

## DIVISION OF GEOLOGY

(Seventy-fourth Annual Report of the State Geologist)

### PERSONNEL

#### Permanent

CHARLES F. DEISS, State Geologist and Director  
 ROBERT BAKER, Draftsman  
 BERNICE BANFILL, Assistant to the State Geologist (Appointed March 16, 1950)  
 DORIS F. BIEBERMAN, Petroleum Technologist  
 ROBERT F. BLAKELY, Spectrographer (Appointed September 16, 1949)  
 BARBARA E. BROOKS, Petroleum Technologist  
 MAYNARD E. COLLER, Chief Chemist  
 THOMAS DAWSON, Petroleum Geologist (Appointed April 1, 1950)  
 RALPH E. ESAREY, Chief, Petroleum Section  
 J. J. GALLOWAY, Chief, Section of Paleontology and Stratigraphy  
 GOTTFRIED K. GUENNEL, Coal Geologist (Appointed July 1, 1949)  
 ROSS HICKAM, Preparator  
 KATHLEEN E. JELLISON, File Clerk and Typist (Appointed August 29, 1949)  
 PATRICIA A. KELLY, Petroleum Technician (Resigned May 20, 1950)  
 PHYLLIS KRAMBECK, Secretary, Petroleum Section (Appointed September 19, 1949)  
 RICHARD K. LEININGER, Chief Spectrographer  
 JUDSON MEAD, Chief Geophysicist  
 WILLIAM H. MORAN, Chief Draftsman  
 JOHN B. PATTON, Chief, Industrial Minerals Section  
 DEAN PENNINGTON, Petroleum Geologist (Appointed June 15, 1950)  
 GEORGE R. RINGER, Photographer  
 JEAN ANNE TAYLOR, Editor and Publications Curator  
 ANN THOMAS, Secretary, Industrial Minerals, Coal, and Spectrography Sections (Appointed September 16, 1949)  
 WILLIAM D. THORNBURY, Chief, Glaciology Section  
 VIRGINIA WARREN, Petroleum Technologist (Appointed April 17, 1950)  
 CHARLES E. WIER, Chief, Coal Section

### SURVEY FIELD PARTIES (Part Time)

#### CLAY-SHALE SURVEY

HOWARD MOREHOUSE, Assistant  
 HAYDN MURRAY, Party Chief

#### COAL SURVEY

FRANK KOTTELOWSKI, Party Chief  
 JAMES T. STANLEY, Assistant  
 W. E. TAYLOR, Assistant  
 COURTNEY WADDELL, Party Chief

JOHN L. HAMILTON, Assistant  
RICHARD HARRIS, Curatorial Assistant  
HAROLD C. HUTCHINSON, Party Chief  
JACK PICKERING, Assistant

## GLACIOLOGY

WILLIAM CRITES, Assistant  
HAROLD L. DEANE, Assistant  
HARMON E. EVELAND, JR., Party Chief  
W. C. HEISTERKAMP, Assistant  
DEE RARICK, Assistant  
WILLIAM J. WAYNE, Party Chief

## INDIANA MINERALS

RICHARD C. ERD, Party Chief

## LIMESTONE SURVEY

DALLAS FIANDT, Party Chief  
JOSEPH ST. JEAN, JR., Assistant

## PALEONTOLOGY AND STRATIGRAPHY

CARLYLE HILL, Assistant

## PETROLEUM GEOLOGY SURVEY

PAUL KELLY, Assistant  
EARL E. NEWCOMER, Assistant  
DON E. SIX, Party Chief  
IRA D. TAYLOR, Assistant  
CLAY WARREN, Assistant  
PAUL D. YUNDT, Party Chief

## GRAVEL SURVEY

DONALD R. COATES, Party Chief  
ROBERT SARGENT, Party Chief  
GORDON GRENDER, Assistant  
WESLEY E. WILLIAMS, Assistant  
HARRY KUGLER, Party Chief

