SOME CONTRASTS BETWEEN GEOGRAPHIC REGIONS IN INDIANA.

Stephen S. Visher, Indiana University.

Indiana is strikingly uniform in many ways. There is comparatively little regional difference in rainfall, in temperature, or in altitude. Nevertheless, minor contrasts occur in Indiana in respect to many geographic conditions and have several significant effects.

Some of the contrasts which may be mentioned are those of climate, of types of soils, of altitude, of relief, of drainage conditions, of relations to waterways and railways, differences in farming practices, in chief crops grown, and in the conveniences and equipment in and about the farm home.

Temperature Contrasts. There is an average difference of about 5° F. between the southwestern corner of the state and the northern part, a difference of nearly 6° in summer and 8° in the maximum temperatures. The northeastern corner never has had an official temperature above 103° while the southern part has had a temperature of 111°. The sectional differences between the lowest temperatures ever recorded is somewhat less. The lowest is 33° below zero at Lafayette, while a temperature of 28° below has been officially recorded from Paoli and Jeffersonville. These differences in temperature are due chiefly to the differences in latitude, but are partly due to differences in altitude, the southwest corner of the state being within 350 feet of the sea level, while the northeast corner is above 1,000 feet.

The growing season, or the period without killing frost, in the southwest third of the state usually is nearly a month longer than in the northeastern corner. However, the frost-free season near Lake Michigan is, on the average, a week longer than somewhat farther south. The lake is comparatively warm in the autumn. Spring frosts occur near the lake as late as they do farther away but they do less damage to fruit trees because the cold winds from the lake and the cloudiness prevent early growth.

Contrasts in Rainfall. There are two chief types of sectional contrast in rainfall. The southern part of the state receives several inches more per year, but a larger fraction falls in the cooler six months than is the case in the northern part of the state. In the southern half of the state the average rainfall is 40 to 45 inches, while in the extreme northwestern corner of the state only 33 inches are received. In general, each month of the year receives about three inches of rain, but in the northern half of the state, about 55 per cent of the year's total falls during the warmer six months, while in the southern part of the state 50 per cent is received in that season. In the extreme northwest, 60 per cent of the precipitation comes in the warmer season, when it is most needed. The decrease in rainfall northward is related to the increased distance from the Gulf of Mexico, the one great source of rainfall for Indiana. The larger percentage in summer to the north is related to the fact that in winter, moisture carried northward by

"Proc. 38th Meeting, 1922 (1923)."

winds from the Gulf is dropped sooner than in summer because the continent is cold in winter compared to the ocean while it is comparatively warm in summer.

Snowfall. The part of the state near Lake Michigan receives three times as much snowfall as does the extreme southern part. (30 inches versus 10 inches.) Furthermore, it does not melt nearly so soon in the northern area, in fact it often remains on the ground for weeks, although it seldom lasts more than a few days in the extreme south end of the state.

Soil Contrasts. The soil shows many local differences, but the U.S. Bureau of Soils recognizes only five main soil regions in Indiana. The

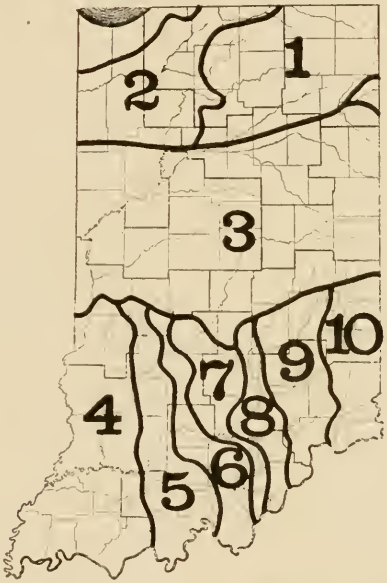

Fig. 1. Physiographic Regions of Indiana. 1=Morainal, 2=Kankakee, 3=North Central or Tipton Till Plain, 4=Wabash Lowland, 5=Crawford Upland, 6=Mitchell Plain, 7=Norman Upland, 8=Scottsburg Lowland, 9=Muscatatuck Slope, 10=Dearborn Upland. (After C. A. Malott).

great central section and much of the northern fourth are covered with a glacial clay loam. Considerable areas in the northwestern quarter are very sandy, while others have the famous brown soils of the northeastern Illinois corn-growing region. In southern Indiana, old glacial soils are found on the east and on the west, while soils derived from sandstones and those derived from limestones cover most of the middle portion of the southern third of the state.

Topographic Contrasts. In respect to relief or ruggedness, four main types may be recognized: (1) Prevailingly smooth to gently undulating, which is the characteristic condition in many counties in central Indiana. (2) Prevailingly gently rolling to rolling, which is true of

much of the southeastern quarter of the state, of a wide belt along the western side of southern Indiana, and also in many areas in central Indiana and northern Indiana. (3) Prevailingly rolling to hilly. This type is found in the lake region of the northeastern quarter, and is represented along the valleys of many streams, notably the Wabash northeast of Vigo County, and along the Whitewater. (4) the roughest part of the state is found along the Ohio River and in the unglaciated middle portion of southern Indiana.

