

A. BIOLOGICAL SCIENCES

I. NATURAL VEGETATION IN RELATION TO THE MOUND BUILDERS AND LATER INDIANS.

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The conclusions reported in this paper are due to the work done by two students of the writer. Miss Anna Shephard now a curator at the San Diego Museum and Miss Mabel E. Bridges. To them full honor is due for much painstaking and independent research—done incidentally without any reward in the way of credit commensurate with the labor involved. The writer's only part in the work, literally, the suggestion of the investigations and the criticism of the work.

Miss Shephard, who is a professional anthropologist, compared the natural vegetation of Ohio with the location of the prehistoric mound-builder's remains. Miss Bridges, who is a history student compared the natural vegetation of the Mississippi Valley with the location of various historical tribes of Indians, taking account of the industries of these Indians.

Naturally work of this type involves a combination of the methods of the scientist and the historian, and is thus subjected to a double set of limitations. The sources used were as follows:

A. *Natural Vegetation of Ohio*—A monograph by Sears which appeared in 3 sections in the Ohio Journal of Science, Vols. 25-26 as follows:

- I. The Virgin Forest
- II. The Prairie
- III. Natural Plant Succession

In this monograph the vegetation of Ohio is pictured as it was at the advent of the white man. The method employed was to transcribe the field notes of the first surveyors, who always listed two or three "bearing trees" at each mile post—naming the species. In case the mile post was set in a prairie the surveyors always noted that fact. By this means a network was recorded with intersections 1 mile apart over all of the surveyed portion of the state. For the rest whatever records were available were used. In general it may be said that the type of vegetation in glaciated Ohio is directly correlated with glacial topography in unglaciated with the character of the underlying rock.

The important vegetation types were; Swamp Forest (Ash, Elm, Maple, etc.) Beech-Maple Forest-Oak Hickory Forest, merging into savannah and open prairie.

B. *The Mound-builder's Remains*. W. C. Mills, curator of the Ohio Archeological and Historical Society's Collections has prepared an exhaustive Archeological Atlas of the state, including not only a general map, but extremely detailed maps by counties. In this atlas the remains are classified chiefly according to whether they represent village sites, fortifications, or ceremonial mounds, pre-Columbian of probably rather late date, and indicate that the Indians who made them possessed well developed maize agriculture.

C. *The Natural Vegetation of the Mississippi Valley*. This data

was based upon the map prepared by Zon and Shantz of the United States Department of Agriculture and issued as Part I, Section E of the Atlas of American Agriculture. This map gives the vegetation regions of the United States. It is not perfect, but represents the best we have and is sufficiently accurate with respect to the broad general features of forest and grassland. It should be noted that the great fan shaped area of the Mississippi Valley was occupied by deciduous forests in the east, by short grass plains in the west, while between these two lay a broad belt of tall grass prairie, reaching from Minnesota to Texas. Between the prairie and the forest lay a region of open savannah, while the presence of the Appalachian foot hills introduced local areas of different forest type, notably chestnut, chestnut oak, and poplar, in West Virginia, Kentucky and parts of Tennessee. Southward towards the gulf the grass lands gave way to forest again.

D. The distribution of Indian tribes and their industrial practices. In securing this data Miss Bridges consulted a great number of sources both historical and ethnological, embodying her results in a map. She also prepared a statement of general conclusions with respect to the plant industries of the various tribes.

Her map dealt with Siouan, Algonquin, Muskhogean, Caddoan, and two small independent groups along the lower Mississippi. This map like others similar to it, rested upon records left by early white explorers in the interior. It should be noted that these explorers did their work considerably after the discovery of the continent. Moreover their first records are scattered and fragmentary. According to Professor Hartley B. Alexander the positions generally ascribed to many of the tribes are the result of pretty extensive post-Columbian disturbances among the interior tribes. If this be true the best of maps must be consulted with reserve.

Findings.

1. The mound-builder's remains in Ohio show no evident relation either to vegetation types, or to the glacial topography upon which these types of forest depend. As exceptions may be noted the relative scarcity of remains in unglaciated Ohio, which is broken rough foot-hill country, and the absence of remains in the great Swamp-Forest Area of Northwestern Ohio. This latter region represents the area vacated by Lake Erie following the recession of the glaciers.

Our object in searching for a relation between the natural vegetation and mound-builders remains should perhaps be explained at this juncture. As stated before, these people maintained a successful agricultural civilization. Ohio, with its diversity of natural vegetation, shows a corresponding diversity of agricultural lands. Obviously many portions of the state could not be worked advantageously under primitive agricultural conditions. In view of these facts it might seem reasonable to expect a concentration of village sites and other remains in the vicinity of those vegetation regions which represent potentially the best farming lands.

Our failure to find this relation is perhaps less surprising than it seemed at first, when one recalls the wide spread custom among agri-

cultural Indians of living in villages and farming the surrounding territory for a considerable radius. So far as Miss Shephard discovered a reason for the location of village sites and other remains, this reason seemed to be the proximity of routes of travel. From villages so located it seems likely that excursions were made to favorable farming areas often at a considerable distance. If this were the case the areas so selected might well fall within restricted vegetation types to whose location the position of the villages would give it a clue. Apropos of the importance of lines of travel it is well to remind a botanical group of the fact (quite familiar to anthropologists) that an impressive commerce existed among prehistoric American Indians. Copper, obsidian, and medicinal plants, are known to have been transported for long distances. Two years ago Professor Schaffner identified remains of material used in the manufacture of moccasins in caves in southern Ohio as belonging to a plant whose nearest station is South Carolina.

2. With respects to the relations between the tribes of the Mississippi Valley and the natural vegetation of the same region I can do no better than to quote verbatim the conclusions reached by Miss Bridges: "The following conclusions are based on the facts presented in the foregoing study:

1. There is no variation in methods of cultivation among the tribes of the Mississippi Valley.

2. The principal crops, maize, beans, pumpkins, squashes, and melons, and tobacco, are the same throughout the Valley.

There is a distinct line of division between the tribes who made agriculture their chief industry, hunting only incidentally, and those who divided their time about equally between agriculture and hunting. This line extends about in the latitude of the mouth of the Arkansas River.

4. The southern tribes whose main dependence is agriculture show greater advance in other plant industries, especially weaving.

5. The Indian made use of a balanced ration.

6. There was a considerable area in western Tennessee, Kentucky, and southern Ohio, which was not inhabited by any Indians at the coming of the white man.

7. The tribes who made agriculture their main industry are admitted to have been more advanced than those who combined agriculture with hunting. Hence there may exist a correlation between importance of agriculture as an industry and social development. There is no corresponding correlation between social development and agricultural methods.

It appears probable that an explanation stated in "3" and "6" may lie in the natural vegetation of the Valley. In maps showing the natural vegetation belts and the distribution of the Indian tribes, it will be noted that the line between the tribes who depend mainly on agriculture and those who depend equally on hunting correspond to some extent with the boundaries of the tall grass area. The correspondence is not complete enough to warrant any statement without further investigation.

It will be further noted that there is almost exact correspondence between the area found uninhabited at the coming of the white man and the belt of chestnut, chestnut-oak, yellow poplar forest. The correspondence is not exact at the southwest, where the Choctaw country extends into this forest area. The reason for leaving this area vacant does not lie altogether in a topography unsuited for agriculture. For the Lexington Basin, a level area of rich soil, is included.

The evidence is insufficient to warrant any final statement; however the study is indicative of some correlation between Indian agriculture and natural vegetation belts, sufficient to demand further investigation.