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AN ECOLOGICAL STUDY OF A PRAIRIE PROVINCE IN CENTRAL IOWA.

BY ADA HAYDEN.

(Abstract.)

This virgin prairie area is mostly of the kame hill, saucer type. One portion of the territory is probably the pre-Wisconsin bed of the Des Moines river whose course was changed by the ice sheet. The region examined in detail is one mile in radius and bordered by a woodland adjacent to Skunk river.

The purpose of the study was (1) to determine the identity of the plants and their locations, (2) to examine environmental factors with a view to accounting for their relative influence in the grouping of the plants. Factors obviously common to the various associations were not considered. Those factors concerning which data were taken are: Topography, drainage, soil type, weather, water content of earth at highland and lowland stations, comparative temperature studies at the same stations including the maximum and minimum temperatures of earth and air, and a comparison of surface, sub-surface and sub-soil earth temperatures with those of the air at these stations.

In summarizing results, an analysis of the floral distribution of the prairie province showed the following grouping:

I. Upland prairie

Stipa—*Bouteloua* formation.
·*Consocias* *Bouteloua*
Consocias *Stipa*

II. Meadow or Wet Prairie

Panicum—*Agrostis* formation
Consocias *Phlox maculata*
Consocias *Agrostis*, *Steironema*, *Lythrum*
Consocias *Panicum*, *Fragraria*, *Senecio*

III. Swamp

Typha, Juncus, Penthorum formation
Consociet Typha, Juncus
Consociet Penthorum
Consociet Ludwigia, Sparganium
Consociet Leersia

IV. Pond

Ranunculus, Sagittaria formation
Consociet Ranunculus
Consociet Sagittaria

Every stable formation may be expressed as a summary of its habitat conditions, which are equal to the number of its associations.

The chief causes of difference in associations are their habitat features which are not common factors.

The principal factors which are not common or which vary in marked degree are (1) type of soil and (2) water content of habitat.

Structure of soil has a direct bearing on water content. Water content depends on the type of soil, drainage, and rainfall.

The main significance of temperature variation in this study is in its application to the production of societies with reference to seasonal aspects.