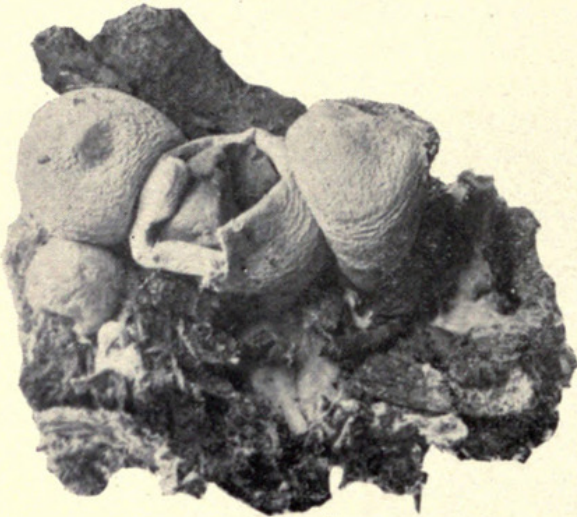


Fig. 4.

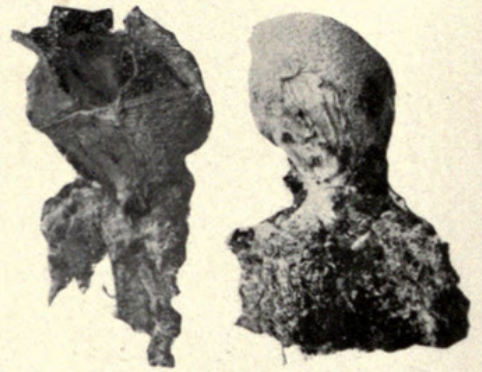


Fig. 5.

Figs. 4 and 5, from E. J. Butler, British India.

GEASTER SUBICULOSUS.



Fig. 6.



Fig. 7.



Fig. 8.



Fig. 9.

Figs. 6 and 7, types collected in Kentucky. Figs. 8 and 9, from C. H. Demetrio, Missouri.

GEASTER CAESPITOSUS.

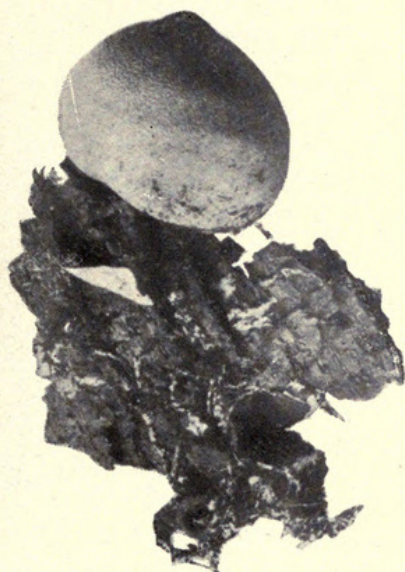


Fig. 1.

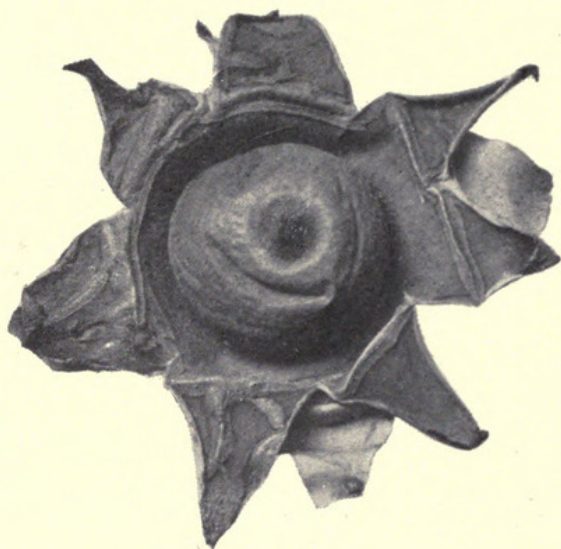


Fig. 2.

Figs. 1 and 2, unexpanded and expanded plants, *Cincinnati*.
GEASTER VELUTINUS.



Fig. 3.