The three-fold division of Indiana, which has often been made, that is Southern, Central and Northern, is largely based on characteristic differences in relief, but partly on differences in soil. Northern Indiana is the portion north of Benton County and the Wabash River. It contains many moderately rough areas, and considerable sandy soil, as well as muck land. Most of it, however, possesses a good glacial clay loam soil. Central, or north central Indiana is prevailingly level to gently rolling and possesses an excellent soil. Southern Indiana is the southern third of the state. These three great physiographic regions are shown in the accompanying map. (Fig. 1.)

Contrasts in Respect to Drainage. With respect to drainage conditions, most of southern Indiana was originally fairly well drained; most of central Indiana has been artificially drained, while large areas in northern Indiana are still undrained. The lakes and marshes of the state are nearly all in this northern section. More than half of southern Indiana was not glaciated while the remainder was glaciated much longer ago than was the case in central and northern Indiana.

Contrasts in Respect to Relation to Waterways. During the early settlement of the state, the relation to navigable streams was important. Then the southern margin, along the Ohio River, and the part along the lower Wabash were much better favored in transportation facilities than the rest of the state. The settlement of the part of the state nearest Lake Michigan was comparatively little affected by the lake because of the belt of sand dunes and marshes which separate the lake from the productive back country.

Later the canal built from Lake Erie to Evansville gave what was then considered a good means of transportation to a narrow strip. The spread of the population over the state from decade to decade reflects the importance of the waterways as highways. The population was fairly abundant along the Ohio, Wabash and Whitewater rivers when there were almost no settlers in large sections elsewhere in the state. Not until the railroad era commenced, about 1850, did the large areas of very sparse population disappear from the northern part of the state.

Regional Contrasts in Railroads. Today, in contrast, the northern two-thirds of the state is much better supplied with transportation facilities than is most of the southern third. There are two southern counties which have no railroads and several which have only a small mileage. Furthermore, a considerable share of the mileage in southern Indiana is of branch lines with inferior service. The chief reasons for this condition are, (1) the roughness of much of southern Indiana with the consequent difficulty in railroad building; (2) the lesser demand for trans-

portation in southern Indiana, which in turn is related to the greater poverty of the region and to its fewer industrial centers; (3) the fact that many more east-west trunk lines cross northern Indiana enroute to Chicago or St. Louis than cross southern Indiana.

Variations in Farms. The contrasts between different regions in the state are well illustrated by differences in the average value of the land. While according to the 1920 Census, the state average was $104 per acre, the Crawford Upland (figure 1, region 5) averaged only $26 per acre, and the Norman Upland only $31, but the wide, almost level north central region had an average of $158. The average values in the remaining regions outlined in figure 1 are as follows: 1—$102; 2—$91; 4—$71; 6—$32; 8—$74; 9—$43; 10—$51.

The variation in the per cent of land in farms is not so great, ranging from 82 per cent in the Norman Upland to 98 per cent in the Dearborn Upland. The wide central plain had 95 per cent of its land in farms. Other regions varied as follows: 1—92; 2—89; 4—88; 5—90; 6—89; 8—90; 9—93.

One might expect that the richer land of central Indiana would be divided into smaller farms than the poorer land in southern Indiana because a smaller acreage can support a family. But instead, the smallest farms, on the average, are found in the Norman Upland, of which Brown County is representative. There the average is 88 acres, in contrast with 114 acres in the north Central plain and 168 acres in the Kankakee region. The average size of farms in the remaining regions are as follows: 1—101; 4—94; 5—110; 6—101; 8—107; 9—99; 10—94.

Not only are the farms larger than the average in the smoother central part of the state, but a larger proportion of the land is in crops and a smaller proportion in pasture, wood lots and waste land. This is illustrated by the total land devoted to cereals per average square mile. The north central plain with 350 acres out of each average 640 acres has three times as large a share of the land in cereals as the Norman Upland with 117 acres. Other regions have intermediate acreages as follows: 1—259; 2—298; 4—282; 5—144; 6—164; 8—296; 9—172; 10—165.

The contrast in the total taxables per average square mile is great, and very important. The richest part of the state, the north central plain, has taxables assessed at $214,000 per square mile, on the average, whereas in the poorest region, the Crawford Upland, the valuation is $34,000, only about one seventh as much. No wonder that the schools and roads are better in the former region than in the latter! The valuation in other regions is as follows: 1—$112,000; 2—$88,000; 4—$122,000; 6—$40,000; 7—$61,000; 8—$103,000; 9—$50,000; 10—$60,000.

