ultimate pinnules 5–15 mm. long, ovate-oblong; texture subcoriaceous; veins evident, numerous, once or twice forked.

Scholl's Canyon, San Rafael Hills, Los Angeles Co., Cal., May 30, 1914. *Geo. L. Moxley*, No. 214.

Known only from the type specimen in my herbarium.

This species differs from *P. andromedaefolia* in its long, narrow frond and more herbaceous pinnules. Indeed in this latter respect it seems to more nearly approach section *Cheiloplecton* than *Allosorus*. The ultimate pinnules do not seem inclined to be revolute and the indusium is rather narrower than in *P. andromedaefolia*, which is, however, probably its nearest ally.

LOS ANGELES, CALIFORNIA.

Fern Trips in Virginia

MARY LOUISE TUTTLE

During the summer of 1914, we made several trips to Virginia in search of ferns. The results of these trips were so satisfactory that it seems quite possible that they would be of interest to the members of the Society.

The first trip was to Rock Enon Springs, Frederick County, Va. This is reached by train to Winchester, and thence by coach or automobile some seventeen miles west to the Great North Mountain. The following ferns were collected during our stay:

POLYPODIUM VULGARE. Common.

PHEGOPTERIS HEXAGONOPTERA. Common.

ADIANTUM PEDATUM. Common.

PTERIS AQUILINA. Common.

CHEILANTHES LANOSA (*C. vestita*). There is a good sized station located halfway between Gore and Rock Enon, on the west side of the road. Several plants had fronds at least twelve inches long.

PELLAEA RAFAELENSIS MOXLEY

PELLAEA ATROPURPUREA. This fern was found in two places only, about three miles apart, and in each locality there were only a few plants, and these were dwarfed and in poor condition.

ASPLENIUM TRICHOMANES. Common.

ASPLENIUM PLATYNEURON. Common.

ASPLENIUM BRADLEYI. Near the top of one of the smaller ridges, a colony of some seven or eight plants was found. They were facing the east, and in a rather exposed position. In spite of their small size, they seemed to be thriving very well indeed.

ASPLENIUM MONTANUM. It would be difficult to persuade a resident of Rock Enon that this is one of our rarer ferns. For miles along the Catamount ridge, it is to be found on almost every boulder, in almost every crevice. There are positively hundreds of plants. Many fronds seven inches in length were observed. Numerous plants had upwards of twenty-five fronds on them. Perhaps the most interesting plants were observed on the summit of Pinnacle, the highest point in the vicinity, 2800 feet above sea level. There were only a few plants, so stunted by exposure that one could scarcely believe them to be identical with the luxuriant plants to be found in the valley. This one fern would in itself justify the trip; in fact, our main reason for going to Rock Enon was to see it, for Dr. Waters had told us that it was abundant in this place.

ASPLENIUM THELYPTEROIDES (*A. acrostichoides*). Common.

ASPLENIUM FILIX-FOEMINA. Common.

POLYSTICHUM ACROSTICHOIDES. Common.

DRYOPTERIS THELYPTERIS. Not common.

DRYOPTERIS NOVEBORACENSIS. Common.

DRYOPTERIS MARGINALIS. Common.

DRYOPTERIS SPINULOSA. Fairly common.

DRYOPTERIS SPINULOSA, var. DILATATA. Only one plant was seen, and this during our last excursion, and

in a locality which we had not previously explored. It is probable that further search would have discovered additional plants.

DRYOPTERIS INTERMEDIA. Fairly common.

FILIX FRAGILIS. Rare in this locality.

WOODSIA OBTUSA. One station only, of some twenty or thirty plants.

DICKSONIA PUNCTILOBULA. Fairly common.

ONOCLEA SENSIBILIS. Common.

OSMUNDA REGALIS. Common.

OSMUNDA CLAYTONIANA. Common.

OSMUNDA CINNAMOMEA. Common.

BOTRYCHIUM TERNATUM. Common.

BOTRYCHIUM VIRGINIANUM. Common.

FERNS AT NATURAL BRIDGE, VA.

PHEGOPTERIS HEXAGONOPTERA. Not very common.

ADIANTUM PEDATUM. Common.

CHEILANTHES LANOSA (*C. vestita*). Near the N. and W. station.

