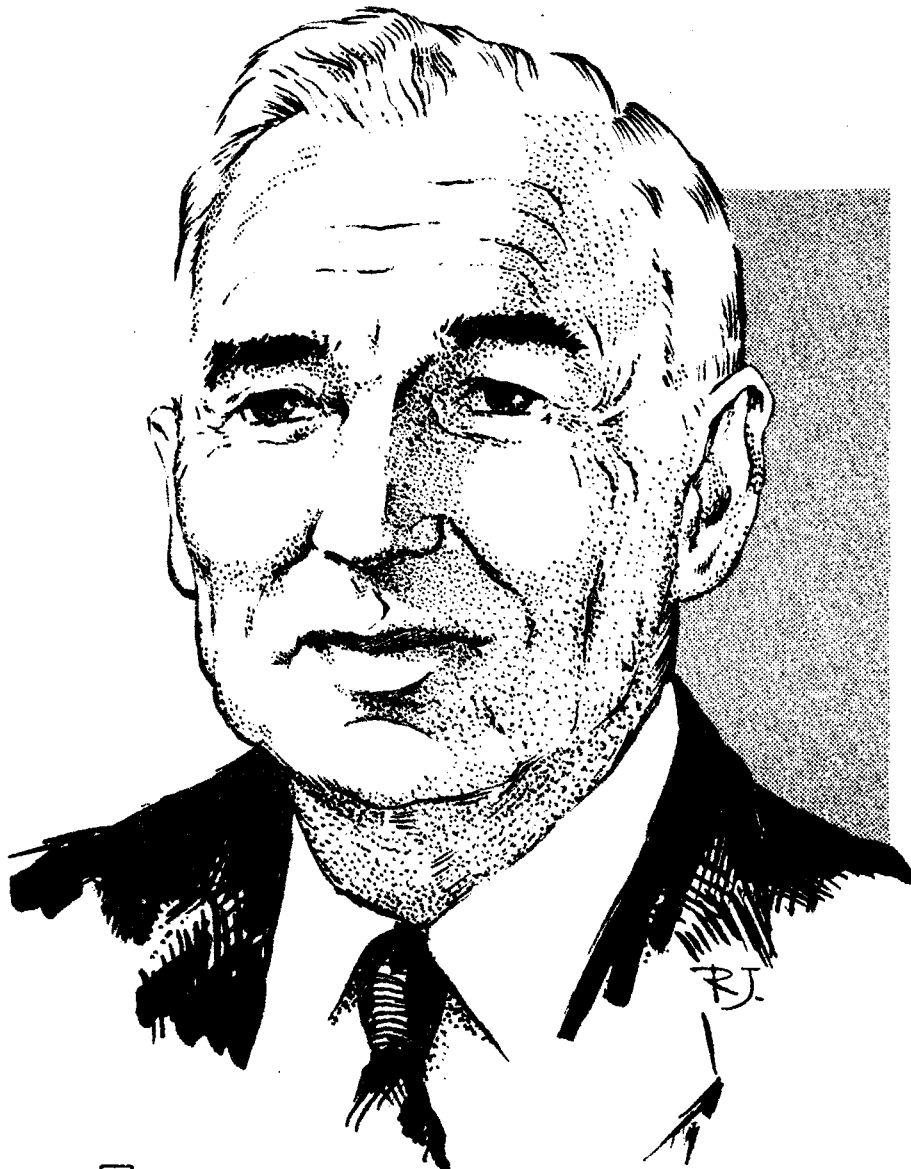


INDIANA UNIVERSITY
DEPARTMENT OF GEOLOGY

NEWS LETTER No.13



Ralph Emerson Esarey

41 Years of Service
to Indiana University

INDIANA UNIVERSITY
DEPARTMENT OF GEOLOGY

News Letter No. 13

May 1966

Editor - Ralph E. Esarey

Faculty

Allen F. Agnew
Carl W. Beck
John B. Droste
Ralph E. Esarey
Donald E. Hattin
Thomas E. Hendrix
Wayne R. Lowell
Judson Mead
Warren G. Meinschein
John B. Patton
Thomas G. Perry

Paul E. Potter
Albert J. Rudman
Robert H. Shaver
Yaron M. Sternberg
William D. Thornbury
David G. Towell
Charles J. Vitaliano
Charles E. Wier

Mark Reshkin (Northwest Campus)
Jack A. Sunderman (Fort Wayne Campus)

May 25, 1966

To my former students, associates, and friends,

As you may know by this time, I am retiring at the close of the present school year. The forty or more years spent here at Indiana have been pleasant and enjoyable, and I have few regrets of a serious nature.

I want to take this opportunity to express my heart-felt thanks for the many letters received from my former students, associates, and friends. The friendship and success in life of my students has been important to me always, and you have made me very happy with your expressions of thanks and gratitude.

Retiring has been made pleasant, also, by the President's Dinner for retiring faculty, the banquet and plaque given to me by Rho Chapter of S.G.E., and the dinner and gifts presented by the Geology Department Faculty.

I hope to spend my leisure time in travel, fishing, swimming, and other things which I have wanted to do. My new address will be 16 Midlane Road, Ocean Ridge, Delray Beach, Florida. Martha and I hope you will visit with us when you come to Florida.

With all best wishes,



Ralph E. Esarey

PROFESSOR ESAREY RETIRES

William D. Thornbury

Professor Ralph Esarey's host of friends among our alumni body will be interested to learn that he is retiring at the end of the 1965-66 academic year. The Esareys have bought a home at Delray Beach, Florida, and will move there early in June.