## SAND SURVEY

CHARLES L. BIEBER, Party Chief  
NED SMITH, Assistant

## SEISMIC SURVEY

MAURICE BIGGS, Party Chief  
DENNIS R. LUCAS, Assistant

## ANALYTICAL LABORATORIES (Part Time)

GERALD L. CARPENTER, Technician  
RAYMOND GEORGE, Assistant in Spectrography  
EDEN J. GIANOTTI, Technician  
EDWIN HICKAM, Technician  
ANDREW J. HREHA, Technician  
DONALD E. HYER, Technician  
FRANK JOHNSON, Chief Technician  
BERYL DALE KLINE, Chief Technician  
JAMES F. POWELL, Assistant  
ROSALIND ROBINSON, Technician  
CAROL SARGENT, Technician  
HAROLD SORGENFREI, Technician  
DANIEL S. TUDOR, Technician  
KENNETH WATERS, Technician

## SUMMARY STATEMENT

Few Hoosiers are aware of the size and scope of the Division of Geology or of its rapid growth since 1946, nor do they realize the dollar value of the Division to the mineral industries of Indiana. During the year, 25 permanent and 51 part-time persons were needed to carry on the many varied tasks required to do research, maintain records, and furnish information to the public. The Division was asked by industry, individuals, and state organizations to furnish technical help or information on problems of finding oil and gas, the thickness of earth materials that cover gravel and limestone deposits, the reserves of coal in several counties, the composition and extent of clay deposits, and many others.

To help answer such questions and to provide useful information in finding and efficiently exploiting mineral deposits, the Division of Geology is organized into sections, each of which carries on research and maintains records pertaining to its special mineral or purpose. These sections are (1) coal, (2) geophysics, (3) glacial geology, (4) industrial minerals—clay, limestone, dolomite, marl, gravel, building stone, and sand, (5) paleontology and stratigraphy, and (6) petroleum. To understand the chemical and physical composition of our industrial minerals and to determine their useful industrial properties, the Division of Geology maintains research laboratories in chemistry, X-ray analysis, spectrography, thermal analysis, microscopic analysis, and geophysics, and also operates a laboratory for preparing the samples for analysis.

In addition to the permanent laboratory and office work, 16 summer field parties mapped coal lands, limestone deposits, sand and gravel deposits, molding sand deposits, oil fields, and glacial deposits. The field parties also studied mineral deposits and the geologic factors that affect them and collected samples of the deposits for laboratory analysis. One field party studied the thickness of glacial drift by means of a seismograph, and another party investigated the composition and distribution of several oil-bearing limestones.

The staff geologists of the Division assembled the results of the field and laboratory research into reports and maps in order to make

the technical information available to industry and the public. Preparation of such geologic maps and reports required a staff of draftsmen, typists, editor, and photographer. The maintenance of records of drilled oil, gas, and water wells, coal borings, and similar materials required eight additional persons. The various sections also gave many hundreds of hours of services to the general public during the year. In addition to such services listed under the Petroleum Section in this report, the Industrial Minerals Section wrote 204 letters in reply to requests for information, identified 125 rocks and minerals, mailed out on request 59 samples of Indiana rocks and minerals, made 7 special field trips, and held 127 conferences with individuals who came to the Section for geologic assistance. The personnel of the Division also lectured before technical bodies, schools, and service clubs on topics dealing with Indiana geology.

The activities and the results obtained by each Section are discussed under separate headings in order to segregate the information and thereby save time for the reader interested in only one kind of mineral deposit.

#### CLAY

Indiana possesses large deposits of clay and shale that range widely in composition, age, and availability. During the past several years the Division of Geology has received inquiries from brick and tile companies concerning such technical questions as the thickness and lateral extent of specific deposits, the percent of certain clays when fired, the reason that some clays produce brittle weak tiles, and others. Two reasons account for the fact that the Division can not answer such questions: (1) geologic work on clays of Indiana has not been done since 1931, and (2) the Division has never had the laboratory equipment nor a clay mineralogist to do the necessary research. In order to get the answers to technical problems needed by the ceramic industry and because some companies are exhausting their present clay reserves and others are encountering trouble because of impurities in the deposits, the Division of Geology this year planned a new clay program to include field surveys and laboratory research. As the first step in this long term program, a survey was begun this year of all operating clay pits and brick and tile plants in the State. The field party is examining each deposit, measuring its thickness, estimating its lateral extent, and collecting samples for laboratory analysis. The party also is obtaining all available technical information about the manufacturing problems of brick and tile directly from officials or ceramic engineers in each plant. The response of clay users in the State has been favorable and several of the largest companies are cooperating fully. A report of progress to the clay industry will be published next year, and will contain a map showing the location of clay pits and plants and the geologic age and characteristics of each deposit.

