
GEOLOGY NEWSLETTER 1977

**INDIANA
UNIVERSITY**

BLOOMINGTON, INDIANA



Dear Alumni,

The Department of Geology at Indiana University is healthy and dynamic. This past year, 1976-77, we had 150 undergraduate majors and 75 graduate students. We have 23 faculty members, three of whom are shared with other departments; Dr. John Hayes with Chemistry, Dr. David Dilcher with Plant Sciences, and Dr. Robert Blakely with the Indiana Geologic Survey. Professors William Thornbury and Wayne Lowell are emeritus and both are active and healthy. Professor Lowell is so active that he has been on crutches for two months this winter because of a skiing accident.

This year we have passed the 1000 mark in the number of geology alumni from the department. These alumni are spread geographically throughout the world. You can be proud of the I.U. Geology Department because of its teaching and research excellence. The field station in Montana continues to be rated as one of the finest in the country and Professor Mead and his staff continually strive to make this field program even better. The department at Bloomington has six active NSF projects, five HEW fellowships on Energy and Mineral Resources, three industrial fellowships, three industrially funded research projects, and six projects funded through the Water Resources Research Center. We need additional fellowship support for our graduate students, so any aid that you as alumni can give by having your company place a graduate fellowship at IU would be deeply appreciated.

Our continuing problem is maintaining the excellence of the department on very tight budgets that have not kept pace with inflation over the past six years. Donations from alumni and friends are desperately needed to help fund departmental activities that cannot be supported with the regular budgets, such as student and faculty travel for research projects, field work, and presentation of research results at national meetings. Your contributions, however large or small, are always needed and most welcome. We have fallen off badly in the past two years in alumni contributions. Professor emeritus Robert R. Shrock, a graduate of the department has written a letter on the philosophy of giving, which is included in this newsletter. Also, at his suggestion, we are establishing a 5-50 club, which is described in a later section of the newsletter.

This newsletter is fairly comprehensive, and includes as complete an alumni directory as we can prepare from our records. Our plan is to provide such a newsletter every five years and a small flyer covering newsworthy items every year. We welcome letters, advice, criticisms, address changes, status changes, and contributions. We are proud of Indiana University and we welcome visits from you whenever you can get back to your university.

Sincerely,

Haydn Murray

DEPARTMENT OF GEOLOGY

FACULTY

Blakely, Robert F.
Dilcher, David L.
Dodd, J. Robert
Droste, John B.
Hattin, Donald E.
Hayes, John M.
Hendrix, Thomas E.
Klein, Cornelis
Krothe, Noel C.
Lane, N. Gary
Mead, Judson
Meinschein, Warren G.
Merino, Enrique
Murray, Haydn H.
Patton, John B.
Ripley, Edward M.
Rudman, Albert J.
Ruhe, Robert V.
Shaver, Robert H.
Suttner, Lee J.
Towell, David G.
Vitaliano, Charles J.
Wintsch, Robert P.

Retired

Lowell, Wayne R.
Thornbury, William D.

STAFF

Basu, Abhijit
Brown, Thea
Coller, Maynard
Crouch, Becky
Denson, Kenneth
Douthitt, Sandy
Freeman, Ellen L.
Hartgraves, Jeanette
Hazen, Dwight
Horowitz, Alan S.
Iverson, Mary E.
Lucas, Betty (Water Resources Research Center)
Martindale, Kathy
Miller, Charles S.
Smith, Barry
Tolen, James R.
Weaver, Derrell

Retired

White, Alfred

U.S.G.S.

Vitaliano, Dorothy

1975-76

ASSOCIATE INSTRUCTORS

1976-77

Ausich, William
Borgerding, Janet
Bottjer, David
Budnick, Dorene
Calengas, Peter
Canfield, Christopher
Cody, Clyde
Dahl, Peter
Dembicki, Harry
Duigan, Mark
Duncan, Julie
Fout, James
Friberg, LaVerne
Gibboney, Melissa
Glover, William
Goltz, Larry
Haase, C. Stephen
Holm, Melody
James, Calvin
Knapp, Ralph
Kuizon, Lucia
Kwon, Byung Doo
Lake, Ellen
Lieser, Michael
Mackey, John
Millen, David
Millholland, Madelyn
Olson, Carolyn
Pheifer, Raymond
Porter, Elise
Risser, Dennis
Roberts, Connie
Thompson, Glenn
Volz, Steven
Waldrip, John
Webb, Myron
Welch, James
Zeller, Thomas

Archer, Allen
Ausich, William
Bauman, Jeanette
Belak, Ronald
Brunson, Karen L. (deceased)
Calengas, Peter
Dembicki, Harry
Fout, James
Gibboney, Melissa
Giffin, Jon
Glover, William
Haase, C. Stephen
Holm, Melody
Hudson, Michael
James, Calvin
Kammer, Thomas
Kelly, Stuart
Knapp, Ralph
Kwon, Byung Doo
Lake, Ellen
Lambert, Michael
Murchie, Bonnie
Pheifer, Raymond
Plymate, Thomas
Porter, Elise
Risser, Dennis
Roberts, Connie
Shearer, Jay N.
Smith, David
Tendall, Bruce
Tilander, Nathaniel
Wade, Jan
Waldrip, John
Wiechmann, Mark

RESEARCH ASSISTANTS

1975-76

Ausich, William Survey
 Bennett, Nathan Murray
 Bottjer, David Hattin
 Bradbury, Kenneth Ruhe
 Brunson, Karen (deceased) Ruhe
 Canfield, Christopher Hattin
 Cody, Clyde Murray
 Duigon, Mark Ruhe
 Duncan, Julie Murray
 Friberg, LaVerne Klein
 Knapp, Ralph Mead
 Kwon, Byung Doo Rudman
 Leshner, Carl Michael Klein
 Mack, Gregory Meinschein
 Olson, Carolyn, Ruhe
 Plymate, Thomas Murray
 Risser, Dennis Ruhe
 Terris, Linda Murray
 Thompson, Glenn Hayes
 Zeller, Thomas Mead

1976-77

Basick, James Ruhe
 Bottjer, David Hattin
 Bradbury, Kenneth Ruhe
 Bromley, Bruce Meinschein
 Cody, Clyde Murray
 Duigon, Mark Ruhe
 Graham, Michael Ruhe
 Holm, Melody Meinschein
 Hudson, Michael Klein
 Kwon, Byung Doo Rudman
 Moreau, Peter Murray
 Olson, Carolyn Ruhe
 Pickering, Ann Murray
 Risser, Dennis Ruhe
 Souders, Mark Ruhe

FELLOWSHIPS

1975-76

Dixon, Joseph HEW (Health, Education, and
 Welfare Mining and Mineral Fellowships)
 Duncan, Mack 4th Year Graduate School Fellowship
 Hohn, Michael 4th Year Graduate School Fellowship
 Kammer, Thomas Graduate School Fellowship
 Orlich, Michael HEW
 Rimstidt, Daniel HEW
 Waters, Johnny Texaco Fellowship

FELLOWSHIPS

1976-77

Bauman, Jeanette HEW
 Belak, Ronald Hunt Oil Award
 Dahl, Peter Texaco Fellowship
 Dixon, Joseph HEW
 Glover, William Hunt Oil Award
 Mack, Gregory Graduate Student Fellowship
 Meschede, Louis HEW
 Orlich, Michael HEW
 Rimstidt, Daniel HEW
 Tendall, Bruce HEW
 Terris, Linda Georgia Kaolin Co.
 Walker, Steven HEW
 Wright, Bruce HEW

STUDENT AWARDS

1975-76

Campbell, Andrew Deiss Award and
 Upperclassman Award
 Inouye, Elizabeth Upperclassman Award
 Glover, William Faculty Scholarship Award
 Lake, Ellen Outstanding Associate Instructor
 Smith, Synthia Upperclassman Award
 Tendall, Bruce Deiss Award and
 Faculty Scholarship Award
 Waterman, Arthur Cumings-Malott Award
 Webb, Myron Outstanding Associate Instructor

1976-77

Bomber, Brenda Upperclassman Award
 Campbell, Andrew Faculty Scholarship Award
 Gorham, Scott Deiss Award
 James, Calvin Outstanding Associate Instructor
 Inouye, Elizabeth Alumni Association Award
 Roberts, Connie Outstanding Associate Instructor

FACULTY ACTIVITIES

FROM LAKE MONROE TO MARS— IU GEOLOGISTS PLAY A ROLE

Geologists at Indiana University belong to an age when scientists in all disciplines are struggling to improve man's understanding of his most immediate environment, even as they reach beyond earth for knowledge of an alien world. The faculty here are involved in research at both ends of that spectrum.

On the home front, Warren Meinschein and Robert Ruhe are conducting a study with Arne K. Bergh of the School of Public and Environmental Affairs, of the organic pollutant content in Bloomington's storm-water runoff. Besides providing valuable environmental information on a community with residential, commercial, university, agricultural, and industrial sectors, the data base of water quality and quantity now being collected can be used to test the validity of a number of theoretical hydrologic models scientists have developed.

Ruhe has also completed a study of circulation and sedimentation in Lake Monroe Reservoir, southeast of Bloomington. Both a recreational lake and Bloomington's water supply, the reservoir has been the focus of research by university scien-

tists from several departments.

Various of the faculty are involved in research related to another focus of current interest—energy needs. Professor Murray has been conducting research on techniques for magnetically separating iron sulfide from coal that have obvious practical implications. Professors Droste and Vitaliano have conducted a study for ERDA of the potential for nuclear waste burial in deeply buried shales in the Illinois basin.

"Otherworldly" research has involved faculty members Meinschein, through lunar studies, and John Hayes, who with Dr. Milos Novotny of the Chemistry Department, acted as consultant for problems which arose during the construction and testing of the Viking equipment designed to analyze the Martian atmosphere and to search for organic molecules in the Martian soil. The Bloomington scientists advised some quite radical changes—too radical for the contractors involved—and wound up constructing and testing part of the instrument, a gas chromatograph-mass spectrometer, in their IU laboratories. Fortunately, the resulting systems performed flawlessly on Mars. The atmospheric

analyses showed conclusively that argon, which Russian workers had suggested might make up nearly 50 per cent of the atmosphere, was present at the level of only one to two per cent, a value consistent with plausible outgassing histories. Rare gas and nitrogen isotopic analyses combined to suggest that the Martian atmosphere had once been considerably denser, a circumstance fully consistent with the abundant evidence for fluvial erosion on the surface. The organic analyses were clearly negative, placing an upper limit of one part per one hundred million by mass on organic matter in the soil. While this result has no direct bearing on the possible present or past existence of life on Mars, it does provide strong indirect evidence against biological activity at or near the area sampled.

Back on earth, our own planet's geologic past, is, with its rich variety, the subject of the bulk of departmental research, and continues little by little to reveal its fascinating story to IU geologists. The following pages represent a survey of the major activities of the faculty over the past few years.

Haydn H. Murray, Chairman

In recognition of his diverse talents in the field of industrial minerals, Professor Haydn H. Murray was presented with the 1976 Hal Williams Hardinge Award at the AIME meeting in Las Vegas, Nevada. The citation on the plaque reads, "For outstanding contributions in the mineral industry as research scientist, educator, author, lecturer, and business executive, particularly in the field of clay technology." At the fall meeting of the Society of Mining Engineers, Professor Murray was made a "Distinguished Member", an honor restricted to one percent of the membership.

As chairman of the UNESCO Working Committee on Kaolin Genesis and Age, Professor Murray has attended and pre-

sented papers at the symposia sponsored by the committee in Dresden, East Germany; Sydney, Australia; and Tokyo, Japan. He also chairs the Earth Science Committee of the Petroleum Research Fund Advisory Board and is a member of the Policy Committee. The Petroleum Research Fund is administered by the American Chemical Society.

In addition Dr. Murray has been active as a member of the NAS committee for the study of non-bauxite sources of alumina, and chairs the Technical Association of the Pulp and Paper Industry Task Group on Future Trends Related to Industrial Minerals; the American Ceramic Society Mineral Resources Committee; and the Clay Minerals Society Budget and Finance Committee. He was appointed a member of the Board of Directors of the University

of Illinois Alumni Association in 1975 for two years and was reappointed for another two year term in 1977.

The Murrays have built a new home four miles southeast of Bloomington, and in view of Professor Murray's busy schedule his wife, Juanita did most of the supervision. They moved in July and were, as a consequence, among those midwesterners most aware of that month's heat wave. The new address is 3790 Inverness Farm.

Robert Blakely

Robert Blakely continued to teach his weather courses through the fall of 1975. At that time the Geology Department decided to get out of the meteorology business and the bulk of the teaching load was taken

over by Dr. Jerry Davis of the Geography Department.

Professor Blakely enjoyed the visit of Dr. William M. Adams from the University of Hawaii who was here on an exchange professorship with Dr. Albert J. Rudman during the 1975-1976 academic year. Adams and Professors Mead and Blakely collaborated on the development of a tsunami seismic trigger during the year. This device, which is designed to give a warning of locally caused tsunami waves in the Hawaiian Islands, is already in place in many of the principle cities of our 50th state. Indiana University and the University of Hawaii are jointly applying for a patent for the device.

In the fall of 1976, Professor Blakely led a seminar on the programming and uses of a microprocessor. The Department has purchased an Alta mini-computer that is based on the Intel 8080 microprocessor, so that early information about earthquakes may be obtained and long term studies of microseisms can be made.

In the period since the last newsletter Blakely has been repeatedly solicited by the news media to discuss seismic events and research. He has given six newspaper interviews, five radio interviews, five talks, and has appeared on local television three times. In addition, he reported to the Evansville Building Council on the seismicity of that region and acted as advisor to the State Administration Building Council during their deliberations on a new building code. During this same period he has authored or co-authored seventeen scientific papers.

J. Robert Dodd

J.R. Dodd has continued research on the paleoecology of the Pliocene faunas of California, with two periods of field work in the area (fall of 1975 and early summer of 1976) and during his sabbatical (second semester of the 1975-76 academic year), when he spent some time in the field and at Texas A&M University. He also completed work on a project to determine the paleomagnetic stratigraphy of the Neogene section in the Humboldt Basin of northern California.

John Droste

Following the retirement of Wayne Lowell, John Droste inherited a second section of non-major introductory geology, a course Professor Droste has taught since coming to Bloomington in 1957. Between 850 and 900 students enroll in the course each semester. From it and Lee Suttner's companion course come up to half the students that elect to major in geology every year.

Professor Droste is continuing to expand his long time interests in research of the Devonian and Silurian of Indiana and adjacent states. Recently he has begun looking at the Maguoketa Group (Ordovician) from the point of view of subsurface nuclear waste disposal, at the request of ERDA. The Illinois Basin is one of the areas the energy agency had been considering in their National Waste Terminal Storage Program.

