

STATE OF INDIANA
HENRY F. SCHRICKER, GOVERNOR

DEPARTMENT OF CONSERVATION
KENNETH M. KUNKEL, DIRECTOR
INDIANAPOLIS

DIVISION OF GEOLOGY
CHARLES F. DEISS, STATE GEOLOGIST
BLOOMINGTON

REPORT OF PROGRESS NO. 3

CRUSHED STONE
IN INDIANA

BY
JOHN B. PATTON

PRINTED BY AUTHORITY OF THE STATE OF INDIANA

BLOOMINGTON, INDIANA
APRIL 1949

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Plate 1. Quarries producing crushed stone in Indiana In pocket

CRUSHED STONE IN INDIANA

by John B. Patton

INTRODUCTION

During the field seasons of 1947 and 1948, two field parties of the Division of Geology, Indiana Department of Conservation, examined, sampled, and mapped the quarries that are producing crushed stone in Indiana. In 1947 the parties were led by George E. Ericksen and the writer and in 1948 by Carroll N. Roberts and the writer. Field assistants for the first year were Robert Stewart and Dallas Fiandt. For 1948 field assistants were W. E. Taylor and Richard Erd.

Although the purpose of the survey was to study only active quarries, some inactive ones which seemed likely to resume operations were studied. Of the 92 quarries shown on the map (Plate 1), 89 were in operation during the time of the field examination, and 3 have since become active. These 3 quarries have not been sampled or mapped, but they have been located, and the geological formations from which they produce have been ascertained.

The samples are being analyzed by the chemical and spectrographic laboratories of the Division of Geology. A report containing comprehensive information on the limestone and dolomite resources of Indiana will be published when sufficient analyses are available to show regional chemical characteristics and variations of the formations. The report will include analyses of several other formations which have commercial potentialities but are not being exploited at this time. Active quarries are not properly distributed for a determination of the regional characteristics of some of the formations. In such cases, field parties will sample and examine the limestones in areas selected to fill out a well-spaced grid of control. These supplementary samples will be taken from natural outcrops, cuts, and abandoned quarries

during the field season of 1950.

In the driftless area of south central Indiana and in most of the portions of southeastern and southwestern Indiana which are covered by Illinoian glacial drift, bedrock is close enough to the surface to permit economical stripping and quarrying. Between the outer border of the Wisconsin drift sheet and the lower portion of the area covered by the Champaign morainic system, major streams and some tributaries out through the glacial drift to bedrock and permit quarrying without excessive stripping. The quarries in Wayne, Rush, Shelby, Bartholomew, Putnam, Montgomery, and northwestern Decatur Counties (Plate 1) are within and near the margin of Wisconsin drift.

In northern Indiana overburden is thin only in the valleys of major streams and at a few places in the till plains. The operator therefore quarries limestone and dolomite where they are available and has little opportunity to select his quarry site from a wide range of possible locations. In the limestone areas of southern Indiana, however, potential quarry sites are numerous, and the quarry operator may select a location upon the basis of convenience, geographic advantage, stripping conditions, and character of the limestone.

The Silurian and Devonian formations in northern Indiana have not been precisely correlated with those in southern Indiana. The two areas have been treated separately in most geologic reports and are so treated here.

LIMESTONES QUARRIED IN SOUTHERN INDIANA

Saluda Limestone

The lowest stratigraphic unit from which crushed stone is produced in southern Indiana is the Saluda limestone. The only area in which it is

quarried in Dearborn County, where the Saluda is drab-gray, impure, dolomitic, thin-bedded limestone that contains thin shale beds. The formation is only 6 feet thick near Richmond and thickens southward to 50 feet near Madison (Cumings, 1908, p. 640), where it is massive Limestone.

Whitewater Formation

The Whitewater formation, which overlies the Saluda throughout Indiana, is rubbly, blue-gray, abundantly fossiliferous limestone that contains thin shale beds. Although most of the limestone is argillaceous, some beds are cr7staUine and fairly pure. The Whitewater is only a few feet thick near Madison but thickens northward to 80 feet near Richmond (Cumings, 1922, p. 438).

Elkhorn Formation

The uppermost Ordovician formation in Indiana is the Elkhorn, which overlies the Whitewater formation north of Riply County and thickens northward. Silurian rocks rest upon the Whitewater from northern Ripley County south to the Ohio River. The middle portion of the formation is gray, crystalline, thin-bedded limestone, which is quarried southeast of Richmond. The upper and lower parts of the formation consist of shale (Cumings, 1922, p. 438).

Brassfield Limestone

The lowest Silurian formation in most of southeastern Indiana is the Brassfield limestone, but the formation is absent in a small area south and west of Versailles. The Brassfield is typically salmon-colored, crystalline, unbedded limestone, desirable for crushed stone and agricultural lime but usually too thin to be quarried economically alone.

Osgood Formation

The Osgood formation, which overlies the Brassfield limestone, consists mostly of tan, dense limestone. Two beds of light-gray calcareous shale, 1 to 3 feet in thickness, are rather persistent and hinder economical quarrying. At present no quarries are operating entirely in the Osgood. Several quarries, mainly in the overlying Laurel limestone, apparently take some of the upper beds of the Osgood. The contact between the Laurel and Osgood is not easily established in a quarry, as both formations are sparsely fossiliferous and appear similar on fresh surfaces. The Osgood is more argillaceous than the Laurel and weathers to a yellow soft rock which is easily distinguished from the Laurel on old exposures.

Laurel Limestone

The principal source of crushed stone within the Silurian rocks of southern Indiana is the Laurel limestone. It is pale-tan to gray, dense, moderately dolomitic, thin-bedded, and in most places extremely cherty in the upper 5 to 20 feet. Throughout the formation thin bands of lenticular and nodular chert are common. The Laurel was once a noted source of dimension stone but is no longer quarried for this purpose. The Waldron shale normally overlies the Laurel, but in places all Silurian rocks younger than Laurel are missing, and Geneva dolomite (Devonian) rests directly upon the Laurel.

Louisville Limestone

The Louisville in Clark County is gray to buff, finely crystalline to dense, rubbly, dolomitic limestone, which contains many chain corals and is overlain south of Charlestown by the Jeffersonville limestone and north of Charlestown by the Geneva dolomite. Throughout its outcrop area the Louisville is underlain by the Waldron shale. The Louisville thins to the

north from 60 feet near Jeffersonville to about 10 feet in central Jennings County and farther north is absent in many places. In northern Decatur County the Louisville is represented by a few feet of light-gray, crystalline, thin-bedded fossiliferous limestone, which weathers pale-lavender or blue.

Geneva Dolomite

The basal Devonian formation in most of southern Indiana is the Geneva dolomite (Geneva limestone of Wilmarth, 1938, p. 810), which ranges in color from light-gray through tan and buff to chocolate-brown and contains white crystalline calcite masses. In the valley of the Flat Rock River in southern Rush and Shelby Counties, the formation is thin-bedded, but in central Jennings County and southward it is massive. The Geneva thins to the south and is absent nearly everywhere south of Charlestown in Clark County.

Jeffersonville Limestone

The Jeffersonville limestone rests on the Geneva dolomite from eastern Bartholomew County to southeastern Clark County. In extreme southern Clark County the Jeffersonville is the oldest Devonian formation and rests on the Louisville limestone. The Jeffersonville in its type section may be divided into a basal brown, coralline, dolomitic limestone; a middle gray to brown, dense to crystalline, fossiliferous limestone (Spirifer gregarius zone of Kindle, 1901, P, 539); and an upper tan, crystalline, massive limestone (Spirifer acuminatus zone of Kindle, 1901, p. 539). The basal coralline limestone is present wherever the basal Jeffersonville is exposed and occurs in Bartholomew County at the northernmost Jeffersonville quarry examined.

The middle limestone unit, characterized by Spirifer gregarius, becomes unfossiliferous northward from the type section. In Jennings and Bartholomew Counties the unit is replaced by beds of light-gray and tan, conspicuously and thinly laminated, dolomitic limestone that contain numerous

small calcite crystals and have an ashy or chalky appearance. In places the laminated beds are crumpled and brecciated and are recemented with calcite and pyrite. The upper or Spirifer acuminatus limestone contains abundant fenestelloid bryozoa in its upper bed and is present wherever the upper Jeffersonville crops out.

