

UCLA
Geology

Department

Newsletter

1974

THE COVER

Sorry to disappoint you in case you think the section at the right is a seismic profile of a really promising anticline. Instead, it is an indication of one of the directions paleontology has taken since you memorized those "index fossils" some years ago. Courtesy of Clarence Hall, this section through the shell of a one-year-old Pismo clam, Tivela stultorum (Mawe) from La Jolla, shows daily shell growth increments as well as a biocheck represented by more closely spaced shell growth increments. The biocheck is probably related to a post-spawning period and regeneration of sex products. There are apparently significant differences in the number of daily shell growth increments in biochecks of shells collected from different latitudes throughout the geographic range of the species. Thus, shell growth patterns may be a useful marine paleotemperature indicator.

Thin-sections of bryozoans have previously been useful in distinguishing them from corals (as well as for shortening one's fingernails and even fingers in their production) and for biostratigraphic use of this important Paleozoic group. Douglas Lorenz supplied the longitudinal section of the Upper Ordovician trepostome bryozoan Peronopora cf. P. decipiens from Goodlettsville, Tennessee, shown on the left of the cover. The colony thickness tapers in the direction of growth, thereby providing resistance to bending stresses imposed on the erect frond. Additional strength was provided by progressive calcification of zooecial walls in the outer parts of the colony. Both exterior shape and pattern of skeletal reinforce were adaptations to an energetic environment, providing an additional clue to the paleoenvironment of 450 million years ago.

ACKNOWLEDGMENTS

Again, the Department expresses its deep appreciation to Chevron Oil Field Research Company, La Habra, California, for reproducing the Newsletter. Illustrations were done by Vicki Doyle-Jones and Julie Guenther, Vicki Doyle-Jones did the typing, and the cover photographs were supplied by Clarence Hall and Douglas Lorenz. The compiler and editor, Helen Loeblich, also acknowledges the assistance of the faculty, staff, students, and alumni who supplied much of the information that makes the Newsletter possible.



DEPARTMENT OF GEOLOGY
LOS ANGELES, CALIFORNIA 90024

October 8, 1974

GEOLOGY ALUMNI

Dear Members of the UCLA Geology Alumni:

It is my pleasure to write to you this year as the incoming Chairman of the Geology Department.

The Department, as it does each year, is currently evaluating its program and curriculum in light of changes within the profession and national needs and interests. The energy crisis and need for natural resources has brought renewed interest in the earth sciences; however, supporting funds from government and industry have not as yet become available to us so as to substantially support graduate students and programs. In fact, the \$5,000 we receive from the Shell Companies Foundation and our 13 to 16 teaching assistantships represent the only support we have for 70 graduate students. In order to spread around what resources we have it is necessary to award worthy candidates only one or two quarters of teaching assistant support. It is not difficult to imagine that UCLA Geology is no longer fully competitive with other Universities that have more graduate student financial support. Currently, we have two undergraduate fellowships, one from Standard Oil and one from Union. Obviously the support we do receive is most welcome and appreciated.

Our increasing enrollments, and declining budgets and number of faculty positions (see Fig. 1, 2, 3) are causing considerable concern. At present the Geology Department ranks 7th in the nation (Roose-Anderson A.C.E. Report). Without budgetary support from the University, adding new permanent faculty, and financial support from industry and alumni it certainly will be difficult or impossible to move upward in the national rankings.

Budgetary matters plague us not only on the Departmental level but in terms of our extraordinarily fine Geology Library. Current subscription costs require an annual outlay of between \$26,000 and \$29,000 alone. This year the remainder of the library budget will allow the Geology Library

Geology Alumni
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to purchase only about 150 books for the three departments it serves.

It is not pleasant to be what amounts to the harbinger of doom. On the other hand I would be remiss if I neglected to inform you of our needs and problems. I have asked the immediate past chairman, Professor Gary Ernst, to act as the fund raiser for the Department. To date, he has met with only modest success. I am therefore also turning to the Geology Alumni. It is my hope that among you there may be some who would be eager to join Dr. Ernst in forming a Geology Alumni Fund Raising Group. Please contact Gary or me if you are interested or willing to serve in such a capacity.

During the last few years we have added a number of courses to our offering, courses that have proven both popular and timely, e.g., Geology of California, Introduction to Oceanography, Natural History of Southern California, Astrogeology, and Earth Science and Society. Our field offering remains strong and will be augmented next year with additional faculty and this year by a required undergraduate course in sedimentology to be taught concurrently and in coordination with the Winter course in field mapping. We are fortunate to have Ted Bear teach his course in Petroleum and Ground-Water Geology and Paul Merifield teach Engineering and Environmental Geology. It is my hope that by next year a course in Geophysical Exploration will be required of all UCLA students majoring in Geology.

Although this letter will probably reach you after this year's Careers Day to be held on November 14, please remember that we will be having the Fourth Annual Career and Alumni Day next year during early November, 1975. Please plan to attend. You will enjoy it I am sure and we would like to see you. Meanwhile, I welcome any suggestions you may have and ask for your counsel in areas with which you are more familiar than I.

Sincerely,

Clarence A. Hall

Clarence A. Hall
Chairman

CAH:sgs

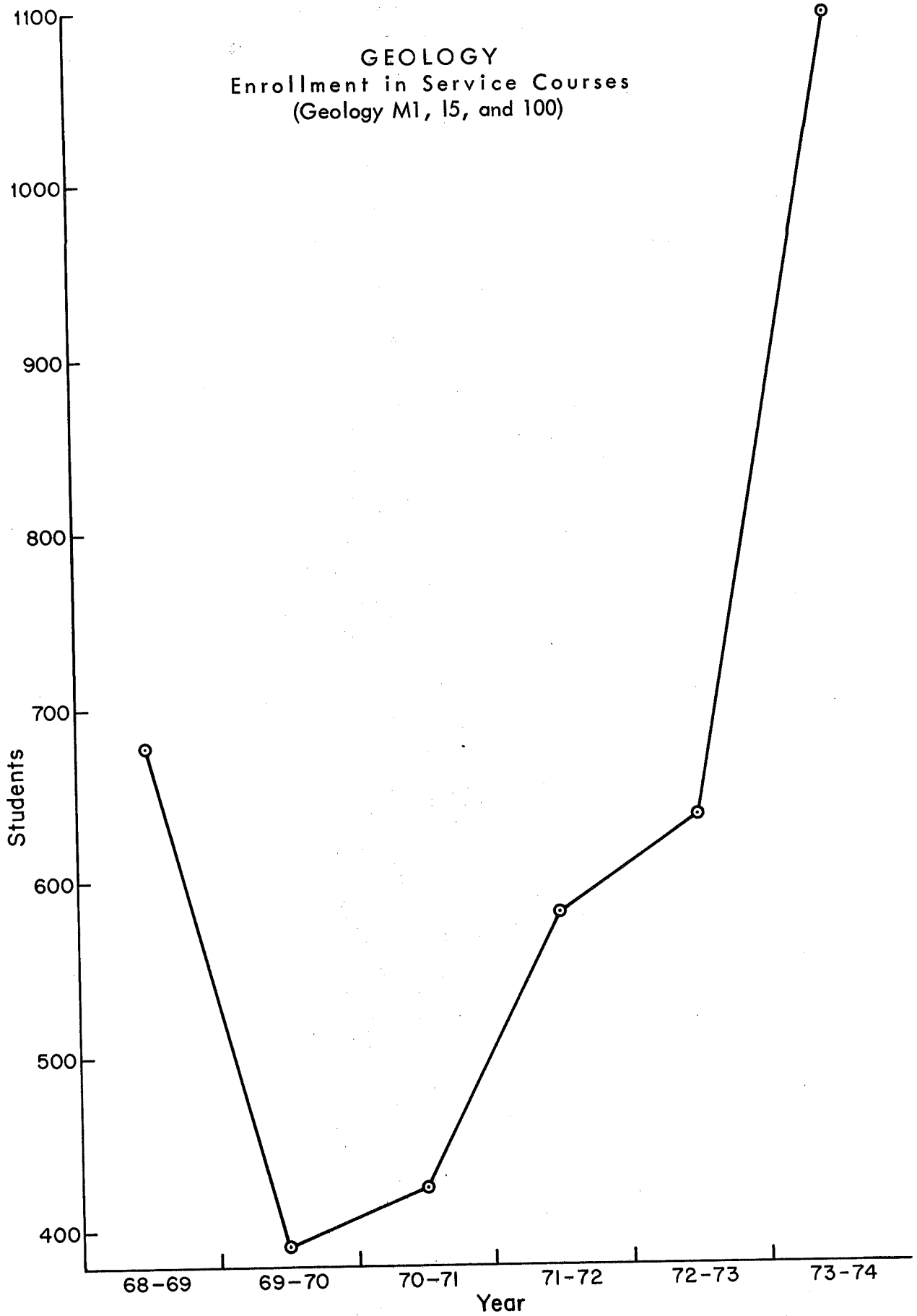


Fig. 1

GEOLOGY

Enrollment in Lower and
Upper Division and
Graduate Courses
(does not include service courses)

and

Expenditures for 1968-73
and
Budget for 1973-74

Uncorrected for inflation

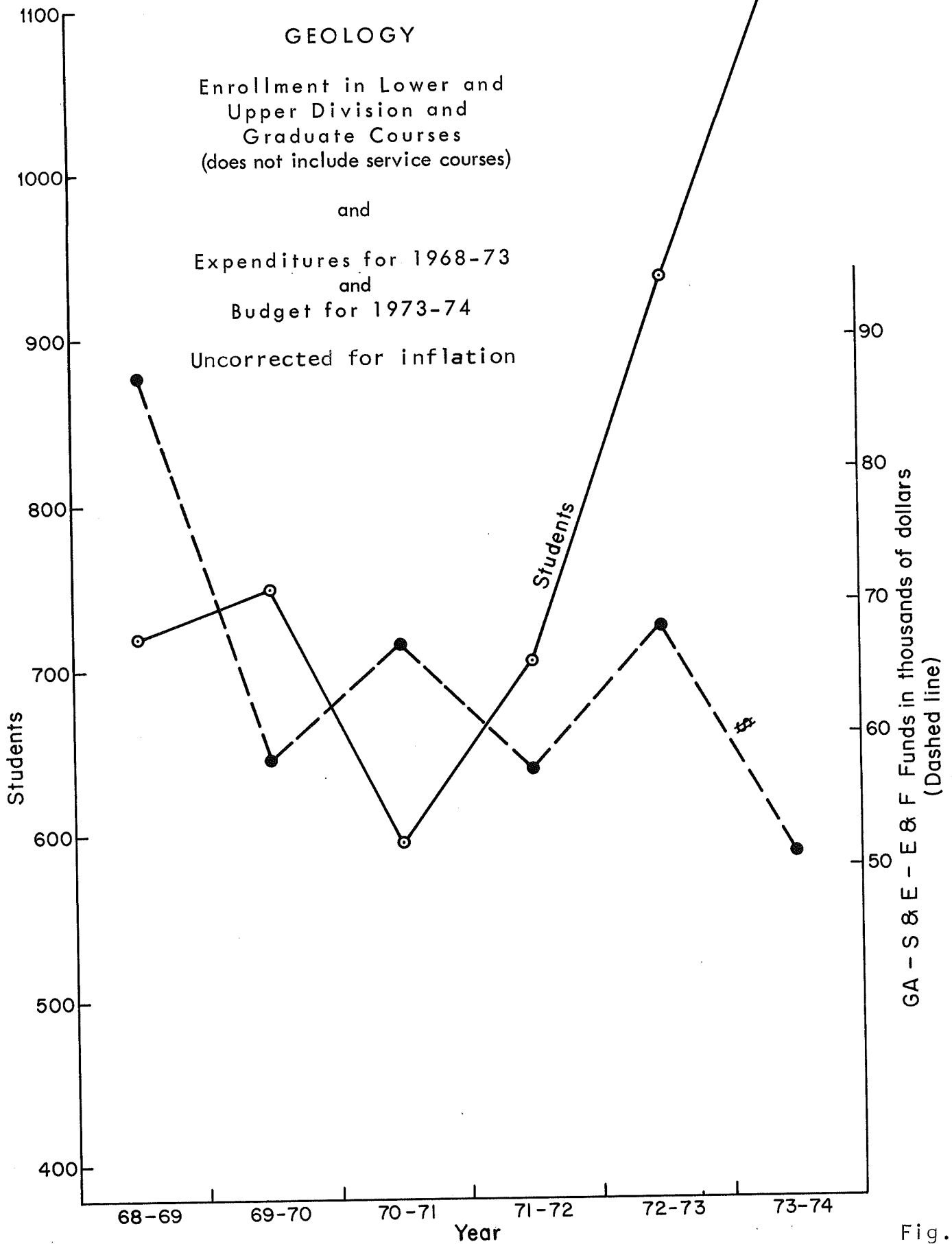
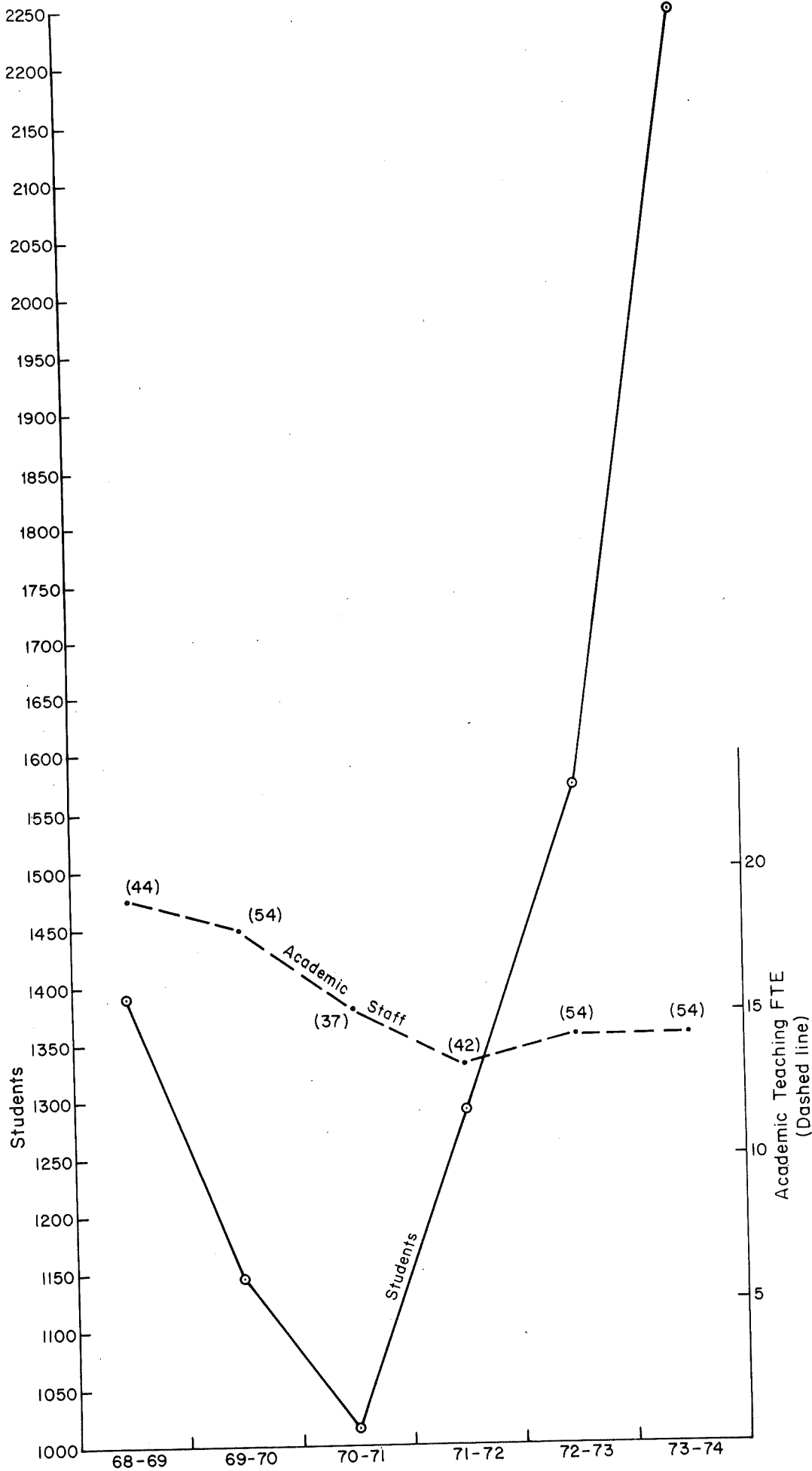


Fig. 2



GEOLOGY
Total Enrollment Figures

and

Number of Academic FTE's
(The number of courses in which
the geology faculty was involved
is shown in parentheses)

Fig. 3



THE UCLA DEPARTMENT OF GEOLOGY has been involved in many things this past year, and many changes have occurred. Like the nation, we have had a change in leadership over the summer: Gary Ernst retired from the chairmanship (he didn't make any resignation speech -- unless his long sighs of relief count as such); and Clarence Hall took over the problems related to our increasing student body, steady-state faculty size, aging equipment, and decreased appropriations that continue to trail inflation. (As one example, the numerous field trips for many undergraduate courses last year resulted in vehicle charges from the University Garage that approximately doubled the amount Geology was allotted for this year. The

Garage has just announced that its rates will be increased 40 percent more this year to reflect the higher cost of gasoline and replacement vehicles.) Due to burgeoning enrollment, one fifth-floor room has been transferred from use as fossil storage to a classroom, and as the Department lacks the necessary money to have the University Buildings and Grounds Department move the fossils, rocks, desks, and storage cases, Clarence organized a "Subduction Day" the Sunday before fall classes began, and geology student volunteers arrived to do the necessary shuffling. Many other ways of limiting expenses are being actively sought, but so far inflation seems to be winning. The library budget for the coming year is about \$3,000 less than was spent during 1973-1974, yet serials have increased in price about 10 to 15 percent, and the number of new serial publications in the various geological subfields continues to expand. Needless to say, the Chairman has our sympathy -- and hopefully the potentially more rewarding sympathy of the University and State administrations.

Although no changes occurred in the teaching faculty, we were deeply saddened this past year by the death of two of our Emeritus Professors, Joseph Murdoch and William W. Rubey. Although officially retired, both were active in research. Their absence will be sorely felt.

Various changes in the Geology staff have taken place since last year. The new Department receptionist (who answers the telephone if you call the Department) is Linda Croxall. Julie Knaack, who had worked for us some years ago, returned on a part-time basis for typing, as Lenore Aagaard retired. Barbara McNames joined the Department in the fall as a secretary, and Vicki Doyle-Jones transferred down the hall to become a scientific illustrator, replacing Jeanie Martinez, who retired in July shortly before the arrival of the daughter that she and Art have named Victoria Ruth Martinez.

UCLA Geology students, alumni, and faculty continue to receive honors. Among those who have come to the attention of the Editor, Professor George Wetherill, Professor of Geology and Geophysics, a member of both Departments of Geology and Planetary and Space Sciences and the Institute of Geophysics, was elected to the National Academy of Sciences.

Professor J. William Schopf was notified that he will receive the 1974 Schuchert Award (presented annually by the Paleontological Society to a member under 40 years of age for outstanding contributions to paleontology through distinguished research and/or teaching). It is to be presented at the annual business meetings in Miami in November.

Adjunct Professor Alfred R. Loeblich Jr. was elected Corresponding Member of the Société Géologique de Belgique on the occasion of the Société's 100th anniversary in 1974, "as an expression of its high esteem for his scientific work."

Bruce N. Haugh (Ph.D., 1973) has been notified that he will receive the "Best Paper" Award for the Journal of Paleontology for 1973. This award will be made at the annual convention of the Society of Economic Paleontologists and Mineralogists next spring.

Professor Emeritus George Tunell, formerly of UCLA, later of Riverside, and now at UC Santa Barbara, received the Washington A. Roebling Medal of the Mineralogical Society of America, for "distinguished research in the fields of crystallography, mineralogy, and thermodynamics."