Droste is just beginning a long term study of Trenton-Black River (Ordovician) rocks. In this effort he will have a chance to work with some volcanic ash beds which occur in this part of the section.

Donald E. Hattin

Donald Hattin has conducted research for several years on the genesis of widespread, time parallel carbonate marker beds. Funded by NSF, this project has involved field work in England, Wales, Arizona, Colorado, New Mexico, Wyoming and South Dakota. Professor Hattin has also undertaken taxonomic studies of Upper Cretaceous cirripids and oysters, research on Holocene cementation of carbonate sediments in Florida, and on fecal pellets in Upper Cretaceous strata of Kansas and Saskatchewan over the past several years.

During this period he has held a position as Research Associate with the Kansas Geological Survey which sponsored field work on the Niobrara Chalk, and on the regional study of carbonate marker beds over four summers.

Hattin has contributed to several symposia, leading a field trip and co-editing a guidebook with Lee Suttner in 1973 for the Great Lakes Section of the S.E.P.M. acting as co-convenor and session co-chairman for the T. G. Perry Memorial Bryozoan

Symposium at the A.A.P.G.-S.E.P.M., 1974 annual meeting in San Antonio, Texas, and co-chairing the 1975 A.A.P.G.-S.E.P.M. meeting in Dallas and the 1976 and 1977 North Central Section GSA meetings in Kalamazoo, Michigan, and Carbondale, Illinois, respectively.

In 1977 he also helped lead a five day field trip across the Western Interior basin in connection with the multinational North American Paleontological Convention II, and co-convened a day long symposium entitled "Cretaceous Facies and Biotas of the North Temperate Realm."

Professor Hattin received the Erasmus Haworth Distinguished Alumni Honors in Geology from the University of Kansas Department of Geology in 1976 and has been selected for inclusion in the next edition of "Who's Who in America." He has presented talks at five geological meetings, given two invited lectures (at the University of Southern Illinois and Fort Hays Kansas State College), and published eight papers since the last newsletter.

John Hayes

Research in John Hayes' group continues to focus on natural variations in stable isotope abundances. While work up to the present has been concerned exclusively with $^{13}\text{C}/^{12}\text{C}$ ratios, instruments have been purchased and techniques are under development for investigation of $^{18}\text{O}/^{16}\text{O}$, $^2\text{H}/^1\text{H}$, and $^{15}\text{N}/^{14}\text{N}$ ratio variations in natural organic materials.

The group presently includes three postdoctoral fellows (from the U.S., Israel, and Italy), nine graduate students, and several full time and part time technicians. Recent graduates include Dr. D.J. DesMarais, now at NASA-Ames (where he is working in isotopic biogeochemistry) after a post-doctoral year in geology at UCLA; Dr. D.A. Schoeller, now an assistant professor working in stable isotope analyses at the University of Chicago; Dr. L.M. Gaines, just joining Proctor and Gamble (where he will be working in environmental chemistry) after a post-doctoral year in chemical engineering at M.I.T.; Dr. Glenn M. Thompson, now an assistant professor of hydrology at Arizona; and Mr. Wayne E. Lee, now affiliated with the Department of Fuel Sci-

ences at the University of Utah. Dr. Zri Sofer, presently a post-doctoral fellow in the group, will be joining Cities Service in Tulsa, Oklahoma.

John continues to be involved with planning for NASA's planetary exploration missions, through his contributions to the Viking Mission's scientific successes, and by serving on a variety of NASA's advisory and review panels.

Tom Hendrix

The period 1975-1977 found Tom Hendrix teaching introductory geology and undergraduate and graduate structural geology, directing six graduate theses (two Ph.D.'s and four A.M.'s), and conducting personal research on strain in the Meagher Limestone of Montana and on the Big Hole, Montana Laramide structure. Hendrix also did service work for the National Association of Geology Teachers (NAGT). As director of the NAGT Summer Field Course Scholarship Committee he raised \$31,000 in contributions from industry, to enable 178 undergraduate and graduate geology students from schools all over the country to take a summer field course in geology.

The interesting NSF funded experiment with the introductory honors geology course in Montana continued in 1977 with 20 high school and college students enrolled. The high schoolers represent some of the best science-oriented students in the country.

Alan Horowitz (staff)

Alan Horowitz continues to work on Mississippian paleontology and Paleozoic bryozoans. Dr. Horowitz has completed a comparative study of the faunal and floral diversity of Chesterian deposits in the Illinois basin and in Arkansas and Oklahoma. His findings are contained in a field book he prepared for the August North American Paleontology Convention in Lawrence, Kansas. Dr. Horowitz is still very much involved in the task he began several years ago, of redescribing all of the Paleozoic bryozoans first described by Scottish paleontologist H.A. Nicholson. The existence of Nicholson's types was unknown for 70 years after his death. Re-

discovered in 1970, they were made available to IU professor T.G. Perry. After Professor Perry's death in 1972 the specimens went to Horowitz.

In 1975 Horowitz attended the International Carboniferous Congress and associated field trips in Moscow, and participated in the International Bryozoan Association in September of this year at Woods Hole, Mass.

Cornelis Klein

Cornelis Klein has continued his research on Precambrian iron-formations and related assemblages with the aid of several NSF grants. Many of his graduate students have completed, or are involved in, mineralogic and petrologic studies in the Precambrian of Montana, in the Lake Superior district, and in the Labrador Trough, Canada. The automated electron microprobe as well as the X-ray diffraction laboratories have been considerably upgraded in the last two years.

In November, 1975 Professor Klein was an invited lecturer for the Canadian Institute of Mining and Metallurgy and lectured on "Sedimentary Iron-Formation in the Labrador Trough" at the University of Windsor, Windsor; Laurentian University, Sudbury; and Lakehead University, Thunder Bay, all in Ontario, Canada. In August, 1976 Klein served as co-chairman of a section on Mineral Deposits, as part of the International Geologic Congress in Sydney, Australia. He presented a paper on iron-formation petrology at the same Congress.

As of January 1977 he has accepted an Associate Editorship for the *American Mineralogist* for four years. He has been awarded a Guggenheim Memorial Fellowship for the comparative study of iron-formations in North America and in Australia. He has also completed a major revision of the *Manual of Mineralogy*, 19th edition, as co-author with C. S. Hurlbut of Harvard University.

Gary Lane

Over the summers of 1975 and 1976 Gary Lane worked on an NSF funded project concerning the origin and early evolution of the anal sac in inadunate crinoids.

That project is now virtually completed and a new NSF grant started last summer for research of the nature and origin of pinnules in this same group of crinoids.

In 1975 and 1976 Professor Lane has also supervised two IU High School Science Institute students, the first of whom did a project that resulted in a paper published in the *Journal of Paleontology*.

Lane is currently finishing up an elementary textbook in paleontology tentatively to be titled "Life of the Past." In addition to normal research and teaching, he has been on quite a few field trips in Alabama, Tennessee, Kentucky, Illinois, and Ohio, as well as Indiana.

Judson Mead

Professor Mead continues as director of the Field Station near Cardwell, Montana. He spends a good part of his time during the winter months selecting students and taking care of the many administrative details involved in running the excellent field station. He still teaches the undergraduate courses in geophysics, supervises graduate theses projects, and participates in the graduate seminars. He leaves Bloomington the last of May leading The Caravan from Bloomington to Cardwell, Montana. He stays in Montana until mid-August when he returns just in time to start the fall semester.

Professor Mead is involved in many cooperative research projects with Professors Rudman and Blakely.

Warren Meinschein

Warren Meinschein has been active in research, teaching and services both in the Geology Department, and as Associate Dean for Academic Affairs in the University's School of Public and Environmental Affairs (SPEA).

In addition to his NSF funded biogeochemical research, and NASA funded lunar research, Meinschein is joining John Patton and other Indiana Geological Survey scientists in a study funded by ERDA, of carbonaceous shales in Indiana as sources of energy and petrochemicals. A grant from the Office of Water Resources Research, Department of the Interior, was also awarded last year to

Meinschein, Robert Ruhe, and Arne K. Bergh of SPEA, to fund a study of the organic pollutants in urban hydrology.

Meinschein co-authored and presented two papers at the 1975 GSA in Salt Lake City, and attended the 1975 and 1976 National Committee for the Advancement of Research meetings in West Virginia. He has attended the past three Lunar Science Conferences in Houston, Texas, presenting a paper at the March, 1976 meeting. Last spring he also traveled to Washington, D.C. for the National Association of Schools of Public and Environmental Affairs and Administration meetings.

Meinschein has talked about lunar research to community groups, including the Bloomington Kiwanis Club and area high school science clubs.

John Patton

The energy crunch, the growth of environmental awareness, and interest in historic preservation, sparked by the Bicentennial Year, have kept John Patton extremely busy since the last newsletter.

The energy shortages have caused many groups to request talks on the subject; Professor Patton has been directly involved with several groups interested in the problem, including the Indiana Academy of Science and the Lieutenant Governor's Science Advisory Committee. Nuclear power stations proposed for various sites in the midsection of the country have resulted in a New Madrid Study Group, of which Professor Patton is a member.

Areas suitable for minerals production and agriculture continue to shrink, due to urban sprawl. Patton has addressed the problem in many talks, and has given expert witness testimony in official hearings. He has also served as the Governor's representative on the Agricultural Land Use Task Force of the Midwest Governors' Conference.

Personal interest in historic preservation, particularly of buildings constructed of stone or brick, has resulted in Patton's appointment as chairman of the Indiana University Committee on Historic Preservation, and in his membership in both the Indiana University Heritage Committee and the Indiana University American Revolution Bicentennial Committee. In the latter committee he served as chairman

of the Subcommittee on Historic Preservation with an assignment to inventory and document buildings of historic significance in the development of Indiana University throughout the state. Patton also served as advisor for a large restoration project on Christ Church Cathedral on the Circle in Indianapolis.

Other activities have included completion of the final year of an appointment as Associate Dean in the Office of Research and Advanced Studies, chairmanship of the Indiana University Biomedical Research Support Grant Committee, 1975 presidency of the Indiana Academy of Science, service as representative of the Association of American State Geologists on the American Commission on Stratigraphic Nomenclature, and activities as contributing editor of stone and masonry terms in the "Dictionary of Architecture and Construction" published by McGraw-Hill. Two schools, Hunter College and Bowling Green (Ohio) State University asked Professor Patton to visit to evaluate their geology programs.

Albert Rudman

Albert J. Rudman spent the spring semester of 1973 on sabbatical at the University of Hawaii in Honolulu. For the 1975-76 academic year, he entered into an exchange professorship with Dr. William M. Adams of the University of Hawaii at Manoa and the Hawaii Institute of Geophysics, and in 1976 was promoted to full professor.

Last summer Professor Rudman again voyaged to Hawaii. After reporting to the Hawaii Institute of Geophysics he flew to Guam to catch a geophysical survey ship which made several traverses on its way to Japan. During the one week voyage, Professor Rudman was responsible for the acquisition of magnetic data. After flying back from Japan, he spent the rest of the summer analyzing that data.

Professor Rudman is proud of his series "Geophysical Computer Programs" published as occasional papers of the Indiana Geological Survey. Four such publications now exist and cover the areas of potential fields, synthetic seismograms, correlation, and calculation of earth tide gravity values.

Robert Ruhe

As head of IU's Water Resources Research Center, Robert Ruhe has been engaged in a number of research projects, all of which promise to expand our baseline knowledge of environmental processes. Among those are studies of chloroflouromethanes in ground water; of the hydrologic circulation and sedimentation of the Monroe Reservoir, southeast of Bloomington; of organic pollutants in urban hydrology; and of the effects of heated discharge on the White River at Petersburg, Indiana.

Although much of his research is centered in Indiana, Professor Ruhe has participated in projects and symposia in Texas (at Texas A & M University, on climatic variation), Hawaii (as an IU delegate in the 1976 annual meeting of the Universities Counsel on Water Resources), and South America, where he supervised a soil geomorphology reconnaissance in the Darien Project area in Colombia.

In 1976 Ruhe was active in a National Research Council Committee on radioactive waste management, as a member of the panel on land burial. This year he presented a lecture series at Iowa State University, and a seminar at Oregon State University, on the committee's work and findings.

Robert Shaver

Robert Shaver continues to offer bi-annual graduate seminars in invertebrate paleontology, in which projects have resulted in publications and oral papers under the authorship "Indiana University Paleontology Seminar."

Professor Shaver also is participating in a joint Geologic Survey and IU Department of Geology study of Silurian reefs of northern Indiana.

Since the last newsletter he has attended eight geologic meetings and presented nine oral papers and talks on Silurian stratigraphy, including two SEPM presidential addresses (in March at the Binghamton, New York Eastern SEPM Section meeting, and in June at the keynote session of the AAPG-SEPM convention in Washington, D.C.), and addresses to the Rocky Mountain Sections of the AAPG-SEPM and the Pacific Sections of the AAPG-

SEPM-SEG joint sessions in Bakersfield, California, both last April.

Bob has also produced seven publications and guided five graduate theses during 1975 and 1976.

He has served as President-Elect and as President of the National Society of Economic Paleontologists and Mineralogists.

Lee Suttner

Lee Suttner presented two papers at the IX International Association of Sedimentologists Congress in Nice, France, and an invited paper at the Paleoclimate Symposium at the New Orleans AAPG-SEPM meeting last year. Recent publications in the *Journal of Sedimentary Petrology* and the *Journal of Sedimentology* reflect aspects of his continuing research into the provenance of sands and sandstones. Professor Suttner used a portion of his sabbatical leave to continue paleoclimate study of the Fountain and Cutler Formations in Colorado.

At the end of last year, he completed a term as Vice President of the Great Lakes Section of the SEPM.

Besides his normal teaching duties, Lee has held special research seminars with graduate students in sedimentary petrology. A recent publication in the *Journal of Sedimentary Petrology* on quartz types as indicators of sandstone provenance, and a presentation at the North Central GSA meeting in Kalamazoo on the paleoclimatic significance of feldspar alteration resulted from such seminars.

David Towell

David Towell continues service as a member of the Budgetary Affairs Committee of the Bloomington Faculty Council. He is also chairman of the Subcommittee Concerning Priorities for Capital Requests.

Professor Towell teaches each summer at the Montana Field Station and plays an important role in the continuing success of that program.