Speed Limestone

The Jeffersonville limestone is overlain from central Clark to central Jennings County by the Speed limestone, which is blue-gray, crystalline, fossiliferous and argillaceous. The Speed is absent in southern Clark County and in Bartholomew and northern Jennings Counties.

Silver Creek Limestone

The Silver Creek limestone, the natural cement rock of Clark County, is a drab-gray, argillaceous, massive, fossiliferous limestone, which breaks with a conchoidal fracture and is cherty in the upper part. The Silver Creek thins northward and is absent north of central Scott County.

Beechwood Limestone

Throughout southern Indiana the uppermost Devonian limestone is the Beechwood, which is gray, hard, coarsely crystalline, fossiliferous, and contains abundant crinoid rings. The Beechwood rests unconformably upon the Silver Creek, Speed, and Jeffersonville and underlies the Now Albany shale throughout the area.

Borden Reef Material

The two upper units of the Borden group (Lower Mississippian) are the Floyds Knob formation and the Edwardsville formation. Stockdale, 1931,

p. 210) referred to crinoid bioherms that began to grow during the deposition of the Floyds Knob and continued during the Edwardsville. The “bioherms” have been described (Stockdale, 1931., p. 251) as “Irregular calcareous masses of variable size and distribution., built in considerable part by crinoids and in lesser degree by bryozoans, and completely surrounded by rock of different lithology” Several of the reefs have been quarried, but only one, in Montgomery County, is now being worked. This exposure is isolated and is insufficiently exposed to reveal its position within the Borden group. It probably is in both the Floyds Knob and lower Edwardsville.

Harrodsburg Limestone

The upper portion of the Harrodsburg limestone (Warsaw limestone of Wilmarth, 1938, p. 2276) is gray, crystalline, massive, fossiliferous, and stylolitic. The lower part of the Harrodsburg consists of thin-bedded argillaceous limestone, bands of shale., thin layers of crystalline crinoidal limestone, and contains numerous geodes. The Harrodsburg is underlain by the Edwardsville formation and overlain by the Salem Limestone.

Salem Limestone

The famous Indiana building stone, a facies of the Salem limestone (Spergen limestone of Wilmarth, 1938, p. 2039) is soft, granular, fossiliferous, massive, cross-bedded limestone. The Salem in places is separated from the underlying Harrodsburg limestone by a few feet of platy shale or impure limestone. The lowermost beds of the Indiana building stone and the uppermost beds of the Harrodsburg are composed largely of fenestelloid bryozoa. The contact is difficult to identify if shale is absent. Above the building stone the Salem consists of brown, fine-grained, silty, argillaceous, dolomitic limestone, which emits a sulphurous odor from freshly

broken surfaces and is termed the "bastard stone."

The building stone in the Salem consists of small fossils and fragments of fossils cemented together. Although termed "oolitic" the Salem is not a strongly oolitic stone in most localities. The granular bodies are predominantly rounded fossil fragments and foraminifera. The building stone is one of Indiana's principal reserves of high-calcium limestone.

St. Louis Limestone

The Salem is overlain by the St. Louis limestone, which is blue-gray, argillaceous, and thin-bedded in its lower part. The upper part is tan to brown, dense, dolomitic limestone. Chart nodules and lenses are common, and at places the formation contains vugs lined with dolomite crystals. Local shale beds are present in the formation, particularly in the lower part.

Ste. Genevieve Limestone

The Ste. Genevieve limestone overlies the St. Louis limestone and has been divided into three members, named, in ascending order, the Fredonia, Rosiclare, and Levias. The Fredonia consists mostly of tan or gray, crystalline to dense, oolitic, thin-bedded limestone but contains massive beds of extremely pure white oolite. The Rosiclare consists mainly of gray, thin-bedded, oolitic limestone but contains shale beds and some sandstone. In many places the limestone contains scattered sand grains difficult to see without a lens. The Levias is predominantly light-colored, thin-bedded, dense to crystalline, oolitic limestone and beds of massive white oolitic of high purity. The oolitic beds of the Levias and Fredonia are a major reserve of high-calcium limestone in Indiana. The uppermost bed of the Levias is a brown, rubbly, brecciated, dense limestone termed the "Bryantsville bed" by C. A. Malott (manuscript to be published, 1950) and marks the Meramac-Chester

contact, where the Aux Vases is absent. The relative thickness of the three members of the Ste. Genevieve ranges greatly within exposures in Indiana.

Aux Vases Sandstone

The lowermost formation of the Chester series of Mississippian rocks in Indiana is the Aux Vases sandstone, which consists of gray or green shale, sandy shale, sandy limestone, or sandstone. In some areas the Aux Vases has not been found, and the overlying Paoli limestone rests directly on the Ste. Genevieve. The Aux Vases, where it is sufficiently calcareous, is produced with the underlying or overlying beds but it is never quarried alone.

Paoli Limestone

The Paoli is tan, gray, or nearly white, dense to granular, oolitic limestone. At many exposures a bed of light-gray shale is present near the middle of the formation, and shale partings are common at bedding planes* The Paoli rests upon the Aux Vases or Ste. Genevieve and is overlain by the Mooretown sandstone.

Beaver Bend Limestone

The Beaver Bend limestone rests on the Mooretown sandstone and is overlain by the Sample sandstone. The Beaver Bend is gray, oolitic, and crystalline. In most places it is not thick enough to be quarried alone but is quarried for crushed stone when encountered in stripping above the Paoli.

Beech Creek Limestone

The Beech Creek is brown or blue-gray, dense to crystalline, fossiliferous limestone that overlies the Elwren sandstone and underlies the

Cypress sandstone. Large crinoid stems with calcitic cleavage stand out on weathered surfaces and distinguish the Beech Creek from other Chester limestones.

Glen Dean Limestone

The Glen Dean limestone rests on the Hardinburg sandstone and is overlain by the Tar Springs sandstone. The lower half of the formation is hard, brown or gray, crystalline, massive limestone. The upper half generally is shale. Locally, erosion has removed part or all of the shale. Thin beds of limestone are usually present within the upper shale. Such beds are not of commercial thickness and are discarded as part of the overburden.

"Minshall Limestone"¹

The "Minshall limestone" (Moore et al. 1944, pl. 1) is dark blue-gray, hard, fine-grained, siliceous limestone that commonly contains lenticular bands of blue chert several inches in thickness. The limestone is above the Minshall coal, from which it is separated by a bed of black shale. The Minshall limestone is the top of the Pottsville series of the Pennsylvanian.

"Maria Creek Limestone"²

The "Maria Creek limestone's" (Malott, 1948, p. 125) is gray to tan, dense to crystalline, hard, fossiliferous limestone that is approximately 75 feet above Coal VII. The limestone lies between beds of shale and is within the Conemaugh series of the Pennsylvanian.

¹No proper type section has been set up and described for the "Minshall limestone," and the name has never been formally proposed.

²No proper type section has been set up for the "Maria Creek limestone," and the name has never been formally proposed.

LIMESTONES QUARRIED IN NORTHERN INDIANA

Middle Ordovician Rocks

A deep seated disturbance in the earth's crust folded, broke, and elevated Middle Ordovician rocks to the surface in a small area in southern Newton County (Quarry No. 52, pl. 1). Shrock and Malott (1933, fig. 5) identified the limestone formations as the Stones River, Black River, and Trenton. The formations quarried near Kentland are limestone and dolomite of variable color and texture. A typical section or description cannot be given because the beds stand at high angles and are broken and faulted.

Mississinewa Shale

The lowest Silurian formation recognized at the surface in northern Indiana is the Mississinewa shale (Cumings and Shrock, 1927, p. 583). The formation is less homogeneous than most descriptions indicate. At most exposures the rock is blue-gray, argillaceous, dolomitic, silty, massive limestone which has conchoidal fracture and weathers to small rectangular blocks. In places the Mississinewa is gray calcareous shale. Interbedding of shale and limestone is not common. Cumings and Shrock (1928a, p. 62) state that all of the known Niagaran reefs "have their roots in the upper 100 feet of this formation." Well samples show (Esarey and Biebermn, 1948, fig. 4) that a thick sequence of dolomite and limestone underlies the Mississinewa and overlies the Brassfield limestone. Exposures of the base of the Mississinewa have not been found. The formation is normally overlain by the Liston Creek limestone (also Niagaran) but at Kokomo and near Peru is overlain by Kokomo limestone (Cayugan).

