

PECULIAR PLANT DISTRIBUTIONS

H. S. PEPOON, M.D.

The author in the last few years has made an extensive study of the Floras of Jo Daviess, Fulton and Cook counties, Illinois, and upon the results of his observations in these counties the following notes are based. During these plant explorations 980 species were found in the first named county, 1000 in Fulton, and 1800 in Cook and adjacent parts of Lake counties, Indiana and Illinois. A "few years" may be better expressed by the term a half life time, for Jo Daviess is the home of his youth, Fulton of his young manhood and Cook of more mature years.

During this period, stretching back 40 years, some 2500 square miles have been carefully explored, 1,000 miles of tramping undertaken and countless thousands of individuals have come under observation. The topographic features have included the bed and border lands of *Glacial Lake Chicago* with its marshes, prairies, dunes and moraines, the rolling uplands of the *Upper Illinoisan* stage of the glacial period and the *Driftless area* of Jo Daviess with its gorges, cliffs, bottom lands and elevated highlands and erosion "mounds." The accompanying map shows the relative position of these regions and other data.

It may be remarked in a generalization that the Jo Daviess area has many boreal forms, the Cook county a great mingling of boreal and temperate species, and Fulton shows many that proclaim a warmer predeliction. Possibly 60 per cent of the plants are common to all the counties named. As might be expected, weeds are far more numerous in individuals and species in Cook county, for weeds are primarily plant-tramps that utilize to the limit the great trunk railways.

Some 54 examples of peculiar distribution are here cited with reasonable explanations of the same where explanation is apparent. The author admits that some of these explanations are possibly open to criticism and invites the same with the hope expressed that it partake of a friendly helpful nature. These examples are given in the order of their natural sequence from lower to higher forms. In a great majority of the examples named the stations are unique, in that the plants were found there and there only in the three counties. This very isolation renders the cases of distribution more interesting, and at the same time more difficult of explanation. To avoid continual repetition, the letters appended refer to the proposed explanations given in the conclusion and summary.

1. *Pellaea atropurpurea*, the rock brake, is found in the deep stone "cuts" of the Illinois Central railway west of Warren, probably five miles from any natural stations which lie south and west. Also in similar cuttings southeast of Freeport, 30 miles distant and nearly 40 miles from natural outcrops. N. W. of center of Distribution (D. C? or A?)

2. *Woodsia obtusa*, in the famous rock cut of the St. Paul railway, north of Warren. One clump only. No other stations known for the species in Jo Daviess. N. W. of center (D).

3. *Botrychium obliquum*, one plant on the Niagara limestone summit of Benton Mound. No others ever found nearer than 10 miles. Only the one station ever discovered in Jo Daviess. (G).

4. *Azolla Caroliniana*, exceedingly abundant along Liverpool road in Illinois River bottoms of E. Fulton, the only station where the plant has ever been seen, in all of the author's botanical tramps. (G).

5. *Tripsacum dactyloides*, on an alluvial border below Seville, Fulton county, the only station; along the northern limit of range. (C).

6. *Acorus Calamus*, Sweet Flag, in isolated and far separated patches here and there in all three counties. The writer hazards the theory that this peculiar distribution, entirely absent in countless suitable places, is due in large part to Indian planting. (B).

7. *Wolffia Columbiana*, exceedingly abundant years ago north of Clarke, Indiana, but absent elsewhere in all three areas. (G).

8. *Commelina Virginiana*, on the dry dune sand S. E. of Clarke, Indiana, and on the sand bluff of the Mississippi river in Jo Daviess. (See Gray 7th Ed.) (G. or I.)

9. *Allium stellatum*, one station on C. B. & Q. railway, sand prairie, Jo Daviess. (A).

10. *Camassia*, abundant in Cook; in one or two stations in Jo Daviess. A plant much used by the Indians as a food plant. (B. and A.)

11. *Clintonia borealis*, in two tamarack swamps in Lake county, Indiana. A numerous colony in each. Plainly an extension from the northeast. (C).

12. *Trillium sessile*, in woods south of Naperville and on Salt Fork of Des Plaines river. A very rare or over-looked species. Never have seen the plant in its place of growth. (G).

13. *Cypripedium hirsutum*, excessively abundant, formerly in Lake county, Indiana, equally common now in Southwest Michigan. Found in two very peculiar habitats in Jo Daviess, one on a dry wooded hillside, and the other on the crown of a limestone cliff, four miles distant from the first station. (G? or I.)