Accompanying these notable contrasts in the semi-permanent assets of the several regions, there is a conspicuous contrast in improvements and equipment on the farms. For example, one area, the Muscatatuck Slope, has six times as many silos in proportion to area as another area, the Norman Upland. Automobiles are least frequent, 2.3 per square mile, in the Crawford Upland, where roads are very poor

and the land is least valuable and the total taxables smallest. They are more than twice as abundant in the central plain and in the Dearborn Upland, both well developed regions. The automobiles are not only more numerous in the richer part of the state than in the poorer, but they average distinctly more costly per car. Tractors are six times as abundant in the north central plain as upon the Norman Upland. Indeed they are two or three times as abundant in the central and northern part of the state as in the southern, with its large areas of rough land. The distribution of auto trucks, however, is distinctly different from that of automobiles and tractors. Trucks are relatively most numerous in the Norman Upland, a region poorly supplied with railroads. They are least common in the Kankakee region with its many low and sandy areas and its many railroads converging towards Chicago. Milking machines are three times as numerous in the northeastern morainal section of the state as in the extreme southeastern or in the Scottsburg Lowland. Running water in barns is rarest in the regions of cheapest lands, the Norman Upland and Crawford Upland. It is commonest in the Scottsburg Lowland and in the morainal region with its extensive dairying.

Within the homes there is no less regional contrast than in the barns and in the value of the land. For example, according to figures given in the Indiana Yearbook, washing machines are six times as frequent on farms in the north central plain as in the Norman Upland and vacuum cleaners are four times as common in the plain as in the rougher sections. Furnaces are more than four times as common in the coolest northeastern section than in the poorer areas of southern Indiana. Electric devices in the farm home are 60 times as numerous in proportion to area in the Kankakee region than in the hilly and rather remote Crawford Upland. Kitchen sinks are three times as common in the north central plain and the morainal region as in the Norman and Crawford Uplands.

The reasons for the foregoing contrasts are largely due to the geographic differences mentioned in earlier pages. The effects of the differences in levelness, soil, climate and accessibility, are supplemented by differences in the education and ability of the people which are in turn related to differences in opportunities. Undoubtedly there is a tendency for many of the more alert young people to go from the less favored regions to the more favored. The discouragement afforded by the small, poorly equipped farms of the less favored areas is increased by the lower average yields per acre of important crops. For example, even along the relatively productive valley bottoms of the Norman and Crawford Uplands, the corn yield is not great enough to give those regions much more than half the average yield on the wide north central plain. Furthermore, so little land is suited to corn in the rougher parts of the state that the average farm had only about a third as many acres as the average farm in the central plain. In respect to wheat there is less contrast. According to the 1920 Census, the average yield in the Crawford Upland was 12 bushels in 1919, but 19 bushels in the Kankakee region. In the three upland regions of southern In-

diana the average farm contained less than 10 acres of wheat in contrast to about 20 acres in the Wabash and Scottsburg Lowlands.

Oats are relatively most important in the northwest part of the state (Kankakee region) where they occupy several times as large a percentage of the land as in the southern third of the state. They also yield far better in the northern than in the southern parts of the state. It may be due in part to the earlier coming of hot weather towards the south than towards the north. Oats, like wheat, stools more heavily and hence yields best where there is a considerable period of somewhat cool weather for it to grow in, before hot weather causes it to head out. Hay and forage are relatively most important in the rougher morainal section of the northeastern corner of the state and are least important in the poorest section of the state, the Crawford Upland of southern Indiana.

Contrast in the Value of Crops Grown. On the average, the poorer counties of southern Indiana each grew crops worth nearly $1,500,000 in 1919, while the better counties in the north central section grew crops worth about $8,000,000. The contrast between the poorest and the best counties in crop production thus is about as one is to eight, when comparative area is considered.

Sectional Contrasts in Manufacturing. In manufacturing there is much more contrast than in crops. Warren County, the county which does the least in manufacturing according to the last Census, produced only one eight-thousandth as much wealth by manufacturing as did Marion County, and only one eleven-thousandth as much as did Lake County. The value added by manufacturing in Warren County was only $16,000 in 1919 while that in Marion County was $136,000,000 and that of Lake County, $180,000,000. Four other counties did less than $100,000 worth of manufacturing in 1919. Strange to say, four of these five counties are in the northwestern part of the state near counties which do much manufacturing. Three of them do less manufacturing than Brown County which is the least active of the southern counties. However, when all of the southern counties are compared with the central and northern counties it is seen that southern Indiana is as backward in respect to manufacturing, on the average, as it is in so many other respects.

Fuller data concerning many of the foregoing points may be found in the author's Geography of Indiana, which is Part I of the Handbook of Indiana Geology, recently published by the State Department of Conservation, Indianapolis. The tables upon which these contrasts in agriculture and farm equipment are based are given in the Economic Geography of Indiana, soon to be published by D. Appleton & Company, where many other points mentioned above are presented more fully.