After 41 years of teaching geology, Ralph decided that he was entitled to a rest and change of scenery. His period of service to the Geology Department ranks next to that of Dr. E. R. Cumings.

Probably no one who has been connected with the Geology Department has more friends among our alumni, or has exerted as great an influence upon students who have become professional geologists as has Ralph. Not only has he contributed significantly to the training of many petroleum geologists, but he came into intimate contact with hundreds of geology majors during the 25 years that he served as advisor to Sigma Gamma Epsilon.

We are sure that all our alumni join with the faculty and staff of the Geology Department in wishing him and Mrs. Esarey many enjoyable years in their newly chosen Florida home. May only the large fish be biting on their bait!

NEW FACULTY

Our faculty roster and list of course offerings continue to grow in order that our students may have as wide a selection of courses as possible and to give them the opportunity for advanced training in specialized fields.

Albert J. Rudman joined the faculty in September 1965 as an Associate Professor of geophysics. Doctor Rudman received his B.S., A.M., and Ph.D. degrees from this department, obtaining the doctoral degree in 1963. In 1954, after completing the master's degree, he joined the Carter Oil Company and did seismic interpretation work in Mississippi, Alabama, Louisiana, and the Illinois Basin area.

Al joined the Indiana Geological Survey in 1957. His research centered on the problem of mapping the Indiana basement complex with the seismic method, and he has presented papers on this subject at national meetings of the A.A.P.G. and S.ExG.

At the present time, Professor Rudman's teaching duties include graduate courses on gravitational and magnetic field analysis, applied seismology, and mathematical models in the geologic sciences.

Yaron M. Sternberg joined the faculty in September 1965 as an Assistant Professor to teach courses and direct graduate research in hydrology, and to develop the quantitative aspects of our hydrogeology program.

Doctor Sternberg received the B.S. degree from the University of Illinois, and the M.S. and Ph.D. degrees from the University of California at Davis. He completed his doctoral work just before coming to Bloomington. His research interest is flow in porous media.

In February of this year Dr. Warren G. Meinschein was appointed Professor of Geochemistry. He received the B.S. degree from the University of Michigan and the Ph.D. degree in organic chemistry from the University of Texas in 1951. Doctor Meinschein was a research associate at Mobil Research Laboratories in Dallas, where he investigated the compositions of naturally-occurring hydrocarbons until he joined Esso Research and Engineering Company, Linden, New Jersey, in 1956. At Esso his work involved studies on the development of methods for the detection of extraterrestrial life.

Doctor Meinschein has developed important theories on the origin and composition of petroleum, and is co-developer of the methane proportional counter method for C-14 dating.

IN AID OF RESEARCH

Robert H. Shaver and Charles J. Vitaliano

A two-year grant was made by the National Science Foundation in support of a research program, entitled "Middle Paleozoic Geology from Arch to Basin in Northern Indiana and Southernmost Michigan," with the following serving as principal investigators: Professors Robert H. Shaver and John B. Droste and Dr. Carl B. Rexroad. Dr. Charles A. Pollock of Edmonton, Alberta, Canada, who recently completed his doctoral work at the University of Wales, has been appointed Research Associate. Research Assistants are being appointed in the Department.

The program will consist of the study of the middle Paleozoic carbonate section in the southern flank of the Michigan Basin with stratigraphic, paleontologic, and petrologic emphases. Doctor Pollock is planning to do some of the conodont biostratigraphy.

The grant also has the support of the Geological Survey by means of Doctor Rexroad's participation, by a Department of Natural Resources Fellowship held by R. William Orr, and by services.

A new National Science Foundation grant will permit geologic field mapping in the Tobacco Root Mountains of southwestern Montana. The grant will provide funds for field work during the summers of 1966 and 1967 and will support part-time research assistantships during the 1966-67 and 1967-68 academic years.

A number of Indiana University students have participated in the Tobacco Root Mountains mapping program, and an area equal to approximately six $7\frac{1}{2}$ -minute quadrangles has been mapped. Four Ph.D. and two A.M. theses have resulted. Part of the earlier work has been supported by the National Science Foundation in the form of Graduate Fellowships. Approximately seven $7\frac{1}{2}$ -minute quadrangles of geologic mapping remain.

Professor Vitaliano, the principal investigator, will devote three-fourths of the 1966 summer field season to teaching at the Geologic Field Station and the remainder of the season to geologic mapping on the project. His time will be equally shared between the two programs in the summer of 1967. Thomas Hanley, a second-year graduate student at Indiana University, will begin field work in the summer of 1966 in the metamorphic terrain on the southwestern side of the Tobacco Root Mountains and will be partially supported during the 1966-67 academic year by a research assistantship covered by the grant.

GEOLOGY AT REGIONAL CAMPUSES

Mark Reshkin

A significant expansion of the Geology Department's programs at the Regional Campuses of the University has occurred since 1964. Beginning in the fall of that year, Mark Reshkin (Ph.D., 1963) joined the faculty and presented beginning-level courses in geology at both the South Bend and Northwest (Gary and East Chicago) campuses. In the spring of 1965, Jack A. Sunderman (Ph.D., 1963) became a faculty member and initiated similar course offerings at the Fort Wayne and Kokomo campuses. For several years prior to these staff additions, geology had been taught at the Indianapolis Campus by members of the Geology faculty and the Indiana Geological Survey, and by graduate students. Professor Ralph Esarey also has taught geology at the Vincennes Campus.