Charles Vitaliano

Charles Vitaliano is still busy enlarging the Petrology Collections. The latest ac-

quisitions include representative collections of volcanic rocks from the Grand Canyon, Hawaii, the Valley of Ten Thousand Smokes, and the Antrim Plateau Volcanics of Northwestern Australia. Completion of research in the Snake River Plains, Idaho, has resulted in three major publications coauthored with W. P. Leeman of Oregon, Martin Prinz of the American Museum of Natural History, and A. Basu, a former student at Indiana University and now Curator of Mineralogy and Petrology.

Continuing joint research with Mrs. Vitaliano on the Bronze Age eruption of the Volcano Santorini and its "effect" on the demise of the Minoan Civilization has resulted in a second publication. In 1975 the Vitalianos accepted an invitation from the British School of Archaeology to sample a stratigraphically controlled excavation at Philakopi, on the Island of Melos, for traces of the ash from the eruption. The positive results of the search will have considerable bearing on fixing the time of the eruption and on determining whether or not the eruption had a major influence on the history of the Minoan civilization.

In other research, Professor Vitaliano is applying the finishing touches to the geologic map of the Archean metamorphic rocks in the core of the Tobacco Root Mountains.

The International Geologic Congress gave the Vitalianos an opportunity to renew old acquaintances and to make new friends in Australia.

New Faculty

Noel Krothe

An alumnus of IU, Assistant Professor Noel Krothe is one of three new faculty members added to the Geology Department last year. Professor Krothe graduated from Bloomsburg State College in Pennsylvania in 1961, and from the M.A.T. program in Earth Science here in 1969. He earned his M.S. and Ph.D. degrees at Pennsylvania State University, receiving the doctorate in 1976. Both his thesis and dissertation focused on water quality and chemistry in carbonate terrains.

At the 1976 Denver GSA meeting, Krothe presented a paper titled "The anomalous occurrence of sodium bicarbonate water in carbonate terrains." A paper

of the same title and a second on the water chemistry beneath a flood plain in a carbonate terrain are ready to be submitted for publication.

Last summer he performed an isotopic study of infiltrating floodplain waters with a summer faculty fellowship. He has also received a Grant-in-Aid for faculty research to study carbonate saturation of karst streams in southern Indiana, and presented a paper to the 1977 Seattle G.S.A. on that topic.

Krothe was invited to attend an August Penrose Conference sponsored by the G.S.A. on geostatistical concepts and stochastic methods in hydrology.

He teaches undergraduate and graduate courses in hydrology.

Enrique Merino

Enrique Merino, also new to the Geology Department faculty last year, received his geologic education on opposite sides of the globe. In 1967 he graduated from Ingeniero de Minas, School of Mines, in Madrid Spain, and in 1973 earned his Ph.D. degree from the University of California at Berkeley with a dissertation on the diagenetic mineralogy and water chemistry of Tertiary sands from the San Joaquin Valley of California. While in Spain, he also worked for American Overseas Petroleum, Ltd. from 1965 to 1967.

Assistant Professor Merino was a visiting professor at the University of Western Ontario in London, Canada, in 1973 and 1974. He worked from September, 1975 until his move to IU, as a research associate on the calorimetry of clays at Case Western Reserve University in Cleveland. His interests include experimental and observational research of the chemical interaction between aqueous solutions and minerals in diagenetic and metamorphic environments. He is embarking on NSF and Petroleum Research Fund-supported studies of the calorimetry of layer silicates, and also plans to do research on the Carboniferous petrology of Rhode Island with Assistant Professor Wintsch. Possible work on Precambrian rocks of the Keweenaw Peninsula, Michigan, is anticipated as well.

Enrique taught graduate courses in diagenesis and chemical sedimentology last year.

Edward Ripley

Edward Ripley, the third faculty member new to IU in 1976 is, at 27, the department's youngest faculty member.

Assistant Professor Ripley graduated with honors from Illinois State University's B.S. program in Geology in 1971. He moved north to the University of Minnesota for his Master's degree, which he completed in 1973 with a study of the copper-nickel mineralization in Archean, layered mafic-ultramafic sills of north-central Minnesota.

Ed entered Pennsylvania State's Ph.D. program and earned that degree in 1976. His dissertation research took him to South America where he studied stratified copper deposits at the Raul Mine, Peru.

His research interests include the study of metallic ore deposits utilizing mineralogic, fluid inclusion and stable isotopic techniques, and geochemical exploration for metal deposits.

He teaches undergraduate courses in economic geology and graduate courses in metalliferous mineral deposits and geochemical exploration. During the first 1977 summer session he also taught "Field Methods," a course the department had not offered for several years, which introduces students to work with the alidade, plane table and Brunton compass.

Robert Wintsch

A fourth faculty member addition since the last newsletter, Bob Wintsch, is be-

ginning his third year with the department. Assistant Professor Wintsch received his undergraduate geology degree from Beloit College in Wisconsin in 1969, and his Ph.D. from Brown University in 1975.

At IU he is using university and NSF funds to set up a high temperature, high pressure experimental lab to continue aspects of his doctoral research into reaction mechanisms in metamorphic rocks and the composition and role of fluids in metamorphism.

Bob is involved in several additional research projects. A paper on the structure, stratigraphy and petrology of rocks he studied and collected during six weeks of field work in Connecticut is nearly ready to submit for publication. A paper he wrote last spring titled "A Chemical Approach to Mica Preferred Orientation," has been accepted for publication in the GSA Bulletin. At the GSA meeting in Seattle this fall, he presented a poster talk on the problem of oxidation of iron during high temperature shearing in metamorphic rocks. Bob has also received support from the Petroleum Research Fund to formalize a long standing interest in the crystallinity of carbonaceous material as well as the petrology of the Carboniferous rocks of Rhode Island.

Bob teaches graduate courses in Phase Equilibria and Metamorphic Petrology. He has also held seminars in experimental petrology and in the tectonics of New England, the latter to prepare three graduate students for field work in southern New England. He designed and last May led a

12 day field course in northern Wisconsin and northern Michigan, where students examined field aspects of sedimentary, igneous and metamorphic petrology.

EMERITUS

Wayne Lowell

Wayne R. Lowell retired in 1976 after 26 years as teacher of Physical and Economic Geology. From 1951 to 1963 Dr. Lowell also directed the Geologic Field Station in Montana. Since 1963 he has devoted all of his energies to the introductory course and his advanced courses in economic geology on the Bloomington campus. He is now actively engaged in consulting on mining and potential mining properties—a service he developed during the latter part of his teaching career.

William P. Thornbury

Retired Professor Thornbury comes to the office he shares with Professor Lowell once or twice a week and still attends colloquia that are of interest to him. He and Mrs. Thornbury traveled to Yugoslavia in 1976 and last winter spent a couple of weeks in California visiting at the home of their son David who is a pilot for Western Airlines.

A SURVEY OF SELECTED FACULTY PUBLICATIONS 1974-1977

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WESTERN OUTPOSTS —Summer Field Program—

The Indiana University summer field program is the largest and perhaps the most well known in the nation. It is also the first choice of the great majority of winners of the prestigious National Association of Geology Teachers scholarships to outstanding students for summer field courses.

With approximately one out of every three students applying from out of state accepted into the program, the Field Station continues to operate at capacity under the direction of Judson Mead. Lee Suttner has been the Associate Director since 1970, and W. Thomas Straw of Western Michigan University is Acting Associate Director during August. Both an eight credit (seven week) and a six credit (five week) version of G429 are offered each summer with a total enrollment of about 140. In addition, Thomas Hendrix has initiated a Field Station-based version of his popular introductory course for majors, G111-112. Tom's course enrolls approximately 15 students, most of whom are honors-calibre incoming freshmen.

G429 is a course in general geology in the field rather than a traditional field-methods course. Emphasis is placed on improving the students' skills in observation and problem solving. Both the eight and six credit versions begin with a seven day field trip between Rapid City and the Field Station. At the Station, about the first

week is devoted to geologic mapping and study of Paleozoic rocks in areas of moderate structural complexity. The second week focuses on Mesozoic geology in structurally complex settings. The igneous and Precambrian metamorphic geology of the Field Station area is next studied for about two weeks. The traditional four day trip to the Disturbed Belt and Glacier National Park concludes the formal instructional phase of the course. In the remaining two weeks of the course, students are assigned to one of five final study areas where their goal is to prepare a geologic map and report on the total geology of the area. About one week is set aside for independent field exercises throughout the course.

— The Tobacco Root Geological Society —

The Tobacco Root Geological Society (T.R.G.S.) was organized in July, 1974 by a group of former Indiana University students, for the purpose of developing a forum in which greater knowledge and understanding of Western Montana and Northern Rocky Mountain geology could be promoted. Organized originally by Richard I. Gibson, Robert W. Langston, and Marian Miller Langston, the membership of the society now numbers nearly

100. One of its primary functions is the organization of field conferences. One such conference with headquarters in Bozeman was held in July 1976. At that conference reports on aspects of the geology of southwest Montana and northwest Wyoming were discussed. In addition, field trips were conducted to Ruby Range, Specimen Creek, the fossil forests of Yellowstone National Park, the Jefferson Canyon region, and to the Allister-Norris area. The conference closed on July 9 with a seminar at the Indiana University Geologic Field Station (I.U.G.F.S.) area, conducted by Professors Tom Straw and Lee Suttner, who explained the relationship of various problem areas to the field mapping program at the station. Following the seminar 48 conferees and the I.U.G.F.S. faculty enjoyed an open house and dinner in the I.U.G.F.S. lodge.

A second conference was held in July of this year in Butte, Montana. Present plans call for Missoula, Montana, as the site for the 1978 conference. Future meetings of the Society will be patterned after Geological Society regional meetings as much as possible.

The officers of the Society for 1977 are Richard I. Gibson, President; Marvin R. Miller, Vice President; Robert W. Langston, Corresponding Secretary; and Marian Miller Langston, Recording Secretary-Treasurer.

INDIANA GEOLOGICAL SURVEY,

By Maurice Biggs

This is an interesting and productive time for the Indiana Geological Survey. The level of service requests continues to rise sharply, indicating that more and more people are thinking about us; the legislature, if not lavish in its funding, has at least been more generous than usual, with the result that a new core storage library has been constructed; and some investigations of reefs, coal, black shale, and metallic minerals in Indiana give indications of leading to some interesting results.

When you visit the Survey on your next vacation trip through Bloomington, a good many familiar faces should be on hand to greet you. You can read a certain organizational stability into the fact that during the past year seven members of our staff—Gerry Carpenter, Andy Hreha, Harold Hutchinson, Martha Smith, Gerald Woodard, Joe Whaley, and Maurice Biggs—were recognized for completing 25 years with the Geological Survey. They joined Mary Beth Fox, Bill Moran, Bob Blakely, John Patton, Dick Leininger, and George Ringer, who had reached that milestone earlier. Henry Gray, Stan Keller, Lou Miller, Dan Sullivan, and Bob Shaver have only a year to go before becoming "elder statesmen."

Lest you gain the impression that the Survey staff is tottering on the brink of senility, I should hasten to add that several new young geologists have brought some fresh vitality and outlooks to the organization during the past few years. Many of our current programs combine the energy of this new group and the wisdom of Hank, Hutch, and others.

One project which involves nearly everyone on the Survey staff is an investigation of the New Albany black shale as a possible source of energy. The U.S. Energy Research and Development Administration has contracted with several state geological surveys and other agencies to do a comprehensive study of the shale and its counterparts in the East to see what hope it offers as a source of oil and gas. This is a project that has been in the back of our minds for 50 years or so, and two years before the ERDA effort was started we sought funding support from various federal agencies, without success. The ERDA contract, which provides nearly \$100,000 for new geologic equipment, has rekindled interest in the shale. Dick Leininger, Don Carr, and Leroy Becker (who retired Dec. 31, 1977,) have been the prime movers on this project, but nine other geologists, geochemists and technicians will work with them.

Cold weather and national energy problems have stimulated our coal program as never before; each month seems to bring a new record of inquiries. In order to make easily accessible the accumulated coal records of many years, Walter Hasenmueller has been working on a state coal data system with John Hickman. In a few months we hope to be able to call up coal analyses, reserve figures, or even maps, with which to respond to numerous questions.

Because most of our coal data deals with fairly shallow deposits, Harold Hutchinson is attempting to extend that knowledge with a coring program to explore deep coals in the Illinois basin. The Survey drill-

ing rig, now manned by John Helms and Marvin Iverson, has been coring south of Vincennes to depths of about 900 feet.

Fortunately, the Survey has a place to store the new core. (For the past few years the old core quonset has been filled.) The new state funded core library, completed around the first of the year, is located about three blocks northwest of the Geology building. It has 5,000 square feet of floor space, and will hold all of the core we presently have, plus that which we will acquire, at the present rate, over the next 20 years.

Nelson Shaffer is now working on a project that may surprise those of you away from Indiana—a study of sulfide mineralization in the state. Although the prospect of finding metallic minerals in Indiana had long been dismissed, Nelson's efforts have turned up many samples of metalliferous minerals. So far none have been found in commercial quantities, but one mass of sphalerite weighing 66 pounds has been discovered.

A combined stratigraphic and economic study of reefs by Curt Ault, Bob Shaver, and others over the past year or so, is now reaching completion. Besides providing material for many debates, papers, and field trips, the combined coring and field work has developed an exciting regional picture of Silurian sedimentation for Illinois, Indiana, and Michigan, and has paved the way for some mineral exploration. The odds favor your having a chance to hear Bob or John Droste review some of the findings at a nearby meeting.