14. *Orchis spectabilis*, very rare in all counties, except in one locality in Fulton where a half acre was found absolutely a colored sheet of bloom. Probably a thousand plants here. Certainly some condition was exceedingly favorable to account for the number and vigor of the plants. (G).

15. *Habenaria leucophaea*. Until five years ago, the rarest orchid in the writer's experience, and then two finds, one in Cook and one in Jo Daviess, disabused his mind about this rarity, but puzzled him the more as to why they were there. The Cook county station was on the flat, moist prairie of a vacant property, near Elston avenue, Chicago, where many score of plants grew. The Jo Daviess station was in two grassy swales on the right of way of the I. C., where the plants flourished by hundreds. Before these finds, two plants had been seen: one on a hillside near No. 13, and one on Platte Island in Platte River, Neb., near Fremont. (E).

16. *Pogonia trianthophora* has been found in five stations during all my many years of collecting. Four are far separated clumps in southwest Michigan, the fifth three plants in a Jo Daviess woodland. (G).

17. *Calopogon*. Abundant southeast of Chicago. Was found as a single plant on a bluff-crown of Jo Daviess. A remarkable habitat for the one solitary example. (I).

18. *Arethusa*. Found in a single locality: southeast of Chicago. A dozen plants in a cranberry bog. (G).

19. *Epipactus pubescens*. A single colony a rod square in a dry oak wood in Jo Daviess. Vigorous, but very strange to its surroundings. This plant is frequent in southwest Michigan, and northeast. Western limit. (G).

20. *Corallorrhiza maculata*. In a dense Jo Daviess woodland; the only station the plant has been seen in outside of Michigan and Canada. Several plants. (G).

21. *Aplectrum hyemale*. Two plants. Twelve miles apart in Jo Daviess, one on a Mound Crest, the other on a slope, both in woods. A third station of two plants under a Thuja on the bluff at Highland Park, north of Chicago. Common in southwest Michigan. (G).

22. *Salix coactilis*. A few plants on the Du Page river at Warrenville, determined by Prof. Fernald. Maine is its home. (I).

23. *Populus heterophylla*. Quite a colony north of Port Chesterton, Ind., in woods. Associated with the three common species of Populus. Far to the north of its center. Badly diseased and seemingly in a dying condition. (C).

24. *Carya Illinoensis*. A tree 3 feet in diameter and 80 feet in height, on the Mississippi river bottoms near lower Jo Daviess. Copiously nut-bearing and perfectly thrifty. (B. C.)

25. *Betula alba papyrifera*. Summit of Benton Mound, 1100 feet altitude, Jo Daviess, on Niagara limestone. Many thrifty trees. From Jo Daviess north along the Mississippi river bluffs. (C).

26. *Fagus grandiflora*. A clump of 5 trees in the midst of an oak wood, northeast of Edgebrook. No other known trees within 30 miles. Perfectly at home. (B. C.)

27. *Quercus Prinus*. On the rocky banks of Apple river, Jo Daviess county. Several trees and far from its home center. (I).

28. *Morus rubra*. Two trees in Apple river gorge near the last. None other ever found in the county. (C). Common in Fulton.

29. *Oxybaphus floribundus, albidus, hirsutus*. Common along the Great Western railway, west of Stockton. Far from home. (A).

30. *Nelumbo lutea*. In the great Calumet, at Clark, Ind. Many plants, but not in vigorous condition. Excessively common below Peoria. This is the plant, that wherever found, is claimed by the natives "to grow in only *one* other place in the world." (B).

31. *Cristatella Jamesii*. Very abundant on the sand dune bordering sand prairie, Jo Daviess county. Not in Gray, 7th Edition. From the far west. (I-B?).

32. *Ribes triste*. A single bush in the center of a dense wet wood northwest of Chicago. Far northern and northeastern. (B-R).

33. *Prunus angustifolia Watsoni*. Two fine thickets on the L. S. & M. S. railway, southeast of Chicago. (A. B.)

34. *P. hortulana*. A single tree. Apparently native, on margin of Little Calumet Valley, near Dune Park. Very thrifty. (B-A.)

35. *Gymnocladus*. A fine clump on a gravel knoll near the Illinois river, north of Havana, in Fulton county. A few fine trees in Apple river gorge, Jo Daviess county. Two similar clumps were found in Van Buren county, Michigan. A strange and exceedingly rare distribution. A single tree found south of Red Wing, Minnesota. (B. or possibly A).