Four current graduate students received Penrose Grants from the Geological Society of America to aid in their research and field work. These were Steve Bachman (M.S., 1974), Mike Garcia, Rick Hurst, and Skip Stoddard. Another graduate student, Tim Lincoln, was nominated by the Department as our candidate for the Faculty Prize for Distinguished Teaching Assistants at UCLA. He was awarded Honorable Mention by the Fellowship Committee of the Graduate Council and received a \$25 honorarium.

Steve Kirby, Graduate Student, received the first Sigma Xi Award for a UCLA student showing "outstanding promise and accomplishment in research." A plaque and a small monetary award were presented at the annual banquet and initiation ceremony of the Society.

The year 1973-1974 was another record-breaking year for UCLA registration. As indicated in the last Newsletter, both the total University of California enrollment and that of UCLA reached their all-time record in the fall of 1972. Fall 1973 enrollment was a replay, with only the figures changed. The total University of California enrollment reached 118,909 in the fall, an increase of 5,646 over the previous year. At UCLA the new record in total registration reached 31,156 (of which 20,030 was undergraduate registration), an increase of 1,495 over the previous record year.

Geology registration also continued to climb. For the fall quarter of 1973, there were 90 undergraduate majors in geology and 62 graduate students registered (exclusive of those on leave of absence or merely completing theses). This included 21 new graduate students, an increase of 11 percent over the number of new students in the preceding year and a record for


many years back. Through June of 1974 the number of B.S. degrees awarded (18) was triple that of the preceding year; and the combined number of M.S. (3) and Ph.D. (8) degrees equalled that of 1973. In addition to geology majors, the number of nonmajor students enrolled in geology courses was up, partly because of the addition of new lower-division courses in recent years. Since 1970-1971, undergraduate majors have doubled in number, graduate enrollment is up 19 percent, and faculty weekly contact hours have tripled. The number of faculty FTE's recently has remained approximately constant, but is down 27 percent since 1968-1969. In fact, during 1973-1974, total enrollment in UCLA geology courses for the entire three quarters reached 2,246, the largest number since 1950-1951, when the University was still on the semester system. This represents a 43 percent increase over the previous year.

As to graduate degrees awarded, some 73 M.S. and 58 Ph.D. degrees were awarded from 1966 to 1974. The master's students averaged four years from admittance to receipt of degree, with an average of 2.4 years in residence. Doctoral candidates averaged 6.2 years from time of admission to degree, with an average of 4.5 years residence. Of these, 13 entered with a master's degree, and 13 obtained a master's at UCLA en route to the Ph.D. with 32 proceeding directly to the Ph.D.

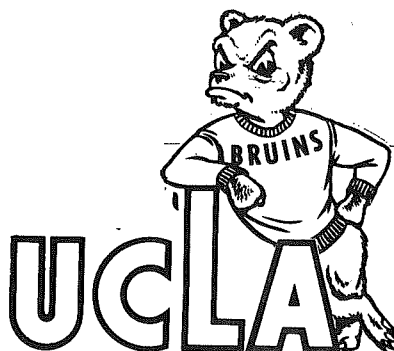
Projections for the coming year suggest that enrollment figures will continue high for the undergraduate courses, and graduate enrollment probably will remain at nearly the same level--the increase being slowed because of sharply reduced availability of financial aid. This year we had 69 applicants for our 14 T.A. positions, 2 university fellowships, and 1 industrial fellowship award. Thirty-three of the applicants were presently registered students, and the result was that the departmental Graduate Affairs Committee for this coming year did not make any awards to new incoming students, but divided the available quarters of T.A.'s and fellowships as far as possible among those already here. It is obvious that the funds from the newly established Geology Alumni Fund came in at a most opportune time. During 1973-1974, the fund provided partial fellowship support for one graduate student, four quarters of "tuition only" fellowships for other graduate students, and a scholarship for the summer field course for an undergraduate student. Details of these awards are given in a separate section, but both students and faculty hope that the alumni generosity will continue (and increase) so that more such aid can be given to outstanding students. For the coming year, three-fourths of the new applicants for graduate studies in geology at UCLA had formally withdrawn their applications by September because of lack of financial aid, going instead where this was offered -- at Harvard, Stanford, Caltech, USC, Brown, and at UC Berkeley, Riverside, Santa Barbara, and Santa Cruz. As a result, the number of new graduate students for 1974-1975 is only one-third as many as entered for the first time during 1973-1974.

The decrease in federal support for education is well known. Elimination of the NSF traineeships and the NDEA fellowships reduced our support of two students more this year, and the NSF now openly discourages support of students by grants to faculty. In addition, UCLA does not have state or industrial support equivalent to that of many other institutions. For example,

1972-1973 data for the geology departments of the "Big Ten" universities (Ohio State, Wisconsin, Illinois, Indiana, Iowa, Michigan, Michigan State, Minnesota, and Northwestern) are compared below to UCLA for the same period.

	Average of "Big Ten"	Range of "Big Ten"	UCLA
Number of full-time graduate students	55	14-87	63
T. A. positions	21	6-34	14
R. A. positions	9	1-30	--
Fellowships	5.5	2-15	3*
Number faculty	18	10-25	16 (14.25 FTE)
Jr. & Sr. majors	57	5-84	61
Elementary geology registration	797	117-1382	1091
* One Alumni Fund Fellowship, one industrial fellowship (Shell), one University-wide fellowship (M & M Newman) allotted to Geology			

Thus, for 13 percent more graduate students than the "Big Ten" average, Geology at UCLA has only 53 percent as many T.A.'s, R.A.'s and fellowships available; and the 89 percent as many faculty teaches more students at all levels (undergraduate enrollment, bachelor's candidates, and graduate students). In spite of these difficulties, the Roose-Anderson Report for the American Council on Education rates UCLA as seventh in the United States in quality of geology graduate faculty, and eighth in effectiveness of the doctoral program in geology. None of the "Big Ten" was even ranked among the top dozen.



UCLA GEOLOGY CAREERS DAY

The second annual Careers Day was held on November 15 in the Geology Building and the Ackerman Student Union. About fifty industry representatives were present, and about ninety students and faculty attended the meetings. Some dozen talks were given, representing a wide variety of geological careers. In the morning session, speakers were:

- Glen A. Brown, Consulting Geologist (Glen A. Brown & Associates), Glendale, California, whose topic was ground-water geology. In spite of a relatively small number of hydrogeologists in southern California, this field is expanding; not only is water quantity a major problem, but water quality is an equally important one.
- Roger Burtner, Research Geologist, Chevron Oil Field Research Company, La Habra, California, described some of the geological problems undertaken by a research laboratory, problems ranging from the organic geochemistry of source rocks to marine geology and micro-paleontology.
- Pat Fazio, Vice President and Manager of Exploration and Operations, McCulloch Oil Corporation, Los Angeles, discussed the more technical aspects of work in an "independent" company and suggested some of the academic background that is important in such work (e.g., field work, mathematics, report writing, and public speaking).
- George B. Pichel, Chief Geologist, Union Oil and Gas Division, Los Angeles, California. He discussed some of the energy "supply and demand" problems and the competing importance of petrochemicals for uses other than as fuel.
- D. L. Ziegler, Chief Geologist, Standard Oil of California, Western Operations Inc., San Francisco, California, described many of the current techniques, such as drilling logs, E-logs, acoustic, density, and neutron logs, continuous dip meter, and reflection seismograph, utilized in oil exploration and production.

Lunch, held in the Men's Lounge of Ackerman Union, was followed by an outstanding movie, "This Land," produced by Shell Oil Company. Those present suggested that it should be made into a television special to allow for a wide audience. After the lunch and movie, a free hour was open to allow company representatives to visit the Department labs or tour the campus. After this recess, meetings were again convened in the Union Lounge for the afternoon talks.

- Robert P. Blanc, Minerals Exploration Operations Manager, Getty Oil Company, Los Angeles, talked about coal resources (North America has about 50 percent of the world's reserves) and their utilization, predicting that coal usage will increase for electric utilities from about 50 percent (for coal and nuclear versus 35 percent for oil and gas and 15 percent water) to about 64 percent by 1985.

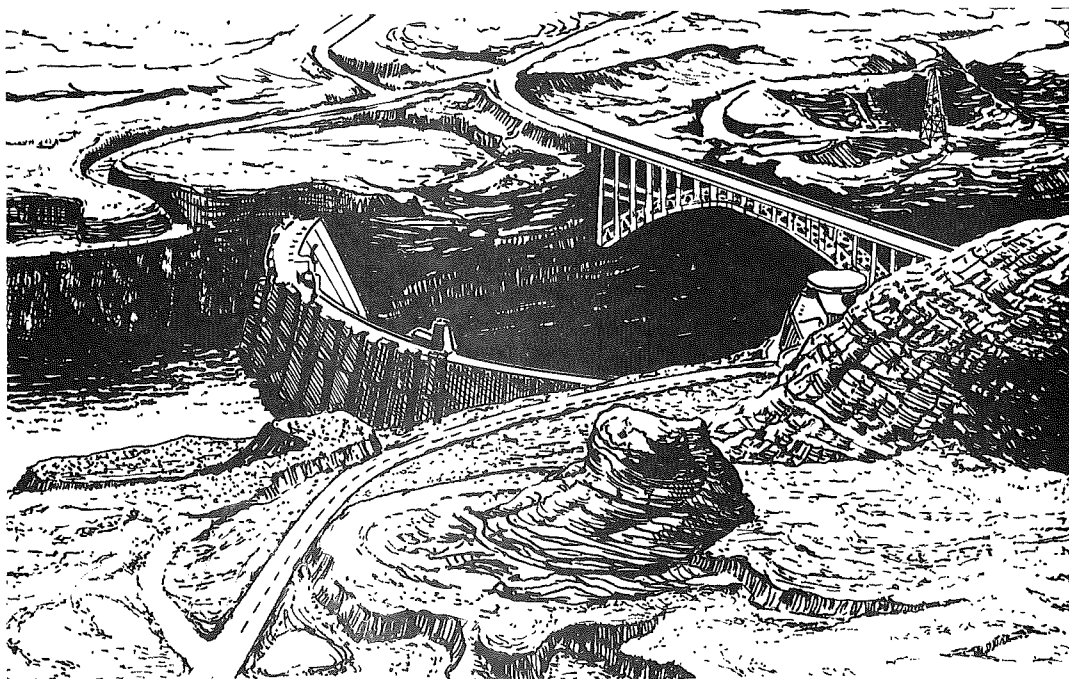
Rachel Gulliver-Dunne, Geologist, U. S. Geological Survey, Sepulveda, California, discussed the field of environmental geology including such topics as fault maps, landslides, and land-use zoning.

Richard J. Proctor, Senior Geologist, Metropolitan Water District, Los Angeles, discussed the water supply of southern California and the geology of tunnels needed for the aqueducts. The five southern counties presently are supplied by the Owens Valley aqueduct (built in 1913), the Colorado River aqueduct (1940), and the Feather River aqueduct (1972).

Jay L. Smith, Executive Vice President, Fugro Inc., Long Beach, who described the uses of engineering geology, e.g., the siting of nuclear power plants, and the company organization and geological responsibilities of the employees.

After this in-depth look at the geological industry, a happy hour was held in the Alumni Room of Kerckhoff Hall, followed by a banquet in the Men's Lounge of the Ackerman Student Union. The post-dinner panel discussion on "The Future of the Earth Sciences" covered the rest of the subject matter and a lot more.... The panel consisted of W. G. Ernst, Chairman of the Department of Geology; James D. Mancuso, Head of U. S. Metals Exploration, EXXON, Denver, Colorado; John E. McCall, Vice President, Chevron Oil Field Research Company, La Habra, California; and Doug Morton, Geologist, U. S. Geological Survey, University of California, Riverside.

All present agreed that the Careers Day was most instructive, and the interest generated in both directions led to a record number of UCLA Geology graduate and undergraduate students working for various branches of the industry over the summer.



SYMPOSIA AND EXTENSION COURSES

In addition to the usual teaching and the many afternoon talks that are open to the public, three major educational programs were held during early 1974. They concerned various aspects of earth and organism interactions, plate tectonics, and earthquakes.

The first of these was a two-day symposium (March 13-14, 1974) on "Earth and Organism Interactions through Geologic Time," organized by A. R. Loeblich, Adjunct Professor, sponsored by the Department of Geology and UCLA Committee on Public Lectures, and with funds for speakers and program generously contributed by Chevron Oil Field Research Company. Four lectures were presented on March 13 in the Ackerman Union Men's Lounge; a panel and audience discussion were held on the following day. The symposium was aimed primarily at relating the effects of continental plate movements to ancient climates, and to distribution, community relationships, diversity, and extinction of organisms. Speakers included F. G. Stehli, Professor of Geology, Case Western Reserve University ("Fossils, Ancient Climates and Moving Continents"), Karl W. Flessa, Assistant Professor of Geology, State University of New York at Stony Brook ("Biogeographic Controls on Phanerozoic Diversity"), and A. M. Ziegler, Associate Professor of Geology, University of Chicago ("Silurian Oceans and Organisms"). Due to illness, the fourth scheduled speaker, Professor A. G. Fisher of Princeton, was prevented from attending at the last minute; hence, the fourth talk ("The Plates and the Protists, a Tectonic Trigger for Evolution") was by Helen Tappan, Professor of Geology, UCLA.

The nine lectures of the program "Continents Adrift" comprised one of a series of programs of Revolutions in Science offered by the Extension Division in cooperation with the Department of Geology. Gary Ernst, Chairman, Department of Geology, was the coordinator and presented the first lecture (March 26) on "History of the Theory of Continental Drift." This was followed on successive weeks by E. H. Colbert, "Fossil Evidence for Continental Drift;" by Henry W. Menard on "Marine Evidence;" by John M. Christie (UCLA) on "General Summary of Plate Tectonics or What's Moving Where;" by Gregory A. Davis on "Implications of Plate Tectonics for California;" Robert E. Wallace on "Earthquakes;" James W. Valentine spoke on "Effect of Continental Drift on the Evolution of Life;" Isaac Kaplan (UCLA) on "Mineral and Fuel Resources;" and William R. Dickenson on "Predictions for the Future."

The second Extension program was titled "Earthquake Country, New Developments in Reducing Risks," presenting ways in which personal and collective risks due to earthquakes can be minimized. Gary Ernst gave the introduction and welcome to this day-long series of talks, held on Saturday, April 27. "The How and Why of Earthquakes" was discussed by Bruce Bolt of UC Berkeley; "California: Land of Sunshine and Earthquakes" was the topic of T. L. Henyey from USC. Following lunch, Leon Knopoff (IGPP of UCLA) spoke on "Predicting Earthquakes;" C. Martin Duke (UCLA Engineering) spoke on "What to do about Earthquakes;" and Senator Alfred Alquist, 13th District, California, and James Stearn, Secretary of Resources, State of California, closed the program with the "Government Response to Earthquake Hazard."

GEOLOGY LIBRARY

As indicated elsewhere, the rising costs of journals, serial publications, and books, as well as their proliferation, has been a serious problem for the Geology Library. Thus, the generosity of those who have contributed books, journals, monographs, and maps to the Library is most welcome and is appreciated by all users: students, faculty, staff, and many of the geologists of the southern California region.

Three major gifts were received this past year. The family of Professor Joseph Murdoch has presented his large library of periodicals and mineralogical books to the Library. Still in process of being sorted and catalogued, it is a most welcome addition. Duplicate materials, when sold, will provide added funds for the UCLA Foundation.

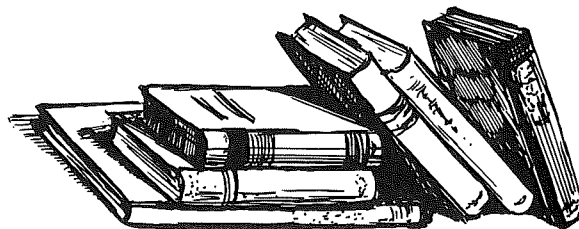
Another major gift of 135 volumes, particularly in the fields of geochemistry, petrology, and geophysics, was made in April by Chevron Oil Field Research Company, La Habra, California. Chevron has been a generous supporter of the Department (including reproducing this Newsletter) for some years.

Dr. E. Fred Davis presented three boxes of geological books, many not previously in the Library collections, and two large boxes of U.S.G.S. folios. All will be of value to the Department and to geologists in this area.

Many other gifts of up to a dozen volumes, serials, and/or monographs have been made during this past year. Although space doesn't allow listing of the gifts themselves, the following is a list of the contributors to the Library since the last Newsletter.

O. L. Anderson
 Atlantic Richfield Corporation
 Donald Carlisle
 Chevron Oil Field Research Corp.
 Paul J. Coleman Jr.
 Conoco
 E. Fred Davis
 Gary Ernst
 David Griggs
 G. Ron Grunebaum
 Clarence Hall
 John D. Hill
 George Kennedy
 Leon Knopoff
 Willard Libby
 Carl Livesay
 Helen Loeblich
 Alfred R. Loeblich Jr.
 Robert MacDonald
 Jack Mount
 Joseph Murdoch

Irving Neder
 Walter Reed
 William W. Rubey
 Mrs. R. W. Schottler
 Ronald Shreve
 Robert Shrock
 Louis Slichter
 George Tunell
 Holly C. Wagner
 Mary Wegner
 David Weide
 Mrs. Rudolph G. Woerker



GEOLOGY ALUMNI FUND

This fund is now in its second year. Gary Ernst wrote in a letter to alumni in December 1973 that the amount received had then reached a total of \$2426.50 from 21 alumni, 15 present faculty and staff, and 1 current graduate student. Although encouraging, 21 is a rather small percentage of the entire UCLA Geology alumni group. The contributions are tax deductible (make checks to "UCLA Foundation—Geology"), and they have filled many urgent needs. As noted in the list of fellowships and assistantships for the past year, these funds were used for a \$1000 graduate student fellowship, four tuition fellowships (at \$277 per quarter, for a total of \$908), an undergraduate fellowship for the summer field course (\$250), and for the purchase of a Hewlett-Packard HP-35 Calculator and security cradle for student use (\$440.40). Those of you who have observed that these figures add up to more than the \$2426.50 mentioned are quite correct, some of the gifts arrived after figuring the total above and were quickly utilized. The records since December are not officially totalled as yet.

As I promised last Newsletter, the alphabetical roster of Contributors since the previous publication follows. (If you did send in a check and aren't listed, some contributions may have arrived after this went to press.):

Amoco Foundation, Inc. (matching the gift of Mr.
Edward D. Pittman
Mrs. Hessie Axelrod
Mr. and Mrs. Morris Balderman
Mr. John Barron
Mr. William K. Barry
T. Bear and P. Kistler
Mr. Ted L. Bear
Mr. and Mrs. Robert Blanc (for Louis M. Morris Fund)
Mr. and Mrs. Robert L. Beatie
California Earth Science Corporation (Lamar-Merifield)
Mr. and Mrs. Donald Carlisle
Mr. and Mrs. Charles Corbató
Mr. and Mrs. Richard H. Daum
Mr. and Mrs. Briant L. Davis
Mr. and Mrs. Wayne Dollase
Mr. Albert Ehrreich
Mr. W. G. Ernst
Mr. and Mrs. Thomas Fairchild
Geological Society of UCLA
Gemological Institute of America
Ms. Julie Guenther
Mr. and Mrs. Clarence A. Hall Jr.
Mr. and Mrs. Warren B. Hamilton
Mr. Jeff Heller and Mrs. Gwenn Heller
Mr. and Mrs. Robert Jones
Mr. and Mrs. Hugh Kieffer
Mr. Ed Kiessling

Mr. George Lapins and Mrs. Velta Lapins
Mr. and Mrs. Donald R. Lindsay
Mr. and Mrs. Juhn-Guang Liou
Mr. and Mrs. A. R. Loeblich Jr.
Mr. John T. McGill
Mr. Mark A. Nahabedian (Sierra Pacific Petroleum Corporation)
Mr. and Mrs. Clemens A. Nelson
Mr. Jerome J. O'Brien
Mr. and Mrs. Gerhard Oertel
Mr. Edward D. Pittman
Mr. Scott Prior
Mr. George L. Quick
Ms. June D. Rogers
Mr. and Mrs. W. W. Rubey
Mr. Aristidis S. Roubanis
Mr. and Mrs. Richard B. Saul
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Mr. Norman Schultz
Mr. Hy Seiden
Mr. Michel P. Semet
Mr. and Mrs. W. Edwin Sharp
Mr. Parke D. Snavely Jr.
Mr. and Mrs. Harold K. Stager
Mr. and Mrs. John H. Van Amringe
Mr. and Mrs. William R. Van Schmus
Mr. and Mrs. K. D. Watson
Mr. F. Harold Weber Jr.
Mr. Robert Winchell



MEMORIAL FUNDS

Memorial funds were established during the year in memory of our former colleagues, Emeritus Professors Joseph Murdoch and William Rubey.