OUTSIDE SPEAKERS

Colloquia 1975-1976

- Frank C. Appleyard, Director-Mining and Exploration U.S. Gypsum Co., Chicago Ill. . . DEVELOPMENT OF A MINERAL DEPOSIT ON PUBLIC LANDS—A CASE HISTORY (Sept. 29)
- Dr. G. G. Beckman, Cunningham Laboratory, Commonwealth Scientific and Industrial Organization (CSIRO), Brisbane, Australia. . . PROBLEMS IN DEVELOPMENT OF SOILS AND PEDIMENTS ON THE DARLINGTON DOWNS, QUEENSLAND, AUSTRALIA (October 16)
- Dr. Khosrow Badiozamani, Manager of Planning, Analysis and Evaluation, Amax Coal Company, Indianapolis. . . HETEROGENEOUS NUCLEATION OF CARBONATE CEMENT AND DIAGNOSIS OF DIAGENETIC ENVIRONMENTS (Oct. 27)
- Mr. John Allen, Research Agronomist, Division of Reclamation, Indiana Department of Natural Resources. . . GEOLOGIC PROBLEMS IN INDIANA RECLAMATION (Nov. 3rd)
- Dr. Frank C. Whitmore, Department of Paleobiology, United States Natural History Museum. . . THE PALEONTOLOGY OF CRUSTACEANS (Nov. 10)
- Dr. R. David Matthews, District Geologist, Minerals Department Dow Chemical Co., Midland, Michigan. . . EVAPORITE CYCLES IN THE DEVONIAN OF THE MICHIGAN BASIN (Nov. 17)
- Dr. William J. Hinze, Department of Geosciences, Purdue University, Lafayette, Indiana. . . RECENT BASEMENT STUDIES OF THE MIDWEST AND THEIR GEOLOGIC IMPLICATIONS: THE PAST AS A KEY TO THE PRESENT (Dec. 1)
- Patrick Wiram, Amax Coal Company. . . ACID WASTE DISPOSAL IN STRIP MINING (Feb. 2nd)
- Dr. Cornelius S. Hurlbut, Jr., Harvard University. . . GEM MINERALS FROM AROUND THE WORLD (Feb. 19)
- Dr. David L. Meyer, University of Cincinnati. . . ECOLOGICAL STRUCTURE OF MODERN TROPICAL CRINOID COMMUNITIES (Feb. 23)
- Dr. John K. Pope, Miami University, Oxford, Ohio. . . THE HISTORY OF GEOLOGY IN SOUTHWESTERN OHIO (March 1)
- Dr. Arthur L. Boettcher, Pennsylvania State University. . . ROLE OF AMPHIBOLES IN THE GENESIS OF ANDESITES (March 27)
- Dr. Robert Spicer, Lindemann Fellow, U.S. Geological Survey, Menlo Park, Cal. . . A STUDY OF DEPOSITIONAL SORTING IN POTENTIAL FOSSIL LEAF ASSEMBLAGES (March 31)
- Dr. Charles F. Kahle, Bowling Green University, Ohio. . . AN EVALUATION OF EVIDENCE FOR KARST AND TIDAL FLAT ENVIRONMENTS AS RECORDED IN THE SILURIAN ROCKS IN NORTHWESTERN OHIO (April 5)
- Dr. Kenneth Stanley, Ohio State University, Columbus, Ohio. . . SANDSTONE PETROFACIES AND DEPOSITIONAL HISTORY OF THE HIGH PLAINS SEQUENCE, WYOMING AND NEBRASKA (April 12)
- Theodore Lietzke, Northern Illinois University. . . DIFFUSION AND REACTION MODELS OF SMALL OCEANIC BASINS (April 13)
- Dr. Joseph M. Prospero, School of Marine and Atmospheric Science, University of Miami, Florida. . . IMPACT OF SAHARAN AEROSOLS ON THE ATMOSPHERE AND THE OCEANS OF THE NORTHERN EQUATORIAL ATLANTIC (April 14)
- Mr. James Jontz, Indiana House of Representatives. . . BIG PINE RESERVOIR: GEOLOGIC VALUES AND THE POLITICAL PROCESS (April 19)
- Dr. Raymond L. Christopher, U.S. Geologic Survey, Reston, Virginia. . . USE OF REGRESSION IN CHARACTERIZING THE CONTROL OF LITHOLOGY ON SPORE-POLLEN FREQUENCIES (April 26)
- William Graustein, Yale University. . . THE EFFECT OF FOREST VEGETATION ON REAL AND IMAGINED CHEMICAL WEATHERING (April 27)
- Wyman Harrison, Argonne National Laboratory. . . THE BEACHES OF ATLANTIS (April 28)

1976-1977

- Hans U. Schmincke, Bochum University, Germany. . . THE GEOLOGY OF GRAND CANARIA, THE CANARY ISLANDS (Sept. 29)
- Dr. Russ Peppers, Illinois Geological Survey. . . PRINCIPLES OF PALYNOLOGY AND SOME APPLICATIONS (Oct. 4)
- Dr. Leo Hickey, Smithsonian Institute. . . EARLY ANGIOSPERM FOSSIL HISTORY (Oct. 18)
- Dr. Herbert Frey, Astronomy Program, University of Maryland. . . COMPARATIVE PLANETARY CRUSTAL EVOLUTION (Nov. 1)
- Dr. Charles Wier, Amax Coal Company. . . PERMIAN COALS IN THE SOUTHERN HEMISPHERE (Nov. 15)
- Dr. Jim Fisher, Department of Geology, Michigan State University. . . ORDOVICIAN AND SILURIAN OF THE MICHIGAN BASIN (Jan. 31)
- Dr. David Scotford, Miami University, Oxford, Ohio. . . GEOLOGY OF BRAZIL (Feb. 7)
- Sharon Mosher, Department of Geology, University of Illinois, Urbana, Illinois. . . PRESSURE SOLUTIONS AS DEFORMATION MECHANISMS IN RHODE ISLAND CONGLOMERATES (Feb. 11)

- Dr. Jack Barnes, ISU-Evansville. . . ENERGY—ITS ENVIRONMENTAL IMPACT ON THE TRI-STATE AREA (Feb. 21)
- Dr. George White, University of Illinois. . . EARLY GEOLOGY IN THE OHIO AND WABASH VALLEYS (March 14)
- Harold Gluskoter, Illinois Geological Survey. . . MINERAL MATTER AND TRACE ELEMENTS IN COAL (April 4)
- Tanya Atwater, Massachusetts Institute of Technology. . . THE CREATION OF OCEANIC CRUST: STUDIES FROM SHIPS AND SUBMARINES (April 14)
- Jack Harrison, U.S. Geological Survey, Denver. . . WESTERN U.S. CONTINENTAL MARGIN—A STABLE PLATFORM DOMINATED BY VERTICAL TECTONICS IN THE LATE PRECAMBRIAN (April 18)
- Dr. Pat Dominico, University of Illinois. . . GEOLOGIC MODELS IN MASS AND ENERGY TRANSPORT (April 25)

AAPG Distinguished Lecturers 1975-1976

- Dr. Peter A. Scholle, APPLICATION OF CHALK-DIAGENETIC STUDIES TO PETROLEUM EXPLORATION PROBLEMS (Nov. 6)
- Dr. Daniel Bush, INTEGRATED DISCIPLINES IN PETROLEUM EXPLORATION (March 11)

1976-1977

- John M. Browning, AULOCOGENS AND MEGASHEARS: NATURAL HABITAT FOR OIL AND MINERAL DEPOSITS (Oct. 13)
- Robert Schmaltz, EVAPORITES, SULFIDES AND PETROLEUM (Jan. 14)
- James H. Clement, GEOLOGIC HISTORY—KEY TO ACCUMULATION AT CEDAR CREEK (Jan. 25)
- Sankey Blanton, GEOLOGY OF BERING SHELF (March 4)

HISTORY OF THE GEOLOGY DEPARTMENT

By John B. Patton

CHRONOLOGY

Instruction in geology was offered at Indiana University as part of courses in natural philosophy for some 10 years before a course specifically named geology appeared for the first time in the 1853-1854 University Catalog. The faculty during those early years, and indeed until the mid-1880's, did not include persons trained as specialists in geology, but Richard Owen, M.D., who became Professor of Natural Science and Chemistry in 1867, and was Professor of Natural Science from 1874 to 1879, would surely have been considered a professional geologist.

In April 1885 the Board of Trustees created a Chair of Botany and Geology, and a Department of Geology was established for the 1885-1886 academic year with the appointment of John Casper Branner as Professor of Geology, Instructor in Botany, and Curator of the Museum. Three courses were listed, and a geology laboratory and museum were set up on the second floor of newly completed Owen Hall, the first building established on the new campus in Dunn's Woods following a fire on July 12, 1883, at the original Second Street and College Avenue campus. The first graduate of record was Edward

M. Kindle, who received the A.B. degree in 1893, by which time Associate Professor Vernon F. Marsters was in charge of the department. Kindle was appointed Instructor for the year 1893-1894, and for the first time the department had a two-man faculty. John F. Newsom joined the faculty as Instructor in 1894-1895, replacing Kindle.

A third faculty member, Edgar R. Cumings, was added as Instructor in Paleontology for the 1897-1898 year, beginning the longest service record in the departmental faculty. Doctor Cumings became head of the department in 1905 and retired as Emeritus Professor in 1944.

The first Master of Arts degree was awarded in 1899 to James Arra Price.

The name of the department was changed to Geology and Geography in 1900, and the word geography was dropped from the title in 1904. J. W. Beede became Instructor in 1901-1902.

In 1902 the department moved from Owen Hall to the fourth and fifth floors of the new Science (now Lindley) Hall. The department's first doctoral degree was awarded in 1913 to J.J. Galloway, who was then appointed Instructor in 1913-1914. The number of faculty reached four in 1916-1917 when W. N. Logan and C. A.

Malott were appointed as Associate Professor and Instructor, respectively (J. J. Galloway had left to join Columbia University at the end of 1915-1916).

Geography was still taught within the Department of Geology, and a faculty addition in geography took place in 1919 with the appointment of S. S. Visher as Assistant Professor, but the teaching staff in geology did not increase (to five) until 1921-1922, when John R. Reeves and William N. Tucker were appointed as Instructor and Assistant Professor respectively. The number of faculty rose to six in 1923-1924 when Arch R. Addington became Instructor.

Ralph E. Esarey joined the faculty as Instructor for 1924-1925, beginning a period of service that extended until his retirement in 1966. In 1928-1929 William D. Thornbury was appointed Instructor in geography, initiating a tenure that extended through 1969-1970. He has been Professor Emeritus since that time. Professors Esarey and Thornbury (and Doctor Cumings earlier) have given more years of service than any other departmental faculty members.

In 1931 the departmental name was again changed to Department of Geology

and Geography. J. J. Galloway returned as Professor for the 1932-1933 academic year, after 15 years of service at Columbia University.

During the summer of 1937, Owen Hall, which had for some years been utilized by the School of Medicine, was renovated for the Geology Department which thus returned to its original home, now occupying the entire structure.

By 1936-1937, with the retirement of W. N. Logan, the teaching staff in geology had declined again to four, and it remained at this level through 1944-1945.

Following Doctor Cumings' retirement from the chairmanship in 1941, C. A. Malott served as Acting Chairman through the 1944-1945 academic year. Charles F. Deiss was then selected as the new Chairman and State Geologist. Under Doctor Deiss' administration, a conscious change in the department's breadth of coverage and size of faculty began (see Figure 1). At the end of the 1945-1946 academic year, a separate Department of Geography was created, and Doctor Thornbury remained with geology. Eugene Callaghan was added as Professor in the same year, increasing the faculty to six. From that time forward, faculty growth was notable (see Figure 1). By the 1949-1950 academic

year the faculty numbered 9; in the 1954-1955 academic year, 11; in 1959-1960 again 11; in 1964-1965, 16; in 1969-1970, 20; in 1974-1975, 22 (including two joint appointments with other departments); and the faculty during the 1976-1977 academic year was 23 (also including two joint appointments).

By the latter 1950's, the academic geology program had expanded to occupy parts of Wylie Hall, Kirkwood Hall, Maxwell Hall, and miscellaneous temporary structures. Planning began in 1955 for a new Geology building. Construction was started in 1959, and the department moved in an eight-day period between semesters in January 1962. A joint Department-Survey dedication was held in April 1964 when the attached Geological Survey building was completed.

Intensive field training at a remote site was initiated in 1947, when the department utilized the Yellowstone-Big Horn field camp at Red Lodge, Montana, and in 1949 the University completed Phase I construction of the Indiana University Geologic Field Station in the Tobacco Root Mountains and offered the first session of a program that has grown into the leading operation of its type in the United States.

John B. Patton became Chairman and State Geologist in 1959 following the death of Charles F. Deiss. Warren G. Meinschein served as Acting Chairman for the 1971-1972 and 1972-1973 academic years, and Haydn H. Murray has been Chairman since.

DEPARTMENTAL OFFERINGS

During the early years of geologic instruction, little opportunity existed for specialization. The early faculty members, despite having specialized interests in paleontology or physiography, had to be generalists. Until the end of the Second World War, the departmental strengths were paleontology, stratigraphy, and geomorphology. A considerable proportion of the degree recipients entered the field of petroleum geology. Following World War II, specialists were added in fields that had previously been taught through service courses (mineralogy, petrology, structural geology, economic geology), and training was offered in fields not previously available (geophysics, geochemistry, hydrogeology).

DEGREES GRANTED

The departmental program began in 1885 with the Bachelor of Arts as the authorized degree, but the number of graduates was small until the late 1940's. Records are lacking for a four-year period following 1893, when Edward M. Kindle received the first degree awarded in geology. From 1902 through 1905, and in 1910 and 1918, no bachelor's degrees in geology were awarded. Nine degrees were granted in both 1925 and 1926, and eleven in 1928. The depression years of the early 1930's resulted in low enrollments but the average number of degrees granted rose modestly through the late 1930's. World War II again resulted in low enrollments, and few degrees were awarded between 1943 and 1948. Then the GI enrollment bulge was reflected by large graduating classes in 1949, 1950, and 1951. Initiation of the Bachelor of Science program in the late 1940's cut into the A.B. degree program during the 1950's. A larger total number of B.S. degrees has been awarded (105 A.B. degrees, 115 B.S. degrees) for the period 1970 through 1977. In 1975 the B.S. degrees numbered 19, the largest number since 1958, when a record 23 were granted. The largest *total* bachelor's-degree productivity was in 1950, when the number was 45 (see Figure 2).