36. *Hosackia Americana*. Abundant along C. B. & Q. railway in Jo Daviess, western. (A).



Fig. 5. *Stropharia epimyces*. The ring can be seen near the base of the stem

37. *Callirhoe triangulata*. A colony near N. Clark street, Chicago, on sand ridge. A thriving colony on Liverpool Island, Fulton County. Abundant on Sand Prairie, Jo Daviess county. (G.-B.)
38. *Viola striata*, on the almost vertical face of a wet limestone cliff of the Mississippi river below Portage, Jo Daviess. So abundant in this strange habitat as to tint the cliff face; a marvelous place for a violet. (I.)
39. *Viola pedata bicolor*. On a bold, gravel bluff in the woods, along Spoon river, Fulton county, growing over a space of fifty feet by a hundred. Never seen by author elsewhere in any of his rambles. (G?-H.)
40. *Cuphea petiolata*. One plant. Illinois valley above Havana, Fulton county (G).
41. *Lythrum Salicaria*. Wabash railway. One plant. Eastern. (A.)
42. *Oenothera speciosa*. Two plants. Along Belt railway, Chicago, western. (A.)
43. *O. serrulata*. One vigorous clump on dry prairie west of Chicago, one clump in Jo Daviess county. (B.)
44. *Vitis Labrusca*. In occasional groups through the Dunes, southeast of Chicago, freely fruiting. Eastern. (B-C?)
45. *Chimaphila umbellata*. A large clump on summit of Benton Mound, near No. 25. Abundant in Southwest Michigan and East and North. (G.)
46. *Primula Mistassinica*. Exceedingly abundant on wet cliff on Apple river, Jo Daviess county, near Junction of Branches. Far northern. (C.)
47. *Ipomoea pandurata*. Common along Mississippi river on slope between I. C. railway and water near Portage, Jo Daviess county. Found once in Fulton on Illinois river. (B.)
48. *Salvia lanceafolia*. Great Western railway, near Elizabeth, Jo Daviess county. One clump. (A.)
49. *Castilleja sessiliflora*. Great numbers on the sand moor north of Waukegan. A western species. (B.)

50. *Martynia Louisiana*. Several plants in alluvium, along a road in Fulton county. (B.)

51. *Diodia teres*. Sand bluff of Mississippi river. Jo Daviess county. Common. (B.)

52. *Cucurbita foetidissima*. One plant on Wabash railway, near Chicago, existing for years. Root eight inches thick. (A.)

53. *Lepachys columnaris*. Several near No. 48. (A.)

54. *Grindelia squarrosa*. Along most trunk railways. A patch over one acre in Van Buren county, Mich., now about eight years established. (A.)

Reviewing these fifty-four examples and keeping in mind their centers of greatest abundance and most normal growth conditions, the author proposes the following explanations of their present isolated or peculiar distribution as to region and particular habitat.

There can be but little question but that examples 29, 33, 36, 41, 42, 48, 52, 53, and 54 are representatives of the great host of species that are being scattered far and wide by trunk or transcontinental railway lines, the traveling seeds falling from freight or stock cars while in transit. While many such remain railway plants, others finding congenial habitats gradually expand their growing areas. None of the plants named can rightfully be classed as weeds. (A.)

It has always appeared to the author that the exceedingly peculiar distribution of the Coffee-bean, Lotus, Calamus, and some other plants not concerned in our present article, might be the result of accidental or intentional aboriginal plantings. Practically all such species had an economic value to the Indian, and it is as consistent to adopt this view as it would be in coming days to explain the presence of many deciduous fruits to the agency of the white race. In the case of the Fox Grape, all Indiana stations lie near the Great Sauk Trail which is known to have been the path of Iroquois marauders, and it seems perfectly reasonable to adopt this explanation for the isolated distribution. There are thousands of suitable localities for the Lotus in Illinois, but the actual stations can