The Murdoch Fund will provide an award yearly, or as feasible, to a graduate or undergraduate student in recognition of scholastic excellence in earth science, preferably in the field of mineralogy. Contributions should be made payable to the UCLA Foundation, Joseph Murdoch Memorial Fund. Contributors to the Murdoch Fund include:

Mr. and Mrs. Albert N. Bardwell
 T. Bear and P. Kistler
 Mr. and Mrs. Eugene Borax
 Mr. and Mrs. A. Louis Canut
 Mr. and Mrs. Donald Carlisle
 Mr. and Mrs. Neville Carter
 Mr. and Mrs. John Crowell
 Mr. and Mrs. M. S. Dunn
 Mr. and Mrs. W. G. Ernst
 The Lillian R. Goldberg Trust
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 Mr. and Mrs. Edward MacKevett Jr.
 Mr. and Mrs. John T. McGill
 Mr. and Mrs. Jerrold McNey
 Mr. Eugene D. Michael
 Mr. Anthony E. Morris (Morris Petroleum Inc.)
 Mr. and Mrs. Mark M. Morris
 Mr. Jerome J. O'Brien
 Mr. and Mrs. William T. Puckett, Jr.
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 Mr. Aristidis S. Roubanis
 Mr. and Mrs. John L. Rosenfeld
 Mr. and Mrs. W. W. Rubey
 Mr. Malcolm Rutherford
 Mr. David C. Salter
 Mr. and Mrs. Norman W. Schultz
 Mr. Hy Seiden
 Mr. Ronald Shreve and Mrs. Jean Shreve
 Mr. and Mrs. Parke Snavely Jr.
 Mr. and Mrs. Harold K. Stager
 Mr. and Mrs. Harold H. Sullwold Jr.
 Mr. and Mrs. Warren C. Thompson
 Col. and Mrs. O. E. Trechter
 Mr. Terry Tullis and Mrs. Julia Tullis
 Mr. and Mrs. Ronald Von Huene
 Mr. and Mrs. Robert W. Webb
 Mr. W. M. Yamara

The more recently established W. W. Rubey Memorial Fund is to provide graduate student support of field- and dissertation-related expenses. Contributions may be made to the UCLA Foundation (W. W. Rubey Memorial). Contributors to date include:

Mr. and Mrs. Arthur A. Aagaard
Mr. and Mrs. Morris A. Balderman
Dean and Mrs. F. E. Blacet
Mr. Neville L. Carter
Mr. John C. Crowell
Mr. and Mrs. W. G. Ernst
Mr. and Mrs. Charles Gilbert
Mr. and Mrs. Clarence A. Hall Jr.
Mr. and Mrs. W. B. Hamilton
Mr. and Mrs. Hugh C. Heard
Mr. and Mrs. Alfred Loeblich
Mr. and Mrs. Edwin T. McKnight
Mr. Paul Merifield
Mr. Clemens A. Nelson
Mr. and Mrs. Thomas B. Nolan
Mr. Willis P. Popenoe
Mr. Aristidis S. Roubanis
Mr. and Mrs. Parke D. Snavely Jr.
Wakefield Elementary School Faculty and Staff



THE GEOLOGICAL SOCIETY OF UCLA (GSUCLA)

Members of this society include all geology students, faculty, and staff. The Society elects student officers to organize various geological and social gatherings. GSUCLA co-sponsors the numerous lectures given by visiting specialists and the "Phase Liquidus" informal discussions following the talks. Phase Liquidus also aptly closes each week with a Friday afternoon hour of relaxation.

GSUCLA presides at the regular Tuesday noon "Instant Seminar," a tradition by which the proponents of the various facets of the earth sciences explain their interests to the rest of the Department. Two speakers talk at each meeting, having been selected the previous week by drawing their names from a sample bag.

Other traditions include the series of student-faculty softball games, held at assorted picnics, field trips, etc.; a field trip to one or more parts of California; the beginning of school picnic honoring new students and/or faculty (generally held at the campus Recreation Center, but this past fall held in the Loeblich's backyard); and the spring picnic, held this year in Tapia Park, west of Los Angeles.

Officers presiding during the past year were:

John Barron, President

Scott Prior, Vice-President

Sara Jacobson, Treasurer

Steve Alpert, Secretary

Rick Hurst and Warren Wegner, Graduate Student Association Representatives

LECTURE SERIES, 1973-1974

The lecture series is sponsored jointly by the Department of Geology and the Geological Society of UCLA. Lectures are open to the public, and most are advertised in the University Weekly Calendar which is distributed to other institutions and companies in the area as well as on the campus. When notice of visitors to the Department is too short for such formal notification, the departmental bulletin boards are utilized. The lectures cover a wide variety of topics and many of the current trends and new ideas in geology; they are a broadening experience for students, faculty, and colleagues in the Los Angeles area. Lectures presented during the past academic year are listed chronologically.

Professor H. D. Holland, Department of Geological Sciences, Harvard University, "Atmospheric oxygen and the isotopic geochemistry of carbon," August 20, 1973.

Dr. Yehoshua Kolodny, Research Fellow, California Institute of Technology, Pasadena, California, "Combustion of organic matter as an agent in thermo-metamorphism, isotopic and petrologic evidence," October 11, 1973.

Professor Joseph I. Goldstein, Department of Metallurgy and Materials Science, Lehigh University, Bethlehem, Pennsylvania, "Studies of metal particles in lunar samples," October 18, 1973.

Dr. James Brooks, BP Research Centre, Sudbury-on-Thames, Middlesex, England, "The role of sporopollenin in geochemistry and palynology and its use as a 'biological marker' in the early Precambrian," October 24, 1973.

Professor E. R. Oxburgh, Oxford University and Stanford University, "Membrane stresses and cracking of the lithosphere," October 30, 1973; "Origin of nappe structures in zones of continental collision," October 31, 1973.

Mark E. Hennes, Core Laboratories, Dallas, Texas; American Association of Petroleum Geologists' Distinguished Lecturer, "Depositional anticlines of deep environments--past success and future exploration," November 2, 1973.

Frederick L. Stead, Consulting Geologist, Malibu, California, "Practical aspects of professional ethics for earth scientists," November 8, 1973.

Professor Hans Ramberg, Institute of Geology, University of Uppsala, Sweden, "Effect of gravity on tectonic processes," November 16, 1973.

Professor Robert J. Stull, Department of Geology, California State University, Los Angeles, California, "Origin of ultramafic nodules at Malapai Hill, Joshua Tree National Monument," November 28, 1973.

Professor Ian Carmichael, Department of Geology and Geophysics, University of California, Berkeley, California, "Source to surface, the evidence in lavas of the P-T path of ascent," November 29, 1973.

Dr. Harold Masursky, Center for Astrogeology, U. S. Geological Survey, Flagstaff, Arizona, "Mars, geologic history and processes," January 8, 1974.

Dr. Claude Froidevaux, Professor of Physics, University of Paris (Orsay), Visiting Professor, Institute of Geophysics and Planetary Physics, UCLA, "Geometry of oceanic ridge systems," January 10, 1974.

Dr. W. J. Kennedy, Department of Geology and Mineralogy, University of Oxford, "Aspects of shelf-sea chalk sedimentation and paleoecology in Western Europe," January 17, 1974.

Dr. Yaacov Bentor, Chairman, Department of Geology, Hebrew University, Jerusalem; former Director, Israel Geological Survey, "The geological history and resources of the Sinai Peninsula," January 31, 1974.

Dr. William P. Stuart, National Center for Earthquake Research, United States Geological Survey, Menlo Park, California, "Nonlinear mechanics of earthquake dilatancy models," February 6, 1974.

Dr. Shmuel Ben-Yaakov, Associate Research Engineer and Adjunct Associate Professor, UCLA, "Quantitative estimates of carbonate saturation and compensation depth in the ocean," February 7, 1974.

Dr. Joel Cline, Assistant Research Geochemist and Adjunct Assistant Professor, UCLA, "Nitrogen cycle in the ocean," February 14, 1974.

Dr. M. King Hubbert, Research Geophysicist, U. S. Geological Survey, Washington, D. C., American Association of Petroleum Geologists' Distinguished Lecturer, "The World's energy economy," February 20, 1974.

Dr. Paul Bateman, U. S. Geological Survey, Menlo Park, California, "Sierra Nevada granites," February 21, 1974.

Dr. Howard Wilshire, U. S. Geological Survey, Menlo Park, California, "Problems in determining local geotherms from ultramafic inclusions and basalt," February 28, 1974.

Professor George Rossman, California Institute of Technology, Pasadena, California, "Color intensification in minerals through metal-ion interactions," March 7, 1974.

Professor George deVries Klein, Visiting Professor, School of Oceanography, Oregon State University, Corvallis, Oregon, "Sedimentology of Leg 30 DSDP cores, Southwest Pacific," April 8, 1974; and "Evidence for a tidal circulation model for Paleozoic-Mesozoic cratons," April 9, 1974.

Dr. S. J. B. Reed, Research School of Earth Sciences, Australian National University, Canberra, and Department of Mineralogy and Petrology, Cambridge University, "Quantitative energy-dispersive microprobe analysis," April 23, 1974.

Professor James W. Valentine, Department of Geology, University of California, Davis, "Genetic strategies in diversification and extinction," May 7, 1974.

Dr. A. J. Piwinski, Lawrence Livermore Laboratory, California, "Lineages of Mesozoic calc-alkaline plutonism in central and western California," May 9, 1974.

Professor L. E. Weiss, Department of Geology and Geophysics, University of California, Berkeley, "Growth of flexural slip folds," May 16, 1974.

Professor W. R. Dickinson, Department of Geology, Stanford University, "Relations of subduction zones to sedimentary basins," May 22, 1974.

Professor Hans-Rudolph Wenk, Department of Geology and Geophysics, University of California, Berkeley, "Structure and metamorphism of the Bergell Alps, observations in a classical area," May 30, 1974.

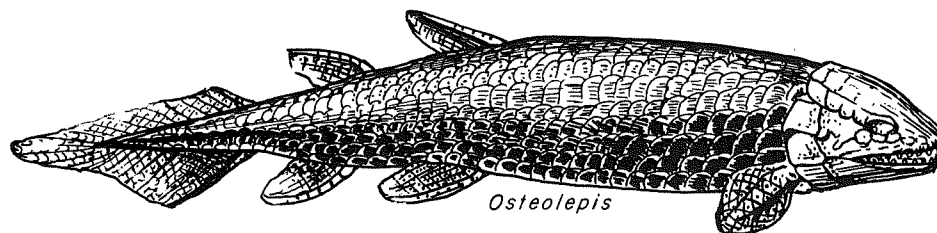
Earth and Organism Interactions through Geologic Time--a two-day symposium relating the effects of continental plate movements to ancient climates, and distribution, community relationships, diversity, and extinction of organisms--was held on March 13 and 14, 1974. Although one of the scheduled speakers could not attend, due to illness, the following four talks were presented as a part of this symposium, followed by open discussion the next day:

Professor Francis G. Stehli, Case Western Reserve University, Cleveland, Ohio, "Fossils, ancient climates, and moving continents."

Professor Karl W. Flessa, State University of New York at Stony Brook, "Biogeographic controls on Phanerozoic diversity."

Professor Helen Tappan, University of California, Los Angeles, "The plates and the protists, a tectonic trigger for evolution."

Professor Alfred M. Ziegler, Department of Geophysical Sciences, University of Chicago, Chicago, Illinois, "Silurian oceans and organisms."



FACULTY NEWS

TED L. BEAR, B.A., UCLA. Lecturer in Geology.

A Geological Consultant (Bear & Kistler), Ted teaches a course in petroleum and ground-water geology for the Department each fall.

DONALD CARLISLE, Ph.D., Wisconsin. Professor; Associate Dean, Graduate Division.

A compound fracture of the leg, sustained in February of 1973, kept Don out of the field that summer, but he finally got out of the cast about Christmastime. He was in good enough shape to attend a congress in Naples, where Dr. Edith Carlisle (on the Research Faculty of the School of Public Health) presented a summary of her recent work demonstrating the essentiality of the element silicon for growth in higher animals. Edith began this research some time ago using the microprobe facility in our Department.

Don's mineral deposits seminar on possible relationships between ore deposit genesis and global tectonics has helped to kindle some new ideas and interests.

His paper "Emergent basalt and submergent carbonate-clastic sequences, including the Upper Triassic Dilleri and Welleri Zones on Vancouver Island" (Canadian Jour. Earth Sci., February 1974) with Takeo Susuki appeared during the year. A joint report with J. E. Muller and K. E. Northcote on the Alert Bay - Cape Scott area of Vancouver Island is at the open-file stage with the Geological Survey of Canada, and Don's paper on Bute Inlet is in preparation.

The summer of 1974 was spent as part of a joint NSF-Kennecott research project in the northwestern states relating to marine volcanic rocks and ore genesis.

JOHN M. CHRISTIE, Ph.D., Edinburgh. Professor.

John has continued his work on the deformation mechanisms of rocks, applying the techniques of optical and transmission electron microscopy to the study of experimentally and naturally deformed rocks. He presented invited papers covering a review of the general topic of transmission electron microscopy of deformation structures in minerals and rocks at the M.S.A. Symposium at the G.S.A. Annual Meeting in Dallas in November, the American Crystallographic Association Meeting at U.C. Berkeley in March, and at the Eighth International Congress of Electron Microscopy in Canberra, Australia, in August 1974. On the Australian trip, John presented a paper at a conference on "Deformation Mechanisms in Rocks" organized by the Geological Society of Australia at Goolwa, South Australia (August 18-23) and a seminar at the Australian National University. It was an excellent opportunity to renew acquaintanceship with former Australian visitors to UCLA (the Phakeys, Hobbises, Patersons, and McLarens)--and with the Australian vineyards and wines.

In their collaborative program on experimental rock deformation, Christie and Professor David Griggs (IGPP) are working with graduate students Steve Kirby and John McCormick and have developed a productive collaboration with Professor Alan Ardell of the Materials Department (School of Engineering at UCLA) on the electron microscopy of deformed minerals. Peter Vaughan (M.S.) and Gerry Dollinger (Ph.D.) have completed their theses; the former has entered graduate school at U.C. Santa Cruz, and the latter has a Post-Doctoral appointment with Jim Blacic (UCLA Ph.D., 1971) at the University of Washington.

WAYNE A. DOLLASE, Ph.D., Massachusetts Institute of Technology. Professor.

After a sabbatical leave to the University of Wisconsin, Madison, Wayne's last year was business as usual, with courses, committees, editing for the American Mineralogist, and a little research squeezed in. A new seminar on the magnetic structures and properties of minerals was organized in the spring quarter. A few of the research projects developed during his sabbatical leave, including a mathematical routine to quantitatively treat polyhedral distortion in crystals and a discussion of the statistical limitations of Mössbauer spectral fittings, are currently in press or review. A new Mössbauer laboratory is being set up in the Geology Department, with the major components delivered in June. His last Mössbauer project using the Physics Department equipment was a study of the ferrous-ferric ion ordering in a suite of alkali amphiboles collected by R. Stull of California State University, Los Angeles. The crystal structures of the same amphiboles are currently in refinement by S. Oswald and G. Novack, also of CSULA; and comparison of the results will provide a useful measure of the reliability of the spectral interpretation. Wayne gave a talk summarizing recent Mössbauer spectral studies at California State University, Hayward, in April.

W. GARY ERNST, Ph.D., Johns Hopkins. Professor of Geology and Geophysics; Chairman, Department of Geology, through August 1974.

Over the past year, Gary spent a substantial proportion of his time as "chairthing, attempting to increase the state funds available to the Department, through augmentation of the regular budget, and through special equipment requests (30 new Bruntons and 11 new microscopes for class use, apparatus for assistant professors Kieffer and Lorenz); in addition, I have been soliciting money for the UCLA Geology Alumni Fund and have been trying to obtain extramural support from mineral resource-based companies (so far, funds are just beginning to come in: \$500 from Union). I am continuing our departmental efforts to improve appreciation and understanding of the mineral industries, for instance, through (a) the annual Careers Day, (b) the AIPG meeting (to be held on campus next October), and (c) through

special extension courses provided through the auspices of the Geology Department (two were given this spring: 'Earthquake Country' and 'Continents Adrift').

"For my regular instructional load this past year, I taught Geology 234 (Phase Equilibrium), Geology 253 (Seminar in Petrology), and supervised Geology 190 (Senior Seminar), as well as a freshman seminar. This summer I'll briefly help Clem Nelson in Geology 121A,B (Summer Field Course). I have had three postdocs here this year: Dick Grauch (aluminosilicate parageneses in the Venezuelan Andes), Adjunct Assistant Professor Tim Loomis (contact metamorphism and the thermodynamics of irreversible reactions), and Colin Graham (Pelona Schist metamorphism). Ph.D. students associated with me include Roy Budnik (Kenai Peninsula trench complex), Ken Crawford (Franciscan structure and metamorphism, Mount Hamilton area), Terry Kato (reconnaissance of meta-argillite terrane, western Chile), Skip Stoddard (progressive metamorphism in the Adirondacks, with Doug Rumble as external advisor), Phelps Freeborn (experimental fractionation of iron and magnesium in olivine + clinopyroxene pairs), Tony Finnerty (trace metal partitioning in coexisting synthetic minerals), Frank Spear (laboratory recrystallization of oceanic tholeiite under controlled P-T conditions), Warren Wegner (diffusion and reaction rate studies in a portion of the system CaO-MgO-SiO₂-H₂O), and Sara Jacobson (experimental studies on mafic melt fractionation under crustal conditions). In addition, I supervised the honors thesis research of Ken Shay (Mount San Gorgonio skarn paragenesis).

"I presented twelve invited lectures this past year: at the AIPG (Ventura); University of Southern California; Cal State Northridge; U.C. Davis; San Joaquin Geol. Soc. (three); Cal State Los Angeles; Oregon State (two); and the University of Texas (two). I also gave papers at both western and eastern AGU meetings (San Francisco and Washington, D. C.), and at the GSA Cordilleran Section meeting (Las Vegas). I'm president of the V.G. & P. section of the AGU and serve on the editorial advisory board of Geology. Papers published during the year include summaries on (1) arcs and subduction zones, (2) Mesozoic framework of California, and (3) diagenetic environments along continental margins in Dickinson, W. R. (ed.) "Geologic Interpretations from Global Tectonics with Applications for California Geology and Petroleum Exploration," San Joaquin Geol. Soc., Bakersfield, California. Another paper, published with Clarence Hall in the GSA Bull., dealt with the newly recognized Cambria Felsite. This summer I'll be a discussion leader at a Gordon Conference concerned with geophysics and lithospheric plate motions and will attend a two-week NATO field conference in the Alps, which deals with volatile components in metamorphism. In between I will be collaborating with Italian petrologists in studies of Ligurian ophiolites and high-pressure metamorphic rocks. Other than that I'm not doing anything."

CLARENCE A. HALL, Jr., Ph.D., Stanford University. Professor of Geology; Chairman of Department beginning in September 1974.

Clarence is continuing his geologic research in the San Luis Obispo

area, particularly along the West Huasna fault zone. The geologic mapping is currently supported by the U.S. Geological Survey. The latest in a series of maps on the area is the U.S.G.S. Misc. Field Studies Map 599 (in press) titled "Geology of the Cambria Region." The map includes the Cambria quadrangle and parts of the Cypress Mountain, Cayucos, and York Mountain quadrangles.