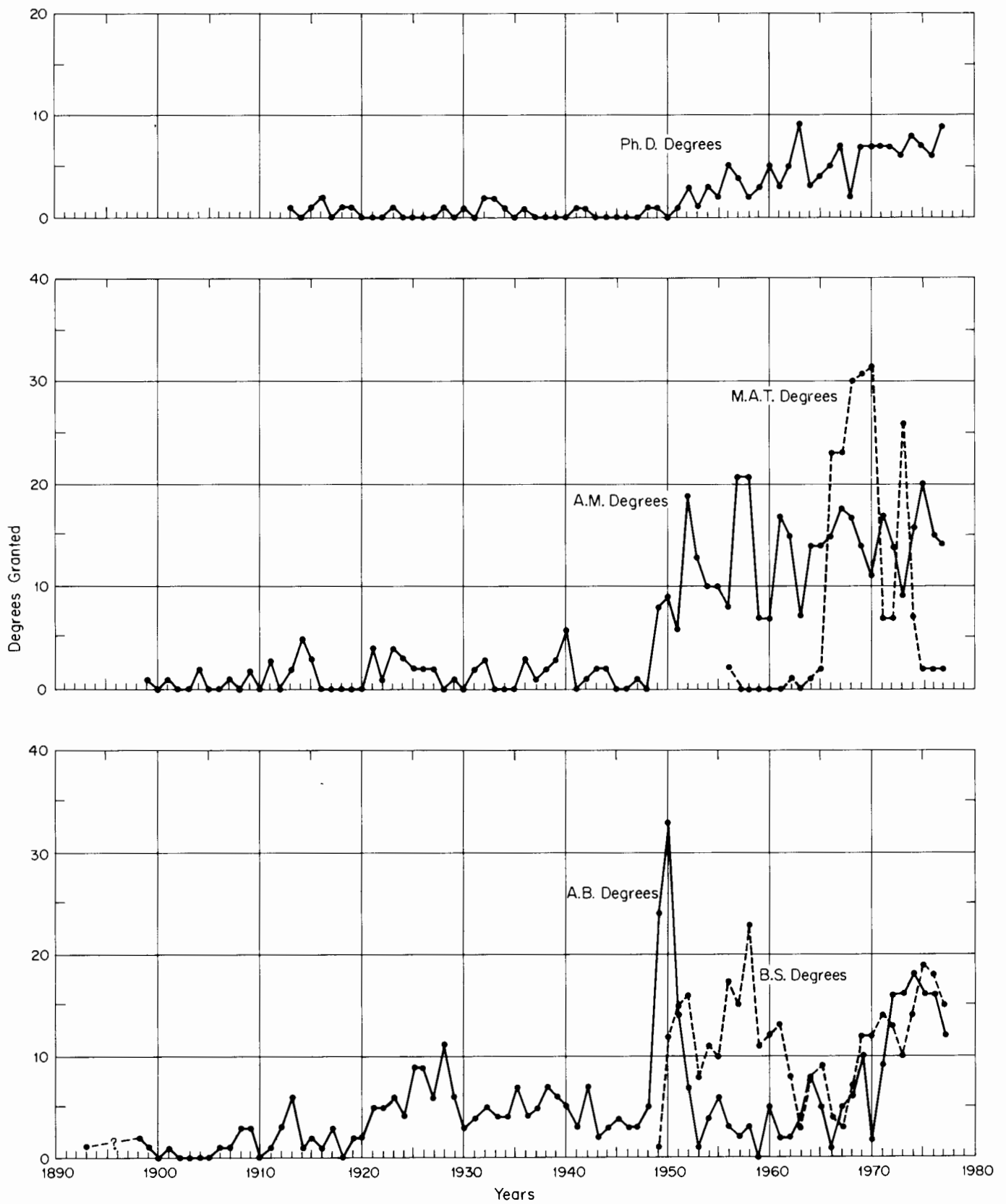
Between zero and six Master of Arts degrees (the first awarded in 1899) were granted per year until 1949. Since then, between six and 21 of those graduate degrees have been awarded each year. Our present yearly average is about 15 A.M. degrees (see Figure 2).

The Master of Arts for Teachers degree (in earth science), first awarded in 1956, had few recipients until 1966, when a series of institutes supported by the National Science Foundation produced bumper crops of M.A.T. recipients for all years except two through 1973. The department was one of the most active in the nation in training earth science teachers through that interval.

The Doctor of Philosophy degree, first awarded in 1913, resulted in no more than two doctorates per year (and none in most years) until 1952. Beginning in the mid-fifties a slow and erratic growth has taken place in the number of Ph.D. degrees awarded annually, although the number of students in the doctoral program has expanded fairly steadily. The department now grants an average of about seven Ph.D.'s per year (see Figure 2).

Tables 1 through 5 list, to the extent that records of the Registrar's Office and the Department permit, in chronological order, recipients of all degrees awarded by the department to date. We solicit corrections and additions from the readers of the NEWSLETTER.

Figure 2—Degrees Granted 1890-1977



A.B. DEGREES

1893	Edward M. Kindle	John Kerr Rose	Thomas Ed Green
1898	Lee Fent Bennett	Victor John Salmi	Joseph E. Keyser
	Charles G. Daily	Paul Freund Simpson	1947 John William Hagey
1899	Emma Leberta Wilson	Mrs. Iris Marie Gilman Stanger	Frank Edward Kottowski
1901	James Frazier Wilson	Gladys Thrasher Tarkington	Mrs. Harriett Maitlen Thomas
1906	Charles William Shannon	George Isaac Whitlatch	1948 Robert A. Biebermann
1907	Albert Warrick Thompson	1929 Louis Donovan Allen	Maurice E. Biggs
1908	George Edgar Burton	Ernest Jasper Downing	Karl Frielinghausen
	Frank Cook Greene	Rifat Habbab	William Francis Jester
	William Motier Tucker	Charles Lewis Starr	James R. MacDonald
1909	Carl Vincent Barker	Ruth Elizabeth Tweedy	1949 Homer R. Brown, Jr.
	Jesse James Galloway	Melvin Edward Wooton	John R. Bullock
	John Arnott Smith	1930 Mabel Irene Dietrich	Jose Candido Marques Cavalcante
1911	Harry Bauer Johnston	George Richard Freed	John Evan Davenport
1912	Hubert Ellis Brown	Martin Milton Nading, Jr.	Harold Lutz Deane
	Charley Harold Oranhood	Mrs. Ruth Rohrer Hays	Robert W. Faith
	Earl Wayne Vickery	Miriam Frances Mayes	Dallas N. Fandt, Jr.
1913	Henry Mathusalem DuBois	Raymond C. Mullen	Jacob Phillip Hamilton
	Paul Hunt	Mrs. Josephine Starr Pond	Thomas Malcolm Hendrickson
	Thomas Franklin Jackson	1932 Robert Ellery Bates	Gerald Joseph Hennessy
	Fred Daniel Lewis	Daphne Ethel Burns	Harold Walter Horst
	Mrs. Eula David McEwan	Robert B. Grosjean	Dick Spease Horton
	Clyde Arnett Malott	Rex Eugene Rader	Andrew John Hreha
1914	Horace Noble Coryell	Ronald R. Rogers	John Herbert Hughes
1915	Thomas Darrell Foster	1933 Noel Ritchey Bailey	Donald Eugene Hyer
	Burton J. Malott	Claudia Miller Hooker	Phillip J. Lane
1916	Frank Emerson Allen	Richard Henry Schweers	Edward D. McKay, Jr.
1917	Colonzo Chelice Beals	Brice Byron Smith	Earle Seifried Newcomer
	Ira Otho Brown	1934 Marion M. Fidler	John Samuel Osborne
	Jesse W. George	Herbert Glen Hudson	Ned Myron Smith
1919	Burleigh Wayne Harter	Robert John Marshall	John R. Taylor
	Paris Buell Stockdale	John Richard Perry	Elbert Clay Warren
	1920 Luther S. Ferguson	1935 Charles Noble Beard	Kenneth Montelle Waters, Jr.
	Glenn A. Lee	Charles Wessler Bicking	Wesley Edward Williams
1921	Glenn Gardner Bartle	Gordon Forsyth Fix	1950 Nick Baciu
	Marshall Allen Harrell	Mark White Pangborn, Jr.	Bernard Robert Broadbent
	Otto H. Hughes	Kenneth Armstrong Payne	Wayne Miley Bundy
	John Irwin Moore, Jr.	Benjamin Franklin Rogers	Elmer Frederick Chilcoate
	John Robert Reeves	William Philip Von Osinski	Charles Robert Connaughton
1922	Archie Rombaugh Addington	1936 Melvin D. Mauck	Cornelius Martin Connelly
	Ralph Emerson Esarey	Norbert A. Parker	Carlton Thomas Cook
	Thomas C. Heistand	James Elmo Reeves	William Henry Crites
	Elmer L. Lucas	Donald Frederick Thompson	Walter Jesse Dahmer, Jr.
	William Post Rawles	1937 John Rodefer Harris	John Anthony Dunn
1923	William John Hill	George Heap	Richard Clarkson Erd
	Raymond Samuel Hunt	Fred Hubert Latimer	Harold Clyde Fancher
	Robert Lewis Kidd	Charles Grason Spencer	John Lowell Hamilton
	Estelle Brown Owen	Elmer Louis Wegner	Warren C. Heisterkamp
	Pearl Stout	1938 Tom Dawson	Richard Louis Hyde
	William Avery Thomas	Margaret Clare Kuzmitz	Frederick Jackson, Jr.
1924	Paul Gerrard Barrett	Lester Lloyd Logue	Wo Jee-Hing
	Florence Mae Elder	James Cole McCulloch	Richard Harold Johnson
	Olena Ferne Peck	Lotus Merle McLemore	Beryl Dale Kline
	Albert Peter Swanson	Claude Leslie Trusler	Edward Ernest Kroner
1925	Ronald Lewis Bartle	Courtney Waddell	John Maurice Miller
	Robert Alexander Hall	1939 Hollis B. Fender	James K. Niehaus
	Pauline Leanora Harker	Herbert James Merrill	Victor E. Olson
	Albert Thomas Hoadley	Ruth Moulton	Wilbur Dean Pennington
	Joseph Conrad Holm	Frederick Paul Schweers	Rosalind Robinson
	Harlan DeBaun Logan	Willis Levy Smith	Robert Lee Sims
	Marshall Atkinson Newnum	Walter Blue Spangler	Harold Sorgenfrei
	Robert Rakes Shrock	1940 George Douglas Charlton	James T. Stanley
	William David Thornbury	John Eugene Combs	James T. Strange
1926	Devere Carter	Preston McGrain	Robert Bernard Sublett
	Floyd Childs	Jay Val Schilling	Henry O. Thomas
	Leroy Isaac Dunfee	John Edward Uhl	Robert Charles Voss
	Mrs. Wava Mabel Line Hummel	1941 Robert Gaylen Reno	Ralph H. Wedow
	Herman Lewis Martin	Henry Glenn Rogers	1951 Raymond Leon Battin
	Arthur Everett Moore	Everest Elmer Wible	Thomas George Beck
	Ralph Eugene Stouder	1942 Charles C. Bajza	Wayne Albert Erickson
	Arthur Franklin Striker	Thomas Murray Bryce	William Hamilton Flanagan
	Lester Harold Wise	Ruth E. Kiper	James Richard Harris
1927	Gladys Helena Brackmier	Dan Kralis	Harold Christy Hutchinson
	Walter E. Burnham	Robert Ray Myers	Robert David Jenkins
	Jessie Scofield Kaserman	Robert Stewart	Thomas David Jones
	Ralph Blackwood McClintock	Frank Hoyt Williams	Joseph Ray Lagro
	Lilburn Harold Seamon	1943 Hugh Henry Berry	Eugene John Lennart
	Ferol Georgia Spencer	John Carlisle Bollenbacher II	Grady Adams Loftin, Jr.
1928	Mary Carolyn Hirsch	1944 Barbara E. Brooks	Donald Richard Newsom
	John Newton Mitchell	Harvey Fierstein	Ranard Jackson Pickering
	John Ewing Organ	Hobart Byron Harris	George Puscas
	Horace E. Rankin	1945 Doris Franz Bieberman	1952 Helen Marie Beikman
	Herman Henry Roerk	William Palmer Jenkins	Herman C. Engles
		Thomas K. Mooney	Harriett Ann Gray
		George Otis Winston	Don Lee Green
		1946 James Woodford Batchelor	Robert L. Jones

Richard E. Martindale
 Paul Edward Middleton
 1953 James Ross Gibson
 1954 John Herbert Cleveland
 Bert Hoadley Fell
 Granville Dalton Foley
 Reeve Dee Rarick
 1955 Donald Henry Buchholz
 James Wilbur Green
 Clyde William Huffman
 William Lewis Kaschube
 Rosalia Eugenia Rey
 James Allen Smith
 1956 James Robert Dodd
 Arthur John Fritz
 Carl W. Myers
 1957 Ralph Eugene Hunter
 Howard William Pee
 1958 James Richard Carter
 John David Downen
 Franklin D. Olson
 1960 Robert F. London
 Forrest Keith Root
 Lawrence Harold Skelton
 Joe Irvin Willman
 Richard Dale Wright
 1961 Roger James Cuffey
 Robert Browning South
 1962 Kenneth William Craw, Jr.
 David James Foggatt
 1963 Paul John Dubiel
 Dale Edward Kenney
 Gary Dean Kochert
 Robert Eugene Seidel
 1964 Robert Wayne Bolin
 Mary E. Buehler
 James Barton Dailey
 Thomas M. Deputy
 Wasfy B. Iskander
 William A. Rensberger
 Paul D. Ryder
 Marlin J. Schaefer
 1965 Paul B. Basan
 Robert B. Cornell
 Brent H. Lowell
 Susan J. Lowell
 Leslie E. Sponsel
 1966 Margaret L. Vogel
 1967 Deborah Jane DeWolf
 Mary Irene Finch
 Michael Lee Fowler
 Stanley Crawford Kent
 Katharine Ann Sommer
 1968 Ruth Martha Rague Emst
 Robert Dale Phillips
 Michael A. Retherford
 Kenneth J. Schoon
 Peter Gordon Schwartz
 Aaron D. Smith
 1969 John Charles Adamson
 Jacqueline Sue Bond
 Peter L. Calengas
 Jacqueline Dee Chapla
 Ann Lynn Gall
 Elizabeth Krebes
 Joe L. Litehiser, Jr.
 James Philip McPhee
 David J. Morton
 Nicholas Wayne Noe
 1970 Jeffrey C. Long
 Lewis C. Sheek
 1971 Patricia D. Blanchard
 John Carl Godersky
 Darrell Gilbert Herd
 James Milton Jackson
 Randall Eric Myer
 Jeffrey Allen Pearce
 Gianfranco G.L. Rinaldi
 Mark Stephen Sonntag
 Joanne Karen Welch
 1972 John R. Bahr
 Sarah Campbell
 Leo K. Chu
 Clyde A. Cody
 Richard Alan Donica
 Peter Thompson Gawthrop

