## EVERGREEN PLANTS OF OHIO.

GRACE T. EARL.

The length of life of leaves varies greatly. The leaves of the so-called evergreen trees and shrubs persist through the winter without much apparent change. The leaves of some evergreens persist through only one year, falling off as soon as those of the succeeding year have fully developed. In some conifers the branches always bear leaves formed during several years, although the old leaves may be shed continually.

The cuticle in some evergreen plants is so very highly developed that the outer wall of the epidermal cells is many times thicker than the inner wall, as in the case of Pines and Christmas Holly. The same is true of evergreen parasites, as, for example, the Mistletoe which lives epiphytically on the bark of trees; and generally the majority of the succulent plants also possess epidermal cells with very thick outer walls. In many plants the cuticular layers are of equal thickness over the whole surface of the leaf and this is common especially in the case of the smooth, shiny, leathery leaves. But the formation of a thick cuticle on the epidermis is not a peculiarity of evergreen leaves, for there are some in which the outer wall of the epidermal cells is not at all or only very slightly thicker than the inner. In various evergreens anthocyan is developed which causes the leaves to take on a red color at the approach of cold weather, as is the case in some species of Sedum.

Evergreen leaves must have special adaptations to overcome the effects of freezing since their delicate tissues are exposed to very low temperatures in our latitude. At a freezing temperature vapor is given off from the protoplasm into the inter-cellular spaces where ice crystals are formed. The frozen tissue shows between the ice masses dense areas composed of the collapsed cell-walls packed closely together. This condition is very noticeable in frozen buds and the bark of hardy trees, and sometimes the cells appear entirely disorganized, but on thawing they again expand by taking up water and the normal turgidity is restored. Some evergreen leaves are so organized that they are able to survive the periods of drought or frost of one or even several years without injury.

A number of kinds of rosettes are evergreen or nearly so in Ohio. Some biennial rosettes as the Verbascums do not freeze entirely even during the coldest weather. Among the more hardy pereninal rosettes may be mentioned the species of Senecio, Taraxacum, and Achillea. Such plants as *Poa pratensis*, *Lonicera japonica*, and *Nepeta cataria* may be included among the plants

which partly withstand freezing; while the *Glechoma hederacea* and some species of Lamium are to be classed among the most hardy of our herbaceous perennials.

The Ohio Evergreens may be classed as follows:

EVERGREEN CONIFERS.

Pinus strobus L.
" virginiana Mill.
" echinata Mill.
" rigida Mill.
Larix laricina (Du Roi) Koch.
Tsuga canadensis (L.) Carr.
Thuja occidentalis L.
Juniperus communis L.
" virginiana L.
Taxus canadensis Marsh.

EVERGREEN WOODY DICOTYLS.

Phoradendron flavescens (Pursh.) Nutt.
Berberis aquifolium Pursh.
Cotoneaster pyracantha (L.) Spach.
Ilex opaca Ait.
Ledum groenlandicum OEder.
Rhododendron maximum L.
Epigaea repens L.
Linnaea americana Forbes.
Kalmia angustifolia L.
Kalmia latifolia L.
Andromeda polifolia L.
Chamaedaphne calyculata (L.) Moench.
Gaultheria procumbens L.
Arctosaphylos uva-ursi (L.) Spreng.
Chiogenes hispidula (L.) T. & G.
Oxycoccus oyxcoccus (L) MacM.
" macrocarpus (Ait.) Pers.

EVERGNEEN FLESHY HERBACEOUS PLANTS.

Sedum telephium L.
" telephioides Michx.
" acre L.
Sedum ternatum Michx.
Sempervivium tectorum L.
Opuntia humifusa Raf.

EVERGREEN HERBACEOUS PLANTS.

Aplectrum spicatum (Walt.) B.S.P.
Alsine media L.
Coptis trifolia (L.) Salisb.
Hepatica hepatica (L.) Karst.
Trifolium repens L.
Malva rotundifolia L.
Pyrola rotundifolia L.
" elliptica Nutt.
" uliginosa Torr.
" asarifolia Michx.
" secunda L.
Moneses uniflora (L) A. Gray.
Chimaphila maculata (L.) Pursh.
" umbellata (L.) Nutt.
Vinca minor L.
Trientalis americana (Pers.) Pursh.
Prunella vulgaris L.
Lamium amplexicaule L.
" maculatum L.
" album L.
Mitchella repens L.

---

## CERTAIN MOUNDS AND VILLAGE SITES IN OHIO.

The Ohio State Archaeological and Historical Society has published an important volume with the above title by William C. Mills, curator and Librarian of the society. The work consists of four special papers reprinted from the Ohio Archaeological and Historical Quarterly together with a preface and complete indices. The papers are entitled as follows: "Excavations of the Ardena Mound," "Explorations of the Gartner Mound and

Village Site," "Explorations of the Baum Prehistoric Village Site," and "Explorations of the Edwin Harness Mound." These reports are handsomely illustrated and show not only the artifacts discovered but also the progress of the work of excavation and the various burials and finds in situ.

The society is to be congratulated on the quality of the work being accomplished by its able curator. These monographs show what the character of future explorations and excavations in our state must be if we are to reap the full benefit of the rich archaeological material within our boundaries. The old, haphazard method of digging a trench or hole into a mound was of little value and usually gave wrong or imperfect impressions of the actual nature of the works investigated. It would be an unfortunate circumstance if lack of funds were to hinder the further progress of the work and it is to be hoped that the society will obtain the proper financial assistance to enable Prof. Mills to carry on these investigations on a much larger scale in the future than has been possible in the past.

J. H. S.