Liston Creek Formation

The Liston Creek is gray, thin-bedded, dolomitic, cherty limestone and intercalated lenticular beds of chert. Chert is less abundant in the lower than in the upper part and in places is absent. Reefs, which apparently began in the Mississinewa, continued their growth into the Liston Creek.

Huntington Dolomite

The Huntington dolomite has been described (Cumings and Shrock, 1928a, p. 95) as "massive to slabby, evenly-bedded, yellowish, gray or pinkish, granular dolomite of sacchoroidal texture." The existence of the Huntington as a formation has been questioned. Although dolomite identified as Huntington is exposed at numerous places throughout an area of more than 1600 square miles, the contact of the base of the Huntington on an older formation has not been observed. Many exposures termed Huntington are reefs or beds associated with reefs. Some reefs formerly called "Huntington" are now considered to be Liston Creek or even Mississinewa in age. Further investigation may move other "Huntington" reefs down into lower formations.

Identification of a Guelph fauna has furnished much of the basis for the existence of the Huntington as a formation younger than Liston Creek. The term New Corydon limestone was proposed (Cumings and Shrock, 1928b, p. 588) for "12 to 15 feet of brown, exceedingly nodular, cherty, slightly fossiliferous limestone (which) rest on Huntington dolomite with a sharp line of contact." The New Corydon was determined to have a Lockport fauna, although it overlay rocks supposedly of Guelph age. Both fauna and lithology suggest that the New Corydon is a more dolomitic eastward facies of the cherty upper Liston Creek and that the even-bedded dolomite beneath it represents the lower non-cherty Liston Creek, more dolomitized than in Wabash

and Grant Counties.

In Adams, Jay, and Randolph Counties, thick massive dolomite and overlying thin slabby dolomite beds have been termed Huntington. Absence of Mississinewa in well samples (D. F. Bieberman, personal communication) from the area suggests that the beds may be surface exposures, of the unnamed subsurface beds overlying the Brassfield and underlying the Mississinewa (Esarey and Bieberman, 1948, fig. 4),

Thus it seems possible that the described exposures of the Huntington include unfamiliar aspects of beds distributed through several hundred feet and several formations within the Niagaran of northern Indiana.

Kokomo Limestone

The Kokomo limestone is gray to brown, banded dolomitic limestone, much of which is finely-laminated. Although the Kokomo usually is described as argillaceous, analyses show little alumina. At Kokomo and near Peru the upper beds are contorted, faulted, and recemented, probably as a result of disturbance of the sediment before it was consolidated. Such disturbance could be caused by wave action or by slumping of beds deposited on a slope. The Kokomo rests unconformably on Liston Creek, Mississinewa, and Niagaran reefs and has been considered to be Cayugan, but the upper part of the formation may be Devonian. The Kokomo is overlain by the Kenneth limestone or by Middle Devonian limestone.

Kenneth Limestone

The Kenneth limestone is tan to brown, dense, extremely cherty, fossiliferous limestone. Some authors have placed the formation in the Cayugan and others in the Lower Devonian. The Kenneth rests upon the Kokomo and, is overlain by Middle Devonian limestones.

Devonian Limestone (undifferentiated)

The Devonian limestone overlying the Niagaran and Cayuga rocks in northern Indiana is, in most places, gray hard, coarsely crystalline, crinoidal limestone which resembles the Beachwood (Hamilton) of southern Indiana. East of Logansport the lowest exposed Devonian consists of a blue-gray nodular stromatoporoid biostrom. The next higher beds are tan, flaggy, crystalline pure limestone which contains many corals and fenestelloid bryozoa and has an appearance similar to the Spirifer acuminatus zone of the upper Jeffersonville (Onondaga) of southern Indiana.

INDIANA CRUSHED STONE QUARRIES

The quarries listed below are operating or have been at some time during the course of the field examinations. The information in this report was obtained when each quarry was examined and will not reflect changes since that time. For example, a quarry may have been deepened into lower geologic formations than those listed. Changes in the plant facilities or operating methods may have added specialized products not listed here.

A thickness in feet, without other qualification, is given for formations whose top and base are exposed in the quarry listed. The highest formation in a quarry is rarely present in its full thickness, since erosion commonly has removed the upper part. In each case a thickness in feet is given, followed by the statement "Upper part eroded" or similar qualification. In unglaciated areas the formation might be expected to have greater thickness at higher topographic levels. When quarrying has not reached the base of a formation, the word "exposed" follows the thickness given, indicating that deeper quarrying will expose a greater thickness of that formation. Underground quarries commonly make their entries in old surface quarries

in hillsides. In such cases formations higher than those now being produced are exposed above the entries. Only the formations and thicknesses which are being mined are indicated.

ADAMS COUNTY

1 Karch Quarry

Location: SW $\frac{1}{4}$ W $\frac{1}{4}$, sec. 31, T. 25 N., R. 15 E.

4.5 miles southeast of Geneva

Date of field examination: July 23, 1947

Geologic formation: Huntington - 22 feet exposed, upper part eroded

Products: agricultural lime and crushed stone

2 Meshberger Brothers Stone Company

Location: SE $\frac{1}{4}$ sec. 33, T. 26 N., R. 13 E.

1.5 miles northwest of Linn Grove

Date of field examination: July 19, 1947

Geologic formation: Huntington - 38.1 feet exposed, upper part eroded

Products: agricultural lime and crushed stone

3 Meshberger Brothers Stone Company

Location: center sec. 4, T. 26 N., R. 15 E.

3 miles southeast of Pleasant Mills

Date of field examination: July 21, 1947

Geologic formation: Huntington - 25 feet exposed, upper part eroded

Products: crushed stone and agricultural lime

BARTHOLOMEW COUNTY

4 Meshberger Stone Company

BARTHOLOMEW COUNTY, cont'd.

Location: NE $\frac{1}{4}$ sec. 6, T. 8 N., R. 7 E.
2 miles northeast of Elizabethtown

Date of field examination: October 10, 29, 31, 1947

Geologic formations: Beechwood - 3.5 feet thick
Jeffersonville - 35 feet exposed

Products: agricultural lime, road stone, and flux stone

BLACKFORD COUNTY

5 Montpelier Stone Company

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 3, T. 24 N., R. 11 E.

North edge of Montpelier

Date of field examination: July 11, 1947

Geologic formation: Huntington - 34.7 feet exposed, upper part eroded

Products: agricultural lime and crushed stone

CARROLL COUNTY

6 Stuntz-Yoeman Company

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 19, T. 25 N., R. 2 W.

Near northwest edge of Delphi

Date of field examination: July 26, 1947

Geologic formation: Huntington - 25.2 feet exposed, upper part eroded

Products: agricultural lime and crushed stone

CASS COUNTY

7 France Stone Company

Location: NE $\frac{1}{4}$ sec. 27, T. 27 N., R. 2 E,

2.5 miles east of Logansport

Date of field examination: July 25, 27, 1947

CASS COUNTY, cont'd.

Geologic formations: Devonian (Jeffersonville?) 26.4 feet, upper part eroded
Kokomo - 22.5 feet exposed

Products: crushed stone and agricultural lime

CLARK COUNTY

8 T. J. Atkins Company

Location: W $\frac{1}{4}$ sec. 10, Clark Military Grant

1 mile northeast of Clayburg

Date of field examination: October 21, 1947

Geologic formations: Silver Creek - 10.1 feet thick, upper part eroded

Jeffersonville - 28.5 feet exposed

Products: agricultural lime and crushed road stone

9 Louisville Cement Company

Location: Grant 132 (and part of 131), Clark Military Survey

1 mile northeast of Speed

Date of field examination: October 1, 16, 1947

Geologic formations: Silver Creek - 13.9 feet thick, upper part eroded

Speed - 4.5 feet thick

Jeffersonville - 35.9 feet thick

Products: crushed stone, agricultural lime, small amount of asphalt filler, raw limestone for portland cement and brixment

10 Sellersburg Stone Company

Location: SE $\frac{1}{4}$ W $\frac{1}{2}$ Grant 90, Clark Military Survey

East edge of Sellersburg

Date of field examination: September 29, 30, 1947

Geologic formations: Silver Creek - 10.4 feet thick, upper part eroded

CLARK COUNTY, cont'd.