In January Clarence attended a conference on "Biological Clocks and Changes in the Earth's Rotation: Geophysical and Astronomical Consequences" held in Newcastle, England. The proceedings from the conference are to be published by Wiley. Clarence's chapter is titled "Latitudinal Variation in Shell Growth Patterns of Bivalve Molluscs: Implications and Problems."

Clarence's recent publications are: "Shell growth in Tivela stultorum (Mawe, 1823) and Callista chione (Linnaeus, 1758) (Bivalvia): annual periodicity, latitudinal differences, and diminution with age," in volume 15 of Palaeogeography, Palaeoclimatology, Palaeoecology (with W. A. Dollase and C. E. Corbató); and "Geology and petrology of the Cambria Felsite, a new Oligocene formation, west-central California Coast Ranges," in Geol. Soc. America Bull. 85 (with W. G. Ernst).

ISAAC R. KAPLAN, Ph.D., University of Southern California. Professor of Geology and Geochemistry.

Kaplan's lab group has spent a good part of 1974 saying goodbye to each other. They had a tremendous turnover in graduate students and lab. members. Three students received their Ph.D.'s this year: Martin Goldhaber (who has accepted a post-doctoral fellowship at Yale) and Ian coauthored a chapter, "The Sulfur Cycle," in Volume V of The Sea; George Claypool is currently working with the USGS in Denver on petroleum research; and Joel Cline is settling in the Seattle, Washington, area with Pacific Marine Environmental Laboratories. They also said farewell to Dr. Sam Ben-Yaakov, who has returned to Israel and is holding two positions there, one at the Hebrew University in Jerusalem and the other with a research and development company in Haifa. They will also miss Mary Jo Baedecker, who has moved to Washington, D.C., with her family.

The critical energy shortage is earning a great deal of Ian's attention this year as well. He has compiled and edited a volume of papers, Natural Gases in Marine Sediments, presented at a symposium at Lake Arrowhead that he organized in 1972. Ian has also been granted a new research contract with the Southern California Edison Company, "Biological Generation of Methane and Hydrogen." Research on this is being undertaken in conjunction with Dr. Paul Holmes (from Woods Hole Oceanographic Institution).

A Visiting Scientist, Dr. Royoshi Ishiwatari (Department of Chemistry, Tokyo Metropolitan University, Japan), has joined the lab. and will work with Dr. Raphael Ikan (Hebrew University, Jerusalem) on problems related to naturally occurring organic matter in recent marine sediments.

In addition to teaching three classes this year (Geology 15, Introduction to Oceanography; M144, Marine Geology; and M130, Isotope Geochemistry), Ian gave a seminar for the Institute of Geophysics and Planetary Physics

on "Gas Hydrates: Solid Gases in Marine Sediments and Elsewhere" and a talk on "Mineral and Fuel Resources" for the "Continents Adrift" Extension Course at UCLA in the spring. He also attended several interesting conferences and symposia, including "Recognition of Alien Life," conducted by the Royal Society of London and held in London during May. Emil Kalil, a graduate student in the group, attended a symposium on the International Atomic Energy Commission on "Nuclear Reactor Plant Safety" in Warsaw, Poland, and presented a paper there.

Research is continuing on analysis of Apollo 17 lunar samples (by post-doctoral fellow John Kerridge and mass spectrometer expert Mrs. Chari Petrowski--who this year received her M.S. degree), on trace element and gas analyses of JOIDES cores, and solubility of carbonates in the ocean using the in situ instrument package.

ALFRED R. LOEBLICH, Jr., Ph.D., University of Chicago. Adjunct Professor.

Al attended the First International Congress of Systematic and Evolutionary Biology in Boulder, Colorado, in August 1973, where he presented a paper on "Protistan phylogeny as indicated by the fossil record." The paper appeared in Taxon, v. 23, p. 277-290 (1974). Other publications that have appeared recently include "Evolution of oceanic plankton," Earth Science Reviews (1973); "Protistan evidence and explanation of the Permian-Triassic crisis," in the Permian-Triassic Symposium Volume (1973); and the VII Supplement to the Bibliography and Index of Calcareous Nannoplankton (1974), all with Helen Tappan. An additional supplement (VII) also was published for the index to Genera, Subgenera, and Sections of the Pyrrhophyta, in Phycologia (1974), jointly with A. R. Loeblich III.

During the past winter, he organized the two-day symposium on "Earth and Organism Interactions through Geologic Time," presented by the Department of Geology and UCLA Committee on Public Lectures, and funded by Chevron Oil Field Research Company, La Habra, California.

Courses taught during the year were a seminar in stratigraphy (Geology 257) and a laboratory for micropaleontology (Geology 216). Present research includes a joint study with Dr. E. R. Wicander, American Chemical Society Petroleum Research Fund Post-Doctoral Fellow, on zonation, diversity, and paleoecology of Devonian phytoplankton of North America; other current research concerns the phytoplankton of the Ordovician. Two weeks were spent in the field in August and September 1974 collecting Ordovician and Devonian samples, jointly with Helen Tappan Loeblich.

HELEN TAPPAN LOEBLICH, Ph.D., University of Chicago. Professor; Vice Chairman of Department.

Invited to be the Convenor of a symposium on "Phylogeny of Protista" for the First International Congress of Systematic and Evolutionary Biology held in Boulder, Colorado, in August 1973, Helen spent much of that summer

and early fall making arrangements for the symposium, for which she gave the introductory talk, "Protistan Phylogeny: Multiple Working Hypotheses," in needling the various speakers to submit their manuscripts, and in editing these for the printer. Speakers for the symposium represented four European countries and three states, the published articles appearing in two consecutive issues of Taxon, the journal of the International Association of Plant Taxonomy, one of the sponsoring organizations for the Congress.

When illness prevented one of the scheduled speakers from attending a two-day symposium at UCLA sponsored by the Department of Geology and the UCLA Committee on Public Lectures, Helen presented a substitute talk entitled "The Plates and the Protists, a Tectonic Trigger for Evolution." Other national meetings attended included the GSA in Dallas in November 1973 and the American Institute of Biological Sciences and the Phycological Society of America at Tempe, Arizona, in June 1974.

As Vice Chairman, she is Graduate Advisor for Geology and also taught the usual courses in Earth History (Geology 2) and Micropaleontology (Geology 216). Two doctoral theses were completed under her direction during the year: E. R. Wicander, studying "Diversity and abundance fluctuations in a Late Devonian - Early Mississippian phytoplankton assemblage from northeast Ohio, U.S.A.," while an American Chemical Society Petroleum Research Fund Fellow and a NSF-supported research associate under grants to Helen. John Barron's research, supported by NSF (Biological Oceanography and Earth Sciences Sections) grants, involved "The Late Miocene - Early Pliocene marine diatom assemblage of southern California, biostratigraphy and paleoecology." Reed Wicander is continuing as a post-doctoral scholar at UCLA, and John Barron is now employed by the U.S.G.S. at Menlo Park. Merton Hill is presently continuing his doctoral studies on mid-Cretaceous calcareous nannoplankton, and Steve Lee has completed field work for his doctoral study of Cretaceous dinoflagellates under Helen's NSF grant.

Publications appearing during the past year include: "Evolution of the oceanic plankton," Earth-Science Reviews, 9: 207-240; "Smaller protistan evidence and explanation of the Permian-Triassic crisis," in The Permian and Triassic Systems and their Mutual Boundary, Canadian Soc. Petrol. Geol. Publ., Calgary, Canada, p. 465-480, and "Annotated index and bibliography of the calcareous nannoplankton VII," Jour. Paleontology, v. 47, p. 715-759, all three being jointly authored with Alfred R. Loeblich Jr. Helen's paper "Protistan phylogeny: multiple working hypotheses," appeared in Taxon, v. 23, p. 271-276.

She continues as a member of the Paleontology-Biostratigraphy Advisory Panel of JOIDES; and the editorial board for Palaeogeography, Palaeoclimatology, Palaeoecology; is West Coast Correspondent for Micropaleontology (Amer. Mus. Nat. Hist.); and will be on the editorial board of the new journal Paleobiology, to be published by the Paleontological Society beginning in 1975. In any other available time she continues work on a book on micropaleontology, stressing the biological aspects of the various groups of plant and animal protists, and compiles and edits the UCLA Geology Department Newsletter.

SUSAN WERNER KIEFFER, Ph.D., California Institute of Technology.
Assistant Professor.

"Probably the most interesting event of my year was a field trip in January to Lonar Crater, India, a meteorite impact crater formed in the Deccan trap basalts. The purpose of the trip was to collect samples of the shocked basalts in order to study the shock metamorphism of the minerals for comparison with lunar rocks and meteorites. The trip was sponsored by the Smithsonian Institution. I was possibly one of the first western women to live in Lonar village since the British left in the late 1940's, and I was as much a curiosity to the villagers as the rocks were to me. Because of the internal air strike, we travelled the whole distance from Calcutta to Bombay by train and jeep.

"I have been awarded a NASA grant to study the shocked basalts from Lonar and to do high-pressure recovery shock-wave experiments on basalt samples at Johnson Space Center in Houston. We hope to recover samples from pressures up to one Megabar, compare them with the naturally shocked basalts, and look for evidence of high-pressure phase transitions and/or chemical reactions. This work will begin during the summer of 1974."

Sue taught Geology I and M160, Astrogeology, which had a two-day field trip to Meteor Crater, Arizona, and the cinder cones of the San Francisco volcanic field. This trip was combined with three days of field work at the crater with Dr. E. M. Shoemaker, who wrote a guidebook with Sue to the geology of the crater. The guidebook, hot off the press, was used for a field trip to the crater during the August 1974 meeting at UCLA of the Meteoritical Society.

A translation of a Russian article by L. Firsov, "Concerning the meteoritic origin of the Puchezh-Katunki Crater," was published, and Sue wrote the introduction to the geology of the region in which the disturbance is located (Meteoritics, v. 8, p. 223, 1973). In addition, a joint article was published with I. Getting, "Pressure dependence of thermal diffusivity," Trans. AGU, v. 54, p. 1202, 1973.

TIMOTHY P. LOOMIS, Ph.D., Princeton University. Adjunct Assistant Professor.

Tim was at UCLA for this past year as a Post-Doc working with Gary Ernst and as Adjunct Assistant Professor teaching the spring quarter of the mineralogy-petrology sequence. He presented a talk in April on "Irreversible reactions of minerals in high-grade metamorphic rocks," for the AGU. His paper "Tertiary mantle diapirism, orogeny, and plate tectonics east of the Strait of Gibraltar" is to appear in the American Journal of Science. Research is continuing on domain equilibrium and nonequilibrium reaction processes in high-grade metamorphic rocks. Beginning in July 1974, Tim will be an Assistant Professor at the University of Arizona, Tucson.

DOUGLAS M. LORENZ, Ph.D., Northwestern University. Assistant Professor.

Doug is continuing work with A. H. Cheetham of the U. S. National

Museum on taxonomic discrimination in cheilostome bryozoans, using functionally integrated, statistically independent characters. His research on structural reinforcement in tubular bryozoans also is continuing, especially as it relates to the ecological role of bryozoans as substrate stabilizers and framework constituents in Paleozoic bioherms and reefs.

An investigation is also beginning into the relationship between environmental variability and enzymatic stability in modern cyclostome bryozoan populations, with the aim of obtaining direct evidence bearing on the question of whether genetic variation itself is an adaptive character in natural populations.

An invited paper on "Environmental stability, ecological strategies, and the structure of an ancient benthic marine community: a stochastic approach" was presented at the First International Congress of Systematic and Evolutionary Biology in Denver, August 1973. Doug was coauthor of the paper (with A. H. Cheetham) presented at the 1974 S.E.P.M. Convention in San Antonio, "A vector approach to size and shape comparisons among zooids in cheilostome bryozoans." This will be published in a G.S.A. Memoir in memory of T. G. Perry. Doug also presented two papers at the Third International Bryozoology Association Convention at Lyon, France, in September 1974; one on "Taxonomic significance of variable morphologic characters in cheilostomes" was coauthored with A. H. Cheetham. The other is on "Patterns of structural adaptation in the skeletal architecture of some erect Paleozoic Bryozoa." Both papers will appear in a proceedings volume of the convention early next year.

PAUL M. MERIFIELD, A.B., M.A., UCLA; Ph.D., University of Colorado. Partner, Lamar-Merifield. Lecturer in Geology.

The interdisciplinary graduate degree program in Environmental Science and Engineering was approved by the Regents, and Paul became a member of the Interdepartmental Committee, representing the Geology Department. He also served as Graduate Advisor and Chairman of the Admissions Committee for the program during the past year and was an editor (with Tom Farley) of "Future alternatives for the Santa Monica Pier," the final report of one of the environmental problems courses.

He presented papers at the annual meeting of the Association of Engineering Geologists in October, the Cordilleran meeting of the G.S.A. in March, and a seminar in Remote Sensing at NASA/Ames Research Center in March. He coauthored the paper "Earthquake recurrence intervals on major faults in southern California," which appeared in Geology, Seismicity and Environmental Impact, Assoc. Eng. Geol., Spec. Publ., 1973.

Paul is a principal investigator on studies for NASA and the U.S.G.S. that apply SKYLAB and ERTS-1 imagery to the tectonics and earthquake hazards of southern California. Results to date were presented at the First International Conference on the New Basement Tectonics in Salt Lake City in June 1974.

CLEMENS A. NELSON, Ph.D., University of Minnesota. Professor.

Clem reports some progress toward finalizing the report on the Papoose Flat Pluton, he completed a manuscript on "Monzonites of the White-Inyo region" with Art Sylvester of UC Santa Barbara, and is working with James Zumberge on the final chapter for a new textbook.

During the past year Clem taught a new course, Geology 98, a freshman seminar, "Field Seminar - Geology of California," to nineteen students: "the brightest group of freshmen I have ever encountered." Clem also taught Geology I, Geology 10 (Geology of California), and the spring quarter of the field sequence (Geology 111C) with Paul Merifield.

Clem taught the summer field course in the eastern Sierra Nevada-White-Inyo region during 1974 (twenty-eight students), with Johnnie Moore as assistant. After the field course, he left for a combined vacation and investigation into some aspects of late Precambrian-Cambrian geology of the American Cordillera, visiting one of his graduate students in the field en route.

GERHARD OERTEL, Dr. rer. nat., University of Bonn. Professor

Gerhard was on sabbatical leave until December 1973, and he stayed in England and Germany until October, when he returned to Los Angeles. Research is continuing on the measurement of deformation (either by compaction or tectonical) of various micaceous rocks, largely using the X-ray pole figure goniometer. He investigated shales, siderite nodules in shales, slaty lapillar tuffs, slates and schists with graduate student Steve Lipshie and a seminar group of six students. He was able to measure schists for the first time using his newly built apparatus which is capable of scanning large specimens of relatively coarse-grained rocks. His NSF grant for study of "Preferred orientation and flow of micaceous rocks" covered this period.

Talks other than at UCLA included one in October 1973 at the University of Göttingen, Germany, and one in April at the annual meeting of the AGU in Washington, D.C. His publications include "A transmission electron microscope and X-ray diffraction study of muscovite and chlorite" (with C. D. Curtis and P. P. Phakey), *Min. Mag.*, v. 39, p. 176-188 (1973); "Unfolding of an antiform by the reversal of observed strains," *Geol. Soc. America Bull.*, v. 85, p. 445-450 (1974); and an abstract, "Finite strain measurement: a comparison of methods" (with D. S. Wood), *Eos*, v. 55, p. 695 (1974).

WILLIS PARKISON POPENOE, Ph.D. Professor Emeritus.

"Nearly all of my efforts both in laboratory and field for the past fiscal year have been devoted to forwarding the description of the Turonian gastropods of the Pacific Coast--a slight enlargement of the originally conceived project of treating only those from the Redding region. Overhaul and preliminary study of Turonian faunas from other regions show that most of the species contained in these assemblages occur also in the Redding Turonian and that little extra work will be involved in the enlargement of scope of the study.

Hopefully, the gastropod descriptions and geologic map for the Redding area may be completed in a year's time. Perhaps it is too optimistic to look much farther ahead than that, but the next project will be directed toward similar treatment of Turonian bivalves.

"The single publication of the year was a chapter contributed to the S.E.P.M. Guidebook for the Fall Fieldtrip concerned with the Cretaceous stratigraphy and faunas of the region. Extra-Cretaceous activities of the year have mainly involved a not-too-outstanding attempt to keep house and yard in some kind of livable condition, ministering to the wants and vagaries of a senile black cat, and raising a garden of zinnias, clove-gilliflowers, dahlias, etc., with the non-cooperation of large numbers of post-Turonian land gastropoda." At last notice, Popenoe was slightly ahead.

WALTER E. REED, Ph.D., University of California, Berkeley. Assistant Professor.

Ted spent most of the past year doing "bench work" on two general projects--crude oil chemistry and sediment geochemistry. In the former category, he began work focusing on Cretaceous (Dakota and Gallup) and Permian (Paradox) oils in the Four Corners region in an effort to relate the composition of the reservoir oil to depositional regime. Some sixty oils have been collected, with analytical work on them now in progress. A set of Tertiary oil seep samples (Green River Formation of the Uinta Basin) was examined by combined gas chromatography-mass spectrometry (GC-MS) in order to study the effects of subaerial weathering on petroleum composition. A manuscript on this last study is in progress.

A geological sciences seminar was given by Ted on November 20 at the University of Southern California: "Stratigraphy of Crude Oil Composition and Sedimentary Organic Matter."

In a combined effort with graduate student Paul Mankiewicz, a massive amount of compositional data collected on the Pleistocene sediments of Searles and Mono Basins indicates that organic geochemistry must merge imperceptibly into paleobiology. Stratigraphic correlation using organic composition has been documented in these sediments, and biological populations can be deduced from the organic compositions in these largely unfossiliferous sequences.

Graduate student R. LeFever is continuing work on sandstone textures using multivariate discriminant function analysis of data from the UCLA automatic particle size analyzer. A long joint manuscript on interpretation of depositional environments using settling velocity data has been submitted for publication.

Ted has been appointed to the research committee of the AAGP for a three-year term of office.

JOHN L. ROSENFELD, Ph.D., Harvard University. Professor.

Outside of teaching, most of John's activity was connected with completion of a manuscript coauthored with Lew Cohen of UC Riverside and Herb Adams, now teaching at California State University, Northridge. This long

paper, entitled "Solid inclusion piezothermometry: geometric basis, comparison dilatometry, and calibration for the association quartz-garnet," was submitted to the American Mineralogist in February, and the wheels of the editorial mill have been grinding slowly. We are hopeful that these results of about five years' work will appear in print this winter. Lew and John are now tooling up to use diamond and its mineral inclusions to infer conditions in the earth's mantle by the same approach. They have been receiving indispensable assistance in this work from the DeBeers Diamond Research Laboratory in Johannesburg through Dr. Jeff Harris. In addition to specimens, that laboratory provided a beautifully machined, ten-millimeter diamond rod for comparison dilatometry, an essential procedure in their approach.

John also spent a month in field work along the southern border of New Hampshire and Vermont in collaboration with J. B. Thompson of Harvard University. They found new primary stratigraphic evidence of stratigraphic "tops" there that "have us back to the drawing board in a major way in our attempt to develop an overall tectonic synthesis in that region."

Extracurricularly and on his own time, John has been advising local groups of citizens on environmental matters.

J. WILLIAM SCHOPF, Ph.D., Harvard University. Professor of Geology and Geophysics.

Primarily as a result of field work carried out during the past year, in part together with Bob Horodyski and Tom Fairchild, diverse, well-preserved microbios have been discovered in six Precambrian formations; the newly discovered microbios range in age from about 1,400 to 800 million years, have been detected at a total of thirteen localities, and occur at at least fifteen separate horizons. Three of these new assemblages occur in South Australia (Blyth Dolomite - 1,150 m.y.; Myrtle Springs Fm. - 950 m.y.; Auburn Dolomite - 900 m.y.); new bios have also been discovered in the Grand Canyon (Galeros Fm. - 850 m.y.), southern India (Vempalle Fm. - 1,400 m.y.; the oldest bona fide fossils known from the Indian subcontinent), and in the Canadian Arctic (collected by Bob Horodyski from the Dismal Lakes Group - 1,200 m.y.). In addition, about a dozen new fossiliferous localities and horizons of formations previously known to be fossiliferous (Skillogalee Dolomite, South Australia - 1,000 m.y.; Bitter Springs Fm., central Australia - 900 m.y.; Kwagunt Fm., eastern Grand Canyon - 800 m.y.) have been collected. These nine fossiliferous formations, currently under study in Bill's laboratory by Tom Fairchild, Bob Horodyski, Bonnie Bloeser, and Bill, together comprise 45 percent (9/20) of all fossiliferous stromatolitic communities yet known from the Precambrian.

