PTERIDOPHYTES OF TURKEY RUN STATE PARK

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Since an annotated list of the ferns of Turkey Run was published by Otto Behrens, Jr., in the proceedings of this Academy for 1927, there have been numbers of inquiries made of the guides at the Park, both by individuals and botany classes, about the ferns to be found there. Therefore, as several more species and varieties have been added to the 1927 list, a few identifications in that list have been found to be incorrect, and distributions in the Park have been further determined, this paper is published as a revision of the one of 1927.

There are few counties in Indiana which can boast such an abundance of ferns, both as to species and to individuals, as Parke County; and Turkey Run offers a wonderful cross-section of the county's fern flora. Gypsy Gulch just back from the south side of Sugar Creek and about three-eighths of a mile above the suspension bridge has a greater abundance of individuals, representing about 12 species and varieties, than any other area of the same size in the Park. The section of the Park lying east of Newby Gulch and south of Sugar Creek is probably the best for study by visiting classes with only a few hours at their disposal, as it contains a comparatively large number of species, most of which are common there.

In the last two years more land has been added to the Park, which now comprises over 1,100 acres. However, only two of the areas have much fern life; the tract taking in the head of Turkey Run Hollow and some land along the south side of Sugar Creek at the west end of the Park.

The observations recorded here were made during the summers of 1927, 1928 and 1929 by Sidney R. Esten, Otto Behrens, Jr., Rexford F. Daubenmire and the writer, while stationed as nature guides in the Park for the Indiana Department of Conservation. The doubtful specimens have been identified by Ray C. Friesner of Butler University and Mr. Charles C. Deam, and we hope that no corrections to this list will be necessary. As more work is done, however, a few species may be added and some found to be more or less abundant. The writer wishes to thank Prof. Ray C. Friesner of Butler University, Mr. Charles C. Deam of Bluffton, Prof. Albert R. Bechtel of Wabash College, Prof. Truman C. Yuncker of DePauw University, Prof. Paul Weatherwax of Indiana University, and Mr. A. T. Guard and Prof. Louis A. Test of Purdue University for help and suggestions. Unless otherwise stated all records are backed up by specimens in the Turkey Run Nature Guide Service Herbarium at 4112 Graceland Avenue, Indianapolis, in care of Sidney R. Esten. The nomenclature adopted here is the one now in use at the Gray Herbarium. Following is the list of species.

1. *Polypodium virginianum* L., Common Polypody is one of the characteristic ferns of the Park. While not as common as some, it is found fairly well distributed on practically all the cliffs. Its preference seems to be for narrow ledges and edges of cliffs, where the roots hold the soil together in a mat.

2. *Adiantum pedatum* L. American Maidenhair is a common and typical fern throughout the area, preferring the rich moist soil along streams in fairly open woods, where it attains a large size. On almost any hillside covered with humus, however, it can be found.

3. *Pteridium latiusculum* (Desv.) Hieron, Bracken. This summer was the first time we found this fern in the vicinity of Turkey Run. As far as we know, it is very rare. The only specimens found were outside the Park in the open at the edge of a sandy field bordered by second growth timber, uncultivated that year. Only ten fronds were found ranging in height from about one to two feet. It was not determined whether all were from the same plant, but the arrangement and nearness of the fronds would seem to indicate that perhaps there was only one plant. Rather careful search was made in the vicinity but no others were found. This spot and the surrounding land will be watched carefully in the future.

4. *Pellaea atropurpurea* (L.) Link., Purple Cliffbrake. Although reported a few years ago by several persons, this species evidently died out in those spots and was not found by us until this summer. The only specimens discovered were in crevices just below the top of a thirty-foot sandstone cliff along Sugar Creek. The situation was rather dry, exposed and faced south. Due to their position a strictly accurate count could not be made but it was estimated that there were about 75 plants in the colony. None were of very large size.

5. *Asplenium Trichomanes* L., Maidenhair Spleenwort is local and rather rare. It is found on sandstone cliffs mostly in damp situations among mosses, although the largest specimens are in niches of the sandstone where there seems to be comparatively little moisture and no other plants. This colony contains 16 plants, and the others, respectively, eight or ten, and six. These three colonies are, so far, the only ones found in the Park.

6. *Asplenium platyneuron* (L.) Oakes., Ebony Spleenwort is local but fairly common. It is found growing in colonies. All five of the colonies we discovered were in rather open situations and all but one in rocky soil. The smallest contained about 25 plants and the largest perhaps 300 plants.

7. *Athyrium angustifolium* (Michx.) Milde. Narrow-leaved Spleenwort is common throughout the Park in rich soil, especially in fairly open situations along streams, where a height of three feet was sometimes attained. In 1929 the first fertile fronds were found uncoiled on August 4. A fertile frond was found with one of the pinnae bifid at the tip. Another interesting "sport" is a frond which had both fertile and sterile characteristics. The upper pinnae seem to be nearly typical fertile ones except that they are more sparingly fruited. Progressing down the stipe the pinnae become gradually wider and bear less and less sori. The lower three-fourths are of the length and width of normal sterile pinnae. Those bearing sori extend nearly two-thirds of the way down the frond. The ones below are normal sterile ones. Of the last two which bear sori, one has four and the other twelve.

8. *Athyrium acrostichoides* (Sw.) Diels., Silvery Spleenwort was found associated with the preceding species throughout the Park, although not so common.