Speed - 1.7 feet thick

Jeffersonville - 33.3 feet thick

Louisville - 22.3 feet exposed

Products: crushed stone and agricultural lime

CRAWFORD COUNTY

11 Hy-Rock Products Company

Location: NW¼ sec. 7, T. 2 S., R. 2 E.

Marengo

Dates of field examination: July 24, 1947

Geologic formation: Ste. Genevieve - 32 feet being mined

Note: underground operation

Products: crushed stone and agricultural lime

12 Mulzer Brothers Quarry

Location: SW¼NE¼; sec. 10, T. 2 S., R. 2 W.

3 miles north of Eckerty

Date of field examination: June 30, 1948

Geologic formation: Glen Dean - 34 feet exposed

Products: crushed stone and agricultural lime

DAVIES COUNTY

13 Arvin Quarry

Location: SW¼NW¼ sec. 16, T. 1 N., R. 5 W.

1.5 miles north of Portersville

Date of field examination: July 14, 15, 1948

Geologic formation: Minshall - 4.8 feet thick

Products: road stone

DEARBORN COUNTY

14 Bennett Construction Company

Location: SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 14, T. 7 N., R. 3 W.

3.5 miles northwest of Manchester

Date of field examination: August 8, 1947

Geologic formations: Whitewater - 7.5 feet thick, upper part eroded

Saluda - 4.8 feet exposed

Products: road rock and agricultural lime

15 Dearborn Lime Company

Location: NW $\frac{1}{4}$ SW $\frac{1}{4}$, sec. 30, T. 8 N., R. 2 W.

1.5 miles northeast of Weisburg

Date of field examination: August 11, 1947

Geologic formation: Saluda - 18.1 feet exposed, upper part eroded

Products: agricultural lime

DECATUR COUNTY

16 Harris City Stone Company

Location: NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 28, T. 10 N., R. 9 E.

.5 mile north of Harris City

Date of field examination: July 28, 1948

Geologic formation: Laurel - 27.9 feet exposed, upper part eroded

Products: agricultural lime and road stone

17 Huber-Dorty Quarry

Location: NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 11, T. 10 N., R. 9 E.

South edge of Greensburg

Date of field examination: August 23, 1947

Geologic formation: Laurel - 54.3 feet thick, thin section eroded from top

DECATUR COUNTY, cont'd.

Products: crushed stone and agricultural lime

18 Layton Quarry

Location: SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 20, T. 9 N., R. 9 E.

3.25 miles northeast of Westport

Date of field examination: August 25, 1947

Geologic formation: Laurel - 14.2 feet exposed, upper part eroded

Products: agricultural lime and crushed stone

19 New Point Stone Quarry

Location: S $\frac{1}{2}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 8 and SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 7, T. 10 N., R. 11 E.

1 mile north of New Point

Date of field examination: August 21, 1947

Geologic formations: Laurel - 16.1 feet thick, upper part eroded

Osgood - 12.9 feet thick

Brassfield - 4.5 feet thick

Whitewater - 3.5 feet exposed

Products: agricultural lime and crushed stone

20 Vail Stone Company

Location: NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 12, T. 3 N., R. 9 E.

.35 mile east of Sandusky

Date of field examination: September 3, 1947

Geologic formation: Laurel - 18.5 feet exposed

Products: agricultural lime and road rock

DELAWARE COUNTY

21 J. & K. Stone Company

Location: SW $\frac{1}{4}$, sec. 23, T. 22 N., R. 10 E.

DELAWARE COUNTY, cont' d.

West edge of Eaton

Date of field examination: August 23, 1947

Geologic formation: Huntington - 18.7 feet exposed, upper part eroded

Products: crushed stone and agricultural lime

22 J. & Stone Company

Location: SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 20, T. 20 N., R. 10 E.

Southwest edge of Muncie

Geologic formation: Liston Creek

Note: not sampled or examined

Products: crushed stone and agricultural lime

23 Muncie Stone and Lime Company

Location: SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 20, T. 20 N., R. 10 E.

Southwest edge of Muncie

Date of field examination: August 25, 1947

Geologic formation: Liston Creek - 48.2 feet exposed, upper part eroded

Products: crushed stone and agricultural lime

GRANT COUNTY

24 Pipe Creek Stone Company

Location: SE $\frac{1}{4}$ sec 35, T, 25 N., R. 6 E.

2.5 miles west of Sweetser

Date of field examination: July 12, 1947

Geologic formations: Liston Creek - 18.3 feet thick, upper part eroded

Mississinewa - 17.3 feet exposed

Products: crushed stone, agricultural lime, and raw material for rock wool

HARRISON COUNTY

23 Corydon Stone Company

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 25, T. 3 S., R. 3 E.

Northwest edge of Corydon

Date of field examination: September 9, 1947

Geologic formation: St. Louis - 52.1 feet exposed

Products: road rock and agricultural limestone

26 Corydon Stone Company

Location: NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 25, T. 3 S., R. 4 E.

2.5 miles southwest of Lanesville

Date of field examination: September 9, 1947

Geologic formations: Salem - 26.2 feet thick upper part eroded

Harrodsburg - 41.5 feet exposed

Products: agricultural lime and crushed stone

27 Davis Brothers Stone Company

Location: SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 15, T. 2 S., R. 3 E.

1 mile northwest of Ramesy

Date of field examination: June 30, July 2, 1948

Geologic formations: Paoli - 5.1 feet thick, upper part eroded

Ste. Genevieve - 33 feet exposed

Products: agricultural limestone and road stone

28 Louisville Cement Company

Location: NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 13, T. 2 S., R. 2 E.

1.5 miles west of DePauw

Date of field examination: July 28, 1948

Geologic formation: Paoli - 17.6 feet exposed, upper part eroded

Products: flux stone and raw stone for burned lime

29 Louisville Cement Company

Location: NW $\frac{1}{4}$ sec. 14, T. 2 S., R. 2 E.

Northwest edge of Milltown

Date of field examination: July 31, September 8, 1947

Geologic formations: Ste. Genevieve - 36.6 feet being mined St. Louis - 18.5 feet
exposed

Products: raw stone for lime kilns; crushed stone and agricultural lime

30 Harrison County Quarry

Location : NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 12, T. 5 S., R. 2 E.

1.5 miles east of New Amsterdam

Geologic formations: Paoli - 21 feet exposed, upper part eroded Ste. Genevieve - 10 feet
exposed

Note: not sampled or examined

HOWARD COUNTY

31 Kokomo Creek Stone Company

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 17, T. 23 N., R. 4 E.

2 miles southeast of Kokomo

Date of field examination: July 15., 1947

Geologic formations: Kenneth - 4 feet thick, upper part eroded
Kokomo 12.4 feet exposed

Products: agricultural lime and crushed stone

HUNTINGTON COUNTY

32 Erie Stone Company

Location: SE $\frac{1}{4}$ SW $\frac{1}{4}$ and SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 12, T. 28 N., R. 9 E.

Eastern edge of Huntington

HUNTINGTON COUNTY, cont'd.

Date of field examination: July 8, 9, 1947

Geologic formation: Liston Creek - 34 feet exposed, upper part eroded

Note: lower part of section possibly Mississinewa

Products: agricultural lime and crushed stone

JACKSON COUNTY

33 Seymour Gravel Company

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec, 29, T. 5 N., R. 3 E.

2 miles northwest of Medora

Date of field examination: June 15, 16, 1948

Geologic formation: Harrodsburg - 25 feet exposed, upper part eroded

Products: agricultural lime and crushed stone

JASPER COUNTY

34 Babcock Construction Company

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 30, T. 29 N., R. 6 W.

Southeast edge of Rensselaer

Date of field examination: July 30, 1947

Geologic formation: Devonian (Jeffersonville?) 15.5 feet exposed, upper part eroded

Products: crushed stone and agricultural lime

JAY COUNTY

35 Rockledge Products Company

Location: NW $\frac{1}{4}$ sec. 30, T. 23 N., R. 14 E.