#### COAL

Coal ranks first among Indiana's industrial minerals; its gross value in 1949 is reported to be more than 76 million dollars. Since 1849



when records of tonnage were first reported, more than 993 thousand million tons have been mined. (See production chart.) This coal is forever lost from our reserves and, more importantly, represents the highest grade coal that was most easily mined. Coal has been stripped from large areas of cheap land, but the deeper veins can not be stripped and will have to be mined underground at higher costs in the future when the remaining coal beds that can be stripped are depleted. The larger coal companies are actively prospecting for new reserves, both in new areas and in extensions of the deposits they are now mining.

In order to assist the coal producers to determine the mineable reserves in Indiana, the Division of Geology has a long-term program that consists of three main parts: (1) detailed geologic mapping of coal quadrangles, (2) reconnaissance mapping of coals by counties, and (3) research on the physical composition of each coal bed in Indiana. The Division also is cooperating with the Fuels Section of the U. S. Geological Survey to obtain by 1952 a new estimate of the coal reserves of the entire State.

Since 1947, the Division has mapped the areal geology and all mineral resources of the following quadrangles within the coal lands: Coal City, Switz City, Jasonville, Linton, Dugger, Hymera, Lewis, Seelyville, Shelburn, Fairbanks, and Hutton. The Coal City, Switz City, Shelburn, and Hutton quadrangles were mapped this year. Coals maps of Sullivan and Vigo counties also were completed this year and mapping of Clay, Parke, and Vermillion counties was started.

In connection with the actual geologic mapping which is being done on airplane photographs, each field party also obtains all available data from the coal companies concerning mined-out coals and drill records that indicate the presence of any coal beds that are beneath the surface of Indiana. Since 1947, drill logs and maps of coal mines have been cataloged. The information on these records has been plotted on new maps which show the mined-out coal beds and the areas in which coal is still present. This precise information is immediately useful and valuable to the coal producers. This year geologic and mined-out maps of the Jasonville quadrangle were published jointly with the U. S. Geological Survey. Mined-out and structural maps of the coals in Sullivan and Vigo counties also were made and will be published next year.

The research on the physical properties of our coals is largely laboratory work upon samples taken by the geologic field parties of coal beds encountered in mapping quadrangles and counties. The samples of coals are macerated, the plant spores and pollen are removed from the macerated samples, the spores or pollen are strained and mounted on microscopic slides, identified and recorded, and a percentage diagram or frequency chart of the species found in each coal is then drawn. This research was started in September 1949 and should give a dependable method of identifying each coal bed and, thereby, of determining the number of coal beds in Indiana. Several months were used to set up the laboratory and obtain a library of publications on spore analyses. By July 1, 1950, maceration was completed on samples of

Coals III, IV, V, and VI, from 74 localities, more than 900 slides were prepared, and 6,000 individual spores were counted, identified, and recorded.

The work so far is confined to commercial coals, but the first publication on this spore work will include all of the known coals in the Alleghanian Series of Indiana and will be ready by January 1, 1951.

#### GEOPHYSICS

The Geophysics Section of the Division was organized in May 1950, and field work was begun June 15. The Section procured seismic refraction equipment, installed it in the geophysics truck, and trained personnel in preparation for the field survey.

This year the Section began a seismic refraction survey of the northern part of Indiana to determine the thickness of the glacial deposits. The area includes all of the State north of the east-west line through the southern boundaries of Pulaski, Fulton, and Allen counties. The thickness of the drift was determined at stations spaced three miles east-west and six miles north-south. About 70 percent of the field work is completed. Interpretation and evaluation of the data will be completed and made available to the Glacial Geology Section by 1951. The corrected thicknesses will then be added to the drift-thickness map of Indiana.

#### GLACIAL GEOLOGY

The Section of Glacial Geology is responsible for mapping all deposits that were produced by glaciers in Indiana, for collecting and maintaining records of water wells, and for constructing a bedrock map and a drift-thickness map of the State. This geologic work gives quantitative answers to such questions as the depth to limestone deposits, the thickness and depth of water filled sand and gravels, the origin and extent of sand and gravel deposits, and the location and size of valleys buried beneath glacial deposits, information which is needed by producers of limestone, sand, and gravel, and by water well drillers throughout more than four-fifths of the State.

