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THE LARGE YELLOW POND LILIES OF THE  
NORTHEASTERN UNITED STATES.

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Plants of two very distinct types, the general aspect of which is shown in the accompanying illustration (plate ii), occur among the large Yellow Pond Lilies of the Northeastern United States commonly known as *Nymphaea advena*. Throughout New England (with the possible exception of parts of Connecticut), New York (except Long Island and the lower Hudson Valley), and the mountainous portions of Pennsylvania, plants with floating leaves are the invariable rule, while from the region of Washington, D. C., north through the lowlands east of the Alleghenies to Long Island and the lower Hudson Valley an erect plant is found to the complete exclusion of the other. The ranges of the two types are thus seen to coincide with the boundaries of the life areas of the region, that of the floating-leaved form embracing the boreal and transition zones, that of the erect plant the upper austral zone. In the New Jersey Pine Barrens the two types are found together; but this is scarcely an exception to the rule, as the biota of the region abounds in such juxtapositions of northern and southern forms. West of the Alleghenies the ranges of the two types are very imperfectly known, though so far as understood they again coincide with the life zones. The erect plant is found in Illi-

nois, Indiana, and southern Michigan, that with floating leaves in northern Ohio, eastern Michigan, and in Wisconsin, Iowa, Minnesota, Montana and British Columbia.

The most obvious structural peculiarities of the two plants are found in the leaves. In the erect form the blade has somewhat pointed lobes and a widely open sinus (well shown in the lower right hand corner of the plate); petiole stout and nearly terete (fig. 1 *b*). In the floating form the lobes are rounded and the sinus narrow or often completely closed by the overlapping lobes. The petiole, relieved of all strain of support, is conspicuously flattened on the side corresponding to the upper surface of the leaf (fig. 1 *a*). This flattening robs the petioles of their strength so effectually that they are generally unable to hold the blades erect when, as sometimes happens, the plants are exposed by low water. In addition to its peculiar flattening the petiole is marked by a median rib, the prolongation of the midrib, and the margins are often, though not invariably, produced as distinct wings.\*

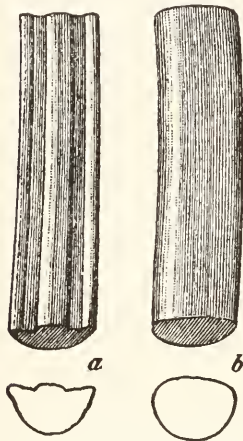


Fig. 1. Section of petiole near middle: *a* *Nymphaea variegata*, *b* *N. advena*.

The flowers and fruit though at first sight closely similar, differ in several important details. In the northern plant the inner surface of the sepals is almost invariably blotched with purplish red near the base; while in the southern the corresponding region is shaded with green. The fruit of the northern plant is smaller, less ribbed and often strongly suffused with red, while in the southern it is green throughout. Finally the stigma rays are as a rule more numerous in the southern plant. In 104 specimens of the latter collected at Four Mile Run, Va., the number of rays varies from 10 to 23, but in 64 percent it is between 14 and 17 (inclusive), with a well defined maximum (20 percent) on 16. In 108 of the northern form from Chau-

\*It is of interest to note that the petiole of this plant is essentially the same as that of *Nymphaea lutea* the common representative of the genus in northern Europe.





*NYMPHAEA VARIEGATA* AND *N. ADVENA*.

tauqua Lake, N. Y., the number ranges from 9 to 16, but in 80 percent lies between 10 and 13 (inclusive) with a well marked maximum (36.1 percent) on 12.

I have referred to these plants as types rather than species because there is every reason to believe that each is an aggregate of several well defined forms. The erect, subterete-petioled plant is the true *Nymphæa advena* of Aiton\* (type locality probably Philadelphia, Pa.). The floating, flat-petioled forms may for the present stand as *Nymphæa variegata* (Engelmann).†

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\*[*Nympha*] *advenæa* Aiton, Hortus Kewensis, II, p. 226, 1789.

†[*Nuphar advena*] var. *variegatum* Engelmann in Gray, Man. Bot. Northern U. S., 5th ed. p. 57, 1867. Type probably from Michigan.

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#### EXPLANATION OF PLATE.

Upper figure, *Nymphæa variegata* (Engelmann). Photographed at Lake Titus, near Malone, Franklin County, New York, by E. W. Nelson.

Lower figure, *Nymphæa advena* Aiton. Photographed at Monteur's Pond, Knox County, Indiana, by Robert Ridgway. The head of a man standing among the lily leaves may be distinguished near centre of this picture.