Mimulus ringens L.

Lobelia syphilitica L.

Cephalanthus occidentalis L.

Nyssa sylvatica Marsh.

Polygala cruciata L.

Spiraea tomentosa L. And more than sixty others, largely sedges and grasses.

In addition, along the beach, between low and high water, we found—

Panicum crus-galli L.

Muhlenbergia sylvatica Torr.

Cyperus diandrus Torr.

Polygonium pennsylvanicum L.

Impatiens biflora Walt.

Teucrium canadense L.

Lycopus virginiana L.

Mentha piperita L.

Mentha canadensis L.

Xanthium canadense Mill

Eclipta alba (L.) Hassk.

Bidens connata Muhl. And more than fifty others. In all making over two hundred plants in and about Lake Maxinkuckee growing below high water mark.

I desire to call attention specially to the following facts: First, that the bed of the lake is comparatively barren under water from two feet to six or eight feet deep; second, that there is an abundance of rank vegetation under water from eight feet to 20 feet deep; third, that we found no vegetation below a depth of 26 feet in Lake Maxinkuckee.

Generic Nomenclature of Cedar Apples.

By J. C. Arthur.

In a communication made to this society at a former meeting (December, 1898) the writer gave some account of recent studies in the nomenclature of plant rusts, especially as applied to species occurring in the State of Indiana.* At that

*Arthur, J. C.—Indiana plant rusts, listed in accordance with latest nomenclature. *Proc. Ind. Acad. Sci. for 1898:* 174-186.

time no extended study of the generic nomenclature of this group of fungi had been attempted, and the conclusions of Dr. Kuntze (*Rev. Gen. Pl. III*) were accepted as the most satisfactory at hand. Since then the ground has been gone over to some extent, and some questions worth public discussion have arisen. Among the most interesting of these is the correct appellation of the cedar apples.

Two species of cedar apples occur in Indiana; both forming swellings, or pseudo-apples, on the branchlets of red cedar in one stage of growth, and so-called rust spots on the leaves of various apples and thorns in the alternate stage. These were placed under the genus *Puccinia*, following the authority of Dr. Kuntze, one being *Puccinia globosa* (Farl.) Kuntze (*Gymnosporangium globosum* Farl. and *Rœstelia lacerata* Fr.), and the other being *Puccinia Juniperi-Virginianæ* (Schw.) Arth. (*Gymnosporangium macropus* Lk. and *Rœstelia pyrata* Thax.).

The development of the concept, now embodied in the genus containing the cedar apples and apple rusts, is an interesting one. Many of the earlier systematists placed the cedar apples among the algæ, and even after becoming fully recognized as fungi, it was long before their close relation to the other *Uredineæ* was firmly established. The apple rusts have been confounded with the cluster-cups of other genera, even quite recently, although it has now been nearly forty years since their connection with the cedar stage was first established. However, it is not with the development of the concept of the genus that this paper has to deal, but with the unfolding of its nomenclature.

Reviving the ancient usage of the generic name *Puccinia* in order to have it replace the familiar name *Gymnosporangium* was done in the interest of a stable nomenclature. The result shows, however, that a stable nomenclature is not to be obtained at a single dash, even when the principles are recognized and accepted that are to govern the procedure. Dr. Kuntze (*Rev. Gen. Pl.*, Vol. 3, p. 507) gives Haller, 1742 (*Enum.*, Vol. 1, p. 17), the credit of founding the genus *Puccinia*, but Magnus (*Bot. Centr.*, Vol. 77, p. 4) has clearly shown that Haller's type material could not have belonged to the *Uredineæ*. The next subsequent author mentioned by Kuntze is Adanson, 1763. In accordance with the Rochester Code, Haller is excluded from consideration on account of antedating 1753, the initial date for priority, but Adanson might be accepted. This author presents an abbreviated diagnosis derived wholly from Micheli's classical work *Nova Plantarum* of 1729. It runs as follows: "*Puccinia Mich. t.* 92. *Tige élevée cilind, simple ou rameuse. Coriace. Toutela plante est formée de piramides ou filets en massues, couchés comme autant de rayons les uns sur les autres*" (*Familles des Plante*, Vol. 2, p. 8). Turning to Micheli, we find that he describes and figures two species under his genus, one evidently belonging to the *Uredineæ* and the other

not. According to Magnus this lack of singleness invalidates the name for replacing that of the De Candollean genus *Gymnosporangium*. It does not do so, however, in the writer's opinion, but it makes it necessary to decide which of the two species included is to be accepted as the type of the genus.