PELLAEA ATROPURPUREA. Very common, one frond in our collection measuring seventeen inches. This fern was noted for the size and complexity of its fronds.

ASPLENIUM EBENOIDES. One locality.

ASPLENIUM TRICHOMANES. Very common.

ASPLENIUM PARVULUM (*A. resiliens*). Very abundant.

ASPLENIUM PLATYNEURON. Common.

ASPLENIUM BRADLEYI. Two plants only. These, however, were growing in a protected place, and were much larger than the plants previously seen at Rock Enon.

ASPLENIUM MONTANUM. About a dozen plants, growing on a ledge of sandstone rock a mile or two to the west of the Bridge.

ASPLENIUM RUTA-MURARIA. Very abundant on the limestone rocks.

ASPLENIUM ANGUSTIFOLIUM. One good sized clump was observed.

ASPLENIUM FILIX-FOEMINA. Less abundant in this locality than one might expect.

CAMPTOSORUS RHIZOPHYLLUS. Carpets the ground and rocks in every direction.

POLYSTICHUM ACROSTICHOIDES. Common.

DRYOPTERIS MARGINALIS. Common.

FILIX BULBIFERA. In great profusion.

FILIX FRAGILIS. Not nearly as common as *F. bulbifera.*

WOODSIA OBTUSA. Fairly common.

BOTRYCHIUM TERNATUM. Common.

BOTRYCHIUM TERNATUM, var. DISSECTUM. Common.

BOTRYCHIUM VIRGINIANUM. Common.

Specimens of *A. Bradleyi, A. montanum, A. Ruta-muraria, A. resiliens, A. ebenoides,* and *Dryopteris spinulosa,* var. *dilatata,* were submitted to Dr. Campbell E. Waters, for his confirmation of our identification, in order that there might be no question as to the correctness of our list.

The foregoing is practically nothing more than a sort of check list of the ferns to be found in these two localities. However, these places are not very far apart, are located in the same range of mountains, and presumably have the same climate. It is, therefore, of more than passing interest to note that ferns which are common in one place are either missing in the other or, if found at all, in exceedingly small quantities. Since the climate is essentially the same, it is obviously a matter of soil which causes these differences, and a brief discussion of this phase of the situation may prove of value.

The Natural Bridge consists of dolomitic limestone, the limestone formation extending for some distance around the Bridge. About a mile or more to the West, there is a small outcrop of sandstone. At Rock Enon,

there are two main formations, one a very hard white sandstone, and the other a soft shale. I am informed by surveyors of the U. S. Geological Survey that only one outcrop of limestone occurs in the immediate vicinity of Rock Enon, and that is in a dry, open field, and contains no ferns whatever.

At Natural Bridge, *Filix bulbifera, Pellaea atropurpurea, Asplenium angustifolium, A. Ruta-muraria, Camptosorus rhizophyllus* were found in the greatest abundance, while the shield ferns were represented by only one species, *Dryopteris marginalis. Asplenium montanum* was represented by a single colony which was located on the sandstone ridge. At Rock Enon, *Filix bulbifera, Camptosorus rhizophyllus, Asplenium Ruta-muraria,* and *Asplenium angustifolium* were absent entirely, and only a few plants of *Pellaea atropurpurea* were found. On the other hand, *Asplenium montanum* occurred in abundance, the shield ferns were well represented, and a fair sized colony of *Asplenium Bradleyi* was found. *Cheilanthes lanosa* grew only on the shale formation. It is apparent, therefore, that *A. angustifolium, A. Ruta-muraria, F. bulbifera, C. rhizophyllus,* and *P. atropurpurea* prefer a basic soil, such as is found at Natural Bridge, whereas *A. montanum* and *C. lanosa* prefer the acid soil of Rock Enon. This is further borne out, at least as far as *P. atropurpurea* is concerned, by the fact that we have noted perhaps half a dozen localities around Washington and Baltimore, where *P. atropurpurea* was found growing in the mortar on old walls. Members of the Society will remember the profusion of *A. angustifolium, F. bulbifera,* and *C. rhizophyllus* growing on the limestone formation at Jamesville, New York. These preferences of various ferns for certain kinds of soil are, of course, not at all new, but the present instance serves to emphasize the point in question.