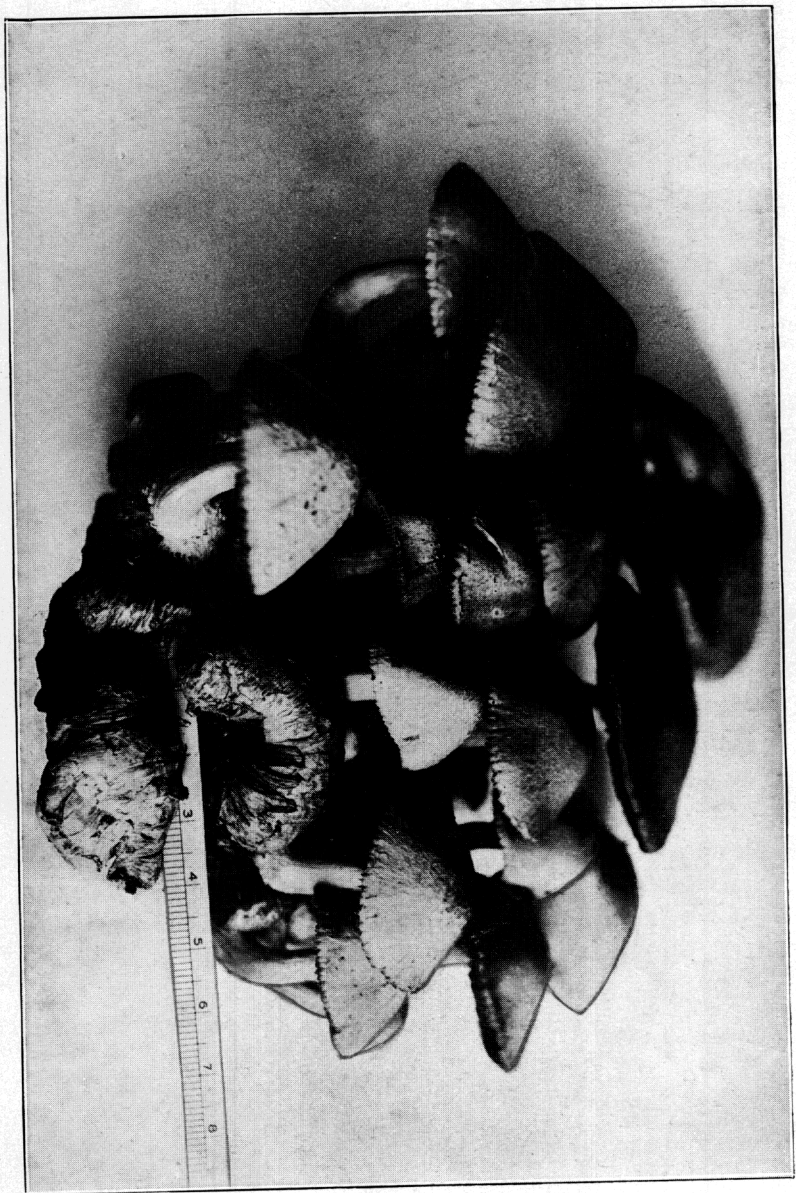


Fig. 6. Cluster of *Stropharia epimyces*.

almost be counted on one hand. It does not appear reasonable to explain by any survival theory when the one here stated is so tenable. (B.)

A few of the species named are plainly the outposts of distribution, although it is very probable that in preglacial days, this distribution might have been far more extensive. The Canoe Birch and Mistassinican Primrose are good examples growing as they do on rocks untouched by the great ice cap, and ending abruptly in Jo Daviess with the advent of the drift. Such species are 1, 11, 24, 23, 24, 26, 28, 44, 46. (C.)

The deep rock cuts of the Illinois Central railway furnish an artificial habitat closely simulating the natural cliffs, and it is easy to understand how *Pellaea* and *Woodsia* would flourish in such surroundings when once established. The question, however, is not so easy of solution, for how did the spores reach the cut east of Freeport nearly forty miles from natural growth? (D. C or A?).

Doubtless a few examples representing all that are left of an original host of plants that through the advance of cultivation and consequent destructions of suitable places of growth, have finally diminished to their present inconsiderable proportions. Such are 10, 14, 15. (E.)

A few are plainly a relic of the ice age, having been pushed southward by the ice and on its retreat scattered remnants persisted here and there. This is particularly the case about the head of Lake Michigan, and may account for such plants as numbers 13, 16, 18. (F.)

The majority of the balance may be considered remnants or survivals of a very much more extended flora that from many varied causes have been exterminated, and these last representatives, leading an uncertain existence until they too disappear, and the species vanish from such localities forever. The very peculiar isolated cases of the rattlesnake plantain, the pipsissewa and the coral root in the Jo Daviess flora may be such. Here it is highly probable the erosive agencies of flood and ice have carried to destruction the intervening stations, so that the isolation becomes much more pronounced. It may be the *Cristatella* comes here, but candidly no theory seems to fit it exactly. Far from transportation lines, in a station so

removed as to be unnoticed in Gray, it offers a puzzle in distribution. (A.)

