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The field work has been done during the months of July and August, in 1934, 1935, 1936 and one month in 1937, while the author was employed as temporary botanist on the staff of the New York State Museum. Headquarters were established at the Allegany School of Natural History, which furnished a convenient working base. The author's associates, especially Aretas A. Saunders and William P. Alexander, have been most generous in supplying ecological data concerning the Allegany State Park region, in the southern portion of the county. Information about early forest conditions has been gleaned from various persons who have lived in the region for a long time. Among them are John M. Holt, of Quaker Bridge; W. J. Ryan, of West Valley; Mrs George Watson, of East Dayton; Charles F. Congdon, M. M. Moffat, and Irving J. Nies, of Salamanca; John J. Walker and Frank Waters, of Limestone. To his wife, Esther Loomis, the writer acknowledges assistance both in the field and in the preparation of the manuscript.

PRIMEVAL TRACTS IN CATTARAUGUS COUNTY

Although a great portion of the county is forested today, there are few areas that are relatively undisturbed and that might be termed samples of the primeval forest. One of these tracts is located in Allegany State Park and is known as the Big Basin tract. It is so fully described in Handbook 17 of the New York State Museum (Gordon and others, '37) that only a brief digest will be given here.

In Big Basin there is one large area of mature timber covering nearly 1300 acres around the headwaters of Stoddard creek. This tract has come to be generally known as "The Big Trees." Old settlers seem to agree that in the early days the white pine was removed as well as black cherry *(Prunus serotina)* and perhaps others of the more valuable trees (Emerson, '37).

Throughout the "Big Trees" area the species are largely beech, sugar maple, hemlock and yellow birch (*Betula lutea*). The latter two species predominate in the lower portion of the valley of Stoddard creek. There are occasional individuals of blue beech (*Carpinus caroliniana*), red maple (*Acer rubrum*), basswood (*Tilia americana*), white ash (*Fraxinus americana*), and cucumber tree (*Magnolia acuminata*) among the hemlocks and northern hardwoods. On the divide between Lonkto and Stoddard hollows is a small area, about 50 acres perhaps, in which such species as chestnut (*Castanea dentata*), white pine, black birch (*Betula lenta*), and red oak (*Quercus borealis* Michx.) enter the mixture. This association of forest trees differs decidedly from other forest types in the Big Basin and is probably an example of the Mixed Mesophytic Forest (Braun, '35*a*).

Another virgin forest tract in the Allegany State Park lies in upper Red House valley. The dominants and codominants on this moist site are hemlock, beech, yellow birch, red maple, black cherry and sugar maple. The "suppressed" trees and shrubs are all shade-tolerant and include sugar maple, beech, yellow birch, hop hornbeam (*Ostrya virginiana*) and hobblebush (*Viburnum alnifolium*). The ground cover of herbaceous plants consists largely of the following species:

Common wood fern	*Dryopteris spinulosa* var. *intermedia* (Underw.)
Common wood sorrel	*Oxalis Acetosella*
Shining club moss	*Lycopodium lucidulum*
False lily-of-the-valley	*Maianthemum canadensis* (Greene)
Foam flower	*Tiarella cordifolia*
Yellow clintonia	*Clintonia borealis*
Twisted-stalk	*Streptopus roseus*
Starflower	*Trientalis borealis*
Indian cucumber root	*Medeola virginiana*
Stemless yellow violet	*Viola rotundifolia*
Woodland white violet	*Viola incognita*

A remarkable area of nearly 400 acres known as the "Waterman Swamp" is located about three miles west of Little Valley, the county seat, and about two miles north of Pigeon Valley School, in Napoli township. It is shown near the bottom of the Cattaraugus quadrangle of the United States Geological Survey. Farmers in the region refer to part of it as "Owlenburg Bog" (miscalled "Allenberg," according to Charles E. Congdon of Salamanca). Ownership is divided among several adjoining farms. The bog and swamp occupy a low divide at the headwaters of Little Valley creek, Cold Spring creek and the Little Conewango creek.

The surrounding forests originally contained white pine, hemlock, beech, yellow birch, sugar maple, basswood, cucumber tree and white ash. The bog is now in an excellent state of preservation, and is a beautiful example of a type of vegetation that commenced its development at the time of the last Wisconsin glacier, nearly 40,000 years ago. The bog itself and land immediately adjoining contain primeval vegetation. The largest specimens of hemlock remaining here exceed in size those found in the Allegany State Park to the south and are the equals of those at Heart's Content and Cook Forest in Pennsylvania. During the past few years, 1934–36, inroads have been made on the virgin forest of hemlock and hardwoods, and unless the area is soon purchased by the State of New York, the last of these great trees may be harvested and this bit of primeval wilderness will be gone forever. The six illustrations (figures 9–14) give a fair idea of different aspects of the vegetation as it appears today.