The response to these geology offerings has been most heartening. Enrollment has increased so rapidly that we have enlisted the aid of several graduates of the Department, who now live in the region of the Campuses, to staff laboratory sections of our beginning course. Lyndon Dean and Dan Hall at Northwest, Dr. Carlton Cook at South Bend, and John McCory (Ball State) have presented laboratory sections of the course. Enrollment during the current semester totals more than 250 students in course G-100 at the Northwest, Fort Wayne, Kokomo, and Indianapolis campuses.

The demand for second-level courses has resulted in Doctor Sunderman's being assigned exclusively to the Fort Wayne Campus beginning with the fall semester 1966. Doctor Reshkin has been full-time at the Northwest Campus since the fall of 1965. Currently at Northwest five courses are being offered, and there are seven geology and earth science majors now enrolled in classes at that campus. Doctor Sunderman plans to offer five courses at the Fort Wayne Campus beginning in September 1966.

During this past year, several developments have taken place which will have a great effect on the Department's programs at the Regional Campuses. The state legislature has approved the offering of bachelor's degrees in Business and Education by 1967 at Northwest and South Bend and by 1968 at Fort Wayne. The Faculty of the College of Arts and Sciences has approved the development of four-year degree programs in 19 academic areas at these campuses and advises that such development should take place within the next five years. Geology has been selected as one of the 19 academic disciplines to be developed, and the Department is now in the process of working with the Regional Campuses to expand the staff and facilities to handle this rapidly growing program.

ACADEMIC YEAR INSTITUTE IN EARTH SCIENCE 1965-66

Allen F. Agnew

In the Fall of 1965 the Department was deluged by twenty earth science teachers from high schools and junior high schools across the country -- deluged, because the director of the program, Professor Agnew, is a hydrogeologist.

These twenty participants in the Academic Year Institute in Earth Science, sponsored by the National Science Foundation, are here for two semesters and the following summer, to obtain the degree of Master of Arts for Teachers. They have been taking both regular and special courses in geology, and also related courses in astronomy and geography.

They came to us from fifteen states, and only five states are represented by more than one participant: Indiana, Michigan, Missouri, Montana, and Pennsylvania. When they finish the special G-429 course at the Field Station in Montana early in August, they will be returning to states that contain other Indiana University alumni -- Colorado, Idaho, Iowa, Minnesota, New Hampshire, New York, North Carolina, Oregon, Tennessee, and Texas -- for some a relatively short trip, but for all the completion of a strenuous and exhausting 36 hours of graduate credit.

Fourteen of the participants have taught earth science before, half of them in the 8th grade; three have taught it in the 9th grade, two in the 10th, and one each in the 11th and 12th grades. The six who have not taught earth science before are slated to do so when they return to their schools next Fall.

Our main objective is to train this group of earth science teachers to approximately the professional level in terms of geology background. They may then 1) continue as earth science teachers in junior high, or 2) continue for additional graduate work in the School of Education, so that they might be science supervisors or other administrators, or 3) go into teaching earth science at the junior college or college level where they can teach other teachers to teach.

This group of twenty participants was selected from nearly 300 applicants, and as a result, they are exceedingly high-ability graduate students. Furthermore, the fact that they have been teachers themselves has caused us college teachers to take a hard look at how we teach our course work. Thus they have been not only very stimulating for the rest of the graduate students, but for the faculty as well.

Our Geology Department has profited very much by their being with us, and we are looking forward to the continuation of this program in 1966-67, when another group of twenty will come to "set a spell".

ANALYTICAL FACILITIES IN THE GEOLOGY BUILDING

Richard K. Leininger

Quantitative and extended qualitative analyses are now being applied more generally to specific problems in geologic investigations. Not only are measurements more commonly utilized in research but also a greater degree of control, requiring more sampling and more analyses, has become commonplace with the advent of rapid means of measurement. To provide for maximum versatility and minimum duplication, the analytical facilities of the Department of Geology and the Indiana Geological Survey are now considered jointly and are operated through coordinated administration.

In the recent past several new facilities have been added. The Carbon-14 dating laboratory is now functioning and will soon be augmented by laboratory equipment to allow sample preparation to be done adjacent to the counting equipment. Additional electronic equipment has been obtained to provide for counting of two small samples simultaneously for the rather long time required.

An accessory permitting use of transmitted light, and therefore thin-sections as samples, has been obtained for use in the electron probe microanalyzer. Studies of zonation in crystals can now be accomplished much more easily. In the near future a vacuum evaporator will be installed so that samples can be coated with the thin carbon film that makes them electrically conductive as required for observation. The evaporator will also be used to complete the fabrication of windows for detector tubes used in the probe and for other x-ray emission spectrometry.

Through the efforts of Professor Meinschein, a mass spectrometer and a gas chromatograph formerly used in his industrial research laboratory have been installed in the building to provide for continuation of his research in organic geochemistry. In the near future augmentation of the instrument laboratory will provide further capabilities in this field.

The four x-ray units in the building are now divided in use between diffraction and emission spectrometric analysis. "Chemical" analyses of silicate rocks are made by joint use of x-ray, chemical, and optical

spectrographic methods. Several laboratories are equipped for chemical analysis; two of these include spectrophotometers and flame photometers; a third is devoted to analysis of coal and other organic materials. A fourth chemical laboratory provides for graduate students' analytical work, and a fifth offers separate space for radiochemical separations. Professor Towell's newly equipped laboratory contains counting and sample handling devices assembled for continuation of his utilization of neutron activation analysis for the study of rare earth element geochemistry. This facility also offers opportunity for counting certain natural radioactivities. The optical emission spectrograph is still the reference tool for inorganic qualitative analysis; the instrument continues also to provide quantitative data for trace constituents.