1.5-miles west of Portland

Date of field examination: August 30, 1947

Geologic formation: Huntington - 52.5 feet exposed, upper part eroded

Products: crushed stone and agricultural lime

JEFFERSON COUNTY

36 Independent Stone Company

Location: SW $\frac{1}{4}$ sec. 26, T. 5 N., R. 9 E.

13 miles northwest of Wirt

Date of field examination: August 9, 1947

Geologic formations: Jeffersonville - 9.2 feet thick, upper part eroded

Geneva - 15.7 feet thick

Laurel - 28.5 feet exposed

Products: agricultural lime and crushed stone

JENNINGS COUNTY

37 Paul Frank Quarry

Location: NE $\frac{1}{4}$ sec. 34, T. 7 N., R. 8 E.

Northeast edge of North Vernon

Date of field examination: August 28, 1947

Geologic formations: Beechwood. - 3.4 feet thick

Speed - 1.7 feet thick

Jeffersonville - 29.4 feet exposed

Products: crushed stone and agricultural lime

38 Muscatatuck State School Quarry

Location: SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 16, T. 7 N., R. 9 E.

1.5 miles northwest of Butlerville

Date of field examination: July 26, 1948

Geologic formation: Laurel - 36.8 feet exposed

Products: agricultural lime and road rock (all used by institution)

LAWRENCE COUNTY

39 Heltonville Limestone Company

LAWRENCE COUNTY, cont'd.

Location: NW¼, sec. 24, T. 6 N., R. 1 E.

1 mile northeast of Heltonville

Date of field examination: July 30, 1947

Geologic formation: Salem (Spalls from company's building stone mill)

Products: agricultural lime

39A Hostettler Quarry

Location: NW¼SE¼ sec. 31, T. 6 N., R. 2 W.

3.5 miles southwest of Springville

Geologic formation: Ste. Genevieve

Note: not sampled

40 Lehigh Portland Cement Company

Location: S½ sec. 30, T. 4 N., R. 1 E.

2 miles northeast of Mitchell

Date of field examination: June 24, 25, and July 30, 1948

Geologic formations: St. Louis - 10 feet thick, upper part eroded

Salem - 62.7 feet thick

Harrodsburg - 53.9 feet exposed

Products: raw stone for cement manufacture

41 Nally Ballard, and Cato

Location: SE¼NE¼ and NE¼SE¼ sec. 12, T. 3 N., R. 2

.5 mile west of Georgia

Date of field examination: June 30, 1948

Geologic formations: Paoli - 23.6 feet thick

Ste. Genevieve - 44.5 feet exposed

Products: agricultural lime and crushed stone

42 Oolitic Ground Limestone Company

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 16, T. 5 N., R. 1 W.

1 mile west of Bedford

Date of field examination: June 25, 1948

Geologic formation: Salem - 37.8 feet exposed, upper part eroded

Products: flux stone and agricultural lime

42A Ralph Rogers Company

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 29, T. 6 N., R. 2 W.

2 miles southwest of Springville

Date of field examination: April 30, May 21, 1949

Geologic formation: Ste. Genevieve - 109.8 feet exposed

Products: crushed stone and agricultural lime

43 Williams Limestone Company

Location: NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 24, T. 5 N., R. 1 W.

East edge of Bedford

Date of field examination: July 8, 12, 1948

Geologic formation: Salem - 20.3 feet being quarried

Products: crushed stone and agricultural lime

MADISON COUNTY

44 Indiana Reformatory Quarry

Location: SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 25, T. 18 N., R. 6 E.

2.5 miles southwest of Pendleton

Date of field examination: August 28, September 1, 1947

Geologic formation: Liston Creek - 51.7 feet exposed, upper part eroded

Products: crushed stone and agricultural lime

MADISON COUNTY, cont'd.

45 Standard Materials Corporation

Location: E $\frac{1}{2}$ NW $\frac{1}{4}$ and W $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 28, T. 19 N., R. 9 E.

Northwest corner of Lapel

Date of field examination: August 27, 28, 1947

Geologic formation: Liston Creek - 20.9 feet exposed, upper part eroded

Products: agricultural lime and crushed stone

MARTIN COUNTY

46 Gerkin Quarry

Location: W $\frac{1}{2}$ NW $\frac{1}{4}$ sec. 12, T. 3 N., R. 4 W.

2.6 miles northwest of Shoals

Date of field examination: July 11, 1947

Geologic formation: Glen Dean - 26.8 feet exposed

Products: crushed stone and some agricultural lime

47 Mt. Olive Quarry

Location: NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 1. T. 4 N., R. 3 W.

2 miles west of Williams

Date of field examination: July 15, 16, 1948

Geologic formation: Ste. Genevieve - 36.1 feet exposed

Products: crushed stone

MONROE COUNTY

48 Bloomington Crushed Stone Company

Location: SW $\frac{1}{4}$ NW $\frac{1}{4}$, sec. 28, T. 9 N., R. 1 W.

.5 mile north of Bloomington

Date of field examination: July 13, 1948

Geologic formations: Salem - 15.6 feet thick, most of formation eroded

Harrodsburg - 39.9 feet exposed

Products: crushed stone and agricultural lime

49 Quimby and Stephen Quarry

Location: SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 6, T. 7 N., R. 2 W.

2.8 miles south of Stanford

Date of field examination: June 17, 18, 1948

Geologic formations: Beaver Bond - 14.5 feet thick

Paoli - 15.4 feet thick

Aux Vases - 8.4 feet thick

Ste. Genevieve - 25.4 feet exposed

Products: agricultural lime and road stone

MONTGOMERY COUNTY

50 New Ross Limestone Company

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec, 3, T. 17 N., R. 3 W.

1.5 miles southwest of New Ross

Date of field examination: August 7, 1947

Geologic formation: Borden (reef) - 13.6 feet thick, upper part eroded

Products: mostly agricultural lime, some crushed stone

51 Waveland Stone Company

Location: SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 34, T. 17 N., R. 6 W.

2 miles southwest of Waveland

Date of field examination: August 8, 1947

N,

Geologic formation: St. Louis? - 30.2 feet quarried

Note: identification tentative. May be Harrodsburg.

Products: crushed stone and agricultural lime

NEWTON COUNTY

52 Newton County Stone Company

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 25, T. 27 N., R. 9 W.

2.5 miles east of Kentland

Date of field examination: July 31, August 1, 1947

Geologic formations: Middle Ordovician limestones and dolomites (depth of quarry 105 feet)

Products: crushed stone and agricultural lime

ORANGE COUNTY

53 Calcar Quarry

Location: SE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 6, T. 1 N., R. 1 E.

1 mile southeast of Paoli

Date of field examination: June 23, 24, 1948

Geologic formations: Paoli - 30.2 feet thick

Aux Vases - 4.3 feet thick

Ste. Genevieve - 67.1 feet exposed

Products: agricultural lime and road stone

54 Cave Stone Quarry

Location: NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 29, T. 2 N., R. 1 W.

3.5 miles northwest of Paoli

Date of field examination: July 1, 1948

Geologic formation: Ste. Genevieve - 51.3 feet exposed, upper part eroded

Products: agricultural lime and crushed stone

55 Radcliff and Berry, Inc.

Location: SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 24, T. 3 N., R. 1 W.

1 mile northwest of Orleans

Date of field examination: June 28, July 1, 1948

Geologic formations: Paoli - 14.9 feet thick, upper part eroded

Aux Vases - 3 feet thick

Ste. Genevieve - 70 feet exposed

Products: agricultural lime, crushed stone, aggregate for blocks and other concrete products

56 Thacker Quarry

Location: NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 33, T. 2 N., R. 1 W.

2.6 miles west of Paoli

Date of field examination: June 25, 1948

Geologic formations: Paoli - 17.7 feet thick, upper part eroded

Ste. Genevieve - 56.2 feet exposed

Products: agricultural lime and road stone

OWEN COUNTY

57 Dunn Limestone Company, Inc.

Location: NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 10, T. 10 N., R. 3 E.