9. *Athyrium angustum* (Willd.) Presl., Lady Fern is infrequent, scattered in the deeper upland woods where there is plenty of rich humus.

10. *Camptosorus rhizophyllus* (L.) Link., Walking Fern is another characteristic fern of the Park, common throughout in colonies on the sandstone cliffs and on fallen pieces of rock. Some interesting plants were found in fruit, growing in moss on the base of a large sycamore. Several were queerly auricled at the base and others were once, twice, and three times bifid.

11. *Polystichum acrostichoides* (Michx.) Schott., Christmas Fern is common in practically all parts and abundant on the humus-covered hillsides. A few

plants were found which had fronds with the lowest two or three pairs of pinnae somewhat abortive. Instead of their bases being halberd-shaped, each one had an ear-like appendage which was free from the rest of the pinna except for one point of attachment.

12. *Polystichum acrostichoides* forma *incisum* (Gray) Gilbert. Scattered over the Park were a few specimens of this variety. They were rather rare and in the same situations as the species.

13. *Thelypteris palustris* Schott., Marsh fern, was found growing in only one place in Turkey Run—along an old fill near the covered bridge. There is quite a colony among the tall grass in a small, swampy area.

14. *Thelypteris noveboracensis* (L.) Nieuwl., New York Fern. Although not as common as some, there are several colonies of this fern. Open sunny spots on the uplands in rather dry gravelly soil seemed to be preferred. However, in the silt of the bottoms along Sugar Creek a colony was found growing in quite dense shade. No fertile fronds were found during a fairly thorough examination of the colony.

15. *Thelypteris hexagonoptera* (Michx.) Weatherby., Winged Beechfern is common in the rich humus of all the upland woods areas in the Park.

16. *Thelypteris marginalis* (L.) Nieuwl., Leather Woodfern is abundant throughout the Park especially in the rich loam of rocky hillsides. With *Thelypteris spinulosa* and its variety it is probably the most common species in the Park.

17. *Thelypteris marginalis* forma *elegans*. (J. Robinson) Weatherby. A few specimens of this variety were found among an abundance of the species in the humus on a rocky hillside back from Sugar Creek.

18. *Thelypteris Goldiana* (Hook.) Nieuwl., Goldie's Fern is rather infrequent. It is found in several ravines, principally on the north side of the river. Prefers the same type of soil as *Thelypteris marginalis* but in the ravine bottoms instead of on the hillsides.

19. *Thelypteris spinulosa* (O. F. Muell.) Nieuwl., Toothed Woodfern is very common and growing in nearly all situations. Among the rotting dead leaves on broad ledges and at the bases of cliffs it forms beautiful luxuriant growths. The distribution and abundance of this and the following variety have not yet been worked out to any extent.

20. *Thelypteris spinulosa* forma *intermedia* (Muhl.) Nieuwl., is found in the same situation as the species but probably somewhat less common.

21. *Cystopteris bulbifera* (L.) Bernh., Berry Bladderfern is common in wet situations at bases of cliffs and along streams throughout the region.

22. *Cystopteris fragilis* (L.) Bernh., Brittle Fern is common in all upland woods. The first of the mid-summer new fronds were noted July 2 in 1929.

23. *Woodsia obtusa* (Spreng.) Torr., Common Woodsia is found sparingly on most of the dryer cliffs in Turkey Run and also on some fallen pieces of sandstone on the north side of Sugar Creek.

24. *Dennstaedtia punctilobula* (Michx.) Moore., Hayscented Fern is rare. It grows in only three places in the Park—on a broad ledge in Rocky Hollow on the north side and on two hillsides, one rough and the other smooth, within a few hundred yards of each other on the south side. All are open situations.

25. *Onoclea sensibilis* L., Sensitive Fern is frequent but restricted to the swampy regions, which are rather few in Turkey Run.

26. *Osmunda Claytoniana* L., Interrupted Fern is infrequent. Only a few plants are found scattered in groups of two to six in moist spots throughout the Park.

27. *Botrychium virginianum* (L.) Sw., Rattlesnake Fern is frequent in moist, rich woods in the region.

It is quite probable that *B. obliquum* and *B. dissectum* will also be found in Turkey Run but we have had no opportunity to find them, due to their time of appearance and no authentic records of their discovery by others have been noted.

28. *Equisetum arvense* L., Common Horsetail is frequent in several open swampy places in the Park, especially near the colony of *Thelypteris palustris* and up Turkey Run Hollow.

29. *Equisetum hyemate* L., Scouring Rush is more common than the preceding. There are several dense stands on the banks of Sugar Creek

30. *Lycopodium lucidulum* Michx., Shining Club Moss is scattered sparingly in most of the canyons on the humus-covered sandstone ledges.

31. *Selaginella rupestris* (L.) Spring., Rock Selaginella. This species was overlooked by us and the only record known has been kindly furnished by Charles C. Deam. In his herbarium is a specimen (No. 34,999) of this plant with the following notes: "On sandstone rock in Sugar Creek at the "Narrows" in Turkey Run State Park; Sept. 21, 1921." Whether it is still there is not known.

32. *Selaginella apus* (L.) Spring., Creeping Selaginella. So far as we know the only place in the Park where it grows is in the open among the grass on the same piece of marshy ground as *Thelypteris palustris* where it is fairly common.