In addition to ongoing studies of these units (which will, no doubt, continue to be "ongoing" for a considerable period of time!), Bill also has been involved in studies of (1) curious, microscopic, stromatolite-like structures--unlike previously reported biogenic microstructures--from the late Precambrian of Australia; (2) organelle-like structures in Phanerozoic and Precambrian plants, both mega- and microscopic; (3) the "mass balance" between oxygen and carbon

over geologic time, as a means of deciphering the time of origin of oxygen-producing photosynthesis; and (4) modern algae, Precambrian algae, Precambrian microfossil-like structures, and terrestrial and extraterrestrial (meteoritic) pseudofossils to determine whether statistical analyses can be used to differentiate between biogenic and abiogenic assemblages (this is especially relevant to studies of the oldest fossil-like structures now known and could prove useful for analyses of Martian samples, if and when such materials become available).

Public lectures were given in San Francisco, San Jose, San Diego, Los Angeles, Riverside, and Pasadena; and during his travels, seminars were presented at Monash University, Melbourne, and the University of Adelaide in Australia; at the Geological Survey of India, in Hyderabad, Bangalore, Madras, and Bombay, India; The University of London, and the University of British Columbia, Canada. Bill is a member of the editorial boards for Precambrian Research, Origins of Life, Evolutionary Theory, Paleobiology, and Le Botanique, as well as for the University of California Press. Research is supported by a NASA grant for studies in Precambrian paleobiology and an NSF grant for his studies of early evolution.

Bill will be on sabbatical leave during the 1974-1975 academic year. During this time he plans to complete and publish results of the various studies underway, do a bit of textbook writing, and learn Russian in preparation for a six-month visit to the U.S.S.R. (as a U.S. Exchange Scientist) beginning in January 1975. He also will attend and present papers at international meetings in Moscow (August 1974), England (April 1975), Barcelona (May 1975), and Leningrad (July 1975).

RONALD L. SHREVE, Ph.D., California Institute of Technology. Professor of Geology and Geophysics.

Ron Shreve divided his research time between theoretical glaciology and statistical geomorphology. In glaciology he spent most of his effort working on a finite-element calculation of ice flow toward a water-filled subglacial tunnel. If successful, the same methods and much of the computer programming can be used to solve a variety of problems, not only of glacier flow, but also of flow in the mantle and deformation of crustal rocks. In geomorphology he wrote an article on "Statistical geomorphology" for Scientific American and finished another, to be published in Water Resources Research, which shows that the observed 0.6-power relationship between mainstream length and drainage area in river basins is a consequence of his hypothesis that natural channel networks are topologically random.

He taught field geology, glaciology, and a seminar in glaciology and glacial geology. Graduate students working with him include Rick Balogh, Bill Bruner, Dwight Carey, Jeff Keaton, Steve Lipshie, Bernard Hallet, Bill Holman, David Thompson, and David Wilson.

KENNETH D. WATSON, Ph.D., Princeton University. Professor.

Part of the summer of 1973 was spent on field study of some metal deposits associated with Archean volcanic rocks in the Canadian Shield and on a

laboratory investigation of kimberlite from the Superior Province. During part of his sabbatical leave in the fall quarter 1973, Ken attended the International Conference on Kimberlites in southern Africa. The first week of the Conference was spent visiting about twenty kimberlite occurrences and diamond mines in the Pretoria and Kimberley regions of South Africa. The second week was devoted mainly to meetings on kimberlites and their inclusions held at the University of Cape Town. The third week of the Conference was spent in Lesotho on field trips to about ten kimberlite pipes and dikes.

Following the International Conference on Kimberlites, Ken spent three weeks visiting gold mines and carbonatites in South Africa; volcanic areas in Kenya and Tanzania; and occurrences of ultramafic rocks in the Apennines of Italy. In May he went to Milwaukee to attend a conference on mineral deposits of the ocean floor that had been arranged by the University of Wisconsin under their Sea Grant College Program.

Papers presented during the year were: "Kimberlites of the Superior Province, Canadian Shield" at the International Conference on Kimberlites, Cape Town, South Africa; and "Shonkinite-syenite plutons, Mountain Pass, San Bernardino County, California" at the Cordilleran Section meeting of the G.S.A., Las Vegas, Nevada, with Douglas Morton (Ph.D., 1966, UCLA), U.S. Geological Survey, and A. K. Baird, Pomona College.

GEORGE W. WETHERILL, Ph.D., University of Chicago, Professor of Geophysics and Geology.

Dr. George W. Wetherill, UCLA Professor of Geophysics and Geology, was elected to the National Academy of Sciences this year. Techniques developed by Dr. Wetherill for measuring the ages of very old rocks have had a major impact on the earth and lunar sciences. These methods, based on the disintegration of radioactive isotopes into stable isotopes, allow dating of rocks collected on the moon as over four billion years of age.

Dr. Wetherill and other scientists have also applied his radiometric methods to determine time scales for the evolution of North America and other continents. By adapting the analytical techniques developed in his isotope research to biological problems, he is currently studying the effect of lead intake from food and air on human metabolism, using stable isotopes as a tracer. In another research area, Dr. Wetherill is investigating the long-scale evolution and orbits of comets, asteroids, meteorites, and other small bodies in the solar system through statistical techniques.

He was chairman of the UCLA Department of Planetary and Space Science from 1968 to 1972.

In Memoriam

The Department of Geology suffered the loss this past year of two of its Emeritus Professors, Professor Joseph Murdoch on December 31, 1973, and Professor William Rubey on April 12, 1974. Although officially retired, Joe Murdoch in 1959 and Bill Rubey in 1966, both had continued to be active in research and will be greatly missed in the Department.

Joseph Murdoch (1890 - 1973)

Joe had been on the faculty at UCLA since 1928, when he came as an Instructor, having received B.A., M.S., and Ph.D. degrees from Harvard. He remained active in his mineralogic research even after his official retirement from UCLA in 1959. In characteristic fashion, Joe had been working at the Geology Department last New Year's Eve. He succumbed to a heart attack on the way home that evening. He is survived by his wife of 60 years, Maude, by a daughter, Mrs. Barbara M. Phillips, and three grandchildren.

William Walden Rubey (1898 - 1974)

We would like to share with all of you, many of whom could not be here then, the tribute to Bill Rubey that Gary Ernst presented at the Memorial Service in the Faculty Center on April 25, 1974.

"Today's brief Memorial Service for Professor William W. Rubey cannot begin to cover the accomplishments of this remarkable man. As you know, the major portion of his career was with the U.S. Geological Survey. This organization was profoundly influenced by Bill: through his research, which was of the highest calibre; through his personal relationships with both scientists and nonscientists; and through his administrative services. Moreover, Bill was an exceedingly active member of the geological profession at large. He was elected President of the Geological Society of America and was an influential member of the National Academy of Sciences and the American Philosophical Society. He was a trustee of the Carnegie Institution of Washington and of the Woods Hole Oceanographic Institution; he served as a member of the National Science Board of the National Science Foundation and for three years was chairman of the National Research Council-National Academy of Sciences. Some of his many contributions to science have been formally recognized, as indicated by receipt of the Distinguished Service Award of the U.S. Department of the Interior, the Geological Society of America's Penrose Medal, and the President's National Medal of Science. Bill was very active in the exploration of space; he set up and became the first Director of the Lunar Science Institute. Bill enjoyed a tremendously active and productive scientific life. Over the years, travels took him routinely to New Haven, Cambridge, Washington, Wyoming, Denver, Houston--often, seemingly, on successive days or weeks. His contributions to the direction of the earth sciences were truly substantial.

"But what I wish to describe today is his association with faculty and students at UCLA. Bill served on visiting committees for many academic earth science departments, but probably had his largest education impact on this campus. He was appointed Professor of Geology and Geophysics at UCLA in 1960. After reaching mandatory retirement age in 1966, he was recalled to service each year thereafter--and was to be reappointed again this year. What was the reason for this extraordinary University procedure? Bill offered a graduate seminar, "Advanced Topics in Geology," which was the most successful

course of its kind in the Department. It dealt with major unsolved problems in earth science, such as the origin and evolution of mountain belts, the diversity of igneous, sedimentary, and metamorphic rocks, the growth of continents, the origin of ocean basins and of seawater, the evolution of the terrestrial planets, and so forth. Bill regarded himself as a general geologist, and this seminar reflected his conceptual understanding and method of addressing such large-scale, complex subjects. I think that Bill's unique contributions here lay in directing the studies by judicious questioning and by an open-minded, objective attack on the problems; only someone with Bill's comprehensive appreciation of physics and chemistry coupled with an extremely broad background in geology could have organized and concluded such an ambitious course series. It was eminently successful. Student enthusiasm for this seminar was sustained at a very high level--so much so that enrollment had to be limited in order that informal discussion and exchange of ideas could be maintained. In all, Bill offered this seminar 11 times, with a total official enrollment of 103 graduate students and uncounted auditors. Each of these students carried away a realization of the magnitude and interconnectedness of all problems in earth science; furthermore, each obtained an appreciation of how to address these problems constructively and analytically. The success of Bill's seminar is reflected in the fact that there were numerous retakers--people who came back for a second or even a third series of meetings.

"Bill's council was sought on numerous occasions by my faculty colleagues and myself throughout his association here; his wise, thoughtful advice will be greatly missed. If anything, however, our graduate students have suffered the more profound loss. Those who knew him, and especially those who were privileged to take his seminar, join with our faculty and staff in expressing the deep sense of loss of an honored and respected colleague, an outstanding teacher, and a kind friend."



MUSEUM ACTIVITIES

W. PHELPS FREEBORN, Museum Scientist.

Phelps has been curator of rocks and minerals, geologic maps, and other materials used in teaching, in addition to completing work on his Ph.D. This position is a half-time one, occupied by graduate students in the later stages of dissertation preparation.

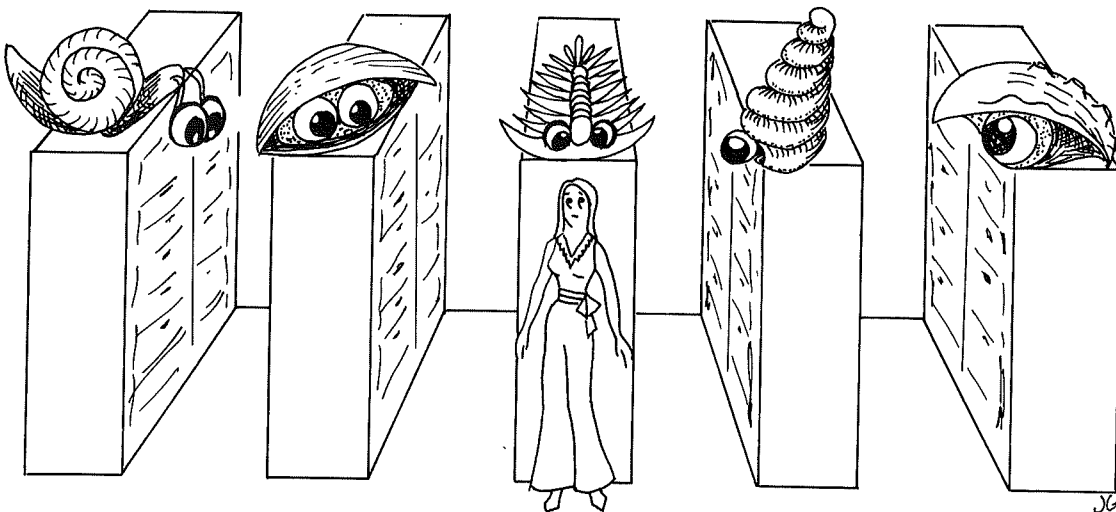
LOUELLA SAUL, Museum Scientist.

During the past year, LouElla has been constantly inundated with fossils to be added to the Type Collection. The number of additions has been orders of magnitude greater than usual. This flood has been (is being??) produced by a bloom of publications describing or discussing shells and fossils--or their traces--ranging in age from Precambrian to Holocene. Students, both present and ex., have provided the bulk of specimens and papers, but faculty members have joined in this fantastic flowering, describing plants, protists, and animalia of various phyla.

TAKEO SUSUKI, Museum Scientist.

In October of '73 Takeo visited Japan on a special tour and still was able to collect fossils from the Upper Cretaceous of Hokkaido, Upper Triassic of northeast Japan, Pliocene and Miocene from the vicinity of Sendai, the Miocene of Mizunami, and Permian-Pennsylvanian in the area of Gifu. He also attended the annual meeting of the Paleontological Society of Japan, hosted by the Department of Geology of Tokyo University, Tokyo.

A joint paper with Don Carlisle, "Emergent basalt and submergent carbonate-clastic sequences including the Upper Triassic Dilleri and Welleri Zones on Vancouver Island" was published by the Canadian Journal of Earth Sciences.



GRADUATE STUDENTS, 1973-1974

- Steven Alpert, B.S., 1969, UCLA. Steve made a study of trace fossils from the Late Precambrian and Cambrian, completing his dissertation in August 1974. A "Systematic review of the genus Skolithos" was published in the Jour. Paleontology, v. 48, p. 661-669 (1974). Steve also won a special prize in the 26th annual Robert B. Campbell Student Book Collection competition at UCLA for his library on a little-known topic, "Tokens and Token Collecting."
- Robert Anderhalt, B.S., 1973, UCLA. Bob plans an independent study project, which is expected to develop into his master's thesis, on a portion of the Southern California Batholith. The study will be petrographic and will include an attempt to determine the cause of some lineaments.
- Steven Bachman, B.S., 1971, University of Washington. Steve completed his master's thesis in August 1974 and is now employed by Standard Oil of California.
- Richard Balogh, UCLA. Rick was a Departmental Scholar this past year, working on both his B.S. and M.S. concurrently. At present he is much interested in fluvial erosion of rock surfaces, especially the erosion that occurs in connection with glacial drainage. He hopes to conduct experiments to simulate such conditions in order to elucidate the origin of "p-forms," "water polish," and deep subglacial gouges.
- John Barron, B.S., 1969, UCLA. John completed his Ph.D. dissertation in June on the "Late Miocene-early Pliocene marine diatom assemblage from southern California--biostratigraphy and paleoecology." A recent publication, "Late Miocene-early Pliocene paleotemperatures for California from marine diatom evidence," appeared in Palaeogeography, Palaeoclimatology, Palaeoecology. Papers from his dissertation on the diatom assemblage and on diatom biostratigraphy have been submitted for publication. John began work with the U.S.G.S. in Menlo Park this summer, where he will continue his study of Tertiary marine diatoms.
- Donald Bing, B.A., 1972, Pomona. A teaching assistant during 1973-74, Don is presently working toward a master's degree in micropaleontology.
- Andrew Bittson, B.A., 1973, Williams College. Andy was a new graduate student this past year and transferred to the University of Arizona for 1974-1975.
- William Bruner, B.S., 1973, Brown University. An NSF Fellow, Bill has been working this past year on a project involving the numerical simulation of the elastic-plastic deformation of polycrystalline calcite. He plans to complete this study during the summer and also to continue work begun last fall on a numerical model for transient creep in ice.
- Roy Budnik, B.S., 1968, Northern Illinois University. A Chancellor's Fellow, Roy completed his Ph.D. dissertation this year. He presented a paper at the G.S.A. Cordilleran Section meeting in Las Vegas entitled "Deposition and deformation along an Upper Cretaceous compressive plate margin, Kenai Peninsula, Alaska." Roy and his wife, Theo Stillman M.D., will be spending the coming year in Honolulu, where she has an

- internship in surgery. Roy states that he will utilize his time surfing, swimming, snorkeling, sailing, and sunning during their Hawaiian stay from June 1974 to June 1975.
- Dwight Carey, B.S., 1972, California Institute of Technology. Dwight currently is investigating the pseudokarst topography and piping caverns of the Carrizo Badlands in Anza-Borrego Desert State Park. Preliminary studies indicate that these underground streams are quite numerous along certain arroyos draining the badlands, and they display complexities ranging from simple piping under landslides that block stream courses to completely subsurface drainage of small watersheds.
- John Cottrell, B.S., 1972, Michigan State University. A teaching assistant and Shell Fellow, John is presently working on his master's degree.
- Robert Countryman, B.S., 1973, California State University, Northridge. Bob is working on a master's thesis, probably involving a stratigraphic problem between the Tertiary Artist Drive and Furnace Creek Formations in the Amargosa Desert. Interests mainly center on economic geology and mineral deposits, as well as igneous and metamorphic petrology. Bob held a T.A. position at Cal. State Northridge during the fall quarter and was on leave during the spring, working in the minerals exploration division of Tenneco Oil Company near Death Valley Junction, where he was involved in the borate exploration and development program.
- Kenneth Crawford, B.S., 1966, Fresno State University; M.S., 1969, UC Davis. Ken is completing his Ph.D. dissertation on "The geology of the Franciscan near Mount Hamilton, California." An article, co-authored with D. M. Kerrick and A. F. Randazzo, on the "Metamorphism of calcareous rocks in three roof pendants in the Sierra Nevada, California" appeared in the Journal of Petrology, v. 14. This coming year he will be on a National Research Council Post-doctoral Fellowship with the U.S.G.S., investigating some more Franciscan rocks of presumed Albian age in the core of the Diablo Range.
- Michael Crose, A.B., 1968, UC Berkeley. Mike has completed residence requirements for his M.S. and is on leave of absence for the coming year.
- Gerald Dollinger, B.S., 1962, M.S., 1965, University of Wisconsin, is employed at the University of Washington while completing his doctoral dissertation.
- Steven Ehrenberg, B.S., M.S., 1973, UC Davis. Steve has been studying processes of thermal alteration and fusion in rock samples penetrated by the Los Alamos Scientific Laboratory's rock melting drill or "subterrene." Current research is directed toward the "practical" goal of describing and understanding the fusion phenomena associated with the drilling operation. However, potential research projects, using somewhat different setups of the subterrene apparatus, include investigations of the kinetics of rock fusion, phenocryst-melt relations in volcanic magmas, and low-pressure contact metamorphism.
- Thomas R. Fairchild, B.S., 1966, Stanford University. The highlight of Tom's past year was a five-month stay in Australia, where he helped Bill Schopf for six weeks of field work in South Australia, Western Australia, and Northern Territory, visiting microfossiliferous outcrops of the

Precambrian strata in the Adelaidean and Amadeus Basins, as well as the modern stromatolites of Shark Bay. From mid-September to mid-December 1973, Tom was employed by the South Australian Bureau of Mines and was provided office space by the University of Adelaide Department of Geology. During those three months he did field work and microscopy on a thick microfossiliferous section of Upper Precambrian rocks, which will comprise a major part of his Ph.D. dissertation. Tom also gave lectures at the Department of Mines and the University of Adelaide during his stay in Australia; and, after returning to UCLA, he also gave a talk on his general thesis topic, "The Late Precambrian Microflora of Boorthanna, South Australia," at the national meeting of the AIBS in Tempe, Arizona, in June 1974.

Christian Finch, B.S., M.S., 1973, Stanford University.