Stephan Alan Graham
 Steven Maxwell Kestle
 Douglas Love
 R. Patrick MacDaniel
 Gary Van Middlesworth
 Douglas Edward Otto
 Joseph Scott Powell
 Michael A. Ringswald
 Ules Samuel Wade
 Gregory Paul Wahlman
 1973 Christopher Alan Andrews
 Lois Arvin
 Stephen Louis Boomer
 Peggy K. Cox
 John Geoffrey Darr
 Eric Alan Dils
 James Gaiser
 Thomas Garnier
 Jeremy Jameson
 James Prather Jontz
 Craig William Kroll
 Willis E. McConnaha III
 Diane C. Matt
 Vera Pokrajac
 James H. Wells, Jr.
 Robert Wayne Wilson
 1974 Merrill James Allen, Jr.
 Margaret Jane Baldwin
 Karen Bauman
 Charles Havard Betz
 David W. Clark
 Terry L. Cox
 Robert C. Crevello
 Larry Neil Goltz
 Arlen Kent Grove
 William K. Heffron
 Gerard Daniel Hicks
 Steven K. Lutter
 Eric William Robbins
 John Paul Schnable
 Lou Ann Smith
 Robin Edw. Spicer
 William L. Ullom
 Becky Sue Weimer
 1975 Michael Bonadio
 Dorene Marie Budnick
 Christopher Jay Canfield
 Jerry Robert Cook
 Ann Pence Detjen
 Paul D. Dubois
 John R. Fields
 James Edw. Golden, Jr.
 Robert Gray
 Alan George Jancovech
 James J. McNally II
 John C. Mackey
 Joseph L. Manson
 Norman James Napier, Jr.
 Wilson Murray Shook
 Myron Webb
 1976 Neil J. Bradford
 Curtis R. Chapman
 Thomas H. Eastridge
 Thomas W. Farlow
 John F. Hickman
 Christopher E. Kohler
 Karl Eric Longstreth
 Timothy Joseph Mills
 Thomas J. Pearce
 Clifford Gary Priem
 Susan Joan Roush
 Melinda Ann Runkle
 Kenneth D. Smith
 Mark Alan Souders
 Steven L. Widdicombe
 Janet P. Zurschmeide
 1977 Keith Harrison Adkins
 David L. Briggs
 Scott Carter Daniels
 Jack Edward Doskow
 Kathleen Kay Fowler
 David Gorman
 W. Brant Howard
 Dennis Clay Parker
 Bruce Alan Underwood
 Heidi Ann Wallace

James D. Wilson
 Brad Eugene Zimpelman

B.S. DEGREES

1949 Ward J. Collins
 1950 Gerald L. Carpenter
 Patricia Arkin Gerdsen
 S.R. Hollensbe
 Robert Frederick Howden
 Paul L. Kelly
 John Kipta, Jr.
 Dennis R. Lucas
 Ralph Lowell McDonald
 Donald Joseph Munich
 Ira Daniel Taylor
 W. Eugene Taylor
 Paul D. Yundt
 1951 George Frank Bechner
 Delmer Lee Elston
 Raymond Leon George
 Gordon Conrad Grender
 John Frederick Hare
 Robert Duncan Hite
 Perry Gregory Holloway
 Addison Harris King II
 Donald Wells Mannan
 Arthur Peter Pinsak
 Abdullah Shakir Sayyab
 Charles Vance Solbrig
 Dan Martin Sullivan
 Richard Amos Surface
 James Clay Wilson
 1952 Robert F. Barbour
 Arthur Clifford Brookley, Jr.
 Wilbur R. Deiters
 Donald Clayton Devening
 David Van Hoff Lewis
 James Robert Mahorney
 John Robert Neel
 Henry Joseph Papparazzo
 Lowell Browning Plock
 Samuel Leander Riely
 Albert Julius Rudnyansky
 Robert Gene Stouse
 Sheldon Kay Turner
 Kenneth Raymond Vance
 Joseph Floyd Whaley
 Bobby Joe Worthington
 1953 Benjamin Edwards III
 Olin R. Holt
 Jack Richard Jankovich
 Stanley James Keller
 Jack Wayne McIntosh
 Robert Marquette Newman
 James Franklin Powell
 John Millard Smith
 1954 Alan Andrew Colville
 Daniel R.T. Davis
 Lowell Eugene Gladish
 Jack Lamar Harrison
 Donald Richard Newsom
 Leonard Benjamin Otte
 David Dewey Prentiss
 Edgar McCormick Roberts, Jr.
 Keith Richard Treadway
 Marvin Eugene Warner
 Jack Roland Warren
 1955 Ferol Frederic Fish
 James H. Kercher
 Charles M. Lindenschmidt
 Carl Ennis Lockhart
 Maurice Dale McClain
 Neil R. Schemehorn
 Jack Wendell Stover
 Daniel Strain Tudor
 Jack William Wells
 Janet K. Wert
 1956 Stephen Ferguson Bedwell
 Joseph Bodart, Jr.
 Jack Francis Conley
 Richard David Harvey
 Kenneth Huff
 John Allen McCormick

	Jack Lewis Nelson	James C. Crisman	Theodore Petranoff
	John Thomas Riddell	Robert Lee Dayson	Humberto Rostworowski
	Alan Jack Rommel	Michael Ross Jordan	Robert Sterrett
	Robert Anton Rudman	Kenneth Earl McCain	Gregory Tipple
	Gerald Bruce Rupert	Robert Leslie Proudfit	Robert B. Vote
	Howard Smith	Dale Allen Schultz	Jerome Paul Walker
	James Fisher Wakeman	Robert Barnett Votaw	1973 Richard LeRoy Adams
	Gary Lee Wirey	1963 Judith Gail Clark	Allen B. Agnew
	Daniel Olin Wright	Stanley Kerry Hamilton	David Barney Buddrus
	Teruo Yamamoto	James Bucknell Mosier, Jr.	John T. Hanou
	George John Yurkas	1964 Donald Edward Hall	Donna Kay Kempf
1957	Jon Benton Abrams	Joseph R. Kramer, Jr.	Dwight D. Schaefer
	Donald Curry Burditt	Richard L. McCain	Garry Lee Scholz
	Howard Orman Clark	Robert Charles Moore	Larry Wayne Studebaker
	Michael Terrence Cowen	Robert S. Nicoll	Donald J. White
	Craig Bond Hatfield	Michael C. Penz	Phillip L. Zink
	Richard Earl Kirk	Howard Renick, Jr.	1974 Michael E. Ardeel
	Fredric Duane Meyer	Larry D. Woodfork	Robert W. Bauer
	Ronald Kent Ogle	1965 David R. Balogh	Rosanne Ruth Buecker
	Frank Donald Pruett	Robert M. Buehrig	Daniel O. Chase
	Daniel Richard Rodriguez	Gary W. Carnes	Susanne E. Cunningham
	Everett Jay Rommes	Charles K. Denzinger	L. Lawrence Goldenberg
	Theodore William Ross	Donald G. Eckerty	Jay Andrew Heitman
	Samuel Robert Schwartz	William C. Herring	Carl Michael Leshar
	Galen Nevada Shirley	Michael C. Moore	Daniel Lee McGrew
	Wilbur Benson Winter	Raymond M. Rene	Marc E. Nelson
1958	Wallace Kirkland Aiken, Jr.	Robert D. Tipple	Keith Alan Schuler
	Thomas F. Arnold	1966 Mohammad Ahmad Ahmad	William D. Shalter
	Jack Wilson Baker	Larry Dean Bennett	Laura L. Turner
	Jacob Gerald Baker	Carl Earl Campbell	Jon Robert Weterick
	Carl W. Christensen	John H. Ravenscroft	1975 David Burke
	Lawrence Paul Cutner	1967 Harry John Allen	Lok Sing Cheung
	George Bendix Derner	William Frederick Althoff	Michael Eugene Clark
	Ronald Dean DeRudder	Stephen Webster Rose	Mary Diane Corbett
	William Gordon Dixon, Jr.	1968 Edwin Thomas Atkin	Robert Lewis Critchlow
	Joseph Michael Duhon	Charles Emil Beck	Holly Catherine Deis
	Maxwell Ellis Gardner	Terry Fischer	Thomas G. Fertal
	Gary Rickey Gates	Kenneth Irwin Reiss	James Francis Goss
	William Arch Girdley	Michael R. Thomas	Bruce A. Hargan
	William Patrick Noone	David Michael Weinberg	Michael Robert McCann
	Jack B. Northrup	Wallace Walter Wrigley	Jeffrey Michael McDermott
	John S. Parker	1969 Douglas Reid Baumgardt	Patrick McDevitt
	Robert Gordon Pirie	Michael Miller Hamilton	Peter Martin
	John E. Ramsey	Patrick W. Kennedy	James Fischer Murray
	John William Ransford	Douglas J. Knab	Dennis Alan Nelson
	William Jack Stangle	Marian Thecla Lankston	Mark Everette Rusk
	William Thomas Straw	Robert Wayne Lankston	Jerome M. Siekierski
	Garnet Henry Ward	Norman M. Lewis, Jr.	James Walter Sukup
	Richard Edwin Wiley	Michael McDowell	Melonie Faye Tonkin
1959	Jerry Pemberton Birge	Terry Allen Miller	1976 David Black
	Marlan T. Boultinghouse	Mary Ann Turner	Behtaz Compani-Tabrizi
	Robert Lee Cullers	Gregg Allen Vane	William Glover III
	Thomas Simon Hirschmann	Stephen Charles Warner	Thomas Lynn Guthrie
	Robert Ward Kirby	1970 Michael C. Carpenter	Michael W. Hall
	David Reid Lankard	Jane Curl	Cynthia Denese Lowrance
	David Lane Mathews	David Alexander Darko	James O. Maxwell, Jr.
	Marion Davis Stallard	David Michael Finton	David Olliver
	Don Cooper Steinker	Stephen W. Henderson	Thomas George Plymate
	Donald Wayne Wirth	Korryn Felicia McLane	Willard Otto Polley, Jr.
	Fredrick Ross Wampler	John R. Mitchell	Gerald Duane Robbins, Jr.
1960	Lyndon Lee Dean	Peter B. Penzenik	William A. Rutan
	Alan Lloyd Dusendschon	George Bruce Reef	Bruce Tendall
	David Andrew Eastman	Michael Jay Stearns	Maxwell Joseph Tilford
	William Francis Hanna	David Edward Thompson	Mark C. Torrens
	Jack Bennett Jacks	James O. Wood	Kurt William Valko
	Gerald Homer Johnson	1971 John Bassett	William Lytle Wilson
	Donald Harold Komito	Stephen Edward Eikenberry	Bruce Allen Wright
	Edward Michael Kuck	Richard Ingram Gibson	1977 James Thomas Basick
	Jim Lee Northrup	Jon Edward Greim	Andrew Robert Campbell
	Larry Eugene Orr	Thomas M. Hare	Gary Benjiman Cohen
	Bernard Mike Parlock	Frederick R. Keer	John Eric Edkins
	Robert Eugene Parsons	Steven W. Koehler	David Michael Falls
1961	John Strother Brumfield	John Richard Lane	David W. Grom
	Roy Elbert Butler, Jr.	Thomas E. Purkey	Stephen Jay Hall
	Paul Robert Deem	Jeffery H. Randall	David F. Kluesner
	Robert Eugene Foster	Scott W. Rogers	Jeffery Charles Line
	Daniel E. Hall	George Ronald Sullivan	Stephen H. Loner
	Richard Wayne Hinton	Theodore Allen Weitzel	Gary Wayne Nelson
	Jerry Allen Lemmons	Stephen G. Wells	William R. Roy
	Allen Ora Perry	1972 Julio Alamos	Donald Bruce Saxman
	David Dale Phoenix	Stanley Wayne Anderson	Louis Edward Schultz
	Richard Luther Schuman	Richard L. Asher II	Robert David Woock
	Lawrence August Taylor	Sigrid L. Bolinder	
	Ronald Joseph Walton	Walter Ryan Burrin	
	Roy Edward Williams	Val W. Chandler	
1962	Edward Elling Berg	Robert Hugh Leach II	

M.A.T. DEGREES

- 1956 Donald Aung Ba
Byron F. Sheldon
- 1962 Joe I. Willman
- 1964 William Richard Shirk
- 1965 Donald Lynn Brobst
Keith Alan Graham
- 1966 Ronald E. Armstrong
Hansom P. Baptiste
Doris Jean Byerly
William R. Chandler
E. Arnold Coe
David D. DeBarthe
Gerald Edward Dietz
Gene F. Ebner
Alvin C. Farmer
Gary Mark Ferrence
James E. Goltz
Roland L. Grant
Ronald C. Gross
Roxanne R. Harper
Ralph M. Huffaker
Samuel F. Huffman
James E. Hughes
Bernard R. Maynard
Richard M. Munson
Charles A. Robichaud
Vernon P. Scott
Russell O. Utgard
Emma C. Witherspoon
- 1967 Garry G. Anderson
Thomas F. Behan
Lowell P. Braxton
Napoleon Bryant, Jr.
Paulino K. Chu
David A. Dahl
Garrett Deckert
Kenneth D. Finer
James R. Jackson
Joseph F. Kimerer
Louis C. Konetski
Richard L. McCain
Donald R. Micklon
Robert G. Reid
Herbert C. Reuter, Jr.
Jerald A. Rice
Alfred C. Robinson
William S. Simonsen
James F. Stratton
Edward J. Tarbuck
Donald R. Tuttle
Robert L. Ward
Frank R. Zindler
- 1968 Arnold L. Andersen
Donald Edward Baker
Harvey B. Barrett
David R. Burd
David G. Clarkson
Joel E. Dysart
Robert W. Eklund
Coleman A. Gentry, Jr.
Bruno Goldschmidt
Wallace H. Helber
Richard G. Hodge
Walter E. Jackson
David Bruce James
Peter H. Kellams
Michael C. Kelleher
Bryan S. Kemmerer
George Thomas Ladd
Jack L. Mason
Robert C. Minning
Thomas Joe Murphy
John V. Nugent
Brenda Carol Romans
Sister Agnes Rotarius
John Jay Rusch
William O. Stinson
Vicki M. Torpy
Gail L. Truho
Peter E. VandeWater
Harry A. Walker
Bryon K. Yoshina
- 1969 Norma Jo Adams
- Sister M. deMontfort Babb
Larry D. Bennett
Edward J. Bielski
Harvey J. Bomberger
Donald C. Braun
Bernardine P. Burke
Sister Georgine M. Cizauskas
Wallace W. Drexler
Jack R. Fish
Thomas J. Fleck
Andre Fontaine
Katharine S. Friberg
Harold J. Funk
Edith M. Ginger
Sidney Green
Patricia Ann Johnson
Sister Mary Maris Krimmel
Noel C. Krothe
Hyong Ho Lee
Elwin Noah LeFevre
Kathleen P. Lyons
William S. McLoda
Shirley Martinson
Celine W. Merrill
James T. Phillips
Richard J. Rezba
John Schofield
Graig D. Shaak
James E. Sterling
John Sutton
- 1970 Jane Smith Allen
Patricia E. Bartus
Darryl G. Blink
Edward C. Coppin
Steve David Fansler
Hilary H. Fish
Stephen Michael Flohr
Melvin Lee Gingrich
Keith A. Hamilton
Edward R. Hardie
William M. Heid
Eldon Duane Hoyt
Victor Lee Hurm, Jr.
Raymond S. Hyde
Henry L. Jones
Irene K. Joyce
Harold N. Kaufman
Linda Knight
Marjorie N. Leder
Charles E. Lenahan
Mikel B. Lewman
Gerry E. Messmer
Herbert H. Meyer
Robert E. Montgomery
William W. O'Leary
Sister Catherine Paskwietz
Orvil Edwin Schlatter
Marilyn June Shaw
Gerald R. Sprinkle
Wayne Douglas Terry
Kenneth M. Usalabar
Donald G. Wertz
- 1971 James Badowski
Jacqueline Sue Bond
Robert Duane Caley
Robert A. Dorsett
Paul B. Dudley
Jutta B. Siefert
John Mark Tipple
- 1972 Danny Lee Chapman
Elmer C. Cravens
Ronald E. Endris
Lynn Edward Lehman
Marsha T. Lemley
Sharon M. Mahan
Raymond N. Pheifer
- 1973 Charles E. Adkisson
Phillip G. Asher
Paul Norris Bishop
James A. Corliss
Louise Froment East
Robert Glenn Foltz
Bruce D. James
William N. Kubsch
Elinor Bakun Lea
John T. McCory
- Lucius B. McHarque
Robert Allen Matthews
Maxwell A. Meise
Charles M. Oberly
William H. O'Keefe
Robert Orlowski
Judith Kaye Pavek
Arthur Percy
George H. Rupp
William P. Savage
Hampton Simmons, Jr.
James S. Thompson
William D. Updike
Diana Gail Utz
James A. Vandemark
Linda Zinter
- 1974 James D. Bonebrake
William A. Fariss
Michael S. Finegan
Steven M. Kestle
Dennis Dee Moore
Mark D. Nickelson
Peter K. Sturm
- 1975 Douglas Diehl
Randall Thorne
- 1976 Larry Goltz
Gayle Hildreth
- 1977 Howard Berliner
Rebecca Chance