3.5 miles northeast of Spencer

Date of field examination: July 21, 22, 1948

Geologic formations: St. Louis - 18.9 feet thick, upper part eroded

Salem - 39.8 feet exposed

Products: agricultural lime

58 Hahn Brothers Quarry

Location: NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 6, T. 8 N., R. 4 W. miles

southwest of Freedom

Date of field examination: July 21, 1948

Geologic formation: Beech Creek - 18.5 feet exposed

OWEN COUNTY, cont'd.

Product: agricultural lime

59 Midwest Rock Products Corporation

Location: NE $\frac{1}{4}$ sec. 30, T. 10 N., R. 3 W.

1 mile southwest of Spencer

Date of field examination: July 8, 1948

Geologic formation: Ste. Genevieve - 50.8 feet exposed (upper few feet eroded)

Products: crushed stone and agricultural lime

60 Winders and Sons Quarry

Location: NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 24 and SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec.13, T. 10 N., R. 4 W.

1.6 miles northwest of Spencer

Date of field examination: July 19, 1948

Geologic formation: Ste. Genevieve - 32 feet exposed (upper part eroded)

Products: agricultural lime and crushed stone

PERRY COUNTY

61 James Quarry

Location: SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 6, T. 5 S., R. 1 W.

1.5 miles east of Leopold

Date of field examination: July 27, 1948

Geologic formation: Glen Dean - 22.4 feet exposed

Products: agricultural lime and crushed stone

62 Lutgring and Sons Quarry

Location: NE $\frac{1}{4}$ sec. 18, T. 4 S., R. 1 W.

.6 mile east of Branchville

Date of field examination: July 23, 1947

Geologic formation: Glen Dean - 23.9 feet thick Products:
agricultural lime and road stone

63 Scheeler Quarry

Location: NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 32, T. 5 S. R. 1 W.

1 mile northeast of Derby

Date of field examination: July 16, 26, 1948 Geologic

formation: Glen Dean - 28 feet exposed Products: agricultural
lime and crushed stone

PUTNAM COUNTY

64 Indiana State Farm. Quarry

Location: NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 17, T. 13 N., R. 4 W.

1 mile southwest of Putnamville

Date of field examination: August 20, 1947

Geologic formation: Ste. Genevieve - 83.9 feet thick, upper part
eroded

Products: agricultural lime and small amount of crushed stone

65 Lone Star Cement Company

Location: junction of secs. 28, 29, 32, and 33, T. 14 N., R. 4 W.

.25 mile southeast of Limesdale

Date of field examination: August 14, 15, 1947

Geologic formation: Ste. Genevieve - 47.9 feet exposed, upper part eroded

Product: raw limestone for manufacture of Portland cement

66 Ohio and Indiana Stone Company

Location: junction of secs. 19, 20, 29, and 30, T. 14 N., R. 4 W.

1 mile southeast of Greencastle

Date of field examination: August 12, 13, 1947

OHIO COUNTY cont'd.

Geologic formation: Ste. Genevieve - 53.4 feet exposed, upper part eroded

Products: crushed stone, agricultural lime, and high-calcium limestone dust

67 Russelville Stone Company

Location: NW $\frac{1}{4}$ SE $\frac{1}{4}$, sec. 8, T. 16 N., R. 5 W. .5 mile south
of Russelville

Date of field examination: August 9, 1947

Geologic formation: Harrodsburg? -20.7 feet exposed, upper part eroded.

Note: identification tentative

Products: agricultural lime and crushed stone

RANDOLPH COUNTY

68 H. and R. Stone Company

Location: SE $\frac{1}{4}$ NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 12, T. 21 N., R. 13 E.
.5 mile southeast of Ridgeville

Date of field examination: August 31, 1947

Geologic formation: Huntington - 17.6 feet exposed, upper part eroded

Products: agricultural lime and crushed stone

69 M. D. & R. Stone Company

Location: SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 10, T. 21 N., R. 12 E.
1.5 miles southeast of Fairview

Date of field examination: August 29, 1947

Geologic formation: Huntington - 21.1 feet exposed, upper part eroded

Products: agricultural lime and crushed -stone

RIPLEY COUNTY

70 Bultman Quarry

Location: SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 3, T. 7 N., R. 10 E.

1 mile west of Holton

Date of field examination: September 23, 1947

Geologic formation: Laurel - 21.3 feet exposed, upper part eroded

Products: crushed stone and agricultural Jim

71 Cord Stans Company

Location: SE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 26, T. 7 N., R. 11 E.

2.8 miles southwest of Versailles

Date of field examination: August 12, 1947

Geologic formation: Laurel - 28.8 feet exposed, upper part eroded

Products: agricultural lime and crushed stone

72 Napoleon Lime Industry

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 29, T. 9 N., R. 11 E.

.5 mile east of Napoleon

Date of field examination: August 14, 1947

Geologic formation: Laurel - 19.7 feet exposed, upper part eroded

Product: crushed stone

73 Ripley County Construction Company

Location: W $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 22, T. 8 N., R. 11 E.

South edge of Osgood

Date of field examination: August 13, 1947

Geologic formation: Laurel - 20.5 feet exposed, upper part eroded

Products: road stone and agricultural lime

RUSH COUNTY

74 McCorkle Stone Company

RUSH COUNTY, cont'd.

Location: NW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 17, T. 12 N., R. 9 E.

4 miles west of Milroy

Date of field examination: July 15, 1947

Geologic formation: Geneva - 23.7 feet exposed, upper part eroded

Products: agricultural lime and crushed stone

75 Rush County Stone Company

Location: W $\frac{1}{2}$ SE $\frac{1}{4}$ sec. 18, T. 12 N., R. 9 E.

West edge of Moscow

Date of field examination: September 3, 1947

Geologic formation: Geneva - 23 feet exposed, upper part eroded

Products: crushed stone and agricultural lime

SCOTT COUNTY

76 Scott County Stone Company

Location: SE $\frac{1}{4}$ sec. 20, T. 3 N., R. 8 E.

2 miles south of Blocher

Date of field examination: August 27, 1947

Geologic formations: Beechwood - 4.9 feet thick

Silver Greek - 4.9 foot thick

Speed - 3.3 feet thick

Jeffersonville - 40 feet exposed

Products: agricultural lime and crushed stone

SHELBY COUNTY

77 Burke Stone Company

Location: SW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 29, T. 11 N., R. 7 E.

West edge of Norristown

Date of field examination: August 15, 1947

Geologic formation: Geneva - 20.2 feet exposed, upper part eroded

Product: agricultural lime

78 Cave Stone Company

Location: SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 22, T. 11 N., R. 7 E.

1 mile west of Geneva

Date of field examination: July 28, 1948

Geologic formation: Geneva - 16.3 feet exposed, upper part eroded

Products: agricultural lime and road stone

79 St. Paul Stone Company

Location: NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 9, T. 11 N., R. 8 E.

.4 mile southwest of St. Paul

Date of field examination: September 2, 3, 1947

Geologic formation: Laurel - 27.7 feet exposed, upper part eroded

Products: agricultural lime and road stone

SULLIVAN COUNTY

80 Kixmiller Brothers, Quarry

Location: SE $\frac{1}{4}$ SW $\frac{1}{4}$, sec. 28, T. 6 N., R. 8 W.

3 miles north of Freelandville

Date of field examination: July 21, 1947

Geologic formation: Maria Creek - 4.9 feet thick

Products: agricultural lime

SWITZERLAND COUNTY

81 Leatherbury Brothers Quarry

Location: SW $\frac{1}{4}$ sec. 9, T. 5 N., R. 12 E.

1.5 miles northwest of Pleasant

SWITZERLAND COUNTY cont'd.

Date of field examination: September 22, 1947

Geologic formation: Whitewater - 9.3 feet exposed, upper part eroded

Products: agricultural lime and crushed stone

WABASH COUNTY

82 Celotex Quarry

Location: NE $\frac{1}{4}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 3, T. 27 N., R. 7 E.

1 mile south of Lagro

Date of field examination: July 3, 5, 1947

Geologic formation: Mississinewa - 48.6 feet exposed, upper part eroded

Product: shale for manufacture of rock wool

83 National Rock Wool Sales, Inc.

Location: NE $\frac{1}{4}$ NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 3, T. 27 N., R. 7 E.