The specific projects and results of work by the Glacial Geology Section during the year are the preparation of a glacial geology map, a drift-thickness map, and four maps of quadrangles along the Wabash River. The glacial geology map of Indiana was started in October 1949. The map is being prepared by interpretation of county soil maps and aerial photographs and by field mapping in counties for which soil maps are not available. As of June 1950, maps were completed for 72 of the 92 counties in Indiana. Of the 20 remaining counties, 10 were mapped during the 1950 summer field season.

Preparation of the report "Glacial geology of Wabash County, Indiana," begun in 1948, is ready for publication as a bulletin by the Division of Geology. A party started field work in Miami County this year, and this survey will make possible another detailed county report on glacial geology. The report on Miami County, like that on Wabash County, will contain an areal glacial map, a bedrock topographic map,

a drift-thickness map, and a complete discussion of the glacial deposits. The drift-thickness map of Indiana started in 1948 was continued this year. During the summer field season of 1949, the areal geology of the Peru and Rich Valley quadrangles was mapped. During the 1950 summer field season, mapping of the Bunker Hill, Onward, and Twelve Mile quadrangles was undertaken.

#### GRAVEL

The work on gravel deposits in Indiana includes both laboratory and field studies. A new gravel analysis laboratory was started this year to make sieve analyses, identify the rocks which comprise the gravels, and compute the percentage of each rock type in each size fraction of the gravel samples taken since 1948. Four field parties examined more than 3,000 gravel pits in Indiana, of which 621 are operating. Several deposits of each major type in the State were sampled and mapped. All the deposits were located, and pertinent geologic data were recorded on printed cards which are filed for the use of producers and consumers of aggregates. A report giving the results of the field and laboratory studies is being written for publication next year.

#### LIMESTONE

In 1948 the Division of Geology began a comprehensive survey of Indiana's limestone deposits and their industrial uses. The chemical and spectrographic laboratories also have worked largely on samples of limestone. In 1949 a published map and report of progress, "Crushed stone in Indiana," resulted from this project, which was continued this year. Since July 1, 1949, the chemical laboratory made 306 quantitative determinations, and the spectrographic laboratory prepared 189 samples, analyzed 341 samples, and made 5,544 quantitative and 236 qualitative determinations. Several reports will result from the research on limestone, the largest being a comprehensive report on the distribution, geology, composition, and industrial uses of the rock.

The Industrial Minerals Section also has nearly completed an optical and chemical study of the laminated or banded limestones in the State. This study was made at the request of the Chief Engineer of the State Highway Department because some banded limestones have proved to be unsatisfactory as aggregate in highway construction.

#### MINERALS OF INDIANA

A comprehensive study to determine a complete list of Indiana's minerals was started this year. The objectives of this project are to publish a popular type of book which will inform the people of the many minerals that Indiana possesses and to publish a technical report on Indiana minerals for use of mineralogists, geologists, and industrialists. The field party is collecting specimens from all the localities from which minerals have been reported. Completion of the field and laboratory work will require another year.

## PALEONTOLOGY AND STRATIGRAPHY

This year the Division continued the study of the areal extent, thickness, composition, and fossils of the Harrodsburg limestone in order to define the relationships of the limestone to the underlying Borden formation and overlying Salem limestone. Precise knowledge of the Harrodsburg limestone is needed by oil geologists in order to accurately identify it and adjacent formations from oil well cuttings. More than half of the work is finished and when complete, the study will result in a book of 125 pages and 70 illustrations.

## PETROLEUM GEOLOGY

The increase in drilling activity that started in 1947 continued this year and is responsible for the greater activity and size of the Petroleum Section. The Section has five responsibilities or public functions: (1) to preserve oil and gas well records, (2) to make field studies of oil pools and petroleum-bearing formations, (3) to do laboratory research on oil geology, (4) to publish geologic maps and reports that assist producers to find new oil pools, and (5) to answer questions of the public concerning the geology of oil and gas in Indiana. The activities of each of these functions is discussed under their respective headings.

