

himself found the plant, but published it in his Synopsis on the faith of a drawing sent him by Leconte. Mr. J. B. Ellis writes me, too, that from Texas he has received *Laternea triscapa*, Turp., and a species of *Lysurus* which he deems new, and calls provisionally *L. Texensis*. *Laternea triscapa*, I believe, has hitherto been found in the Western Hemisphere, only in Chili and St. Domingo. On the other side of the globe it occurs in the East Indies. Diligent search on the part of collectors may reveal in Texas the presence of *Clethria crispa*, Turp., which is known to inhabit Mexico. In the "Medical Repository" for 1808, in which Rafinesque gave a poem to his contemplated revolutionizing of the American flora, he characterized, under the name of *Colonnaria*, a genus of the fungi, which was apparently the same as what is now known as *Laternea*. He describes it thus: "Divided into four pillars united at the top, which bear seeds in the margin." What he had in view was evidently what is now called *Laternea columnata*, Bosc.; unable, however, to restrain his natural propensities he made several species out of it, such as *urceolata*, *truncata*, etc. If my surmises are correct in regard to the identity of this Rafinesquian genus with Bosc's plant, the latter then has a range as far north as Philadelphia at least. Another genus of the *Phalloidei* proposed by Rafinesque was *Edycea*, which evidently was what Berkeley and Curtis have since distinguished as *Corynites*, which, by the way, does not seem to possess very strong claims to be regarded as different from *Cynophallus*, or *Mutinus*. The genus is thus characterized by Rafinesque:—"Tubular, perforated at the top, gelatinous composed of utriculs (*sic*) containing the seeds." The species *rubra* was "cylindrical, reddish, the top covered with a brown mucilage." Our author had also observed (or rather he *said* he had) a species which was entirely white, and which he names *alba-fusiform*. "Both species," he remarks, "have a most intolerable stinking smell." By Mr. H. W. Ravenel I am informed that the *Corynites brevis* inserted in my list is merely the first Ms. name for *C. Ravenelii*, and was probably printed thus in Dr. Curtis's catalogue by an oversight of the author.

Before leaving this subject I must allude to an interesting matter connected with these plants, and one which, although it may have attracted the notice of others, I have never met with in print. I refer to the curious

§ 27. **Correlation Between the Odor of the Phalloids and their Relative Frequency**—I do not wish to occupy space in the BULLETIN with matter, which without explanation, would prove intelligible to but few, and may therefore be excused for entering upon some preliminary remarks in regard to the structure of these fungi, and which, although they may appear trite to the mycologist, will serve to make the subject of more interest to the general reader. One of the six families into which Fries divides the fungi is that of the *Gasteromycetes*. The characteristic of this family is, that the plants which compose it have their hymenium or spore-bearing portion enclosed in a volva or wrapper, making them truly angiocarpous. One of the orders of this family (the *Trichogastres*) contains genera whose species are commonly known as "puff-balls"—objects which are so familiar to

everybody that they need no very extended description. If a common puff-ball (*Lycoperdon*) be broken open at an early stage of its growth, the internal fleshy substance will be found to be firm and of a creamy whiteness. An examination of a very thin section of this whitish substance under a high power of the microscope will show that it is composed of closely compacted anastomosing threads, with here and there an irregular sinuous cavity lined with closely crowded club-shaped bodies (basidia) each tipped with from four to six spicules, and each spicule bearing at its apex a globular spore. When the spores are fully matured they become brownish and free, the hymenium is resolved into dry threads, and both together form a pulverulent mass. Next, the peridium bursts at the apex; and it then requires but the least touch from some passing animal, or even a slight pressure of the wind on the thin peridium to set free, in a single "puff," millions of the microscopic spores, which are thus disseminated far and wide. All this is very simple. Another order of the family is that of the *Phalloidei*, which, from the form and odor of a well-known species, is sometimes designated, with more truth than elegance, the "stink-horn" tribe. Here we have a structure analogous to that found in some of the puff-balls, but with a few important variations. In these fungi the volva or peridium is composed of three coats: an outer, thick white membrane; an inner, thin white membrane, and, between the two, a thick gelatinous layer. The hymenium or spore-bearing surface, enclosed within the inner membrane, is similar in structure to that of the puff-balls, and consists of a dense mass of threads presenting sinuous cavities lined with spore-bearing basidia. In these plants, however, the hymenium, instead of drying up into a dusty mixture of spores and threads, becomes moist, and then deliquescent; and, at maturity, drips away in a thick tenacious mucilage. It is evident, therefore, that were no method provided for their dispersion, the spores would simply flow down into the lower cavity of the volva, and there dry up into a hard mass; and that the plant would not only become local, but, in the struggle for existence constantly taking place in the organic world, would run the risk of extermination. Nature, however, has made a provision against such a calamity. On examining a section of the volva of one of the phalloids, we find that, according to the genus, the hymenial substance either surrounds the upper and external portion of a stem; or is enclosed in a network at the top of a stem (January BULLETIN, Pl. 1, Fig. 3); or is enclosed within stellate rays at the apex of a stem. In all cases, this stem is composed of large pits or cells, which, while the plant is still enclosed in the volva are very strongly compressed (See same Figure); but as the plant goes on maturing these cells acquire a rounder or more elongated form (Fig. 5, same plate), till at length their upward tendency is so strong that the volva is ruptured (sometimes with a loud report) and the hymenium is lifted to a height of several inches in the air. In the fungi of this order which have no stems (as in *Clathrus*) the network of the receptacle has the same cellular structure, and has precisely the same effect in bursting the volva and lifting the sporiferous mass into the air. One step is thus taken towards spore dispersion, but this is not enough,