Although a facility that does not aid in performing measurements, the computer and auxiliary data handling equipment of the Geological Survey are indispensable to the other analytical facilities. Calculations formerly done by desk calculator and graphing are now carried out in a fraction of the time by the computer, programmed by the analytical staff. And, of course, much of the data yielded by the analytical staff through their measurements and computer programs is fed back to the computer by research workers for their interpretive investigations.

JOBS UNLIMITED

During the 1965-66 academic year representatives of twenty industrial companies interviewed many of the students in our department and were well impressed with the quality of our graduate students.

The Department received notices for 47 teaching positions available at colleges and universities throughout the United States and some foreign countries.

Two students are completing Master of Arts for Teachers of Earth Science degrees -- Robert Minning, who has accepted a position at Wittenberg University in Springfield, Ohio, and Russell O. Utgard, who will be teaching at Joliet Junior College, Joliet, Illinois.

Four students will receive their Ph.D. degrees in June or September. Kennard Bork has accepted a position at Denison College, Granville, Ohio; Robert Burger will teach at Smith College, Northampton, Massachusetts; David Hess will go to Western Illinois University, in McComb; and James Howard has accepted a position at Ohio University in Athens. Gene Heien will also be teaching at Ohio University, while he completes his dissertation.

Nine students will receive their master's degrees. Darrell Leap will join the South Dakota Geological Survey. David Balogh will go to Denver in June with Chevron Oil Company. Clyde Conger joins the Texas Company in Oklahoma, and Jim Dailey, the Chevron Oil Company in Casper, Wyoming. In February Thomas Schull went to Dallas with Standard Oil Company of Texas; Austin Smith joined Pan American Petroleum Company in New Orleans, and Tom Kalan was employed by Shell Oil Company at Oklahoma City.

HOOSIER HOSPITALITY

Several meetings held in Bloomington in recent months, with regional, national, and international participants, have added spice to the lives of the inhabitants of the Geology Building.

Water Resources

Allen F. Agnew

The Water Resources Research Center held an informal conference on problems associated with strip mining on February 24, 1965. Dr. Richard Parizek, of the Department of Geology and Geography, Pennsylvania State University, who is involved in acid mine-water research, was the principal speaker.

Geology of Sand and Sandstone

Paul Edwin Potter

On October 17 to 22, 1965, the Department of Geology and the Indiana Geological Survey sponsored a conference entitled Geology of Sand and Sandstone. The objective of the conference was to give the participants an integrated review of existing knowledge in this field and to discuss new developments. The five days were spent in lectures, a petrographic laboratory, and a half-day field trip, plus opportunities for informal discussion. Application of chemistry, statistics, and hydrology supplemented a wide range of geologic topics. Conference leaders were F. J. Pettijohn, The Johns Hopkins University; Raymond Siever, Harvard University; and Paul Edwin Potter, Indiana University. A 247-page syllabus was specially prepared in order to give the participants a lasting record of the conference.

There were 55 participants, 12 of them from outside the United States -- from Argentina, Canada, France, Surinam, and Venezuela. Seven participants work for governmental surveys, 24 were from universities, 22 were from the petroleum industry, and 2 were from the sand industry.

The participants were housed in the Indiana Memorial Union, and the sessions were held in the Frangipani Room. A social hour and dinner gave the participants an opportunity to meet members of the Geology faculty and Geological Survey members.

Forum on Geology of Industrial Minerals

Lawrence F. Rooney

The second Forum on Geology of Industrial Minerals was held at Indiana University on March 31 and April 1, 1966. Organized and directed by

Lawrence F. Rooney, the meeting included 17 papers on the geology of cement raw materials, a field trip, a business session, cocktail party, and banquet. Charles Vitaliano and Lawrence Rooney gave papers. John Patton, Judson Mead, and Wayne Lowell of the Geology Department, and Donald Carr, Maurice Biggs, and Robert French of the Geological Survey, acted as chairmen of the sessions.

In total production and value, industrial minerals dominate the mining industry of the United States. Yet the geology of these materials has received little attention compared with the geology of metals. Dwindling supplies and tighter specifications have resulted in increased demand for geological analysis in both exploration and exploitation of the industrial minerals. In order to focus attention on geology rather than on processing, the Forum on Geology of Industrial Minerals was organized in 1964 under the direction of Professor Robert L. Bates of the Ohio State University. The theme of the first meeting, held at Ohio State in 1965, was the industrial geology of limestone and dolomite.

Attendance at the second Forum was 138 persons from 22 states and Canada, including 72 from industry, 37 from government organizations, 23 from universities, and 6 unaffiliated. The proceedings will be published by the Geological Survey later this year.

The third Forum will be held at the University of Kansas in April 1967, and the fourth Forum will be held at the University of Texas in 1968. A steering committee was formed to provide continuity to the Forum. Lawrence Rooney is one of its six members.