1 mile south of Lagro

Date of field examination: July 4, 5, 1947

Geologic formation: Mississinewa - 24.8 feet exposed

Product: raw shale for manufacture of rock wool

WASHINGTON COUNTY

84 Hoosier Lime and Stone Company

Location: NE $\frac{1}{4}$ sec. 24, T. 2 N., R. 3 E.

.7 mile west of Salem

Date of field examination: August 19, September 9, 1947

Geologic formation: Salem - 40.5 feet exposed, upper part eroded

Products: agricultural lime and road stone

85 Ralph Rogers Company

Location: NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 20, T. 2 N., R. 4 E.

1 mile south of Salem

Geologic formation: Harrodsburg limestone

Product: road stone (on demand)

Note: not sampled or examined

86 Washington County Quarry

Location: NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 13, T. 2 N., R. 3 E.

2 miles east of Livonia

Date of field examination: June 28, 1948

Geologic formations: Paoli - 7.4 feet thick, upper part eroded

Ste. Genevieve - 43.6 feet exposed

Products: road stone

WAYNE COUNTY

87 DeBolt Quarry

Location: NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 11, T. 13 N., R. 1 W.

3 miles southeast of Richmond

Date of field examination: November 12, 1947

Geologic formation: Elkhorn - 15.2 feet exposed, upper part eroded

Products: agricultural lime and road stone

WELLS COUNTY

88 Erie Stone Company

Location: NW $\frac{1}{4}$ sec. 28, T. 27 N., R. 12 E.

1.5 miles north of Bluffton

Date of field examination: July 16, 1947

Geologic formation: Liston Creek - 38.7 feet exposed, upper part eroded

Products: agricultural lime and crushed stone

WHITE COUNTY

89 Monon Crushed Stone Company

Location: SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 28, T. 28 N., R. 4 W.

1 mile south of Monon

Date of field examination: July 29, 1947

Geologic formation: Huntington - 85 feet exposed, upper part eroded

Products: agricultural lime and crushed stone

ANALYSES

All determinations in the following tables, except those of carbon dioxide, were made in the spectrographic laboratory of the Division of Geology by Mr. R. K. Leininger. The carbon dioxide determinations were run chemically by Mr. Maynard Coller. All samples were run in duplicate or triplicate.

The numbers in the column headed "Quarry" refer to the quarries on the map (Plate 1).

Formations are arranged alphabetically. The samples are placed in the same order and vertical relationship that they had in the quarry wall. The word "total" in parentheses after the thickness of a sample indicates that the sample represents all of the formation exposed or quarried.

Chip samples were used for all the analyses except one, No. P4836. Chip sampling was done by removing small chips of rock from the quarry face in such a way as to give nearly continuous samples from the bottom to the top of the rock unit. The chips were taken from unweathered surfaces and were kept free of clay and other contamination. Chips of equal size were taken from equal thicknesses of rock within a given unit.

Formation	Quarry	Sample Number	Thickness	CaCO ₃	MgCO ₃	Al ₂ O ₃	Fe ₂ O ₃	SiO ₂	TiO ₂	CO ₂
Aux Vases	49	P4829	Upper 6.6 feet	61.1	2.44	4.87	1.58	29.9	0.26	26.4
		P4827	Lower 1.8 feet	35.0	1.40	3.79	1.00	58.8	0.16	15.8
Aux Vases	55	P48111	3 feet (total)	48.5	32.5	2.27	1.78	15.1	0.09	38.6
Beaver Bend	49	P4836	*Rock sample 6.8 feet	98.1	0.96	0.062	0.32	0.59	N.D.	43.8
Beech Greek	58	P48153	Upper 9.8 feet	95.6	1.86	0.41	0.60	1.55	Tr.	42.9
		P48151	Lower 8.7 feet	94.0	2.28	0.82	0.58	2.22	0.34	42.0
Beechwood	76	P47105	4.9 feet (total)	81.9	14.3	0.72	0.52	2.54	Tr.	43.4
Beechwood	4	P47239	3.5 feet (total)	97.7	0.64	0.17	0.24	1.22	Tr.	42.8
Brassfield	19	P4777	4.5 feet (total)	97.2	1.09	0.34	0.44	0.89	0.025	43.1
Devonian (undif)	34	E47182	14.9 feet (total)	51.0	41.4	1.17	1.14	5.3	0.034	44.0
Elkhorn	87	P47264	Upper 1.9 feet	51.6	34.1	3.0	0.88	10.3	0.066	40.6
		P47262	7.4 feet	84.4	12.3	0.79	0.76	1.64	0.03	42.9
		P47260	Lower 2.5 feet	90.3	7.26	0.52	0.76	1.13	0.024	42.9
Geneva	36	P4746	15.7 feet (total)	58.6	38.8	0.16	0.26	2.18	Tr.	46.2
Geneva	74	P47127	Upper 8.6 feet	61.6	37.3	1.53	1.32	7.58	Tr.	47.0
		P47129	10 feet	56.0	42.7	0.18	0.13	1.01	N.D.	46.5
		P47131	6.3 feet	59.1	39.7	0.14	0.13	0.89	Tr.	46.6
		P47133	Lower 7.9 feet	57.3	40.6	0.27	0.18	1.56	0.015	46.3

* From base of 14.5 feet thickness

Formation	Quarry	Sample Number	Thickness	CaCO ₃	MgCO ₃	Al ₂ O ₃	Fe ₂ O ₃	SiO ₂	TiO ₂	CO ₂
Glen Dean	46	P4714	Upper 8.7 feet	90.8	5.04	0.54	0.83	2.70	0.028	42.2
		P4716	9.5 feet	76.9	15.4	1.21	2.06	4.41	0.044	42.3
		P4717	Lower 4.5 feet	88.7	6.38	0.54	0.79	3.62	0.026	42.0
Glen Dean	62	P47121	Upper 10.0 feet	90.5	5.48	0.64	0.69	2.58	0.027	42.8
		P47119	Lower 13.9 feet	85.4	10.5	0.45	1.06	2.52	Tr.	43.1
Harrodsburg	67	E47246	20.8 feet (total)	86.2	4.89	1.44	0.66	6.72	0.034	40.0
Harrodsburg	48	P48133	Upper 10.2 feet	95.0	3.33	0.28	0.16	1.23	Tr.	43.6
		P48134	10.2 feet	94.9	2.35	0.44	0.40	1.90	Tr.	42.1
		P48131	11.0 feet	89.5	6.70	0.96	0.42	2.44	0.030	42.1
		P48129	Lower 8.5 feet	61.9	22.8	3.15	1.26	10.9	0.11	38.3
Huntington (reef)	89	E47174	Upper 46.8 feet	58.3	41.2	0.083	0.21	0.18	Tr.	47.6
E47173		Lower 23 feet	52.9	45.1	0.35	0.33	1.32	0.022	46.3	
Jeffersonville	36	P4750	Upper 6.0 feet	82.9	10.4	0.035	0.072	6.62	N.D.	41.5
		P4748	Lower 3.2 feet	89.0	8.72	0.083	0.18	2.06	Tr.?	43.5
Jeffersonville	4	P47241	Upper 7.1 feet	90.9	4.37	0.10	0.14	4.40	Tr.	41.7
		P47243	11.0 feet	60.2	33.6	0.62	0.20	5.30	0.022	44.3
		P47245	11.3 feet	59.5	33.8	0.79	0.25	5.42	0.026	44.2
		P47248	Lower 5.6 feet	74.8	20.0	0.28	3.17	1.80	0.016	41.8
Kenneth	31	E4783	4 feet (total)	94.7	1.04	0.94	0.22	3.10	0.035	40.9
Kokomo	31	E4782	Upper 12.4 feet							
			(total)	81.5	12.8	0.90	0.26	3.38	0.032	41.9
Laurel (cherty)	36	P4744	Upper 7.8 feet	53.0	29.2	0.64	0.26	16.9	0.036	38.4

