

GEOLOGY AND GEOGRAPHY

Chairman: O. P. STARKEY, Indiana University

C. L. Bieber, DePauw University, was elected chairman for 1951.

ABSTRACTS

The flood problem in the watershed of the South Nation River (Ontario). R. LOUIS GENTILCORE, Indiana University.—The watershed of the South Nation River covers an area of approximately 1500 square miles in the eastern part of Ontario. The economy of the region is predominantly agricultural and centers around the Holstein cow and the cheese factory.

The most pressing problem that farmers here have to face is poor drainage. The South Nation River rises four miles north of the St. Lawrence and falls only 245 feet on its 100 mile course to the Ottawa. Because of the slight river gradient, approximately 55,000 acres flood every year. Floods reach serious proportions if there is a notable excess of spring precipitation. In the serious flood years of 1934, 1936 and 1938, March precipitation ranged from 25 percent to 90 percent in excess of normal.

The only solution proposed thus far for the problem is reforestation. Dams and reservoirs have also been suggested but due to the flatness of the land, good sites are difficult to find.

Ground water depletion in Ventura County, California. H. F. GREGOR, Indiana University.—Increasing irrigation, industrial and urban water demands, plus periodic droughts, have reduced ground water supplies in Ventura County to an all-time low. This situation is particularly serious in a coastal lowland located about fifty miles northwest of Los Angeles. One-third of all the lemons and commercial lima beans and one-tenth of the walnuts raised in the United States are produced in this section.

Excessive drafts have also encouraged salt water intrusion. By 1949 the hydraulic gradient was already sloping from the coast inland to a record depth of over fifty feet below sea level. Salt water has recently been noted in wells along the immediate coast. Prolongation of the present drought begun in 1943-44 and resulting increased irrigation demands are expected to intensify the situation—unless underground reservoirs are quickly recharged.

Surface reservoir construction in the adjacent mountains, as well as pumping of underground reservoirs farther inland so as to increase their capacity, have been proposed. Currently-wasted winter flood waters would then be trapped in both reservoirs and sent to

the deficit underground water areas of the lowland. Expense and opposition by ranchers in inland areas have prevented any progress beyond the planning stage, however.

Pioneer occupancy of the Calumet region of Northwest Indiana-Northeast Illinois. ALFRED H. MEYER, Valparaiso University.—A cartographic representation and chorographic analysis of the occupancy patterns of circulation, settlement, and industry of a region, as they have changed from time to time, are essential in understanding how the present-day landscapes have evolved out of the past.

This paper is one of four companion studies illustrating this type of sequent occupancy treatment as applied to the Calumet region of Northwest Indiana-Northeast Illinois. It deals with the Pioneer stage of occupancy.

Significant relationships of land and life are considered with reference to four primary geographic functions: Geographic position, regional differentiation, interregional relationships, and recognizable areal correlations between human and physical elements of the environment.

Fragmentation of the urban fringe in Indianapolis. BENJAMIN MOULTON, Butler University.—Urban growth in Indianapolis from the areal point of view has taken on two features that seem significant to the geographer. The first feature of growth has been eccentric and to the north and northeast from the center of the city. The second feature of growth, to which this paper is primarily directed, is the irregular and fragmented urban fringe. Fragmentation of this urban fringe can be traced from early days of the city as typical and has become more pronounced in recent years. The reasons for such fragmentation are related to both the natural and cultural environment but the natural elements appear to be the motivating forces underlying the cultural forces. Large expanses of relatively flat land is the key to the fragmentation of the urban fringe in Indianapolis.

Textile manufacture in eastern England: A study in industrial location. N. J. G. POUNDS, Indiana University.—The counties of Norfolk and Suffolk in England were the scene during the middle ages of a vigorous development of the woolen cloth industry which continued of importance until the end of the 18th century. The area formerly important for cloth manufacture is now the seat of a number of industries, including silk weaving and the manufacture of canvas and sailcloth, which have something in common with the earlier woolen industry.

The decline of the woolen industry, which was on a domestic basis, was in large measure due to the growth of the factory industry in the north of England. But its decline left a labor force in eastern England able and willing to accept work at lower wage levels than prevailed in London and elsewhere. At this time the silk industry, then established in London, was faced with rising wages in the capital, and employers turned to eastern England as an area in which to relocate their industry.

The silk and other textile manufactures came to this region to fill the economic vacuum left by the woolen industry.

The forces which build mountains. JAMES A. REEVES, *Terre Haute*.—The purpose of this paper is to analyze the forces which acted on the earth's crust since its creation. The two major forces being the attraction of the sun and the moon.

Engineering methods are applied to the problems of Geology.

Due to tilting axis of rotation, angularity of orbits, elliptical orbits, and other factors that produce small shiftings of our earth's axis in a year, which add up to sizeable changes over periods measured in millions of years, the axis of our earth has shifted thru many degrees and the 45 mile thick shell of the earth has slid long distances over the plastic interior. The resulting migration of the north and south poles and the equatorial bulge furnished the means whereby mountain ranges were folded and raised to their present heights, coal beds were formed, then sunk under the sea where they were covered up as we find them.

A new idea is introduced: that, as an equatorial bulge lifts a new equatorial zone by means of its newly acquired centrifugal force, the land is lifted higher than the water because it is heavier. (The centrifugal force of anything varies directly with its weight).

Climate and the seasonality of export trade. OTIS P. STARKEY, *Indiana University*.—Since 1921 the League of Nations (recently the United Nations) has published international trade statistics by months. An analysis of these statistics was made to determine whether the type of climate was reflected in the export trade of various countries. Significant seasonal trends appeared in data for the less industrialized countries but were lacking in industrialized countries. Seasonal fluctuations appeared less pronounced in the decade 1931-40 than in 1921-30, probably because increased diversity of product and greater industrialization. World War II and resulting trade controls largely upset pre-war seasonal trends.