East-Central Section, National Association of Geology Teachers

Thomas E. Hendrix

On April 1 and 2, 1966, approximately 85 college and secondary school earth science teachers from the four-state area of Ohio, Indiana, Kentucky, and Michigan gathered in the Geology Building for the annual meeting of the East-Central Section, NAGT. Registration lasted from 9:00 a.m. to 1:30 p.m., and during this time participants toured the Geology Building, viewed book displays presented by Wiley, Brown, McMillan, Freeman, and Crowell publishing companies, and visited informally in one of the freshman geology laboratories which was furnished as a "hospitality room". Laboratory demonstrations were set up in the laboratory for the participants to view, and several kinds of souvenirs were available in the room for the participants. Plaster of Paris casts of several trilobite species, finished in antique gold, were prepared as souvenirs by Rho Chapter, Sigma Gamma Epsilon, and were well received.

The Friday afternoon part of the program consisted of a panel discussion about revisions in the beginning geology courses. Panelists were Dick Hoare, Bowling Green University; Don Eschmann, University of Michigan; Bud Fischer, University of Kentucky; and Floyd Nave, Wittenberg University.

The Panel discussion was followed by a well-attended Happy Hour at the Holiday Inn and a banquet at the Indiana Memorial Union. Wiley and Brown, publishing companies, sponsored the Happy Hour, thereby assuring good attendance.

The second day of the meeting was devoted to a field trip to southern and southwestern Indiana. Stops were made at the dam and spillway of the new Monroe Reservoir, the P.M. & B. building stone quarry at Oolitic, the U. S. Gypsum Company and National Gypsum Company underground mines at Shoals, the Minehaha coal strip mine at Dugger, and the Illinois Central railroad cut at Solsberry. Approximately 65 teachers attended the field trip.

Tom Hendrix and Tom Perry served as co-chairmen of the committee in charge of local arrangements. The former was elected as Vice President of the East-Central Section for 1966-67.

Association of American State Geologists

Maurice E. Biggs

The Indiana Geological Survey was host from May 8 to 12 to the 58th Annual Meeting of the Association of American State Geologists. Although not large, the meeting is an important one to State Geologists because it presents an opportunity to discuss mutual problems and to coordinate the work of the state organizations with that of those federal agencies which deal with the earth and earth materials. In all, 37 states were represented at the meeting. This number is believed to be a record, as it even surpasses the attendance at the meeting in San Francisco last year.

A distinguished group of representatives of federal agencies reviewed the work of their organizations. Dr. William Pecora, Director of the U. S. Geological Survey, and Dr. Walter Hibbard, Director of the U. S. Bureau of Mines, with some of their staff, discussed programs and policies of their organizations.

Other presentations were made by Vice Admiral H. Arnold Karo of the Environmental Sciences Service Administration, General Richard E. Hagan, Secretary-General of the International Water for Peace Conference, Mr. Alfonso Geiger, U. S. Soil Conservation Service, and Mr. Philip Oetking of the Graduate Research Center of the Southwest.

A field trip on May 11 and 12 covered the mineral resources, physiography, and geologic history of an area through central Indiana. Cars on the trip were equipped with citizens band radios so that geologic features along the route could be discussed by the participants.

NATIONAL MEETINGS

Business Aspects

Faculty and students of the Department have been active not only in attendance but in the presentation of papers at meetings of geologic societies. Listed below are titles of papers and authors for the various meetings.

A.I.M.E., February 1965

Gypsum Deposits of Northern Indiana, by Lawrence F. Rooney
 Geology of Gypsum and Anhydrite in Southwestern Indiana, by
 Robert R. French

G.S.A., November 1965

Use of Ash Skeletographs and Profiles to show vertical variation
 of Ash in a Coal Seam, Pike County, Indiana, by David F.
 Branagan and Charles E. Wier
 Cincinnati Series (Upper Ordovician) of Southeastern Indiana,
 by George D. Brown and Jerry A. Lineback

Additional papers were presented by former colleagues and students,
 such as Orville Bandy, Dick Bowen, Gene Callaghan, Frank Kottowski,
 Dick McCammon, and Paul Proctor.

A.I.M.E., February 1966

Dry Beneficiation of Gypsum, by Robert R. French
 Dimension Limestone in the United States and Western Europe,
 by John B. Patton

A.A.P.G., April 1966

Many people from the Department and the Geological Survey were concerned with planning and conducting the annual meeting. John Patton, Leroy Becker, Allen Agnew, and Gerald Woodard were the Printing Committee; Tom Dawson was Vice-Chairman of the Matson Award Committee; Larry Rooney, Bill Webb, and Bill Moran were the Slide Editor Committee; and Jerry Carpenter and Ralph Esarey were on the Technical Program Committee.

Former Indiana University graduate students in geology presenting papers or co-authoring papers at the conference include Douglas W. Reynolds, Flag Drilling Company, Greenville, Kentucky; Michael C. Mound, Chevron Research Company, La Habra, California; Jerry A. Lineback, Illinois State Geological Survey, Urbana, Illinois; and George D. Brown, Boston College, Chestnut Hill, Massachusetts. Papers by current faculty and students are listed below.

- World Occurrence of Petroleum in Pre-Silurian rocks, by
John B. Patton and Leroy E. Becker
- Conodont Zones in the Salamonie Dolomite and Related
Silurian Strata of Southeastern Indiana, by
Robert S. Nicoll and Carl B. Rexroad
- Physical Techniques of Correlation Applied to Upper
Ordovician Rocks of Southeastern Indiana, by
Henry H. Gray, George D. Brown, and Jerry A.
Lineback.

American Mining Congress, May 1966

A Quarter to Zero - Surface Mining and Water Supplies,
by Allen F. Agnew

Social Aspects

A.A.P.G., New Orleans, April 1965

Mr. and Mrs. J. J. Schmidt and Mr. and Mrs. Kenneth Waters, of the Consolidated Gas Supply Company, were hosts for a social hour at the New Orleans Petroleum Club and dinner at Antoine's for the Indiana faculty and alumni. The social hour was the best ever, and dinner at Antoine's is always excellent. The following list of those in attendance may be incomplete.

