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THE FUNCTIONS OF SMALL URBAN PLACES
IN MINNESOTA

JOHN W. WEBB

University of Minnesota, Minneapolis

ABSTRACT

Urban geographers are much concerned with discovering methods for determining and describing the functions of urban places. This paper examines some of the basic concepts involved in the idea of functional differentiation of urban places. It is found that a function in an urban place needs to be considered not only in relation to other functions in the urban place but also in relation to the same function in other urban places. From the conclusions of this examination of concepts a method of measuring functions is derived and applied, by way of illustration, to the small urban centers of Minnesota. Using the 1950 Census statistical data on employed population by industry (considered to be a valid criterion for functional characterization), each urban place between 2,500 and 50,000 population in Minnesota is described both in its type and degree of functional specialization.

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SOME ASPECTS OF LANDFORM DESCRIPTION
IN MINNESOTA

NEIL E. SALISBURY

State University of Iowa, Iowa City, Iowa

ABSTRACT

This paper constitutes a report on the organization and methods of description employed in a filmstrip of the Minnesota Audio-Visual Education Service entitled, "The Form of the Land of Minnesota." The readily observable characteristics of slope-relief, surface materials, and drainage are defined and classified. Examples of each type of the three characteristics are shown by frames from the filmstrip.

Landform regions have been delineated by superimposing maps of the separate characteristics. Ten regions are differentiated and their characteristics described. The resource values of each region are analyzed and their advantages and disadvantages for human use are summarized. Three regions, the Red River Valley Core, the Rough Moraine Belt, and the Rough Hill Land of Southeastern Minnesota, are selected as illustrations.

The purpose of presenting the landform regions in this manner is to draw the student's attention to their characteristic features so that he will be able to observe them in the field. He is also assisted in correlating the natural and cultural features of the landscape.

MINNESOTA'S TACONITE INDUSTRY
A PRELIMINARY SURVEY

FRED WITZIG

University of Minnesota, Duluth

ABSTRACT

Two World Wars and an unprecedented, expanding economy following the second of these wars have seriously depleted the high grade iron ore reserves of the Lake Superior region. Now, after several decades of experimentation, mineralogists have found a way to concentrate economically the vast tonnages of low grade magnetic taconite on the Eastern Mesabi. This will not only assure the future of Minnesota as a major iron ore producer, but will serve to sustain the economy of Northeastern Minnesota as well.

Since the magnetic taconites are found only in the Eastern Mesabi, the new mining and processing centers are being constructed in an area which has experienced little development in the past. The largest of the two plants is being constructed by the Erie Mining Company four miles east of Aurora, Minnesota, where a completely new town called Hoyt Lakes has been built. A 73 mile railroad connects the plant site with lake shipping facilities at Taconite Harbor, 85 miles north of Duluth on Lake Superior. Similar operations are being carried out at two sites by the Reserve Mining Company. This concern has established the new town of Babbitt to house employees who work in the mine and primary crushing plant. The crushed material is shipped by company railroad 43 miles to another new community, Silver Bay, Minnesota, where processing continues and final lake shipment is made.

The separation and concentration of magnetic taconite into a usable product for the blast furnace require unique, elaborate mining and processing methods. The large expenditures in time, money, and effort to establish the new taconite projects are finding expression in the geography and economy of Northeastern Minnesota. Changes in the settlement pattern are evident in the development of the new modern communities. Population increases and shifts in population density on the Iron Range can be expected. Transportation patterns are changing with the construction of new highways to connect the plants with existing routes and with the completion of the two railroads from the Range to Lake Superior. Year around employment in the new industry will mean a more stable economy. The long range possibilities in taconite bring to the region an atmosphere of permanence and stability it has never had in the past.

Apart from its regional implications, this new industry will also have a stabilizing effect on the established steel producing district of this country because it means new assurance of a continuing supply of high grade ores from the Minnesota Ranges. The strategic values of this development can readily be seen. With the patterns of mineral

production constantly changing here, as well as in many other regions around the world, evaluation and interpretation of these changes constitute a continuing challenge to the geographer.

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THE NATURE AND PROPERTIES OF TANNINS

SISTER M. ROGATIA SOHLER
College of St. Benedict, St. Joseph

ABSTRACT

Tannins, amorphous substances found in special vacuoles in the cell sap of plants, are present in the roots, bark, stems, and seeds. They are soluble in water, colloidal in nature, and characterized by an astringent taste. The chemical nature of tannins has been investigated from both the standpoint of analysis and of synthesis. Reports of results were misleading because though workers referred to specific tannins they apparently were unaware that the term tannin should be used only generically. Tannins are very specific substances which are most accurately referred to by naming the exact source of the tannin as oak tannin, wattle tannin, or *Hypericum* tannin. Since the introduction of chromatographic technique in 1949, definite advances have been made in the study of tannins. Through this means it was discovered that tannins are polymeric mixtures and not polymeric molecules.

To demonstrate the nature of tannins as revealed by paper chromatography slides were shown of studies made of extracts from tropical plants. Two-dimensional chromatograms most clearly demonstrated the complex nature of tannins.

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VINYL POLYMERS CONTAINING ACIDIC INGREDIENTS

COURTLAND L. AGRE
St. Olaf College, Northfield

The polymers observed in this research are typical products obtained by the free radical polymerization of active vinyl monomers. A monomer such as acrylic acid, $\text{CH}_2 = \text{CHCOOH}$, or more generally a vinyl monomer represented as $\text{CH}_2 = \text{CHY}$, has been shown to polymerize predominately in a head-to-tail fashion to give a macro molecule, $-\text{CH}_2-\text{CHY}-\text{CH}_2-\text{CHY}-\text{CH}_2-\text{CHY}-$. It is evident that head-to-head, tail-to-tail, and the mentioned head-to-tail mode of attachment might all occur, but polar factors rather than random distribution control the process to give the directed type of polymer pictured above. Other variations might be molecular weight distribution, chain branching, and similar factors which complicate the study of polymers.