The 400-acre bog covers a peat deposit formed by the decay of sphagnum moss and other bog plants for thousands of years. It is only because of this thick deposit of water-soaked peat that the bog vegetation has survived long periods of drought during its history. The low bog shrubs are principally leather-leaf or cassandra (*Chamaedaphne calyculata*) interspersed with bog rosemary (*Andromeda glaucophylla*), Labrador tea (*Ledum groenlandicum*), black chokeberry (*Aronia melanocarpa*) and sour-top blueberry (*Vaccinium canadense*). Most characteristic are the scattered and dwarfed conifers, seldom 20 feet high, which include tamarack (*Larix laricina*), black spruce (*Picea mariana*) and white pine. Wintergreen (*Gaultheria procumbens*), cranberries (*Oxycoccus* sp.) snowberries (*Chiogenes hispidula*) and moccasin-flowers (*Cypripedium acaule*) grow beneath the dense cover of bog shrubs. Near the margins of the bog are taller shrubs, including highbush huckleberry (*Vaccinium corymbosum*), mountain holly (*Nemopanthus mucronata*) and witherod (*Viburnum cassinoides*) beneath which are cinnamon ferns (*Osmunda cinnamomea*) as high as a man's shoulders (figure 15).

Two small ponds occur in the area, one near the western border of the swamp and another to the south. The latter is a little gem of the wilderness. The black pool of open water is about 50 yards in diameter, bordered with white water-lilies (*Castalia odorata*). This is surrounded by a sphagnum and cranberry bog meadow containing pitcher plants (*Sarracenia purpurea*), sundew (*Drosera rotundifolia*), yellow-eyed grass (*Xyris caroliniana*), cotton sedge (*species of Eriophorum*), buckbean (*Menyanthes trifoliata*) and some characteristic bog orchids.

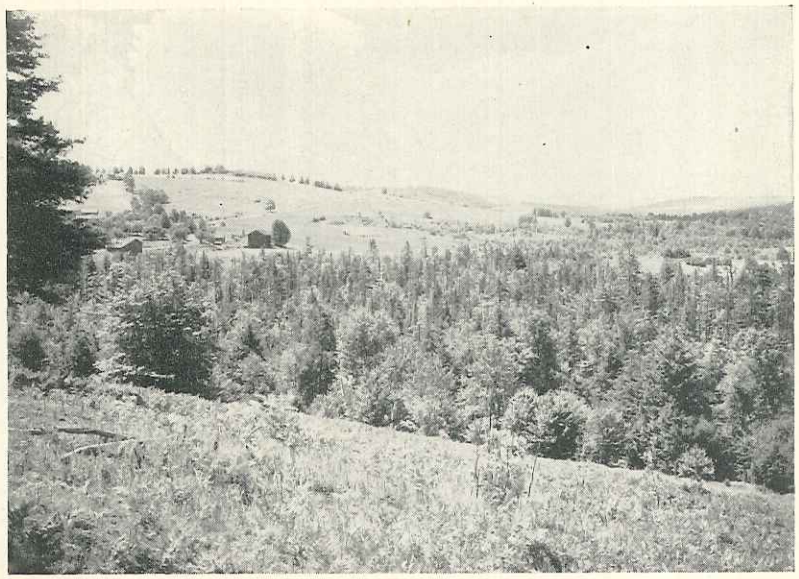

Figure 9 Eastern portion of Waterman swamp from the Case farm

Figure 10 Western portion of Waterman swamp from the Case farm

Figure 11 Black spruces and tamaracks in Waterman swamp

Figure 12 "Black pond" in Waterman swamp, town of Napoli

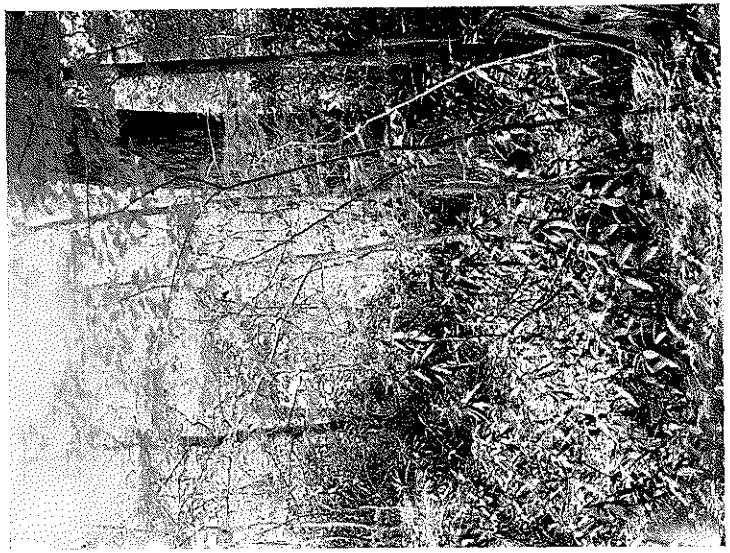

Figure 14 Undergrowth of *Rhododendron maximum* in the bog forest at Waterman swamp

Figure 13 A hemlock 45 inches in diameter at Waterman swamp

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NEW YORK STATE MUSEUM

CHARLES C. ADAMS, *Director*

THE PRIMEVAL FOREST TYPES OF SOUTHWESTERN NEW YORK

BY ROBERT B. GORDON Ph.D., *Temporary Botanist*

New York State Museum

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