Mr. and Mrs. Ken Waters	Robert Dodd
Mr. and Mrs. J. J. Schmidt	T. E. Hendrix
Mr. and Mrs. Karl Frielinghausen	Elmer L. Lucas
Mr. and Mrs. Wayne Fowler	Dick Brown
Mr. and Mrs. Orville Bandy	Mr. and Mrs. Dallas Fianadt
George Freed	Mr. and Mrs. Gene Taylor
Mr. and Mrs. Wayne Lowell	Mr. and Mrs. Michael Mound
Mr. and Mrs. Robert Shaver	Denny Lucas
Richard Kirk	Frank Kottowski
T. A. Dawson	Mr. and Mrs. L. L. Logue
Mr. and Mrs. Lawrence Rooney	Jerry Carpenter
Mr. and Mrs. George Moore	Sam Friedman
Mr. and Mrs. H. H. Bradfield	T. G. Perry
Ronald Tank	Grady A. Loftin
Mr. and Mrs. Ralph Esarey	Jerry Lineback
Charles Lindenschmidt	Mr. and Mrs. Harold Sorgenfrei
Frank Johnson	Robert Sublett
Carl Rexroad	Mr. and Mrs. Leroy Becker
Howard Smith	

G.S.A., Kansas City, November 1965

Many of our alumni took advantage of the central location at Kansas City and participated in the G.S.A. meetings. Our Geology Department hosted a "Happy Hour" at Hotel Muehlebach. A good time was had by the garrulous group of alumni and friends listed below.

Allen Agnew	Philip Malone
Orville Bandy	Brian Mason
Dr. and Mrs. Glenn Bartle	W. Darwin Meyers
Ken Bork	Haydn Murray
Dick Bowen	Jim Noel
George D. Brown	John Patton
Robert Burger	Thomas G. Perry
Eugene Callaghan	Jack Pickering
Robert Dodd	Martin Prinz
Dr. and Mrs. John Droste	Harbans Puri
Arthur Ehlmann	R. D. Rarick
Gary Gates	Ben Richard
Kathryn Gray	Robert H. Rose
Frank Groselle	Ted Ross
Richard Harvey	Robert Sippel
Craig Hatfield	Ned Smith
Alan Horowitz	Robert Stanton
James Howard	Ron Tank
Neil Hulings	Dr. and Mrs. William Thornbury
Ralph Hunter	Don Triplehorn
Alan Jacobs	John Utgaard
Caroline Kierstead	Charles Wier
Frank E. Kottlowski	Roy E. Williams
Jerry Lineback	Dr. and Mrs. John Winslow
Richard McCarmon	Stanley Wissler
John Mactavish	

A.A.P.G., St. Louis, April 1966

Many of our alumni actively participated in the A.A.P.G. meeting -- either helping with the program, by presenting a paper, or both. These diligent geologists include Orville Bandy, George Brown, Jerry Carpenter, Tom Dawson, Ralph Esarey, Tom Hiestand, Jerry Lineback, Mike Mound, John Patton, Doug Reynolds, and Cotton Sublett. A social hour was held at the Sheraton-Jefferson Hotel and the following enjoyed the excellent conversation.

H. H. Bradfield	John Droste
A. C. Brookley	Henry Gray
George D. Brown	Don Hattin
Ann Burger	Ralph Hunter
Jerry Carpenter	Frank Kottlowski
Tom Dawson	Mr. and Mrs. Hugh Latimer

Jerry Lineback
 Ralph L. McDonald
 Mike Moore
 Mike C. Mound
 Bob Nicoll
 William Orr
 John Patton
 Ronald D. Perkins
 T. G. Perry
 Charles Pollock
 R. D. Rarick

Douglas W. Reynolds
 Larry Rooney
 Mr. and Mrs. Joe St. Jean
 Robert Shaver
 James H. Shea
 Ken Waters
 Bill M. Webb
 Charles E. Wier
 C. Gordon Winder
 Stan Wissler

SIGMA GAMMA EPSILON

James F. Howard

The period since the last Alumni News Letter has been exceptionally active and successful for Rho Chapter. Elections held in February 1965 resulted in selection of the following officers: James F. Howard, President; David R. Balogh, Vice President; David F. Hess, Secretary-Treasurer; Robert H. Burger, Corresponding Secretary-Editor; and Marvin R. Miller, Program Chairman. Major accomplishments in the spring included sponsorship of the May issue of the COMPASS, the spring picnic at Lake Lemon, and initiation of three new members.

During the latter part of the summer, the final touches were put upon what is felt to be a significant contribution to geology in Indiana. With the financial backing of the Department of Geology, Rho Chapter produced "A Survey of Indiana Geology", a compendium designed to acquaint newly arrived geologically-interested persons with the basic geologic framework of Indiana. Consisting of 105 pages, it included a resume' of, and pertinent bibliographic data for, Indiana structural geology, geomorphology, glacial geology, hydrogeology, economic geology, basement studies, geophysics, and sedimentation and stratigraphy. Detailed road logs for two full-day field trips in the Paleozoic of Indiana are included. These field trips were offered by members of Rho Chapter with a resultant attendance of 65 students and faculty.