and the plant must needs have some extraneous aid; and furthermore, any such aid must come quickly, inasmuch as these fungi by reason of their loose cellular structure are quite short lived. Now one of the most prominent characteristics of nearly every species of this order is that the sporiferous substance has a most abominable, fetid odor—one that can only be compared with that emitted by putrescent animal matter. In fact, so similar to decaying animal organisms is it, that even flies are deceived thereby; and before the ill-scented mass has had time to drip away it will have been greedily devoured by numbers of these insects. As flies have “no local habitation” they give the minute ingested spores a wide dissemination by means of their ejections. It is a well-observed fact that the very common species of “stink-horns” (*Phallus impudicus*, *indusiatus*, etc.) are found in the greatest abundance around human habitations, where they occur under porches, in the door-yard, and in the garden, and often in such numbers, and so frequently as to occasion serious inconvenience. This tendency to become domesticated is thus correlated with their fetid odor and the presence of those constant companions of man—the flies. More rarely, these malodorous plants are found in woods in the vicinity of villages and cities. In such localities, where flies are less abundant, the same office is often performed for them by other insects—especially by beetles. The only fresh specimen of a *Phallus* that I ever met with in the woods was being visited by several individuals of a common species of carrion-beetle—*Silpha Noveboracensis*. A writer in the *Science Gossip* for Nov., 1879, mentions a case observed by him where a stink-horn “had its cap almost denuded of the dark slimy mucus which covers it by swarms of ants, which were busily engaged upon what appeared to be to them a dainty feast.” There is thus evidently something in the composition of this sporiferous substance which proves grateful to the taste of such flesh-eating insects as are attracted to it by its cadaverous odor. Braconnot, as the result of an analysis of this fetid slime, states that it is composed of “highly animalized fungin, albumen, mucus, superacetate of potash, and of a peculiar acid in combination with potash.” It follows from what has been said that those species of these plants which possess the most putrid odor ought to be the commonest and most widely distributed ones. This, as far as observation can be made on the comparatively few species that occur in the temperate zones, is what we find to be the case. Those species, on the other hand, that do not possess a powerful odor tend to become rare. Thus, for instance, *Cynophallus caninus* is nearly odorless. It has a wide range, being found both in Europe and America, but it is recorded in all the books as being extremely rare and local. In the 10th volume of the British Entomology, Curtis figured a peculiar species of *Phallus* which he states was exhaling a faint odor of violets. On this figure Mr. Berkeley has founded a species and called it *P. iosmos*. This plant, although it has been carefully searched for, has never been found a second time. Has it become extinct from not offering an odor attractive to carrion-eating insects? Throwing out such species as have been founded on indifferent figures, and not on the plants themselves, the number of good species of this order which have been

described is probably less than seventy. Of these, two-thirds, as far as known, do not occur outside the tropics, and most of them have been described from one or two specimens collected by exploring expeditions, or individual explorers. It is thus impossible to obtain facts relative to their distribution. In the majority of cases, however, where any allusion is made to their odor, they are stated to be extremely fetid, and it is usually recorded of such species, too, that flies were observed eating their ill-smelling hymenium. In the cases of one or two Javanese species we are told that they were found growing on bamboo in the vicinity of the cottages of the natives. In some of these tropical genera the forms are extremely elegant; and especially is this the case in the genus *Aseroë*, the receptacle of which is divided into beautifully stellate, brilliantly colored rays. In most of the species of this genus the loathsome sporiferous substance is comparatively small in quantity, and in order to ensure of this being dispersed by insect agency, it would seem that this lack of quantity were compensated for by the bright conspicuous colors and the attractive forms that the plants assume. I was once asked by a friend who brought me the unexpanded volva of a *Phallus* as the supposed cause of an intolerable stench which proceeded from beneath a porch in front of his house, and which had caused his family great annoyance: "What good are these things; and, having such a vile odor, why do they remind us of it by so persistently thrusting themselves beneath our very noses?" The first question, in the present state of our knowledge, would be difficult to answer. So far as we know, these plants are of no practical use to man—being fit neither for food nor medicine; and, from an æsthetic standpoint, the species of the temperate zones, at least, have little to recommend them to the sense of sight, as most certainly they have nothing to commend them to that of smell.

The second question, I think has been sufficiently answered; although, in connection therewith, I may repeat what has often been remarked before, that the fragrant odors or the vile smells possessed by plants have been assumed by the latter with no reference whatever to man's delectation or annoyance, but, on the contrary, that they may prove advantageous to the plants themselves. It was probably with a feeling (shared by so many) that all things have been created for man's benefit alone, that led Bernardin de Saint-Pierre to write: "Plants which exhale delicious perfumes are of low stature in order that man may respire them." But Saint-Pierre, in his conceit, overlooked the magnolias, the honey-locusts, and a host of other trees which bear their fragrant blossoms way up out of man's reach.

W. R. G.

§ 28. **The North-Jersey Botanical Club.**—The regular monthly meeting of the North-Jersey Botanical Club, was held on Saturday, March 13th, in the High School building at Montclair. Twenty-four new members were elected. The following officers were chosen for the ensuing year: President, Henry H. Rusby; Vice-President, Miss H. Adelaide Shibley; Secretary, Walter M. Wolfe; Treasurer, George O. F. Taylor; Curator, Charles M. Davis; Executive Committee, the President and Secretary *ex-officio*, Chas. M. Davis, Randall Spaulding and Miss Nellie F. Bradford.