Fig. 4.

Fig. 3, type specimen at Paris. Fig. 4, specimen from Florida in herbarium,
Department of Agriculture, Washington.

GEASTER WELWITSCHII.

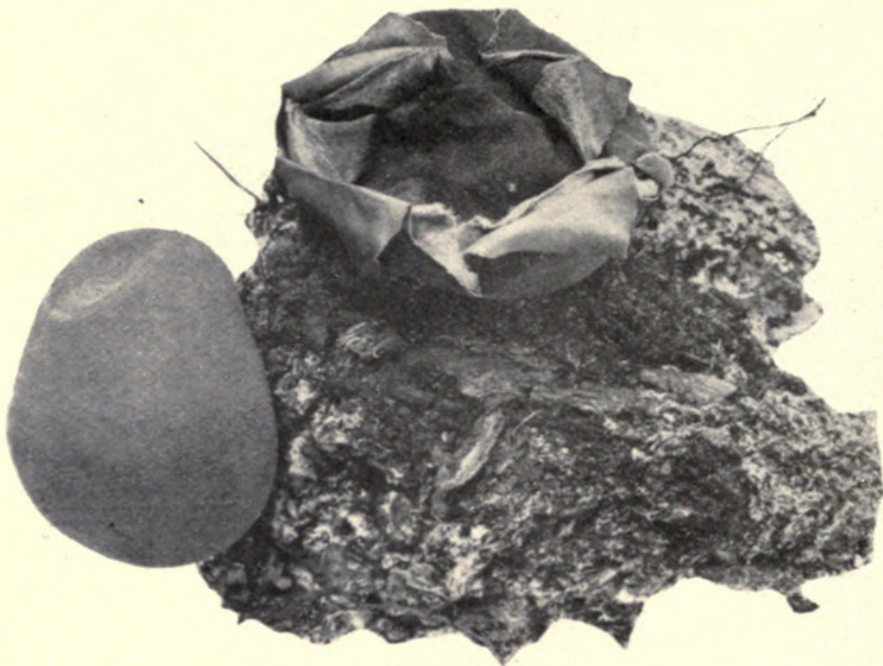


Fig. 5.

Fig. 5, specimens from Rev. J. Rick, Brazil.

GEASTER JAVANICUS.

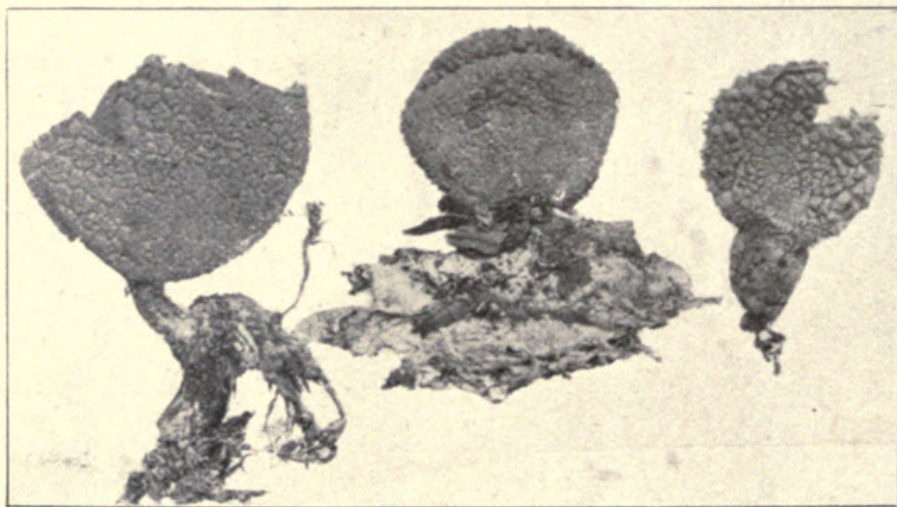


Fig. 6.

Fig. 6, type specimens in herbarium of Montagne.

GEASTER SCLERODERMA.



Lloyd, C. G. 1907. "Mycological Notes, No. 25." *Mycological writings of C. G. Lloyd* 2, 309–324.

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