One hundred copies of the compendium were printed and distributed to Indiana University faculty and students. A description of the project published in GEOTIMES produced a number of requests from outside sources and prompted the revision and reprinting of the compendium with addition of a section on paleontology in Indiana and a unified geologic column of Indiana. It is expected to be completed by mid-July and will be offered for sale to any interested party.

Brown Bag Seminars were offered at intermittent intervals, highlighted by an October session at which Drs. Francis Pettijohn, Robert Shrock, Raymond Siever, Kenneth Hamblin, John Hubert, F. R. van Veen, Jaques Le Fournier, and Robert Q. Oaks were present for informal discussion with the students in the department.

Social activities, headed up by Arthur N. Palmer, Fall Program Chairman, were equally successful with 55 participants in our annual Fall Frolic held at Professor Esarey's home. The annual Christmas Party included a social hour and an excellent buffet dinner. One hundred fifteen people were in attendance and applauded Dr. Judson Mead, winner of the Second Annual S.G.E. Screwball Award, presented by last year's winner, Dr. Donald Hattin.

The year's social activities were brought to a rousing conclusion by the annual spring picnic, organized by Pete Renick and Marvin Miller, at which approximately 185 participants had their fill of hot dogs, cold drinks, and assorted delicacies contributed by the wives of the faculty, Geological Survey, and Academic Year Institute participants. Only one sour note was present -- the Faculty-Graduate Student softball game ended in a disastrous defeat for the Graduate Students. But, as they always say "Just wait til next year!"

February elections brought in a new slate of officers, including Daniel Tudor, President; Thomas Straw, Vice-President; Michael Lane, Secretary-Treasurer; Robert Frey, Corresponding Secretary-Editor; and Howard Renick, Program Chairman. Activities are still in full swing with a complete schedule of Brown Bag Seminars and final editing of the revised "Survey of Indiana Geology".

New members added during this interval are William Althoff, Robert Anstey, Assad Barari, Larry Bennett, Frank Capozza, Clyde Conger, Eric Corneliussen, James Friberg, Thomas Hanley, Michael Lane, Michael McGee, Michael Penz, Vijay Satoskar, and Russell Utgard.

GRADUATE STIPENDS

The Department of Geology has been fortunate this year in having a substantial number of graduate stipends available. Awards were made of 24 Graduate (Teaching) Assistantships, 2 University Fellowships, 2 industrial fellowships sponsored by Shell Oil Company and Standard Oil Company of Texas, 4 NASA Traineeships, 2 NSF Traineeships, 3 NDEA Fellowships, and 3 Indiana Geological Survey Fellowships. One NSF Graduate Fellow is in residence.

MEMORIAL FUNDS

John B. Patton

Three funds, established through the generosity of alumni, make it possible to give financial aid to deserving students.

The E. R. Cumings Award, made possible through a fund of \$1,000.00 established by Frank C. Greene (1909) and dedicated to Professor Cumings, is made annually in recognition of the most significant contribution to Indiana geology. Representing interest accrued during the year, this award is used for books or other professional material. Don L. Kissling and Jerry A. Lineback received the award

in 1965 for their jointly authored paper "Paleoecological analysis of corals and stromatoporoids in a Devonian biostrome, Falls of the Ohio, Kentucky."

Established shortly after Doctor Deiss' death in 1959, the Charles Deiss Memorial Fund provides, through the accrued interest and new contributions, tuition each summer for one or two outstanding students (generally one from Indiana University and one from the University of Montana) enrolling in course G-429 Field Geology in the Rocky Mountains. The Deiss Fund currently stands at approximately \$1,900.00, including the invested amount and subsequent contributions.

Realizing a hope of many years' standing, Robert R. Shrock (1928) arranged for the establishment of the Edgar Roscoe Cumings-Clyde Arnett Malott Memorial Fund in 1960. The annual income from the investment of this fund is made available for support and encouragement of superior work by staff and students in the geological sciences. Within the past three years the fund has been used to support field work for a thesis and toward expenses pertinent to a publication resulting from research. During 1965-66, half the stipend for an undergraduate scholarship in earth science for David Darko, a freshman, was made from the fund. Annual income from the Cumings-Malott Fund, which now has nearly \$6,000.00 invested, is approximately \$200.00.

Continuing contributions from our alumni and other benefactors allow us to support worthy students and useful departmental projects in varied situations that could not be accommodated by the University budget.

INTERNATIONAL VISITORS

The Department of Geology continues to be an attraction for foreign visitors, as shown by the following items:

On March 29, 1965, the Department of Geology was co-host with the Department of Geography to Horizons of Knowledge lecturer J. A. Steers, University of Cambridge, Cambridge, England. Professor Steers, a specialist in geomorphology, spoke on the subject "Coastline Processes".

Professor Enrico Marchesini, University of Florence, Florence, Italy, was a guest of the department during the week of April 19, 1965, under the Visiting International Scientist Program of the American Geological Institute. Specializing in regional structure and petroleum geology in the Mediterranean region, Professor Marchesini presented four lectures during the week on the relief and structure of the area, including structural trends of the African Shield and structural aspects of the Appennines.

Following an earlier visit approximately ten years ago, Professor A. H. Voisey returned to the Department on April 26, 1965, to address the Geology Colloquium on the subject "The Growth of Continents". Professor Voisey, a member of the faculty of the University of New South Wales,

Australia, was a visiting professor at Wayne State University, Detroit, Michigan. His specialty is stratigraphy and structural geology.

Dr. Hilliary J. Harrington, L. A. Cotton School of Geology, New England University College, New South Wales, addressed the Colloquium on May 17, 1965, on the subject "Structural Geology of Antarctica". In 1964-65, Doctor Harrington was Visiting Professor at the University of Illinois.