A few like the last named and the salix are an uncertain problem. (H.)

Finally one or two seem to have actually adopted a new habitat as a place of safety in the struggle for existence. Notably is this so with *Liola striata*, and its remarkable home on the wet cliffs of the Mississippi river bluff. Luxuriant to a degree and absolutely safe from extermination, it shows how survival may be brought about by change of habit. (I.)

Summarizing the causes of peculiar or isolated distribution we have,

A. Resulting from railway traffic and other commercial agents.

B. Aboriginal plantings by the Indians for food or other purposes.

C. Extension out-posts of floras with growth centers far removed.

D. Production of artificial habitats resembling in essentials the natural.

E. Destruction by cultivation, of most of the suitable habitats, isolated stations remaining. --

F. Results of the glacial ice extension and retreat.

G. Survivals in the struggle for existence.

H. Uncertain.

I. Acquirements of new habitats by change in habits of growth.

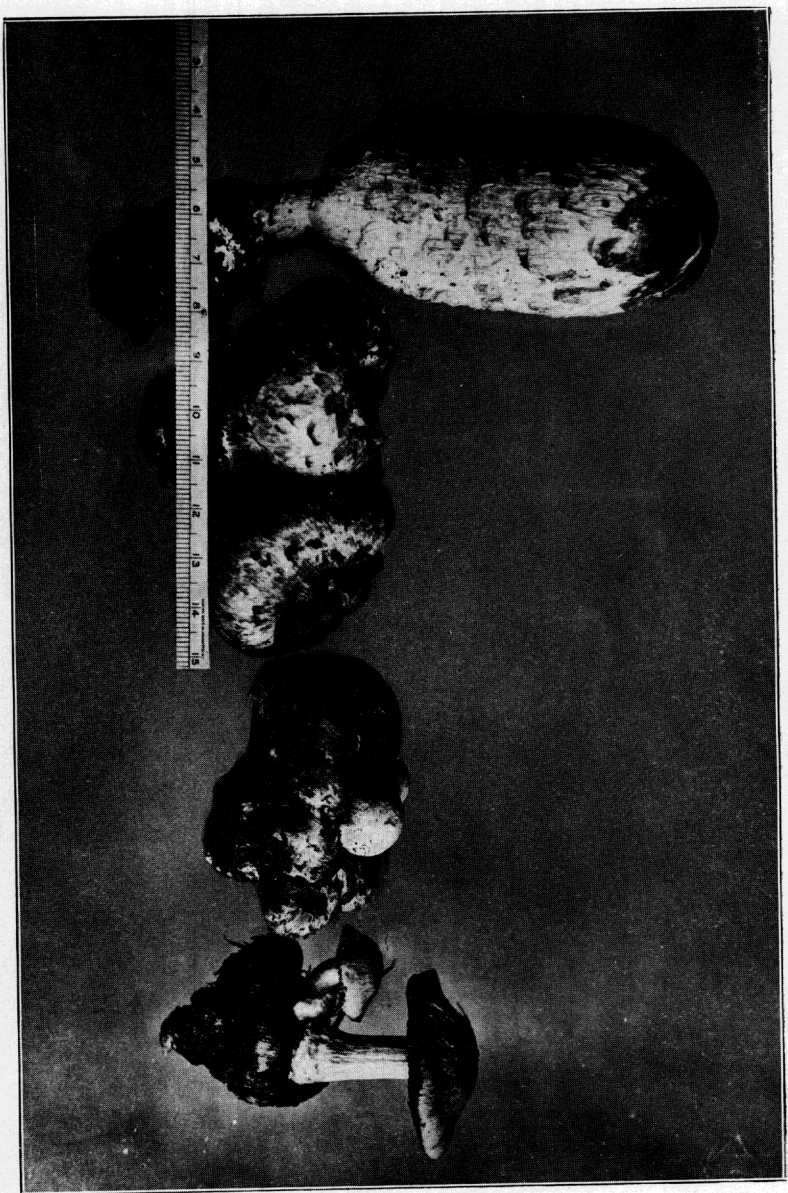


Fig. 7. *Coprinus cematus* and *Stropharia epinyces*. See explanation in text.