**Records.**—Samples of well cuttings from 873 wells and cores from 16 wells were boxed, cataloged and stored, and samples from 77 wells were mounted on strips for study. Scout tickets for 1,342 wells were copied and filed, and more than 500 electric logs and 75 driller's logs were obtained and filed. Maintaining these complex records in readily usable form is the first duty of the Petroleum Section to the oil producers in Indiana.

**Field studies.**—Mapping of the older oil fields of Indiana was begun two years ago. Two field parties continued to map the older oil fields and to locate and determine the altitude above sea level of abandoned wells in Knox and Spencer counties. The information thus obtained is used to construct county structure maps of certain formations and other county maps showing the location of oil wells and dry holes. Abandoned oil fields and many dry holes not recorded on any previous maps are being found.

Another field party under Professor Esarey's direction continued to study the outcrops of the St. Louis limestone. This research, started in 1949, should have immediate value to petroleum geologists because the St. Louis limestone, 250 feet thick in Indiana, has not been described nor subdivided in detail. The formation boundaries were not clearly established, and confusion prevails concerning the accurate identification of the St. Louis and similar limestones both in outcrops and in the subsurface. The results of this research should be published next year. The Petroleum Section also obtained cuttings from some exceptional wells as they were being drilled, in order to get information that was urgently needed or would otherwise have been lost.

In addition to the field surveys, the Petroleum Section prepared the guide book and directed the Fourth Annual Indiana Field Conference, sponsored jointly by the Division of Geology and Indiana University.



The Conference this year examined the stratigraphy along the Mississippian-Pennsylvanian unconformity of western Indiana, and attracted more than 225 geologists and students from the mid-west.

**Maps and reports.**—In addition to the seven petroleum exploration maps, the map of the oil and gas fields of Indiana, and the Guide Book for the field conference, all listed in "Publications" at the end of this report, the Petroleum Section also published the following reports: "Oil and gas developments in 1949," *Am. Assoc. Petroleum Geologists Bull.*, vol. 34, no. 6, pp. 1078-1090 (1950). "Oil and gas production in Indiana," *Am. Inst. of Min. Met. Eng., Trans.* (1950).

**Laboratory research.**—During the year, the Petroleum Section started work on structure maps on the Devonian of Jackson and Dubois counties and of Indiana, and another structure map of the State. Stratigraphic research leading to the construction of isopach maps to show the thickness and lateral extent of oil-bearing formations was continued this year. Two special maps also were kept up to date: one shows the location of wells for which samples strip logs are made, the other shows the wells that have been drilled into Silurian reefs, fore-reef deposits, or reef outwash.

**Public service.**—Visiting oil geologists spent 200 working days this year in the Petroleum Section laboratories and required hundreds of hours of the personnel's time. More than 200 conferences also were held with non-geologic visitors seeking information, and 500 letters were answered. Many of the letters required some research and others consumed as much as 10 hours.

#### SAND

Although sand is present and usually constitutes more than half of most gravel deposits, it has no value to foundries as a molding sand. Along the south shore of Lake Michigan, from Gary east to beyond Michigan City, is a belt of wind-blown sand that is one-half to nearly two miles wide. These sands, which were washed out of the lake during storms and then blown by winds into dunes, are one of the country's important sources of molding sand.

This year a field party of the Industrial Minerals Section began to map these sands, obtain industrial information about them, and sample each deposit that is being mined. A new laboratory began to make sieve analyses, determine the total amount of heavy minerals, and describe the amount of rounding of grains in each sample. The report of these field and laboratory studies is in preparation and will be sent to the printer by January, 1951.

#### PUBLICATIONS

The publications program formulated in 1948 was enlarged this year with the addition of the series of miscellaneous maps. The volume of sales and correspondence is indicated by the fact that 2,390 maps and 1,269 other publications were sold and 590 additional free publications were sent out. The names of 109 institutions are now on the exchange and gratis lists.



The importance of the publications program to the industries and people of the State is indicated by the fact that more than 600 persons called at the Publications Office during the year for specific information or to obtain published reports or maps.

## REPORTS AND MAPS PUBLISHED DURING FISCAL YEAR 1950

A price list of all available publications may be obtained by writing to the Publications Section, Division of Geology, Indiana University, Bloomington, Indiana.