Dr. Sadrettin Alpin, General Director of the Turkish Mineral Research and Exploration Institute, Ankara, visited the department on September 20, 1965, as a participant in the Foreign Leader Exchange Program of the U. S. Department of State. His prime interest is in mineral resources and the development of geophysical and drilling equipment. He is also interested in the possible exchange of professors.

A foreign lecturer from Israel was in our midst for a week last Fall. Dr. Dan H. Yaalon, of the Department of Geology at Hebrew University, Jerusalem, spent September 26 to October 1, 1965, with us, enroute home from attending the International Quaternary Association meeting and field trips. A soils specialist, he presented lectures and seminars dealing with hydrology, soils, and clays.

On October 18, 1965, a delegation from Brazil stopped by for a look at our Department and the Geological Survey, to see facilities and to meet faculty and staff members. Sponsored by the U. S. Department of State, they were in the process of visiting outstanding Departments of Geology, research organizations, Geological Surveys, and industries. These visitors were:

Marcelo de B. Oliveira, Chief, Geology Division, Superintendency for the Development of Northeast Brazil (SUDENE), Recife.

Judsen da C. e Silva, Deputy Chief of SUDENE.

Joao B. de B. Dias, Professor of Mineral Prospecting, University of Recife, Geology School of Pernambuco.

Geraldo da C. B. Muniz, Professor of Geology, Paleontology, and Stratigraphy, Catholic University of Pernambuco.

On the same date we were visited by Dr. Slavko Macarol, a Yugoslavian geodesist who is also Rektor (President) of the University of Zagreb. The purpose of his trip, sponsored by the U. S. Department of State, was to learn of the administration and organization of colleges and universities in this country, the relationships between the Federal government and the states, and sources of support by governmental agencies and foundations.

On January 10, 1966, the department again had as its guest Professor F. H. T. Rhodes, Chairman, Department of Geology, University of Swansea, Wales. He lectured on the subject "The

geology of Britain, a new look at an old map". Professor Rhodes, whose special field is paleontology and stratigraphy, is located at The Ohio State University this year. Earlier visits were on January 4, 1960, when he spoke on the subject "Geology and evolution", and on May 23, 1955, when his subject was "Conodonts - a problematical group of fossils".

Dr. Norman Clark, Director of Research for English Clays Lovering Pochin and Co. Ltd., was in Bloomington May 6 and addressed a group consisting of Professor Patton's graduate class in nonmetalliferous mineral deposits and Professor Droste's clay mineralogy seminar. Doctor Clark had been Professor Patton's host in Cornwall (England) in April 1965.

The week of May 19 to 22 brought a delegation of Japanese scientists to Indiana University, at the invitation of the National Academy of Sciences. One of the party, Dr. Takeo Watanabe, Professor of Economic Geology at Osaka University, spent some time with Professor Patton and the Department of Geology. The group was interested in the methods and operations of American universities.

NEWS

We learned with much regret of the death of Dr. R. E. Deane last October. A party of four were sampling bottom sediments in Lake Huron, and all were lost.

In June 1965 Harold Kaska was transferred to Perth, West Australia, where he is doing palynology, paleontology, and stratigraphy for California Exploration Company. He reports that he and his family enjoy living there.

Phyllis Renzetti, who has been employed in the Publications Section of the U. S. Geological Survey in Washington, D. C., is being transferred to Menlo Park, California, in June.

Jim Noel and Don Thompson, who have been with Pure Oil Company in Crystal Lake, Illinois, were transferred to Brea, California, when Pure was bought by Union Oil Company.

Don Buchholz is now employed with Cominco American Company in Bixby, Missouri.

D. V. Carter and Robert L. Kidd have announced their intention to retire before this year ends.

Conrad Gravenor, after some years with the Research Council of Alberta, is now Research Director for Peace River Mining and Smelting Ltd. in Edmonton, Alberta, Canada.

Donald Wirth has informed us he is with the Bureau of Land Management, Department of the Interior, in Montrose, Colorado.

Ted Ross is completing his Ph.D. degree at Washington State this spring, and will join Ron Tank on the faculty at Lawrence College, Appleton, Wisconsin, in the fall.

Ben Richard has accepted a new position beginning in September 1966 at Wright State College, Dayton, Ohio.

Andy Van Coutren has just returned to Algiers for a second two-year assignment for Independent Exploration Company. He says it's a beautiful, fertile country with excellent wine and fruits, and "bureaucrats".

Tom Hirschman is now General Manager for Christensen Diamond Products - Longyear of Central America, living in Costa Rica.

Glen Bartle has returned to his home and President Emeritus office at Harpur College from Washington, D. C.

Arch Girdley is completing his doctoral dissertation at Washington State University and has accepted a faculty position at Indiana State University at Terre Haute beginning next September.

Harry Kugler is now with the Department of Highways at Fairbanks, Alaska.

George Leckie is with British Petroleum Company in London.

Larry Rooney received the award for the best paper presented at the 1965 annual A.I.M.E. meeting in Chicago for his "Gypsum Deposits in Northern Indiana".

And hot off the U.S.G.S. press is the news that Jack Pickering, of the U.S.G.S. office in Columbus, Ohio, presented a paper entitled "Radioactivity in Bottom Sediment of the Clinch and Tennessee Rivers" at an international symposium, sponsored by the International Atomic Energy Agency, in Vienna, Austria.