Todd C. Frazier, B.A., 1971, University of Colorado; M.A., 1973, University of Indiana. During the past year, Todd was a research assistant to Alfred Loeblich, preparing acritarch samples of Cambrian, Ordovician, Silurian, and Devonian ages, as well as other miscellaneous samples. Current research is concerned with Silurian acritarchs from Indiana and the Ordovician Martinsburg Shale which was collected from the Appalachians this summer for study of its microflora. Todd received a Geology Alumni Fund Tuition Scholarship, was elected an associate member of Sigma Xi, and coauthored the following: Indiana University Paleontology Seminar, "The Silurian reeflike complex at Rockford, Ohio," Geol. Soc. America Abstracts with Programs, v. 6, p. 517-518 (1974). Indiana University Paleontology Seminar, "Quarry of Rockford Limestone Co., near Rockford, Ohio," in Kesling, R. V. (ed.) Silurian reef-evaporite relationships: Michigan Basin Geol. Soc. Field Conf. 1974, p. 97-102, 2 figs.

Phelps Freeborn, B.S., 1965, California Institute of Technology. Phelps is the departmental map and rock curator while completing his doctoral studies on the partitioning of Fe and Mg between olivine and calcic clinopyroxenes in Gary Ernst's lab. Phelps presently is analyzing his run products.

David Frishman, B.A., 1970, University of Pennsylvania. Dave is continuing work on his thesis, which includes mapping parts of the Gasquet and Ship Mountain quadrangles in the Klamath Mountains of northern California. Major rock types represented in the area include metasediments of probable Jurassic age and various alpine-type ultramafic bodies related to the Josephine Complex. During the academic year, part of Dave's time was also spent working for a civil engineering firm in West Los Angeles, testing soils and doing research for various pollution control studies.

Michael Garcia, B.A., 1971, Humboldt State College. Mike spent the summer in field work in his thesis area in Oregon.

David Gardner, B.S., 1971, UCLA. Dave is working on his master's thesis on a "Hydrogeologic investigation of the Montecito ground-water basin, Santa Barbara County."

Keith Gordinier, B.S., 1970, UC Santa Barbara. A Chancellor's Fellow, on leave of absence during 1973-1974.

- Ray M. Griffin, B.S., 1971, UCLA, has completed residence work for the master's degree.
- Eugene Grudewicz, A.B., 1962, California State University, San Diego; M.S., 1972, UCLA.
- Bernard Hallet, B.S., 1970, UCLA. A Regent's Graduate Intern Fellow working toward his doctoral degree, Bernard Hallet has focussed his attention on the processes that are active at the base of temperate glaciers. A thorough understanding of the subglacial processes is necessary in order to gain some insight into the mechanics of glacial erosion and deposition, as well as into the physics of glacial flow. Recently he had been particularly concerned with the chemical exchange that is active at the glacier-bed interface. In an effort to understand the mode of formation of a calcium-carbonate deposit that forms subglacially, he has conducted a series of experiments to study the chemical evolution in slowly freezing dilute CaCO_3 solution. It now appears that the melting and freezing that is thought to occur continuously at the base of temperate glaciers can result in the concentration and eventual precipitation of solutes. These experiments were complemented with a theoretical model predicting the subglacial activities of the chemical species in the water-carbonate system.
- Merton E. Hill, B.S., 1969, University of Redlands. Mert is studying an assemblage of Albian-Cenomanian (middle Cretaceous) calcareous nanofossils from the Gulf Coast for his doctoral dissertation under the direction of Helen Loeblich. Mert is a research assistant under her current grant from the NSF. A paper concerning the effects of dissolution on the preservation of nanofossil taxa and assemblages has been submitted for publication.
- William Holman, B.A., 1967, UCLA. For his doctoral dissertation, Bill has been doing finite-element analysis of stresses developed in bedrock with simple sinusoidal surface topography, taking account of gravity, various tectonic compressions, and near-surface expansion. He finds that the predicted orientations and distributions of tensile fractures are inconsistent with the observed occurrence and characteristics of sheeting. He is now evaluating the role of tectonic compression in the deep sheeting observed in New England and is investigating the distribution of gravity-induced tension at the base of slopes in connection with the formation of steep-sided V-shaped valleys between domes and with slope retreat.
- Edward Hoylman, B.S., 1970, University of Hawaii. Ed completed his master's thesis on the "Geology of the Poverty Hills area, Inyo County, California."
- Richard W. Hurst, B.S., 1970, SUNY at Stonybrook. Rick's research concerns geochronologic studies in the Precambrian of Canada, both in the Sudbury Basin of Ontario and the Archaean Craton of Labrador. He is an investigator in the Nain Anorthosite Project in Labrador. During the summer (1974) he collaborated with Dr. K. D. Collerson (Memorial University, Newfoundland; structural geologist) and Dr. D. Bridgwater (Greenland Geol. Survey; Precambrian field geologist) in a study of the early crustal evolution of the Archaean of Labrador. He is completing work in the Sudbury Basin concerning the effect of a meteorite impact on

- the granitic country rocks and the subsequent impact-triggered volcanism. Rick was elected to Sigma Xi in May, and he received a G.S.A. Penrose Grant for the 1974 field season to continue his studies in Labrador. A paper on a "Rb-Sr study of the Sudbury nickel irruptive" was presented at the AGU in Washington, D.C., in April. Rick's publications include "The early Archaean of coastal Labrador," *Nain Anorthosite Project: Field Report 1973, Univ. Mass. Contrib. 13*, S. A. Morse ed. (with coauthors S. A. Morse, E. P. Wheeler, D. E. Runkle, M. J. Saunders, and J. Dunlavey); and (with coauthor G. W. Wetherill, "Rb-Sr study of the Sudbury nickel irruptive," *Trans. Amer. Geophys. Union*, v. 55, no. 4, p. 466.
- Sara Jacobson, B.S., 1972, SUNY at Stonybrook. Sara spent six months (through December 1973) at the U.S. National Museum (Smithsonian) in Washington, D.C., making a petrographic and electron microprobe study of oceanic ridge basalts, lunar samples, and other volcanics. She returned to UCLA in January 1974 to continue work on her Ph.D.
- Peter Juda, B.S., 1973, SUNY at Stonybrook. Peter is a Chancellor's Fellow.
- A. Kashef-Mobarakeh, Licent., 1972, Tehran University.
- Terence Kato, B.S., 1968, M.S., 1971, UC Davis. Terry was on leave during the winter and spring quarters, completing his field work as a Chile-California Cooperative Fellow. He returned to UCLA in the fall quarter 1974.
- Jeffrey R. Keaton, B.S., Geological Engineering, 1971, University of Arizona; M.S., Soil Mechanics, 1972, UCLA. Jeff is working toward the Ph.D., with interests in engineering geology and geomorphology. He has not yet selected a thesis topic, but it will involve engineering or quantitative geomorphology and deformation of very young sediments. Jeff is employed by Dames & Moore.
- Kenneth Kettnering, B.S., 1966, Lehigh University. Ken's master's thesis "Paleoecology of an Upper Ordovician community in southern Nevada," directed by Doug Lorenz, should be completed this coming year.
- Stephen Kirby, B.S., 1967, University of Illinois. Steve was awarded the First Graduate Student Research Award by the UCLA Chapter of Sigma Xi. On educational leave from the USGS, he presented papers at the AGU in Washington, D.C., and at the GSA in Dallas. He recently coauthored (with C. B. Raleigh), "Mechanics of high-temperature, solid-state flow in minerals and ceramics and their bearing on the creep behavior of the mantle," *Tectonophysics*, v. 19, p. 165-194 (1973).
- Thekkey Krishnan, B.Sc., 1958, Presid. Coll., Madras, India; M.Sc., 1960, University of Madras, India. T.K. has been on leave of absence, working for the Iron Ore Company of Canada in Sept Iles, Quebec, but he returns to UCLA this fall.
- Daphne LaPointe, B.A., 1973, Smith College. During the summer (1974) D.D. worked for the Minerals Department of EXXON Company in Missoula, Montana.
- Donald Layton, B.S., 1956; M.S., 1958, University of Arizona. Donald is teaching at Cerritos College, Norwalk.

- Stephen Lee, B.S., 1971, University of Illinois. Steve spent the summer collecting material in the Gulf Coast for his Ph.D. study of Cretaceous microplankton under Al Loeblich. He is a research associate under an NSF grant to Helen Loeblich for the coming year.
- Richard LeFever, A.B., 1967, Occidental College; M.S., 1971, UCLA. Rich is continuing work on sandstone textures for his doctoral studies. A long manuscript has been submitted for publication, jointly authored with Ted Reed.
- Timothy Lincoln, B.S., 1972, University of Massachusetts. Tim was nominated by the Department for the campus-wide Faculty Prize for Distinguished Teaching Assistants. He was awarded Honorable Mention as a T.A. by the Fellowship Committee for the Graduate Council, which also provided a \$25 honorarium. He was employed by EXXON Company in Salt Lake City, Utah, during the summer of 1974.
- Steven Lipshie, B.S., 1965, California Institute of Technology. Steve completed his master's thesis on the "Surficial and engineering geology of the Mammoth Creek area of Mono County" during the summer of 1974 and is continuing work at UCLA toward a Ph.D. In the meantime, he is working with Gerhard Oertel on a series of NSF-funded projects involving the use of phyllosilicates as strain markers. The degree of preferred orientation of platy minerals can be measured on the X-ray pole-figure goniometer and used to calculate the amount of deformation that the material has undergone, using March (1932) strain theory. As of May, he had studied compaction strain in Carboniferous cyclothem deposits of Wales and tectonic strain in specimens of Moine schist from Scotland; and he is currently looking at a lapillar tuff from the Lake District of England. Oertel (1970) found that the lapilli recorded total strain (including compaction), whereas the phyllosilicates formed after compaction and recorded only tectonic strain. The present project is an extension of that work to specimens from a different locality in the same tuff. This spring Steve's application for registration as a geophysicist in the State of California was approved by the State Board of Registration for Geologists and Geophysicists.
- Peter I. M. Lyttle, B.A., 1973, Boston University. Peter's general interests are in economic geology and specifically in minerals exploration and the economics and supply of mineral resources. During the summer of 1974, he worked for the Minerals Exploration Company, a subsidiary of Union Oil, on their oil shale project in Colorado.
- John McCormick, B.S., 1970, Pennsylvania State University. John is interested in mineral deformation mechanisms. His current research involves quartz deformation and observation of dislocations by transmission electron microscopy. Additional studies involve the nature of electron micrograph dislocation images in quartz through computer simulations. An article in press, coauthored with A. J. Ardell and J. M. Christie, is on the determination of Burgers vectors in quartz.
- Calvin Miller, B.A., 1969, Pomona; M.S., 1973, George Washington University. Calvin is beginning field and chemical work on a late Triassic or Jurassic monzonite body in the northern San Bernardino Mountains and adjacent Mojave Desert. The body is unusual both in age and its

- very alkaline character. In addition, as continuation of a master's thesis project at George Washington, Cal is analyzing coexisting mafic phases in garnet-bearing quartz monzonite from the eastern Mojave, in an attempt to trace the paragenesis of the garnet.
- David Miller, B.S., 1973, SUNY at Binghamton. Dave has defined his interests as structural petrology, metamorphic petrology, and structural geology, and is actively looking for a field area for his thesis. Dave is a new Chancellor's Fellow.
- Molly Miller, B.A., Wooster; M.S., 1971, George Washington University. Molly is working on the trace fossils and environments of deposition of the Ordovician Eureka Sandstone and Ely Springs Dolomite, Arrow Canyon Range, Nevada. During the summer she was involved in the marine biological program at Woods Hole Oceanographic Institution in Massachusetts.
- Richard Miller, B.S., 1965, San Fernando Valley State; M.S., 1967, UCLA. Rick is teaching at California State University, Northridge, while completing his dissertation. His research concerns Late Ordovician - Early Devonian conodont biostratigraphy of the southwestern Great Basin; Lake Cambrian conodonts from Death Valley, California; and Silurian foraminifera from the Roberts Mountains Formation, western Nevada. In press in the GSA Bulletin is "Late Ordovician - Early Silurian conodont biostratigraphy, Inyo Mountains, California," which was presented at the meeting of the GSA Cordilleran Section in Las Vegas.
- Gordon Moir, B.S., 1965, University of Capetown, South Africa. Gordon completed his doctoral dissertation in December 1973 and returned to South Africa for a visit.
- Johnnie Moore, B.A., 1970, San Fernando Valley State; M.S., 1972, UCLA. Johnnie teaches part-time at California State University, Northridge.
- Roland Mora, B.A., 1973, Pomona. Roland was employed by Standard Oil of California in San Francisco during the summer. He will again be a teaching assistant this fall.
- Brad Newman, B.S., 1971, UCLA.
- Paul Pausé, A.B., 1972, UC Berkeley.
- Scott Prior, B.S., 1972, UCLA. Scott completed his master's thesis during the summer of 1974. This consists of a mapping project directed by Clarence Hall and a foraminiferal biostratigraphic study (supervised by Helen Loeblich) of a portion of the upper Oligocene and Miocene formations in western San Luis Obispo County, California. Scott then accepted a job as an exploration geologist with Atlantic Richfield International. He left for the ARCO training school in Dallas this fall.
- Burleigh Putnam, B.S., 1968, UCLA. Burleigh completed his master's thesis on "Geology and geochemistry of cinnabar deposits in the Horse Creek area, Siskiyou County, California," this year.
- Richard Redfern, B.S., 1973, California State University, Northridge. Interested in economic geology, Rick is working with Don Carlisle in trying to document examples of concentration of ore materials (e.g.,

massive sulfide deposits) by fluid mobilized during metamorphism. For the past five years, his personal research interest has been the late Paleozoic and Mesozoic evolution of southern California, particularly the shelf-to-slope facies transition during Permo-Carboniferous time. Field areas are in the Peninsular and Transverse Ranges. A considerable amount of stratigraphic and petrographic work has been done on the Julian Schist in the Peninsular Ranges.

- Richard Sakal, B.S., 1971, California State University, Los Angeles.
- Rand Schaal, B.S., 1973, UC Davis. Rand's interests lie in the fields of igneous petrology, shock-metamorphic petrology, and volcanology. During the summer of 1974, Rand worked with Sue Kieffer, doing microprobe analysis of meteorite-shocked basalts which she collected on her recent expedition to India.
- Gary Sherwood, B.S., 1970, UCLA. Gary has completed residence requirements for the master's degree.
- Ronald Shmerling, B.A., 1970, UC Santa Barbara.
- Frank Spear, B.A., 1971, Amherst. Frank was an NDEA IV Fellow for three years and received the Cand. Phil. degree this year. His specialty lies in the field of metamorphic petrology, phase equilibria, and experimental petrology. He is presently completing his dissertation which concerns an experimental investigation of the metamorphism of mafic rocks, the subsolidus phase petrology of mafic rocks, amphibole compositional variation with metamorphic grade, and applications to regional and sea-floor metamorphism.
- Edward Stoddard, A.B., 1971, Amherst. Skip is involved in the petrographical and chemical study of high-grade (upper amphibolite to granulite facies) metamorphic rocks from an area at the northern end of the northwest Adirondack lowlands of New York State. He is interested in identifying metamorphic mineral reactions that have taken place in rocks of diverse bulk chemistry in order to define the intensive physical parameters governing the mineral parageneses.
- Warren M. Thomas, B.A., 1973, Pomona. Warren is interested in igneous and metamorphic petrology, especially with regard to the plutonic rocks in California. During the summer he mapped the oil shale of the Piceance Basin in northwestern Colorado.
- David Thompson, B.S., Indiana University; M.S., 1971, UCLA (Planetary and Space Science). Dave spent a major portion of the past year formulating and solving, analytically, a second-order perturbation analysis of the response of glaciers to changes in mass balance. The first-order theory had previously been investigated by J. F. Nye of Bristol University. The higher order analysis reveals constraints not apparent in the first order. Further insight into glacier behavior is sought from the analysis. In addition, Thompson did extensive reading in the theory of nonlinear discontinuous oscillations. This has led to better understanding of possible solutions to the glacier surge phenomenon.
- Jerome Treiman, B.S., 1972, UCLA. Jerry has been studying the use of different scales of aerial photography for the detection, mapping, and

Peter Juda * (Chancellor's Teaching Fellow)
Terence Kato *
Thekkey Krishnan *
Daphne LaPointe *
Stephen Lee - Post-graduate research, NSF
Timothy Lincoln *+
Steven Lipshie *, post-graduate research, NSF
Peter Lyttle *
Calvin Miller *
David Miller - Chancellor's Fellow
Molly Miller *
Johnnie Moore +, post-graduate research, NSF
Roland Mora *
Margaret Saunders *
Ronald Shmerling *
Frank Spear *, post-graduate research, NSF
Edward Stoddard *+
Warren Thomas * (Chancellor's Teaching Fellow)
David Thompson *
Barrie Wall *
Warren Wegner *+
Beth Zigmont - Regent's Fellow

* = University Teaching Assistant

+ = Partial fellowship from Shell Companies Foundation



NEW ALUMNI, 1973-1974

Listed below are those who received degrees between July 1973 and June 1974. Thesis or dissertation title is listed for those obtaining advanced degrees.

Bachelor of Science

Philip G. Behrman	(73)
Frank E. Denison	(73)
Jeffrey H. Dinauer	(73)
James A. Goodrich	(73)
John A. Kuhlman	(73)
Peter W. Moore	(73)
Gary A. Parkison	(73)
Kenneth H. Smith	(73)
Michael E. Vediner	(73)
William R. Wood	(73)
Alice Marie Campbell	(74)
Robert Edward Crippen	(74)
Guy Shigeo Nakasu	(74)
James Courtney Norman	(74)
F. Ronald Philippsborn	(74)
Kenneth John Shay	(74)
Jeffry Joel Stone	(74)
Thomas William Troutman	(74)

Master of Science

Hoylman, Edward W.

Geology of the Poverty Hills, Inyo County, California. 1974.

Putnam, Burleigh J.

Geology and Geochemistry of Mercury Occurrences in the Horse Creek Area, Siskiyou County, California. 1974.

Vaughan, Peter J.

Acoustic Emissions Associated with the Development of Creep Instability in Experimentally Deformed Dunite. 1973.

Doctor of Philosophy

Barron, John A.

The Late Miocene - Early Pliocene Marine Diatom Assemblage of Southern California--Biostratigraphy and Paleoecology. 1974.

Budnik, Roy T.

The Geologic History of the Valdez Group, Kenai Peninsula, Alaska: Deposition and Deformation at a Late Cretaceous Consumptive Plate Margin. 1974.

Horodyski, Robert J.

Stromatolites and Paleoecology of Parts of the Middle Proterozoic Belt Supergroup, Glacier National Park, Montana. 1973.

Moir, Gordon J.

Depositional Environments and Stratigraphy of Cretaceous Rocks, Southwest Utah. 1974.

Neder, Irving R.

Conodont Biostratigraphy and Depositional History of the Mississippian Battleship Wash Formation, Southern Nevada. 1973.

Oehler, Dorothy Zeller

Carbon Isotopic and Electron Microscopic Studies of Organic Remains in Precambrian Rocks. 1973.

Oehler, John H.

Morphological and Biochemical Changes in Blue-Green Algae During Simulated Fossilization in Synthetic Chert--a Guide to Interpretation of Precambrian Microfossils. 1973.

Wicander, E. Reed

Diversity and Abundance Fluctuations in a Late Devonian-Early Mississippian Phytoplankton Assemblage from Northeast Ohio, U.S.A. 1973.

ALUMNI NEWS

This year the following section contains reports about 69 alumni. Some of this information was compiled from newspapers and journals, some from friends and faculty, and some of you sent in the requested news yourself, for which we are grateful. I note that each year class from 1951 to 1973 is represented by at least one individual, with representatives also from some seven earlier years. The most "senior" alumnus reporting was from 1930; the years best represented were 1958 (8 alumni) and 1966 (7 alumni). As some 120 B.S. and 144 M.S. and Ph.D. degrees have been awarded in the last ten years alone, many of you are keeping your whereabouts unknown. If you don't see much about your own classmates, they're probably wondering about you as well. Please let us know if you change address, employment, etc.; otherwise some of these Newsletters will reach the "dead letter" slot in the postoffice--in spite of all that expensive postage.