The idea of definite and unchangeable types is of comparatively recent growth. The type of a species is the individual plant to which the name is first given, and the type specimen is therefore an important adjunct in fixing the name and character of the species. In like manner the type of a genus should be the species mentioned under it, if there is but one given, but if more than one be given, and the author has neglected to designate the one to be accepted, it would seem to require for the sake of uniformity and stability that the first species named under the genus be assumed to be the type. This method in whole or in part has been ably advocated by Underwood, Cook, Jordan, Coville, Ward, Greene and others. Up to the present time it has been put into rigid practice to a limited extent only, the revision of American ferns by Prof. Underwood being the most conspicuous example, but it seems to the writer that the general acceptance of the rule will go far toward furnishing a stable basis for taxonomic nomenclature. To one who has watched the course of the present movement for a nomenclature that stands squarely upon priority, guided by uniform procedure rather than by individual judgment, the rule of types here set forth must seem a necessity that will inevitably be adopted sooner or later. It is for the sake of lending a hand in bringing about so desirable an end that the study of the cedar apple nomenclature is here presented.

If the rule of taking the first species mentioned under a genus as its type is applied, there can be no question that Adanson's genus *Puccinia* is to be accepted as a name antedating *Gymnosporangium*, and we may waive the discussion of the exact determination of the type, brought forward by Magnus. But this does not settle the matter.

In Linnæus' *Species Plantarum* of 1753, which is accepted as the beginning of valid nomenclature, only two species occur belonging to the *Uredineæ;* one is *Lycoperdon epiphyllum*, now called *Puccinia epiphylla* (L.) Wettst., and the other is *Tremella juniperina*, known to be unquestionably *Gymnosporangium juniperinum* (L.) Wint. Linnaeus' genus *Tremella* contains seven species, the one just mentioned being the first, while the six which follow do not belong to the *Uredineæ*. The first species is characterized as follows (p. 1157):

> "Tremella sessilis membranacea auriformis fulva. *Fl. suec.* 1017.
> Byssus gelatinosa fugax, junipero innascens. *Fl. lapp.* 531.
> Habitat in Juniperetis primo vere."

Hill, a clump of red-bud trees. At another, on the border line between the upland and lowland forest, the ground is thickly covered with ground ivy, *Nepeta gleichoma.*

Here in the low-ground forest we have, especially in the first forest mentioned (that near the laboratories), a dense undergrowth of hazel-nut, prickly ash, hop tree and many other shrubs, so that the wood was somewhat difficult to pass through. The forest floor is also thickly covered with a quite dense growth of vines and tall weeds of numerous species, among which may be mentioned virgin's bower (*Clematis virginiana*), grape, hop, spotted touch-me-not, false nettle, American bell flower, great blue lobelia and cardinal flower, rice cut-grass, and many other such plants.

The low-ground forest in the vicinity of the laboratories was much modified during the summer of 1900, as a good deal of the underbrush was removed. In all cases it goes entirely down to the fringe of willows which grows at the edge of the lake.

The second low-ground forest, at the southern or west of southern side of the lake, not far from the region of Clear Creek mouth, consists of nearly the same sort of trees as the other, but the ground is rather more marshy, black and level, and the vegetation of the forest floor is of a somewhat different sort. There are more soft maples and large willows here, and lizard's tail is a characteristic plant. A small part of the shore is sandy here, and there is, between the lake shore and the low ground, back from the lake, a high, narrow ice ridge, four or five feet wide and breast high, and quite steep on each side. There are tolerable good ice ridges in other places, as south of Chicago Hill pier a little way, shown in Figure 2 (Fig. 2 shows lake plain on the left with willows on the ice ridge on the right), and over by Yarnelle's point, but these are not nearly so well marked.