A.M. DEGREES

- 1899 James Arra Price
- 1901 Abram Vardiman Mauck
- 1904 Albert B. Reagan
Essie Alma Smith
- 1907 Charles William Shannon
- 1909 Frank Cook Greene
William Motier Tucker
- 1911 Ray Myron Bonsib
Edgar Roscoe Cumings
Jesse James Galloway
- 1913 Halbert Pleasant Bybee
Earl Wayne Vickrey
- 1914 Henry Mathusalem DuBois
Thomas Franklin Jackson
Eula Davis McEwan
Grover Cleveland Mance
James Hardin Whitmarsh
- 1915 Horace Noble Coryell
Clyde Arnett Malott
Harry Warren Wood
- 1921 Prentiss D. Moore
John Robert Reeves
Louis Roark
Paris Buell Stockdale
- 1922 Luther S. Ferguson
- 1923 Lora May Baker
Glenn Gardner Bartle
Ralph Emerson Esarey
Burton Joseph Malott
Glenn A. Lee
- 1924 Elmer Lawrence Lucas
William Avery Thomas
- 1925 Arch Rombaugh Addington
Raymond Samuel Hunt
- 1926 William Post Rawles
Robert Rakes Shrock
- 1927 Mrs. Viva Dutton Martin
Ralph Eugene Stouder
- 1929 George Isaac Whitlatch
- 1931 Philip Forsyth Fix
John K. Rose
- 1932 Robert Ellery Bates
George R. Freed
Christine Manning
- 1936 Charles Noble Beard
Marion Moore Fidler
Kenneth Armstrong Payne
- 1937 Richard H. Schweers
- 1938 William Odis Allen, Jr.
Howard Lee Tipsword
- 1939 George Heap
James E. Reeves
Charles Grason Spencer

1940	Lewis Childs Tom Dawson John Rodefer Harris John Barratt Patton Walter Blue Spangler Frederick Paul Schweers				William Francis Hanna Herbert Carl Heim Gene W. Heien Gerald Homer Johnson George Gallie Leckie Warren Lee Nelson Forrest Keith Root Theodore William Ross John Livingstone Smith Roy E. Williams Daniel Allen Wilson
1942	Preston McGrain				
1943	Richard S. English Charles Fay Passell				
1944	Charles Carl Bajza Esther Ruth Warner 1947 George Otis Winston 1949 James Bush George E. Erickson Hollis Blair Fender Hobart Byron Harris Frank Edward Kottlowski Carroll Norton Roberts Courtney Waddell Robert M. Weidman	1957	David Allen Boots Pei-Yuan Chen James Robert Dodd Ferol Frederic Fish Olin R. Holt Robert David Jenkins Richard Keith Leininger John Allen McCormick Jack Lewis Nelson George Morrison Nevers Donald Richard Newsom Martin Prinz Frank Alexander Revetta Ernesto Sirvas Don Murray Triplehorn Daniel Strain Tudor George Robert Wagner James Fisher Wakeman Joseph Floyd Whaley Richard LeRoy White Teruo Yamamoto	1963	Lawrence Harold Balthaser Donald Ellsworth Hallinger John Martin Heckard Thomas Simon Hirschmann Lawrence August Taylor Donald John Thompson Paul Gerald Wagner Shaiban K. Al-Shaibani Kennard B. Bork Wallace N. Bowman Henry Robert Burger III Edward J. Doheny August James Felli Myra Helen Fox David Filbert Hess Brian Benton Holm Moayad H. Khaiwka Phillip Garcin Malone Eric Mustonen Michael Schaiowitz Robert Barnett Votaw
1950	Victor Felix Barua Robert Arthur Bieberman Maurice Earl Biggs Dallas Fiandt, Jr. Karl Wm. Frielinghausen Raymond Laurence Parker Kenneth M. Waters, Jr. William John Wayne Charles Eugene Wier	1958	John Edward Brueckman Alan A. Colville Michael Terrence Cowen Ronald Clinton Crane Richard Fitch William Flanagan James John Frugoni John William Gilmore Richard David Harvey Gary Edward Henry Lawrence Robert Lebauer William Francis Moll, Jr. Mark Reshkin Gerald Bruce Rupert Robert Craig Saenger Phyllis Jean Scudder William Kelly Summers Keith Richard Treadway Marvin Eugene Warner Gary Lee Wirey George John Yurkas	1964	Henry Robert Burger III Edward J. Doheny August James Felli Myra Helen Fox David Filbert Hess Brian Benton Holm Moayad H. Khaiwka Phillip Garcin Malone Eric Mustonen Michael Schaiowitz Robert Barnett Votaw Ann Lawrence Burger Roger James Cuffey Norman Paul Dion Kenneth K. Heh Yarub K. Ibrahim Alan M. Jacobs Allan Ludman Marvin R. Miller Arthur N. Palmer Donald Neil Peterson Howard Renick, Jr. Douglas W. Reynolds Vijay V. Satoskar Larry D. Woodfork
1951	John George Barr Richard Lee Bowen John Herbert Hughes Donald Eugene Hyer Harry Wesley Kugler Don Eldon Six				
1952	Sheldon Axenfeld William Henry Crites Harold L. Deane Wayne Albert Erickson Gordon Conrad Grender Perry G. Holloway Harold Christy Hutchison Frank Marion Johnson Harold V. Kaska Beryl Dale Kline Victor E. Olson, Jr. Howard W. Peirce Ranard J. Pickering Frank T. Rago, Jr. Bert L. Renzetti Harold Sorgenfrei Ira Daniel Taylor W. Eugene Taylor Elbert Clay Warren	1959	David Richard Berendsen Eugene Howard Core Ronald Kent Ogle Howard W. Pee David Harrison Phail Frank Donald Pruett Kenton Nile Riggs Ronald Dean DeRudder Gary Rickey Gates Robert Lee Laney David Lane Matthews Ralph Wayne Miller Irwin S. Parrish William Thomas Straw Richard John Beckman Bernard Richard Berry James Clifford Bloom Donald Henry Buchholz Walter John Burfeind Jack Francis Conley William Arch Girdley Barry Turner Haff Craig Bond Hatfield Michael Charles Mound John Stephen Parker Robert Gordon Pirie Alan Rogers Pratt Helmo M. Rand Benjamin Hinchcliffe Richard John Edward Utgaard Lewis Anderson Van Coutren	1965	Larry D. Woodfork David R. Balogh J. Clyde Conger James B. Dailey William G. Dixon, Jr. Charles W. Fetter Peter R. Hoover Thomas Kalan Lee G. Knudtson Darrell I. Leap Michael T. McGee Raymond M. Rene Kathleen F. Ridge Thomas J. Schull Austin C. Smith Milton A. Wiltse Robert L. Anstey Roy E. Butler Frank C. Capozza Sherman M. Clebnik Eric F. Corneliussen Edward L. Davis Robert W. Frey James F. Friberg Susan E. Glass Stephanie V. Hrabar Samuel F. Huffman Ronald W. Klusman Michael A. Lane Robert S. Nicoll Daniel A. Sundeen Sheila Lynn Wagner Douglas R. Wilke William H. Wright III
1953	Dean Stanley Clark Charles Robert Connaughton Donald Clayton Devening Wayne Edward Fowler Seymour Samuel Greenberg Warren Craig Heisterkamp Thomas D. Jones Arthur P. Pinsak George Puscas Samuel Leander Riely Joseph St. Jean, Jr. Robert Edward Sargent Kenneth Raymond Vance	1960	Richard John Beckman Bernard Richard Berry James Clifford Bloom Donald Henry Buchholz Walter John Burfeind Jack Francis Conley William Arch Girdley Barry Turner Haff Craig Bond Hatfield Michael Charles Mound John Stephen Parker Robert Gordon Pirie Alan Rogers Pratt Helmo M. Rand Benjamin Hinchcliffe Richard John Edward Utgaard Lewis Anderson Van Coutren	1966	Robert L. Anstey Roy E. Butler Frank C. Capozza Sherman M. Clebnik Eric F. Corneliussen Edward L. Davis Robert W. Frey James F. Friberg Susan E. Glass Stephanie V. Hrabar Samuel F. Huffman Ronald W. Klusman Michael A. Lane Robert S. Nicoll Daniel A. Sundeen Sheila Lynn Wagner Douglas R. Wilke William H. Wright III Deborah J. Allen Earl Joseph Boone Carl E. Campbell II Nelson M. DaSilva Donald G. Eckerty Justo P. Fernandez Thomas B. Hanley
1954	Robert Ernest Boyer Wayne Miley Bundy Donald Kenzie Cameron, Jr. John Tufts Cass Richard Clarkson Erd Alfred Thomas Miesch George Thomas Moore Donald Gregory Roemermann Albert Julius Rudnyansky Abdullah Shakir Sayyab	1961	Richard John Beckman Bernard Richard Berry James Clifford Bloom Donald Henry Buchholz Walter John Burfeind Jack Francis Conley William Arch Girdley Barry Turner Haff Craig Bond Hatfield Michael Charles Mound John Stephen Parker Robert Gordon Pirie Alan Rogers Pratt Helmo M. Rand Benjamin Hinchcliffe Richard John Edward Utgaard Lewis Anderson Van Coutren	1967	Deborah J. Allen Earl Joseph Boone Carl E. Campbell II Nelson M. DaSilva Donald G. Eckerty Justo P. Fernandez Thomas B. Hanley
1955	Bruce Forbes Bohor Arthur Clifford Brookley, Jr. Elbert L. Hale Jack Lamar Harrison George Albert Herr Richard Walter Larson Paul Cletus Raymond Ned M. Smith David Edward Von Tress	1962	Sambhudas Chaudhuri John Lawrence Chute, Jr. Stephen Cohen Elizabeth Clare Foster		

Charles D. Harrington
 J. David Lazor
 Michael J. McLane
 Robert L. Methot
 James M. Mitchell
 Barry Perlmutter
 Christopher J. Schmidt
 Robert K. Schwartz
 Charles T. Siemers
 Jeffrey B. Smith
 1969 Garry G. Anderson
 Robert L. Boyce
 Thomas M. Deeter
 Abraham H. Diaraj
 Thomas L. Dobecki
 Michael L. Fowler
 Norman Gillmeister
 Mary Elizabeth Hanson
 John Kelly Lehner
 Wulf F. Massell
 James H. Meyers
 Ralph R. Root
 Carl J. Smith
 Joseph S. Uttley
 1970 Dario L. Barrero
 Gene A. Carr
 Jack H. Christiansen
 Lee Edward Evinger
 Terry Lynn Fischer
 Charles R. Gloré
 Norman R. King
 Bradford D. Kuhn III
 Ronald A. Riepe
 Dorothy M. Viola
 V. Patrick Wiram
 1971 Douglas R. Baumgardt
 Steven R. Benham
 Louis F. Blanchard
 Joan E. Buehler
 William S. Cordua
 Erle G. Duff
 Thomas J. Jackson
 Alan F. Keiser
 Douglas J. Knab
 Larry W. Knox
 Robert W. Lankston
 David J. Morton
 James R. Orgill
 Michael H. Paine
 Kenneth I. Reiss
 John L. Sexton
 Elliott S. Weinstein
 1972 Richard R. Alexander
 David S. Brumbaugh
 David J. DesMarais
 Gerald J. Henderson
 Phillip D. Hiestand
 Neal T. Immega
 Ralph W. Knapp
 Herbert L. Magley
 John R. Mitchell
 Allen H. Nelson
 Robert E. Richert
 James F. Stratton
 Gregg Alan Vane
 Madan M. Varma
 1973 Julio O. Alamos
 Stanley W. Anderson
 Todd C. Frazier
 Wen-Yen Huang
 Inda P. Immega
 Steven W. Koehler
 Shafik A. Nasser
 Gianfranco G. Rinaldi
 Arthur R. Snyder
 1974 Joyce M. Basciano
 John L. Bassett
 Alfred P. Canepa
 Val W. Chandler
 Laverne M. Friberg
 Harlan W. Gerrish
 Larry E. Hall
 Timothy S. Hamilton
 Margaret K. Nelson
 Sylvia S. Noirat
 J. Donald Rimstidt

Khadim U.S. Sheikh-Ali
 Michael A. Spangler
 Joseph N. Stellavato
 Michael A. Wischmeyer
 Steven W. Young
 1975 Alan Brittain
 David Buddrus
 Peter L. Calengas
 Nancy Darnell
 Dorothy Forbes
 Michael Hamilton
 Stephen Henderson
 Stuart Hirsch
 Michael Hohn
 Byung Doo Kwon
 Gregory Mack
 Paul Mazalan
 Vincent Mikulski
 David Millen
 Raymond Pfeifer
 Diane Suchomei
 Jerome Thornburg
 Gregory Wahlman
 Arthur Waterman
 Aileen Wojtal
 1976 William Ausich
 Nathan Bennett
 Janet Borgerding
 Karen L. Brunson
 Phillip Caserotti
 Marcia Engle
 Lucia Kuizon
 Marian Lankston
 Carl M. Leshner
 Michael Lieser
 Madelyn Millholland
 Priscilla Nelson
 Johnny Waters
 James Welch
 Thomas Zeller
 1977 Stephen Blyskal
 Kenneth R. Bradbury
 Peter Dahl
 Joseph A. Dixon
 Mark Duigon
 James Fout
 James Goss
 Melody Holm
 Carolyn Olson
 Daniel Rimstidt
 Dennis W. Risser
 Steven Volz
 John Waldrip
 Bruce A. Wright