JAMES D. AITKEN, Ph.D., 1953. Jim is with the Institute of Sedimentary and Petroleum Geology, Geological Survey of Canada, 3303 - 33rd Street, NW, Calgary, Alberta, T2L-2A7, Canada. Jim says that having been "defeated by three years of teaching" at the University of Calgary (1969 to 1972), he decided that doing geology--and not teaching or administering it--is his bag. While grinding away at the publication of 1:250,000 maps of the Mackenzie Arc, he is moving more and more into regional Proterozoic stratigraphy. Jim also was Editor of the Proceedings of the Symposium on Canadian Arctic Geology (Geol. Assoc. Canada; Can. Soc. Petroleum Geologists) 1974. He also comments that "in experiencing Irkutsk and Yakutsk with Clem Nelson, I experienced once more the phenomenon by which one's old professors become contemporaries."

BENJAMIN N. AKPATI, B.A., 1964; M.S., 1966. On leave of absence from California State University, Northridge, Ben is Director of the University of California Study Center in Ghana and is teaching courses in sedimentary petrology, environmental geology, and economic geology in the Department of Geology, University of Ghana, Legon-Accra, Ghana. Ben had received his Ph.D. from the University of Pittsburgh in 1970. Publications concern "Observations on the effects of islets and shoals on salinity distribution in an estuarine regime," Maritime Sediments, v. 9; and "Mineral composition and sediments in western Long Island Sound, New York," Maritime Sediments, v. 10. Current research in Ghana concerns the geologic structure and evolution of Keta Basin, Ghana, and the source and dispersal of Holocene sediments on the Ghana continental shelf. When the military government in Ghana closed the three universities in Ghana a month into the second quarter, the University of California Education Abroad students were aided by the American embassy in Accra. Ben's students were distributed among the embassy personnel in Accra, eight miles from the University. The University was closed for five weeks, hence the usual three-week Easter vacation was cancelled and the academic year extended two weeks in the spring. In December Ben packed six of the students in his station wagon and all drove the 310 miles to Nigeria, making stops in Togo and Dahomey.

DONALD O. ASQUITH, Ph.D., 1972. Don recently left F. Beach Leighton and Associates and is now a Consultant in Environmental Geology and Land Use Planning, 16881 Meadowview Drive, Yorba Linda, California 92686.

ALLEN D. BAILEY, B.A., 1959. Allen is Vice President and Co-founder of TerraMetrics, Inc., a geotechnical service and products company. The Nimbus Instruments Division of TerraMetrics designs and manufactures the "Pocket-Seis" and strong motion seismographs. Allen is a Certified Engineering Geologist in California and Chairman of the Sacramento Section of AEG. Research is in the area of dynamic site response, and he provides engineering geology and geophysical services to engineering and construction firms. His office address is 2791 Del Monte Street, West Sacramento, California 95691, and his home address is at 1153 Fernwood St. in Sacramento.

RICHARD A. BARCA, B.A., 1957, is Senior Staff Geologist, International, Champlin Petroleum Company, Fort Worth, Texas. Recent projects have involved the offshore of Irian Jaya, Peruvian Oriente Basin, in Uruguay, offshore northern Peru, and El Salvador-Pacific Nicaragua. After leaving UCLA, Dick got an M.A. from USC, worked a year for the Ralph M. Parsons Company in potash exploration in the Ethiopian Danakil Depression, then worked for Oasis Oil Company in petroleum exploration in Libya, for Sinclair Oil Corporation in the Permian Basin, for Canadian Superior Oil Ltd. in western Canada, for Panarctic Oils Ltd. in the Canadian Arctic Islands, and then joined Champlin Petroleum Company, International. Dick's home address is 4275 Cadiz Drive, Fort Worth, Texas 76133.

ROBERT BEATIE, B.A., 1951; M.A., 1958, has been a teacher in the Napa Community College for eight years, teaching geology and geography. He will be on sabbatical leave in 1974-1975 and will travel to Mexico and South America. Bob is a member of the Napa County Conservation and Environmental Quality Committee, evaluating environmental impact reports. Address: 3034 North Avenue, Napa, California 94558.

STANLEY S. BEUS, Ph.D., 1963. Professor of Geology, Department of Geology, Northern Arizona University, Flagstaff, Arizona 86001. Stan also is coeditor of the Journal of Paleontology, 1974-- , and Vice Chairman of the Rocky Mountain Section of the Geological Society of America, 1974.

HARVEY BLATT, Ph.D., 1963. Harvey has been promoted to Professor as of September 1974 in the School of Geology and Geophysics, University of Oklahoma, Norman, Oklahoma 73069, but is spending from June 1974 to May 1975 in Germany on sabbatical leave. Home address: 2609 Holly-wood Avenue, Norman, Oklahoma 73069.

EUGENE BORAX, M.A., 1942, is with Pennzoil International Company,

900 Southwest Tower, Houston, Texas 77002. Home address: 3601 Allen Parkway, Houston, Texas 77019.

VICTOR V. BOTTS, Jr., B.A., 1955, left the New Almaden Mine this past March and moved to northern Nevada. He is now the mine superintendent for the McDermitt Mine, a joint venture operated by Placer Amex, Inc., who also operate the Cortez Gold Mine south of Carlin. The mine is located about one-half mile north of the old Cordero Mercury Mine. They are presently constructing a 700 TPD mercury flotation plant and are undertaking preliminary pit stripping of 4,000 yards per day. The mine is scheduled to go into production in the spring of 1975. Vic writes that he likes life in McDermitt, a town of 200 people--quite a contrast to his former Bay Area life style. Address: McDermitt Mine, P.O. Box 101, McDermitt, Nevada 89421.

ELWOOD B. BREDELL, Jr., B.A., 1957. Woody has resigned as Exploration Manager for XO Exploration, Inc., and is now Operations Manager with Bond and Associates, Inc., Petroleum Exploration Consultants, Suite 1175, Three Park Central, Denver, Colorado 80202.

DEAN K. BRYSON, B.A., 1953. Dean was erroneously listed as having the A.A. degree from UCLA, a misprint for which we apologize, as he received his bachelor's degree that year. Present address: R.R. #2, Lyndon, Kansas 66451.

EDDIE RAY CHIPP, B.A., 1958. Ed Chipp is Vice President and Chief Geologist of Resource Associates of Alaska, Inc., P.O. Box 80006, College, Alaska 99701. After leaving UCLA, he obtained his master's degree from the Mackay School of Mines, University of Nevada, and has been working in minerals exploration in Alaska since 1961. Published reports are with the Alaska State Geological Survey and NASA and cover such subjects as "Rock and stream sediment sample analyses from Arctic Alaska;" a "Guide to land selection for economic resources;" "Geology and geochemistry of the Chandalar area, Brooks Range, Alaska;" and "Remote sensing evaluation of the Klondike mining district."

CHARLES E. CORBATÓ, B.A., 1954; Ph.D., 1960. Since 1972 he has been Chairman and Professor of Geology and Mineralogy at Ohio State University, Columbus, Ohio 43201. Charlie writes that he has "two more years to go before I can get back to teaching and research from what is essentially a full-time administrative job. The only break from pushing paper is going to teach at OSU's field course each summer in Ephraim, Utah, although there's a good chance that I'll be working on a structural problem in Antarctica this coming winter. UCLA alums passing through Columbus are always welcome to visit the department."

WILLIAM C. CORNELL, Ph.D., 1972. Bill was Assistant Professor

of Geology, Department of Geological Sciences, University of Texas at El Paso 79968 and was awarded tenure as of June 1974. He also became the department's Undergraduate Advisor at the same time, was "elected" Faculty Council Representative, and appointed as Introductory Earth Science Laboratory Coordinator. He is Vice President of the El Paso Geological Society and Editor of its newsletter (for an indefinite term, eight years is the standing record). He writes that he is "arm-twister and editor of the department's Introductory Earth Science Lab. Manual, with tentative publication date of January 1975. Publications recently have included "Archaeomonadopsis incerta Rampi, 1940--a diatom fragment," Jour. Paleontology, v. 47; "Maastriichtian silicoflagellates of the Great Valley, California," Geoscience and Man, v. 9, p. 37-44, 1974; and another in press in the September 1974 Journal of Paleontology.

JOHN C. CROWELL, Ph.D., 1947. Professor of Geology, University of California, Santa Barbara, California 93106. John has received the Chrestien Mica Gondwanaland Medal awarded by the Mining, Geological, and Metallurgical Institute of Calcutta, India.

RICHARDSON F. CUTHBERT, B.A., 1930. Present address is 48 Rafael Drive, San Rafael, California 94901. He has retired.

LOUIS J. CZEL, Jr., B.A., 1958. Geologist, Purchasing Department, E. I. du Pont de Nemours & Co., Inc. Since leaving UCLA, Louis mapped in Alaska for General Petroleum Corp.; was Senior Geologist for American Potash and Chemical Corp., Searles Lake, California; a consultant geologist with Richard Mayberry & Associates, working on fertilizer minerals, borates, and mineralized brines; then Chief Geologist, Industrial Minerals Division, Occidental Petroleum Corp.; and at present, as Geologist with duPont, has been examining fluorspar deposits in Mexico, Brazil, and the western U.S. and directing fluorspar exploration in Argentina. Home address: R.D. #1, Hillspring Road, Chadds Ford, Pennsylvania 19317.

JAMES C. DAWSON, B.A., 1965; M.S., 1967. Associate Professor of Geology (as of September 1974), Department of Earth Sciences, State University of New York, Plattsburgh, New York 12901. Jim received his Ph.D. in 1970 from the University of Wisconsin, Madison, and has since been in Plattsburgh. In addition to his promotion to Associate Professor, he also was elected to Chairman of the Faculty Senate in April 1974. Research areas are the Mesozoic stratigraphy of northwestern Colorado, the petrography of chert-rich sandstones, and deltaic sedimentation in Lake Champlain. Home address: Box 92, Birchwood Drive, Peru, New York 12972.

RIDGELY E. DORSEY, M.A., 1960. Senior Geological Engineer, Tenneco Oil Company, P.O. Box 1996, Bakersfield, California, 93303. Ridgely is a member of API, SPE of AIME, and the San Joaquin Geological Society. Home address: 4505 LaMirada Drive, Bakersfield, California 93309.

ROBERT G. DOUGLAS, M.S., Ph.D., 1966. Bob has returned to the west coast and Los Angeles after teaching at Case Western Reserve in Cleveland for some years. He is now Associate Professor, University of Southern California, Los Angeles 90007. He will have between eleven and fourteen graduate students working in micropaleontology there this fall. The lab facilities in the Hancock Building at USC are being renovated to accommodate the large group. This fall he is attending and speaking at the SCOR Planktonic Conference at Kiel and next January will be in Tunisia for a joint biostratigraphic-geophysical project aimed at establishing biochronologic control for the Cretaceous paleomagnetic reversal time scale of Larson and Pitman. Bob's oxygen isotope paleotemperature work with Sam Savin at Case Western Reserve is rapidly reaching one of its primary goals: a marine paleotemperature curve for the last 135 m.y. A paleotemperature curve for the Cretaceous will appear in the DSDP Volume for Leg 32 in early 1975. They are now concentrating on key thermal events, such as the Tertiary-Cretaceous boundary. Bob is exploring the biological ramifications of the major temperature changes, especially in bottom waters, on benthic foraminifera and on plankton evolution.

J. JAMES EIDEL, M.A., 1962. Exploration Manager, the Hanna Mining Company, P.O. Box 243, West Perth 6005, Western Australia. Jim was transferred to western Australia from being Project Geologist-Manager BHP-Hanna Joint Venture, New Guinea-New Hebrides, and says he hasn't seen any UCLAans in New Zealand, New Guinea, or Australia in the past five years. He is active in island arc porphyry copper studies and is Advisor for Kalgoorlie School of Mines, updating their geology curricular facilities. He wrote a chapter on Mineral Park for Ore Deposits of the United States, Graton-Sales Volume.

JACK G. ELAM, B.A., 1943; M.A., 1948. New address: 511 Gulf Building, Midland, Texas 79701.

RICHARD E. FAGGIOLI, A.B., 1942; M.A., 1953. Manager, Special Projects, EXXON Corporation, 1251 Avenue of the Americas, New York, New York 10020. As part of the U.S. delegation, L.O.S Conference, Caracas ("petroleum expert") in the summer of 1974, he states that "the conference accomplished all that could reasonably be expected, considering the complexity of issues." Follow-up meetings are scheduled for 1975, and they are trying for an international agreement in 1975. He writes that "untimely national unilateral acts involving resource or other jurisdiction will indefinitely deter international agreement and ultimately reduce U.S. technical and professional impact."

ROBERT J. FARINA, B.A., 1957. Chief, Geology Branch (Regional Geologist), U.S. Bureau of Reclamation, PN Region, 550 West Fort Street, Boise, Idaho 83724. He had been working as an engineering geologist for the U.S. Bureau of Reclamation in Sacramento since 1957, but transferred in October of 1973 to Boise as Regional Geologist for the Pacific Northwest region

of the Bureau (Washington, Idaho, most of Oregon, western Montana, and fragments of Wyoming, Nevada, and California). Technical responsibility is for all planned projects, as well as safety investigations on older projects. These include dams, power and pumping plants, canals, tunnels, pipelines, bridges, transmission lines, and other structures relating to power or irrigation development. Current jobs under construction are in eastern Idaho (the Teton dam and power plant), Washington (Grand Coulee Third Powerplant is under construction) and an extension of this is in the advance planning stage), and west of Portland, Oregon (Scoggins dam and two pumping plants). He was active in the Sacramento section of the Association of Engineering Geologists (Vice Chairman and Chairman at various times), but "in the wilds of Idaho there is no local section of AEG and probably not enough engineering geologists to form one!"

DONALD L. FERNOW, M.A., 1960. Senior Fuel Industry Analyst, Jas. H. Oliphant & Company, Inc., 61 Broadway, New York, New York 10006.

A. EUGENE FRITSCHÉ, A.B., 1958, Ph.D., 1969. Associate Professor of Geology, California State University, Northridge, California 91324. Gene is on sabbatical leave during 1973-1974 and toured Europe through September 1974, collecting rocks and fossils. He was Secretary of the Pacific Section S.E.P.M. through December 1973 and Co-Chairman of the 1973 Fall Field Trip for the Pacific Section S.E.P.M. The Guidebook for this trip included Fritsche's "Bibliography of previous work and geologic map compilation for the Cretaceous strata of the Santa Monica Mountains and Simi Hills, California;" and (with Devin R. Thor) "Preliminary heavy mineral analysis of Upper Cretaceous strata, Simi Hills and Santa Monica Mountains, California." Home address: 17605 Cantara Street, Northridge, California 91324.

GERALD GANOPOLE, B.A., 1948. Consulting Geologist, Box 4-1261, Anchorage, Alaska 99509.

ROGER F. GANS, M.S., 1968; Ph.D., 1969. After two years as a post-doc at Caltech, Roger went to MIT for two years as an instructor in the Mathematics Department and one year as a research associate in the Aeronautics and Astronautics Department. In July 1974 he became an Assistant Professor in the Mechanical and Aerospace Sciences Department, University of Rochester, Rochester, New York 14627. In spite of his departmental affiliation, he has not entirely deserted the earth sciences, as publications have covered "Viscosity of the earth's core," Jour. Geophysical Research, v. 77, 1972; "Reflection of SH in the presence of a magnetic field," Geophys. Jour., v. 29, 1972; "On the Poincaré problem for a compressible medium," Jour. Fluid Mech., v. 62, 1974; "A new, theoretically tractable earthquake model" (with J. A. Whitehead, Jr.), in press; and "On the gravitationally-forced motions of a compressible fluid within a horizontally-rotating cylinder," Jour. Fluid Mech., in press. Roger writes that he is

"presently involved in a number of stability analyses concerning flows of compressible fluids dominated by rotation," and hopes to "restart an experimental program on a particular instability of a rotating incompressible fluid."

WILLIAM C. GOTH, B.A., 1951. Assistant Manager, Minerals Exploration Company (a subsidiary of Union Oil), Union Oil Center, Los Angeles, California 90017.

DONALD W. HAGEN, B.A., 1953; M.A., 1957. Special Projects Geologist, Texaco Exploration Canada Ltd., P.O. Box 3333, Calgary, Alberta, Canada T2P 2P8. Donald writes "between August 1972 and March 1973, I was on loan to Amoseas for a wildcat drilling program in the Java Sea of Indonesia, used Bali for a base and saw all of southeast Asia. For all of 1974, I'll be on loan to Aramco for a study of the giant Saudi Arabian fields. It sure beats working for a living."

RICHARD B. HAINES, A.B., 1931. Consultant, 5562 Hollings Street, Ventura, California 93003. Retired from Continental Oil Company in October 1973 after 36 years as a petroleum geologist with various assignments in California, Nevada, Oregon, Washington, and Alaska. His retirement was the occasion for a banquet attended by 65 co-workers and friends, held at the Pierpont Inn, Ventura, with division geologist Roger Hubbell presiding. He is a registered geologist and petroleum engineer in the State of California, is past President and Treasurer of the Pacific Section, AAPG, and served on the AAPG National Business Committee for two terms. Various articles have been published on the San Miguelito and Seal Beach oilfields of California.

WALTER S. HARRIS, M.A., 1958. Vice President - Exploration, Cleary Petroleum Corporation, 300 Prentice Building, North Broadway Plaza, Oklahoma City, Oklahoma 73116. Walter left Occidental Petroleum in March 1973 after seven years as Senior Staff Geologist in Bakersfield. He now directs the foreign and domestic efforts for Cleary Petroleum Corporation in Oklahoma City.

GORDON S. JONES, B.S., 1959, assumed command of the U.S.S. Aylwin (destroyer escort) in Norfolk, Virginia, on June 7, 1974. Home address: 981 Kelso Court, Virginia Beach, Virginia 23462.

PHILIP KERN, Ph.D., 1968. Associate Professor, Department of Geology, San Diego State University, San Diego, California 92115. Phil is currently working on the deformation of Pleistocene terraces and on various trace and other fossils. During 1974-1975 he will be on sabbatical leave at the Paläontologisches Institut Wien, Universitätsstrasse 7/n, A-1010 Wien, Austria. Recent publications include "Early Pliocene marine climate and environment of the eastern Ventura Basin," Univ. Calif. Publ. Geol. Sci., v. 96, 117 p., 1973; "Trace fossils and bathymetry of the Upper Cretaceous Point Loma Formation, San Diego," Geol. Soc. America Bull., v. 85, p.

893-900, 1974 (with J. E. Warme); and "Origin of a bathymetrically displaced marine invertebrate fauna in the upper part of the Capistrano Formation (lower Pliocene)," Jour. Paleontology, v. 48, p. 495-505, 1974 (with E. R. Wicander). Home address: 4683 Natalie Drive, San Diego, California 92115.

ED KIESSLING, M.A., 1958. California Division of Mines and Geology, Resources Building, Room 1341, 1416 Ninth Street, Sacramento, California 95814.

ROBERT EUGENE LEARNED, M.A., 1962. Project Chief, Research in Exploration Geochemistry, Puerto Rico, U.S. Geological Survey, Denver, Colorado. After leaving UCLA, Robert obtained a Ph.D. at UC Riverside, where he remained as a graduate research geologist for a time. He was then Assistant Professor of Geology at Chapman College, Orange, California, before joining the U.S.G.S. in Denver in 1967. His interests lie in the geology and geochemistry of ore deposits and in methods of geochemical exploration. Home address: 614 Wyoming Street, Golden, Colorado 80401.

DONALD R. LINDSAY, M.A., 1952, was Staff Geological Engineer, Shell Oil Company, in Los Angeles until January 1974, when he was transferred to Houston, Texas. He is project leader for Shell's Geothermal Energy Project, exploring for geothermal steam in The Geysers area, northern California. This year he was advanced to National Vice President of the Count Dracula Society and was a member of the advisory board of Cinema Buffs in Los Angeles. New home address: 10762 Briar Forest Drive, Houston, Texas 77042.

JERE H. LIPPS, B.A., 1962; Ph.D., 1966. Associate Professor, Department of Geology, University of California, Davis 95616. Jere writes that he has "gladly relinquished the Chairmanship of the Department and now has time to respond to the Newsletter." His research is continuing on the biology of Antarctic foraminifera, using shipboard, scuba, and lab techniques on the Antarctic Peninsula. He returned in March 1974 from spending three months there and says it's not really so cold! Several publications have appeared reporting on aspects of foraminiferal biology and the Antarctic project.