The greater part of the country between the lake and the hills is a flat, level, meadow-like tract, forming the *Lake plain.* The soil of this plain is generally of a black or brown muck, with plenty of marl in places. Ditches dug through it reveal an abundance of gasteropod shells, many of them yet entire but very fragile, and many of them broken. These attest the former existence of the lake over the lake plain.

Traditions of old settlers refer to a time when the lake shore came up, in places at least, to the foot of the hills. One such tradition refers to the lake reaching the base of the hill known as Hamilton Mound, and the

date assigned is about 1836. It is not reported whether this was simply the result of a temporary flood or a constant condition. The area of the surface is subject to quite marked variation at present, possibly more so than before the removal of much of the surrounding forest. The Government Survey shore line of 1834 lies at places considerably outside present maps of the lake. Mr. Large expresses his opinion that it perhaps marked the limit of the swampy ground.

In appearance and vegetation the various parts of the lake plain differ considerably from each other. In some places the soil is a reddish or brownish muck, in other places it is a blackish soil. In some parts it is a

Fig. 2.

sedgy, ferny meadow, in others it is covered with a dense growth of bushes, as clumps of willow, *Cephalanthus* and *Cornus*. There seem to be indications, however, that it was once nearly alike in vegetation, and that the sedgy, ferny meadow has been cleared off by artificial means. One indication of this is that we have wholly different regions on different sides of fences, one side of the fence being bushy, and the other covered with sedges, grasses and ferns only. In one place where there was such a level meadow, a few dead willow sprouts were noticed. Examination revealed that they were charred about the roots and had probably been killed by

? I. On Amelanchier alnifolia. (*Rœst. Harknessiana* E. and E.)

III. On Junip. occidentalis. (*Gym. speciosum* Peck.)

—— T. GLOBOSA (*Farl.*) *n. n.* (1880. *Pod. fuscum globosum* Farl. Gym. of U. S. : 18.) North America.

I. On Malus, Cratægus, Sorbus and Cydonia. (*Rœst. lacerata* Am. Auct.)

III. On Junip. Virginiana. (*Gym. globosum* Farl.)

—— T. BERMUDIANA (*Farl.*) *n. n.* (1887. *Æcid. Bermudianum* Farl. Bot. Gaz. **12** : 206.) North America.

I. On Junip. Virginiana. (*Æcid. Bermudianum* Farl.)

III. On Junip. Virginiana. (*Gym. Bermudianum* Earle.)

—— T. CUNNINGHAMIANA (*Barcl.*) *n. n.* (1889. *Gym. Cunninghamianum* Barcl. Mem. Med. Off. India **5** : —.) India.

I. On Pyrus, Cotoneaster (*Æcid. Cunninghamianum* Barcl.)

III. On Cupressus. (*Gym. Cunninghamianum* Barcl.)

—— T. NIDUS-AVIS (*Thax.*) *n. n.* (1891. *Gym. Nidus-avis* Thax. Bull. Conn. Sta. No. 107 : 6.) North America.

I. On Amelanchier. (*Rœst. Nidus-avis* Thax.)

III. On Junip. Virginiana. (*Gym. Nidus-avis* Thax.)

—— T. KOREAENSIS (*Henn.*) *n. n.* (*Rœst. koreaensis* Henn. Monsunia 1 : —.)

I. On Pyrus, Malus and Cydonia. (*Rœst. koreaensis* Henn.)

III. On Junip. Chinensis. (*Gym. Japonica* Syd.)

ADDITIONS TO THE FLORA OF INDIANA.

BY STANLEY COULTER.

Since the publication of the "Catalogue of the Flowering Plants and of the Ferns and their Allies Indigenous to Indiana" numerous reports of additions have come to my hands. These reports have been examined with great care, in many cases the specimens themselves being submitted with the report. As a result quite a number of species are to be added to the flora of the State. It is gratifying to note, however, that the majority of these additions are to be found in the grasses and sedges, groups that have been largely neglected by collectors. Another considerable number includes extra-regional plants the occurrence of which within our bounds is to considered as exceptional, and which, while members