1913 Jesse James Galloway
 1915 Halbert Pleasant Bybee
 1916 Thomas Franklin Jackson
 William Motier Tucker
 1918 Mrs. Eula Davis McEwan
 1919 Clyde Arnett Malott
 1923 John Robert Reeves
 1928 Robert Rakes Shrock
 1930 Paris B. Stockdale
 1932 Glenn Gardner Bartle
 George Isaac Whitlatch
 1933 Herbert Henry Bradfield
 Marshall Allen Harrell
 1934 John Warfield Huddle
 1936 William David Thornbury
 1941 Caroline Ella Heminway
 1942 Marion M. Fidler
 1948 Orville Lee Bandy
 1949 Paul Dean Proctor
 1951 Frank Edward Kottowski
 1952 Conrad P. Gravenor
 Courtney Waddell
 William John Wayne
 1953 Eric Patrick Henderson
 1954 James Virgil Barnes
 John Barratt Patton
 Stuart Ross Taylor
 1955 Wayne Edward Fowler

Charles Eugene Wier
 1956 George Thomas Moore
 James Arthur Noel
 Lawrence Frederick Rooney
 Joseph St. Jean, Jr.
 Steven Daniel Theodosis
 1957 George Delbert Brunton
 Wayne Miley Bundy
 Alan Stanley Horowitz
 Bert L. Renzetti
 1958 Jack L. Harrison
 Arthur P. Pinsak
 1959 Seymour Samuel Greenberg
 Mrs. Helen Mary McCammon
 Richard Baldwin McCammon
 1960 Nityananda Bhattacharya
 Ronald Clinton Crane
 William Turner Elberty, Jr.
 Richard David Harvey
 Joaquin Rodriguez
 1961 Alan Andrew Colville
 Tjiang Liong Gan
 Mrs. Phyllis Jean Renzetti
 1962 Ronald Dean DeRudder
 Lawrence Robert Lebauer
 Ronald Dee Perkins
 Ned Myron Smith
 Ronald Warren Tank
 1963 George Donald Brown, Jr.
 John Neal Bubb
 John Herbert Cleveland
 Michael Charles Mound
 Robert Gordon Pirie
 Mark Reshkin
 Albert Julius Rudman
 Jack Allen Sunderman
 John Edward Utgaard
 1964 Craig Bond Hatfield
 George Gallie Leckie
 Jerry Alvin Lineback
 Gary R. Gates
 1965 William F. Hanna
 Gerald H. Johnson
 Ralph G. Stevenson
 H. Robert Burger
 Roger J. Cuffey
 James F. Howard
 Benjamin H. Richard
 Forrest K. Root
 1967 Kennard B. Bork
 Walter J. Burfeind
 Edward J. Doheny
 David F. Hess
 Alan M. Jacobs
 Don L. Kissling
 R. William Orr
 1968 W. Thomas Straw
 Milton A. Wiltse
 1969 Lawrence H. Balthaser
 Donald D. Carr
 Robert W. Frey
 Ikram U. Khawaja
 Ronald Klusman
 Howard Renick, Jr.
 Otto Sardi
 1970 Robert L. Anstey
 James F. Friberg
 Charles D. Harrington
 Samuel F. Huffman
 Arthur N. Palmer
 John L. Smith
 Daniel A. Sundeen
 1971 Garry G. Anderson
 Eric F. Corneliussen
 Charles W. Fetter, Jr.
 Michael A. Lane
 J. David Lazor
 James H. Meyers
 Charles T. Siemers
 1972 Richard R. Alexander
 Thomas Lee Dobecki
 Michael J. McLane
 James M. Mitchell
 Vijay V. Satoskar
 Robert K. Schwartz
 Daniel S. Tudor

Ph.D. DEGREES

1973 David S. Brumbaugh
William S. Cordua
Michael L. Fowler
Robert D. Hall
Thomas J. Jackson
Norman R. King
1974 Maurice E. Biggs
Robert F. Blakely
David J. DesMarais
Gerald J. Henderson
Larry W. Knox
Wulf F. Massell

Gianfranco Rinaldi
John L. Sexton
1975 Abhijit Basu
Edward Crisp
Thomas B. Hanley
Wen-Yen Huang
Barry S. Kues
James F. Stratton
Madan Varma
1976 LeVerne Friberg
Michael Hohn
Neal Immega

Saleh Okla
Christopher Schmidt
Steven Young
1977 Peter L. Calengas
Peter Dahl
Harry Dembicki
Mack Duncan
Inda P. Immega
W. Calvin James
Ralph Knapp
Gregory H. Mack
Glenn Thompson

ALUMNI COUNCIL

The Alumni Council of the Indiana University Geology Department acts as liaison between you, our alumni, and the department. It keeps the department informed as to the ideas of our graduates and the needs of the industries in which they work.

The Council nominally meets twice a year, during GSA in the fall and at AAPG in the spring. Members accept three-year appointments from our department chairman, Haydn H. Murray, an ex-officio member of the Council. Bob Blakely is secretary and Arthur Lotz of the I.U. Alumni Office is also an ex-officio member.

The chairman of the Council is Dr. Daniel S. Tudor whose address is: Chevron Oil Field Research Co., P.O. Box 446, LaHabra, California 90631. Please communicate with him, Haydn Murray or Bob Blakely on matters that you would like the Council, the department, or your alma mater to consider.

Other members of the Council are:

To June 1978

Frank E. Kottowski (Assoc. Chrm.)
(A.B. 1947, A.M. 1949, Ph.D. 1951)
703 Sunset Drive
Socorro, New Mexico 87801

Lawrence R. Lebauer
(A.M. 1958, Ph.D. 1962)
General Refractories Company
50 Monument Road
Bala Cynwid, Pennsylvania 19004

Helen McCammon
(Ph.D. 1959)
9616 Culver Street
Kensington, Maryland 20795

David E. VonTress
(A.M. 1955)
11303 Ash Creek Drive
Houston, Texas 77043

To June 1979

George D. Brown
(Ph.D. 1963)
Boston College
Chestnut Hill, Mass. 02167

Frank Pruett
(B.S. 1957, A.M. 1959)
144 Cragmont
Walnut Creek, Calif. 94596

Stanley Hamilton
(B.S. 1963)
22 South Erie
Aurora, Minn. 55705

Nancy R. Darnell
(A.M. 1975)
941 St. Paul
Denver, Colorado 80206

Richard I. Gibson
(B.S. 1971)
6370 Windswept #68
Houston, Texas 77027

To June 1980

Arthur F. Fritz
(A.B. 1956)
Art Fritz Oil Company
Box 185
Fort Branch, Indiana 47533

John Patton
(Ph.D. 1954)
Dept. of Geology
Indiana University
Bloomington, Ind. 47401

Wayne E. Fowler
(A.M. 1953; Ph.D. 1955)
1101 Pere Marquette Bldg.
New Orleans, La. 70112

Death has claimed 12 of our members since the last newsletter. They are:

Glen G. Bartle (A.B. 1921, A.M. 1923, Ph.D. 1932) - September 14, 1977
Lewis Childs (A.M. 1940) - August 27, 1976

Ronald D. DeRudder (B.S. 1958, A.M. 1960, Ph.D. 1962) - June 24, 1975
Ralph E. Esarey (A.B. 1922, A.M. 1923) - October 21, 1975

Bert H. Fell (A.B. 1954) - October 17, 1977

Frank C. Greene (A.B. 1908, A.M. 1909) - March 31, 1975

John W. Huddle (Ph.D. 1934) - November 22, 1975

Joseph E. Keyser (A.B. 1946) - April 22, 1975

Glen A. Lee (A.M. 1924) - July 12, 1974
Burton J. Malott (A.B. 1915, A.M. 1923) - October 7, 1974

Horace E. Rankin (A.B. 1928) - September 12, 1975

Ned M. Smith (A.B. 1949, A.M. 1955, Ph.D. 1962) - January 23, 1976

IN MEMORIAM

Ralph Esarey

Ralph Emerson Esarey, faculty member in geology from 1925 until he took early retirement and received emeritus status in 1966, died October 21, 1975, at Summerville, South Carolina. With his passing a high proportion of the geology alumni of four decades have lost their most personal contact with Indiana University, and faculty colleagues throughout the University mourn the loss and treasure the memory of a valued friend.

Born at Cannelton, Indiana, on April 25, 1901, to Logan Esarey and Laura Pearson Esarey, Ralph was a fourth-generation Hoosier whose great-grandfather crossed from Kentucky into Indiana at Tobinsport, in Perry County. Ralph's parents moved to Bloomington in 1911; Logan Esarey later joined the history faculty at Indiana University, a role in which he was to become the most noted authority of his time on the history of Indiana.

Ralph graduated from Bloomington High School in 1918 and was a member, in both 1917 and 1918, of the basketball teams that played in the State Finals, where in his senior year he was recipient of the prestigious Gimbel Award to the player who displayed the best attitude and sportsmanship. Ralph's interest in athletics was life-long; following his college training he became athletic director for Bloomington High School, and at Indiana University he served for a period as tennis coach, along with his faculty position in geology, and was for many years a member of the University Athletic Committee.

In 1922 Ralph received the A.B. degree with a geology major at Indiana University and was elected to Phi Beta Kappa. In 1923 he received the A.M. degree, and later he did graduate work in geology at the University of Chicago.

In 1925 Ralph was appointed Instructor in the then Department of Geology and Geography, and through the years and the academic ranks he continued to serve Indiana University, except for several leaves of absence, until his retirement. In the course of those years he taught a wide variety of subjects—general geology, mineralogy, structural geology, sedimentation, and stratigraphy—but his principal field of interest was applied geology, meaning the mineral resources and their development, and along this line he taught economic geology and offered, for the latter 20 years of his active teaching, the Department's program in various aspects of petroleum geology.

Rho chapter of Sigma Gamma Epsilon, a national honorary geological fraternity, was established at Indiana University in

1926, and Ralph Esarey was a charter member. For many years he was faculty adviser to the group, and in the national organization he was Vice President of the Eastern Province for six years, co-editor of the organization's publication THE COMPASS for two years, Grand Historian for two years, and President of the National Council for two years in 1958-1960.

Ralph was a Mason, a member of Kiwanis, and a participant in numerous public service activities, including the Indiana State Planning Commission, the City Planning Commission of Bloomington, and the Bloomington Board of Zoning Appeals. In professional organizations he was a charter member of the Indiana-Kentucky Geological Society, a long-term member of the American Association of Petroleum Geologists, and Governor Schricker's appointee to both the Engineering Committee and the Secondary Recovery Committee of the Interstate Oil Compact Commission.

In 1936 Ralph became State Geologist of Indiana and Director of the Indiana Geological Survey and served in this role until 1945. He was an Honorary Member of the Association of American State Geologists.

As a staff member for several companies, and as a consultant to numerous others, he is credited with being responsible for the discovery of several oil fields in Indiana and Kentucky, and for a considerable period in the 1950's he was the most active professional geologist engaged in the location of underground reservoirs for storage of natural gas in Indiana. Many of his students participated in these studies and have become successful practitioners in the arts of oil and gas discovery and development.

All of us who knew Ralph Esarey will remember him as a person who loved to do geologic work and see the results, in addition to teaching others how to do it.

Professor John B. Patton

Professor Emeritus William D. Thornbury

Karen Brunson

We were all very much saddened by the death in October, 1976 of graduate student Karen Brunson. Karen had just completed her Master's degree and was beginning work on her Ph.D. when the leukemia she had been successfully fighting for a number of years defeated her.

Karen was a fine person and a strong and dedicated student, and is greatly missed by the many friends she had among the faculty and other students in the department.

PHILOSOPHY OF GIVING

by Robert Schrock

The Indiana University Department of Geology has been changed in many ways throughout the years that it has graduated more than 850 geologists and geophysicists. Many of the alumni would not recognize the department if they visited, but they would perceive the level of excellence which continues to produce earth scientists sought after by industry, academia, and government. Change is an integral part of maintaining excellence and has been supported by the State, the University, the department, industry and alumni. The teaching and research programs need continued support from all of us.

Support comes in many ways. We can all be proud of the building facility and other programs which require large amounts of money for maintenance. We can also be proud of the research and student support derived from the relatively small, yet very important, funds generated by donations from organizations, individuals and alumni. These funds support research and teaching activities which extend the learning process beyond the classroom and laboratory to the field for collect-

ing samples, observing geology, making field measurements, attending symposia, and many other functions. Most of us can recall instances where support of this type aided our efforts to learn while at the university.

For those of us who badly needed financial help when we were students, and got it, through the department; for many of us who were fortunate enough to be taken on expense paid field trips, or who received many other kinds of help, the following question seems appropriate—shouldn't I now contribute as generously as I can to the Department's special or general funds so that some Indiana University student who needs help as I did, can get it?

An important responsibility of alumni, who consider their training a major reason for their current success, is the continued support of the department. Some look back, count the monetary support received while in school, feel the weight of that responsibility, plan repayment in kind, and donate what they can to funds of their choice. Others are trying to repay the sup-

port they received in total, adjusting for inflation. Perspective on giving is often clarified by asking the question, "Where would I be today had I not been supported at critical times while in school?"

The philosophy of giving is simply the repayment of past support to perpetuate the institutions from which the support was derived. Remember, donations, no matter the amount, will help to maintain the excellence of which we all are proud.

The 5-50 Club

The Geology Alumni Council recently approved the establishment of a *5 to 50 Club Fund*, to which alumni and their friends will be invited to make annual contributions from \$5 to \$50 (or more if they wish), thereby getting their names included in an annual membership list. Contributions would be credited to any fund which the donor wishes or if no designation is made, to a special 5-50 endowment fund. The income from this fund would be used to advance geology at Indiana University at the discretion of the department chairman and the faculty.

I would like to become a member of the 5-50 club and pledge an annual contribution of:

- \$5.00
- \$ _____
- \$50.000

in support of the 5-50 Endowment Fund

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Name _____

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As it has been a long time since we published an alumni directory, we would appreciate your sending confirmation or correction of the information shown for you. We should like to have both residence and business addresses.

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BUSINESS

Also, we would appreciate help in locating the few "lost souls" for whom no address is shown.

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