		P4742	10.2 feet	61.8	33.0	0.79	0.58	3.78	0.032	44.3
		P4740	Lower 10.5 feet	75.9	20.0	0.77	0.19	3.15	0.032	43.7
Laurel	19	P4783	Upper 7.4 feet	67.6	28.6	0.69	2.28	2.76	0.032	44.6
		P4781	Lower 10.5 feet	59.6	28.4	1.90	0.55	9.43	0.061	40.9
Laurel	79	P47157	Upper 8.0 feet	88.2	8.08	0.48	0.14	3.28	0.024	42.7
		P47155	8.2 feet	86.4	9.73	0.53	0.17	3.06	0.026	42.6
		P47153	Lower 11.3 feet	85.0	10.5	0.80	0.24	3.43	0.035	42.4
Liston Creek	24	E4766	Lower 18.3 feet							
			(total)	83.6	4.78	1.24	0.40	9.78	0.053	38.0
Louisville	10	P47224	Upper 11.2 feet	66.1	15.0	3.26	0.82	14.6	0.12	36.5
		P47226	Lower 11.1 feet	67.2	14.0	3.25	0.71	14.6	0.12	36.5
Maria Creek	80	P4720	4.9 feet (total)	87.5	6.47	0.72	1.92	3.23	0.035	42.5
Minshall	13	P48144	Upper 0.9 feet	75.0	6.44	3.77	2.61	12.2	0.14	35.9
		P48141	2.6 feet	72.4	2.74	1.99	1.11	21.7	0.067	31.8
		P48139	1.3 feet	82.3	2.62	3.30	1.30	10.4	0.15	35.8
Mississinewa	24	E4765	Upper 17.5 feet							
			(total)	30.9	24.5	7.06	1.77	36.0	0.22	23.2
Osgood	19	P4779	Lower 9.1 feet	71.5	17.5	2.66	0.74	8.45	0.091	38.8
Paoli	49	P4834	Upper 7.4 feet	96.2	1.40	0.30	0.31	1.78	N.D.	42.7
		P4832	Lower 8.0 feet	94.7	0.94	0.81	0.19	3.31	0.032	41.6
Paoli	55	P48114	14.9 feet (total)	94.8	0.80	0.90	0.15	3.39	0.038	42.2
Ste. Genevieve	66	E47262	Upper 21.4 feet	97.1	0.53	0.36	0.22	1.84	0.014	43.1
		E47261	10.1 feet	97.1	0.58	0.26	0.16	1.94	Tr.	42.8
		E47260	Lower 12.2 feet	92.7	0.83	0.58	0.14	6.08	0.028	40.3
Ste. Genevieve	11	P476	Upper 12.3 feet							
			(of tunnel)	98.0	1.15	0.014	0.054	0.64	N.D.	44.2
		P478	10.3 feet	81.1	12.8	0.64	0.16	5.31	0.032	42.2

Analyses of Limestones Quarried in Indiana, Cont'd.

Formation	Quarry	Sample Number	Thickness	CaCO ₃	MgCO ₃	Al ₂ O ₃	Fe ₂ O ₃	SiO ₂	TiO ₂	CO ₂
Ste. Genevieve	11	P4710	Lower 8.7 feet	85.4	7.81	1.02	0.20	5.51	0.053	41.3
Ste. Genevieve										
(Levias)	59	P48124	Upper 14.5 feet	91.3	0.98	0.53	0.11	7.08	0.024	39.5
		P48122	14.7 feet	93.0	1.98	0.72	0.12	4.19	0.034	41.6
		P48119	14.1 feet	95.8	1.12	0.56	0.12	2.42	0.022	42.4
		P48116	Lower 4.9 feet	92.9	1.50	1.28	0.38	3.96	0.048	40.6
Ste. Genevieve										
(Fredonia)	29	P4728	Upper 12.1 feet	90.3	6.74	0-45	0.096	2.44	0.030	43.0
		P4730	(Lost River chert)							
			5.8 feet	34.0	0.58	0.11	0.053	65.2	Tr.	15.2
		P4732	9.9 feet	98.5	0.91	0.098	0.040	0.51	N.D.	43.7
		P4734	Lower 7.6 feet	97.6	0.99	0.20	0.043	1.15	Tr.	43.4
Ste. Genevieve										
(Fredonia)	53	P4837	Upper 9.3 feet							
			(total)	98.5	0.866	0.16	0.043	0.44	Tr.	43.9
Ste. Genevieve	55	P48108	Upper 8.8 feet (L)	95.6	0.91	0.76	0.14	2.56	0.029	42.6
		P48105	8.0 feet (L)	97.6	0.66	0.24	0.067	1.44	N.D.	43.6
		P48102	8.2 feet (L)	94.0	3.90	0.24	0.091	1.64	Tr.	43.2
		P48100	8.6 feet (L)	90.5	6.88	0.36	0.12	2.09	Tr.	43.2
		P4898	9.4 feet (L)	89.5	7.96	0.26	0.10	2.22	Tr.	43.4
		P4870	11.8 feet (R)	95.0	0.69	0.56	0.098	3.60	0.032	42.4
		P4868	15.2 feet (F)	99.0	0.80	0.048	0.048	0.13	N.D.	44.3
St. Louis	29	P4736	Upper 8.6 feet	95.7	2.31	0.44	0.092	1.39	0.022	43.6
		P4738	Lower 11.2 feet	78.8	16.1	0.62	0.16	3.80	0.028	43.1
St. Louis	25	P47181	Upper 12.2 feet	73.9	19.6	0.51	0.16	5.83	0.026	42.6
		P47179	8.5 feet	92.1	3.72	0.53	0.10	3.59	0.026	42.1

		P47177	11.1 feet	85.4	5.68	0.43	0.11	8.33	0.025	40.4
		P47175	7.8 feet	75.1	16.0	1.49	0.37	6.99	0.064	40.7
		P47172	Lower 10.5 feet	81.2	11.2	1.25	0.29	5.92	0.059	40.9
Salem	84	P47171	Upper 8.2 feet	95.8	2.28	0.21	0.14	1.58	Tr.	43.1
		P47169	7.9 feet	79.4	17.2	0.52	0.35	2.50	0.030	43.6
		P47168	12.7 feet	97.2	1.06	0.064	0.14	1.56	N.D.	43.2
		P47166	Lower 11.6 feet	96.9	1.14	0.072	0.095	1.80	N.D.	43.5
sales	48	P48137	Lower 8.6 feet	97.2	0.96	0.20	0.20	1.39	Tr.	42.8
Saluda	15	P4752	Upper 9.1 feet	47.9	23.8	4.71	2.47	20.8	0.22	33.6
		P4755	Lower 9.4 feet	88.6	2.68	1.77	0.50	6.35	0.088	39.4
Saluda	14	P4759	4.6 feet (total)	50.0	23.7	4.50	1.98	19.5	0.23	33.8
Silver Creek	76	P47107	0.8 feet (total)	49.0	31.2	4.79	1.41	13.0	0.18	36.2
Silver Creek	10	P47213	10.3 feet (total)	59.9	19.8	4.40	1.06	14.8	0.16	36.0
Silver Creek	9	P47228	Upper 7.9 feet	53.8	25.7	3.28	1.22	15.8	0.13	36.9
		P47230	Lower 6.1 feet	61.8	19.6	4.07	0.92	14.4	0.17	35.9
Speed	9	P47231	4.4 feet (total)	84.7	5.05	1.93	0.64	7.60	0.071	38.8
Whitewater	14	P4757	8.5feet (total)	84.9	3.19	2.95	0.58	8.27	0.10	38.1
Whitewater	19	P4775	3.5 feet (total)	88.4	3.38	2.06	0.64	5.43	0.083	38.5
Whitewater	81	P47205	8.5 feet (total)	78.3	9.55	2.78	0.71	8.45	0.11	38.7

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ADDENDA

The following quarries, which came to the attention of the author after this report was in an advanced stage of publication, do not appear on the map:

HARRISON COUNTY

Carl Mathes Quarry

Location: SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 13, T. 4 S., R. 3 S.

3 miles south of Corydon

Geologic formation: Ste. Genevieve

Products: crushed stone and agricultural lime

Note: not sampled

PULASKI COUNTY

Francesville Stone Company

Location: NE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 21, T. 29 N., R. 4 W.

2.5 miles south of Francesville

Geologic formation: Huntington

Products: crushed stone and agricultural lime

Note: not sampled

WELLS COUNTY

Heller Stone Company

Location: sec. 29, T. 27 N., R. 11 E.

7 miles west and 1 mile north from Bluffton

Geologic formation: Liston Creek

Products: crushed stone and agricultural lime

Note: not sampled or examined