## Petroleum Exploration Maps:

- Esarey, R. E., and Brooks, B. E. (September 15, 1949) No. 13, *Structure map of Greene County, Indiana.*
- Esarey, R. E., and Brooks, B. E. (September 15, 1949) No. 14, *Structure map of Clay County, Indiana.*
- Esarey, R. E., and Brooks, B. E. (September 15, 1949) No. 15, *Structure map of Parke County, Indiana.*
- Esarey, R. E., and Brooks, B. E. (September 21 1949) No. 16, *Structure map of Vermillion County, Indiana.*
- Esarey, R. E., and Brooks, B. E. (October 4, 1949) No. 17, *Structure map of Fountain County, Indiana.*
- Esarey, R. E., and Brooks, B. E. (October 19, 1949) No. 18, *Structure map of Owen County, Indiana.*
- Esarey, R. E., and Brooks, B. E. (November, 1949) No. 19, *Well location map of Putnam County, Indiana.*
- Esarey, R. E., and Brooks, B. E. (November, 1949) No. 20, *Well location map of Montgomery County, Indiana.*

## Miscellaneous Maps:

- Esarey, R. E., and Brooks, B. E. (January, 1950) *Oil and gas fields of Indiana.*

## Aeromagnetic Survey Maps: (Completed maps published in cooperation with the United States Geological Survey.)

- Dempsey, W. J., Henderson, J. R., and Duffner, R. T. (October 21, 1949) *Total intensity aeromagnetic map of Fulton County, Indiana.*
- Dempsey, W. J., Henderson, J. R., and Duffner, R. T. (October 21, 1949) *Total intensity aeromagnetic map of Posey County, Indiana.*
- Dempsey, W. J., Henderson, J. R., and Duffner, R. T. (November 4, 1949) *Total intensity aeromagnetic map of LaPorte County, Indiana.*
- Dempsey, W. J., Henderson, J. R., and Duffner, R. T. (November 4, 1949) *Total intensity aeromagnetic map of Pulaski County, Indiana.*
- Dempsey, W. J., Henderson, J. R., and Duffner, R. T. (November 4, 1949) *Total intensity aeromagnetic map of Starke County, Indiana.*
- Dempsey, W. J., Henderson, J. R., and Duffner, R. T. (November 4, 1949) *Total intensity aeromagnetic map of White County, Indiana.*
- Dempsey, W. J., Henderson, J. R., and Duffner, R. T. (March 8, 1950) *Total intensity aeromagnetic map of Cass County, Indiana.*
- Dempsey, W. J., Henderson, J. R., and Duffner, R. T. (March 8, 1950)

Dempsey, W. J., Henderson, J. R., and Duffner, R. T. (April 14, 1950)  
*Total intensity aeromagnetic map of Pike County, Indiana.*

Dempsey, W. J., Henderson, J. R., and Duffner, R. T. (April 14, 1950)  
*Total intensity aeromagnetic map of Spencer County, Indiana.*

Dempsey, W. J., Henderson, J. R., and Duffner, R. T. (April 14, 1950)  
*Total intensity aeromagnetic map of Warrick County, Indiana.*

Coal Investigations Maps: (Published in cooperation with the United States Geological Survey)

Wier, Charles E. (May 25, 1950) No. C 1, *Geology and coal deposits of the Jasonville quadrangle, Clay, Greene, and Sullivan Counties, Indiana.*

Guide Book Series:

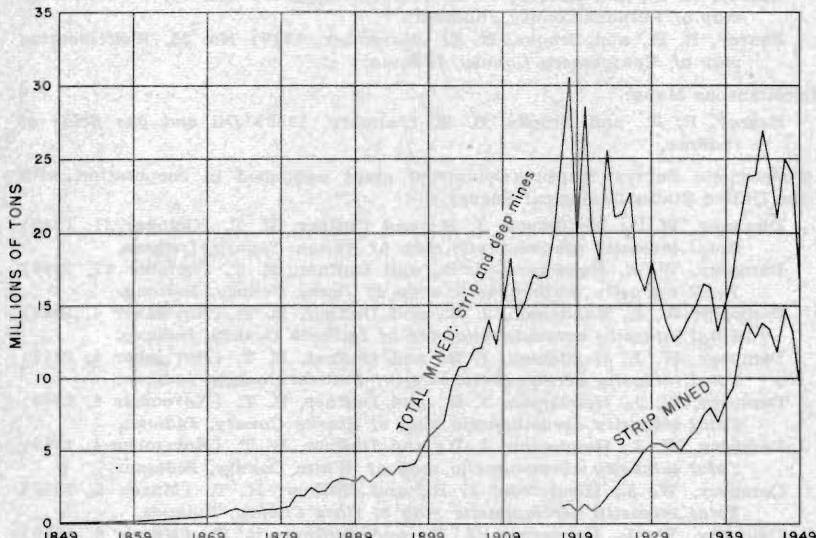
Esarey, R. E., Bieberman, D. F., and Bieberman, R. A., comps. (May, 1950)  
No. 4, *Stratigraphy along the Mississippian-Pennsylvanian unconformity of western Indiana*, 21 pp., 2 pls., 3 figs.

Bulletin Series:

Thornbury, William D. (June, 1950) *Glacial sluiceways and lacustrine plains of southern Indiana*, 23 pp., 3 pls., 2 figs.

Annual Report of the State Geologist:

No. 73 (1949) Charles F. Deiss, State Geologist. (From the 31st Annual Report of the Department of Conservation.)



DIVISION OF PUBLIC RELATIONS  
OUTDOOR INDIANA

## PERSONNEL

R. L. HOOVER, Director and Editor of *Outdoor Indiana*  
JOAN SCHAUB, Associate Editor  
HENRY W. MOESCH, Jr., Director of Radio and Special Events  
MILDRED NELSON, Secretary  
MARGARET LANAHAN, Publications Director  
HERBERT J. FARLEY, Photographic Technician  
ALDEN H. HADLEY, Ornithologist and Lecturer  
MARGARET FRAHLICH, Circulation Clerk  
WANDA CREWS, Circulation Clerk  
REVA BYARD, Circulation Clerk

The activities and accomplishments of every division of the Conservation Department are brought to public attention by the Division of Public Relations. In an effort to keep the public informed, this division utilizes the pages of every daily and weekly newspaper in the state as well as the three wire services in Indiana. During the past fiscal year more than 150 prepared news releases were distributed from this office to better than 450 state newspapers, radio stations and special conservation publications. This division is also responsible for the preparation and distribution of the monthly magazine, *Outdoor Indiana*. The magazine jointly serves the Conservation Department and the Department of Agriculture.

As of January, 1949, *Outdoor Indiana* was placed on a free subscription basis. At that time circulation was approximately 14,500; however by June, 1950, nearly 84,000 persons were receiving the magazine free of charge. Reader correspondence indicates that the magazine is being utilized in biology, botany and zoology classes in our public and private schools, and by 4-H, Boy Scout, Girl Scout and Campfire Girls groups. Countless letters from readers indicate an increased interest in conservation practices which is occasioned by articles appearing in the magazine. Three and four color cover pages have been added and the number of pages was increased from 20 to 24 pages per month.

The publications program was responsible for the production of literature on three state parks and six state memorials. Including Pittman-Robertson and State Parks, Lands and Waters reprints, 21 various pieces of literature were composed, edited and put into pamphlet form with total quantities of same amounting to 265,000.

Nearly 3,500 requests for literature, photographs, special stories, radio shows and specific information on fish, game, wildlife and natural resources were filled by members of the Public Relations staff.

Our ornithologist lectured to more than 300 groups, including garden clubs, university classes, primary and secondary school students, luncheon clubs, women's organizations, Boy and Girl Scout troops and other conservationists, reaching more than 22,300 persons during the year. In

addition to the regular lecture schedule, a monthly *Outdoor Indiana* article on song-birds is prepared.

A radio and special events section set up in the division keeps pace with the trends of other agencies which utilize the air waves in publicizing their work. The "special events" portion of this section includes the annual Hobby Show, Sportsman's Show and Indiana State Fair, and is aimed at increasing the number of conservation exhibits and improving the quality of these and other conservation displays. Special window displays were added at Department of Conservation offices this year as a means of directing attention to conservation measures.