

GEOLOGY AND GEOGRAPHY

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ABSTRACTS

Stromatoporoid and Coral Reefs in Indiana. J. J. GALLOWAY, Indiana University.—It is likely that Indiana has more organic reefs or bioherms than any other similar area in the world. The reefs of Indiana are in Paleozoic rocks, of Ordovician, Silurian and Devonian age. They are largely composed of Stromatoporoids, with few to many corals; the corals are the conspicuous fossils, for stromatoporoids look mostly like mere chunks of rocks. The organisms grew as great colonies, and grew up to the level of the water at high tide, for the specimens are often found overturned and broken, indicating wave action. Corals and stromatoporoids could withstand the breakers, and they sheltered other organisms, such as Algae, Mollusca, Bryozoa, Brachiopods and Foraminifera.

The oldest reef in Indiana is a layer of stromatoporoids in the Whitewater formation (Upper Ordovician) in the big cut in Road 56 near Hanover. It is only 3 or 4 feet thick, and consists entirely of one species of stromatoporoids, *Labechia huronensis*. Large corals, *Favistella stellata*, occur in profusion in the Saluda limestone (Upper Ordovician) at Clifty Falls and in the north cut at Madison, but they do not make convex masses qualifying as reefs.

The most abundant reefs are in the Silurian. Cumings and Shrock (1928) have identified and located on a map over fifty reefs in the various parts of the Silurian rocks of Indiana. The reefs are made up mainly of stromatoporoids, of the genera *Stromatopora* and *Clathrodictyon*, but in places there are also corals, brachiopods, molluscs and trilobites. In other places, as at the famous reef at the Big Four station at Wabash, the fossils have been largely recrystallized so that they cannot be identified. Dolomitization is common in the reefs as well as in inter-reef rock.

Devonian reefs are not abundant in Indiana, but they are of large size, and the most famous reef in America, that at the Falls of the Ohio at Jeffersonville, is made up entirely of stromatoporoids at some levels, while in the lower part corals and stromatoporoids occur in profusion. The corals lie helter-skelter, and some large heads of stromatoporoids more than a foot across now occur upside down, showing that the reef was in very shallow water. Cumings (1922) has compiled a list of over 500 species of fossils from that reef; he does not consider the occurrence at the Falls of the Ohio to be a reef or bioherm, but an extended bed of organic limestone, or biostrome. Galloway and St. Jean have recently (1957) described 9 species of stromatoporoids from that occurrence, and there may be many more.

A very large Devonian reef occurs five miles east of Logansport, Indiana. Here a large quarry has been developed, consisting very largely of stromatoporoids. Galloway and St. Jean have described 20 species of stromatoporoids from a lower bed 10 feet thick, having no other identifiable fossils, and have described 9 different species from an upper mass of fossils 20 feet thick. The upper mass also contains abundant corals but few other kinds of fossils. A small Devonian reef occurs at Pipe Creek Falls, 10 miles southeast of Logansport, the type locality of the Logansport limestone. A bed of limestone 3 or 4 feet thick, composed entirely of the spaghetti-like stromatoporoid *Amphipora ramosa*, occurs in the Independent Quarry, 4 miles south of Dupont, Indiana; such an occurrence can scarcely be called a reef. Great Devonian reefs, largely composed of stromatoporoids, occur in Michigan, from which, according to Alexander Winchell, shiploads of stromatoporoids, some specimens 12 feet in diameter, have been quarried, crushed and used as a flux in the making of steel.

The crushed rock, taken from reefs is used in Indiana for road metal, concrete, lime, and mineral wool, and oil has been found in Devonian reefs in western Indiana. Reefs have become important in the last ten years as reservoirs for petroleum in the Indiana-Illinois Basin, Texas, and western Canada. The stromatoporoids of reefs deserve more study to be used in correlation, including inter-continental correlation.

Geologic Observations on Southampton Island, N. W. T. WILLIAM J. WAYNE,¹ Indiana Geological Survey.—One problem in the study of Pleistocene glaciations in Indiana is to learn more about the climates that existed along the margins of continental glaciers that reached these lower latitudes. A geologic objective of the Indiana Gear Works Expedition to Southampton Island, N. W. T., in August 1957, related to this problem was to make observations on the geomorphic processes and biologic phenomena in an area of tundra that might be compared with some of the features encountered in Pleistocene sediments in Indiana.

Southampton Island lies between lat. 63°N. and lat. 66°N. and is directly north of eastern Indiana. Mean annual temperature is about -13°C (8°F), mean July temperature is about 7°C (45°F), and average annual total precipitation is 12 inches. Ground temperature below the top few feet is continuously below freezing. Solifluction features and patterned ground are everywhere present.

Pre-Cambrian gneisses are fairly well exposed in the northern part of the island, but limestone and glacial drift exposures are restricted to sea cliffs and river banks where frost-shattered debris is quickly washed away. Much of the island was submerged during late Pleistocene time, and virtually all glacial deposits examined showed evidence of marine sedimentation as well as post-depositional disturbance by solifluction and frost. Silurian bioherms were exposed on the tidal flat near Manico Point and near Renny Point. Interbiohermal strata are flat-lying thin- to medium-bedded limestone and are moderately fossiliferous locally.

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Industrial Minerals in Indiana's Economy.¹ DUNCAN J. MCGREGOR, Indiana Geological Survey.—Indiana's industrial minerals include crushed limestone and dolomite, dimension stone, sand and gravel, clay and shale, high silica sand and gravel, gypsum, cement, marl, whetstones and peat.

The total value of these mineral commodities in 1955 was \$117,275,458 (U. S. Bureau of Mines). If the value of petroleum and coal is added to this figure the total value of Indiana's mineral products is \$211,810,458. Indiana ranks 20th among the 48 states and Alaska in total value of mineral production.

Industrial Mineral Resources of Washington County, Indiana.² JACK A. SUNDERMAN,³ Indiana Geological Survey.—Mississippian shales, silt stones, sandstones, and limestones, the Ohio River sands, some small argillaceous sand bodies, glacial sands and gravels, glacial lake clays and silts, and residual clays constitute potential mineral resources in Washington County, Indiana.

In previous years, mineral raw materials have been quarried from the Borden siltstones and sandstones, from the Harrodsburg, Salem, and Ste. Genevieve limestones, and from the Sample sandstone. Material also has been dug from the Ohio River sands, from other sand bodies found in the county, and from glacial sands and gravels.

Unfavorable locations of pit and quarry sites, poor quality of some of the raw materials extracted, and other economic factors have forced abandonment of all operations in the county with the exception of one large limestone quarry in the Harrodsburg, Salem, and St. Louis limestones.

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