KENNETH LISTER, B.S., 1967; M.S., 1970. Department of Geology, University of Kansas, Lawrence, Kansas 66045. Ken completed his Ph.D. at the University of Kansas on the "Paleoecology of Ostracoda from Quaternary sediments from the Great Salt Lake Basin, Utah." Other research involves a computer simulation of change in shape of ostracode carapaces with growth, and Pleistocene paleoclimates. Articles include "Micropaleontology of Spittal Pond, Bermuda," Bermuda Biol. Sta. Res. Spec. Publ. 2, p. 60-68, 1971; "Diversity changes in a Quaternary lacustrine ostracode community from the Great Salt Lake Basin, Utah," presented at the G.S.A. south-central section meeting, Stillwater, Oklahoma, 1974; and, coauthored with

former UCLAans Phil Kern and John Grimmer, "A new fossil siponid tube, Pliocene and Pleistocene of California and Baja California," Jour. Paleontology (in press 1974). Ken also will be presenting "The significance of temporal changes in a lacustrine ostracode community from the Great Salt Lake Basin, Utah" at the Paleontological Society Symposium to be held at the Miami Beach G.S.A. Meeting this year.

LOUIE MARINCOVICH, B.A., 1966. Louie received an M.S. in 1970 and a Ph.D. in 1973 from the University of Southern California, both degrees with a specialty in Cenozoic molluscan paleontology. Since graduation he has been working for Texaco as a geologist and molluscan paleontologist. Publications, "Intertidal mollusks of Iquique, Chile," Natural History Museum of Los Angeles County, Science Bull. 16, February 1973, 50 pages; and others in press concern Recent, Cenozoic, and Cretaceous mollusks. Address: Texaco, Inc., 3550 Wilshire Blvd., Suite 1100, Los Angeles, California 90010.

JOHN T. MCGILL, B.A., 1943; M.A., 1948; Ph.D., 1951. John is Chief, Engineering Geology Branch, U.S. Geological Survey, Denver Federal Center, Denver, Colorado 80225.

ANTHONY E. L. MORRIS, B.A., 1942. Morris Petroleum Inc., Petroleum Exploration, 10680 West Pico Blvd., Los Angeles, California 90064. He writes: "After three years as a partner in the consulting firm of Hazzard, Morris and Associates, I moved back to the west Los Angeles area one year ago following the death of our partner, Dr. John Hazzard. I am still carrying on the principal aim of the partnership by engaging in international consulting as well as domestic. More recently I have been involved as a member of the technical program committee for the Circum-Pacific Energy and Minerals Conference which concludes the end of August 1974 in Honolulu. Participation in this rather exciting conference has been rewarding in the development of contacts with well known geologists in the Far East and the Southwest Pacific as well as Central and South America."

WILLIAM M. NEILL, B.S., 1971. Bill is working on his Ph.D. at Stanford and has part-time employment with the U.S. Geological Survey. He authored "Possible continental rifting in Brazil and Angola related to the opening of the South Atlantic," Nature, Phys. Sci., v. 245, no. 146, p. 104-107, 1973.

ROBERT C. NEWTON, B.S., 1956; M.A., 1958; Ph.D., 1963. Associate Professor, Department of Geophysical Sciences, University of Chicago, Chicago, Illinois 60637. He has been revising a chapter in a book on experimental petrology.

WARREN NØKLEBERG, B.A., 1961. New address: Assistant Professor, Department of Geology, California State University, Fresno, California

93740. Warren writes that he is enjoying his fourth year of teaching at CSU Fresno and published several articles this past year (two with students). He works now and then for the U.S.G.S. on a part-time basis and is presently working on a new beginning geology curriculum, inspired by reading books like "Teaching as a Subversive Activity." He is to be married shortly to Gail Gray and has bought an old house with 60 citrus trees on Highway 168 outside of Clovis. This summer he will teach beginning geology by backpacking in the Sierra Nevada.

JEROME J. O'BRIEN, B.A., 1932. President, Seaboard Oil and Gas Company, 1801 Avenue of the Stars, Los Angeles, California 90067. Jerry has an M.S. in petroleum engineering from USC, was past president of the Texas Independent Producers and Royalty Owners, and is President of the California Ind. Producers Association. He also was Director of the Office of Oil and Gas, Department of the Interior, Washington, D.C., 1961-1964. He was elected President of Seaboard in March 1972. Home address: 1434 Westwood Blvd., Los Angeles, California 90024.

THOMAS A. OLIVER, Ph.D., 1952. Department of Geology, University of Calgary, Calgary, Alberta, Canada. Jim Aitken writes that "Tom retains his sense of humor, his homespun-philosopher manner, and his chronic pessimism despite now mixing administrative and teaching duties at the University of Calgary."

RICHARD J. PROCTOR, M.A., 1958. Head, Engineering Geology Branch, Metropolitan Water District of Southern California, Box 54153, Los Angeles, California 90054. As noted in the last Newsletter, Proctor received the E. B. Burwell Memorial Award of the GSA for 1972 for his paper "Mapping geological conditions in tunnels," Bull. Assoc. Engineering Geologists, v. 8, no. 1, which the presentation citation indicated as "an extremely useful guide to geologists and engineers engaged in tunnel work. The value of the work has been multiplied by its glossary and its extensive bibliography." His response (in the Bull. Geol. Soc. America, July 1973, xxx-xxxii) included the following interesting comments:

"I'd like to tell you how this paper on "Mapping Geological Conditions in Tunnels" came to be written. The need for guides for the geologist working in a tunnel became evident to me in my association with the Metropolitan Water District of Southern California. Within the span of a few years in the mid-1960s, we had six large tunnels under construction in which geologic mapping was required. I was dismayed to find that the tunnel rock descriptions initially submitted by the six resident geologists were as varied as their backgrounds! At first I asked the geologists to follow Terzaghi's 1946 rock conditions guide, but most of our tunnels were being excavated by mechanical moles in soft ground, and so that hard-rock guide didn't apply. It was then that I started to seek equivalent words to describe soft-ground conditions and still use Terzaghi's

useful guide. The result of that imperfect marriage is Table V of my paper which correlates soft-ground terminology to the nine-fold rock-condition classification.

"Such a guide will always be somewhat subjective; nevertheless, everyone with a program now knows what is meant by a given rock-condition term.

"I then worked up a table to illustrate typical tunnel supports required with each soft-ground and rock condition. Besides correlating steel ribs to rock conditions, I included rock bolts and shotcrete which have become used increasingly for tunnel supports since the 1950s.

"Of special help to geologists, I feel, is a part of Table II which includes a suggested rock-hardness scale. Everyone uses the terms 'hard' and 'soft'; this table attempts to describe them in geologist's terminology along with a gross equivalent to Mohs hardness scale.

"It would be useful to distribute a glossary that defines terms in common usage in tunnel construction, and so I chose 83 definitions and reworded most of them, drawing on the vast knowledge of Carl R. Rankin, retired civil engineer....

"Someone suggested that the bibliography would be more useful if the references were keyed to specific categories, such as rock mechanics, case history sources, tunneling methods and supports. It was a good idea. I also included a list of journals and serials pertinent to tunneling."

JAMES QUICK, B.S., 1972. Jim spent two years at the University of Minnesota and is now working on a Ph.D. at Caltech in Pasadena.

B. BRICK ROBINSON, B.A., 1954; M.A., 1956. Exploration Geologist, Occidental Petroleum Corp., P.O. Box 2247, Houston, Texas 77001. Bob writes that after eighteen and a half years as a Production Geologist with Shell Oil in various assignments from California through the Four Corners, to Houston and finally New Orleans, he resigned to join Occidental in Houston, where he is involved in the exploration of offshore Louisiana and Texas in the Gulf of Mexico. Home address: 315 Greenbelt, Houston, Texas.

GARY D. ROSENBERG, Ph.D., 1972. Postdoctoral Fellow, Department of Geophysics and Planetary Physics, University of Newcastle upon Tyne, NE1 7RU, England. Together with Professor Runcorn, Gary organized a conference on "Biological Clocks and Changes in the Earth's Rotation," held in Newcastle, 8-10 January 1974, based on the Well's coral clock hypothesis. Some 30 papers were presented, with subjects ranging from biological rhythms to ancient astronomical observations and the earth's rotation. A medieval banquet and a meeting with the Lord Mayor were included. Gary and Runcorn are jointly editing the proceedings volume, to be entitled Growth

Rhythms and History of the Earth's Rotation, John Wiley, London. Gary also contributed an article (with Chris Jones, a Ph.D. candidate at Newcastle) on chemical periodicities in molluscs and stromatolites. Gary writes that he has been plodding along the English coast looking at clams and has been fossil hunting in Skye, Yorkshire, and northwest England.

JIM C. ROTH, B.A., 1956; M.A., 1959. President of Carlsberg Petroleum Corporation, has also been appointed Vice-President of Carlsberg Financial and Carlsberg Resources. He will be responsible for all natural resource activities for the Carlsberg group of companies, headquartered in Century City. Jim has been traveling frequently because of Carlsberg's increased activity and most recently has been in New Delhi, India. Address: Carlsberg Petroleum Corporation, 1801 Century Park West, Suite 600, Los Angeles, California 90067.

RICHARD H. SAMS, M.A., 1964. San Antonio Exploration Company, D-308 Petroleum Center, San Antonio, Texas 78209. Richard Sams was formerly District Geologist for Tesoro Petroleum Corporation of San Antonio in charge of their Texas Gulf Coast Exploration District, but has joined Mr. Austin W. Mosley, owner of San Antonio Exploration Company, as a consultant for oil and gas exploration. San Antonio Exploration is a newly formed company which will be concentrating its exploratory efforts in the Texas Gulf coast and surrounding areas.

RICHARD B. SAUL, B.A., 1956; M.A., 1959, is an Associate Geologist with the California State Division of Mines and Geology. Dick is currently working in the field of environmental geology in cooperation with Los Angeles County. Field areas have included the west-central part of the Mt. Wilson quadrangle, the SE/4 of the Oat Mountain quadrangle, and, currently, the S/2 of the Mint Canyon quadrangle. He is one of five in-house contributors to a forthcoming bulletin on the San Fernando earthquake. He has published Map Sheet 16, "Geology and slope stability of the SW/4 Walnut Creek quadrangle, Contra Costa County, California" (1973). Home address: 14713 Cumpston Street, Van Nuys, California 91401.

RONALD R. SCHMIDT, Ph.D., 1970. Geologisch Instituut, Oude Gracht 320, Utrecht, The Netherlands. Ron is "Scientific Cooperator I" (= Assistant Professor) in the Department of Micropaleontology, State University of Utrecht. He is Coeditor of the Utrecht Micropaleontological Bulletins and Coeditor of a symposium volume on "Messinian events in the Mediterranean." His major research activity involves a calcareous nannoplankton zonation for Neogene deposits in the Mediterranean region. Other research involves calcareous nannofossils from Cretaceous deposits, France, and Paleogene planktonic foraminifera from localities in India, Pakistan, and California. Publications on these topics have appeared or are now in progress. He reports that he spends a month each summer checking the field work of students stationed in Calabria, south Italy, and has visited the field areas of

Ph.D. candidates on Crete, Malta, and Sicily. This program has given him the opportunity to collect many of the classic Cretaceous and Tertiary localities in Italy, Spain, and France.

MICHEL P. SEMET, Ph.D., 1972. Institut de Physique du Globe, Université de Paris VI, 4 Place Jussieu, Tour 14, 75230 Paris, Cedex 05 France.

ROBERT SHANK, B.S., 1973. Graduate student in mining at Mackay School of Mines, University of Nevada, Reno, Nevada, during 1973-1974.

WILLIAM V. SLITER, Ph.D., 1966. Paleontology and Stratigraphy Branch, U.S. Geological Survey, 345 Middlefield Road, Menlo Park, California 94025. Bill left the Canadian Geological Survey in Calgary in the summer of 1973 to join the USGS. His research concerns the west coast Cretaceous foraminifera and modern foraminiferal taxonomy, life cycles, and ecology. Presently he is working on dissolution effects on Cretaceous foraminifera and modern faunas from slope depth low-oxygen zones. He is also Editor (since April 1973) of the Journal of Foraminiferal Research, published by the Cushman Foundation for Foraminiferal Research. Publications include "Upper Cretaceous foraminifers from the Vancouver Island area, British Columbia," Jour. Foram. Res., v. 3, no. 4, 1973; and "Test ultrastructure of some living benthic foraminifers," Lethaia, v. 7, 1974.

DOUGLAS H. STILES, B.A., 1953. Geologist, Marathon Oil Company, P.O. Box 120, Casper, Wyoming 82601. Home address: 95 Valley Drive, Casper, Wyoming 82601.

ARTHUR G. SYLVESTER, M.A., 1963; Ph.D., 1966. Associate Professor of Geological Sciences and Associate Director, University of California Education Abroad Program Study Center at the University of Bergen, Norway. Art is also the American Member of the Board of Directors, United States Educational Foundation in Norway (Fulbright Commission).

JAMES B. TAYLOR, M.A., 1963. Director and Exploration Manager, Occidental Petroleum de Venezuela, S.A., Apartado 60784 Chacao, Caracas 106, Venezuela. In January 1971, Jim transferred from Bakersfield to Port-of-Spain, Trinidad, as Vice President and Exploration Manager of Oxy there. Seismic surveys were conducted on the North Coast offshore and regional geological investigations extended in the Caribbean area. In June of 1972, he transferred to Caracas to his present position. Activity in Caracas centers in Lake Maracaibo, where they discovered oil "after drilling five dusters." The major effort continues in South Lake Maracaibo, with development of the two fields discovered in 1973 and exploration of other interests involving continuing investigations along the junction of the southern Caribbean and northern South America. He spends his spare time "beneath the Caribbean, scuba diving along Venezuela's untouched clear water coral reefs, photographing marine life."

JOHN VAN AMRINGE, B.A., 1956; M.A., 1957. District Exploration Manager, Union Oil Company, Lafayette, Louisiana. His work covers the southwest Louisiana onshore oil and gas exploration and western Louisiana offshore; the four major offshore lease sales in the last three years kept everyone busy. He writes, "There's a greater need than ever for good exploration geologists and geophysicists." John is an AAPG delegate and a member of the Constitution and By-Laws Committee. He was coeditor of a publication on oil and gas field of offshore Louisiana, published jointly by the Lafayette Geological Society and the New Orleans Geological Society.

WILLIAM R. VAN SCHMUS, Ph.D., 1964. Associate Professor, Department of Geology, University of Kansas, Lawrence, Kansas 66044.

ROLAND VON HUENE, B.A., 1953. Deputy Chief, Office of Marine Geology, U.S. Geological Survey, Mail Stop 915, Reston, Virginia 22092, writes that he has almost completed one year of the two-year assignment at the Survey headquarters in Reston and will be returning to his project work in the Pacific in about a year. "It is almost impossible to keep any research work on continental margins going along with all of the administrative duties, but the Survey has now acquired a research vessel and is equipping it with the latest geophysical instrumentation. Because of the energy crisis, our work has received new support, and these two years have been a time of considerable growth in program and staff."

JOHN E. WARME, Ph.D., 1966. Associate Professor of Geology, Department of Geology, Rice University, Houston, Texas 77001. John's interests include deep marine sedimentation and bioturbation, marine bioerosion, and the geology and depositional history of the High Atlas Mountains of Morocco. He traveled to Kenya and Tanzania last August to visit Ron Surdam (UCLA Ph.D., 1967), who is investigating Rift Valley geology, sediments, and saline deposits. Papers published by John have appeared recently in *Geology*, the *G.S.A. Bulletin*, and the *Journal of Paleontology*. A chapter on "Marine borers and the processes of bioerosion," is in a new book on trace fossils, edited by Frey.

EDWARD WARNER, M.S., 1971. Ed moved from New Orleans, where he was working for Shell Oil, and returned to Denver, Colorado, to work for Amoco as an exploration geologist. Home address: 9363 West Kentucky Pl., Lakewood, Colorado 80226.

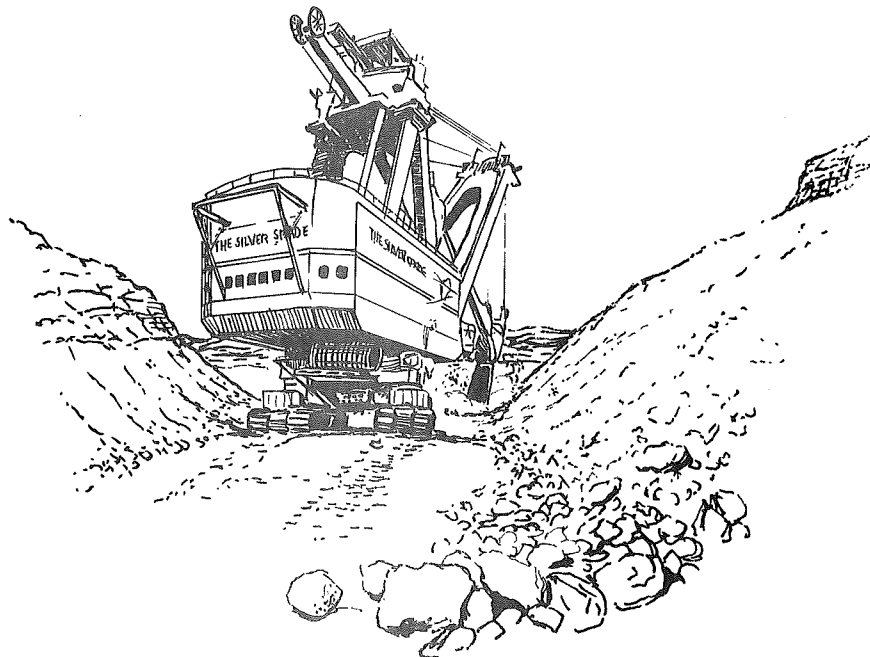
ROBERT W. WEBB, A.B., 1931. After obtaining his M.S. and Ph.D. degrees from Caltech, Bob taught at UCLA and then at UC Santa Barbara, where he is now Professor of Geology. He received the Neil Miner Award (1973) of the National Association of Geology Teachers as the "Outstanding College Teacher of Geology," was also the first recipient of a new award established in 1973 by the FarWestern Section of the NAGT, and named the Robert Wallace Webb Award, conferred for "sustained excellence of earth

science teaching and sustained exceptional service to the geological teaching profession." Home address: 898 Via Campobello, Santa Barbara, California 93111.

GARY D. WEBSTER, Ph.D., 1966. Associate Professor, Department of Geology, Washington State University, Pullman, Washington 99163, was the author of G.S.A. Memoir 137, published in December 1973. He is continuing research on crinoids and conodonts and this fall will go to Amsterdam (taking Bev and the kids) to work with Dr. A. Briener on late Paleozoic crinoids while he is on sabbatical leave from Washington State.

ELBERT R. WILKINSON, A.B., 1955. Regional Administrative Officer, California Division of Oil and Gas, 5199 E. Pacific Coast Highway, Suite 309N, Long Beach, California 90804. He was recently promoted from Offshore Operations Engineer to the present position on the Regional Staff, published a paper on "California offshore oil and gas seeps," and has been involved with offshore oil operations for the past four years. This has included geologic studies of the sea floor and subsurface structures and a continuing evaluation of the mechanical operations and environmental impact resulting from the drilling and producing operations offshore.

JAMES J. WILLIAMS, B.A., 1955, M.A., 1957. Vice President of Exploration, Occidental of Britain Inc., 4 Grosvenor Place, London, SW1X 7HF, England. Jerry's work concerns the North Sea exploration. He presented talks at the national AAPG meeting in San Antonio in April 1974 and at the North Sea Oil Conference in London in November 1974 on the Piper Oil Field, North Sea (to be published in the AAPG Bulletin and the Conference Proceedings).



Geology Newsletter Editor
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University of California
Los Angeles, California 90024

Name _____

Address _____

UCLA degree and date _____

Present position, company or institution, address

Recently transferred? promoted? retired?

Professional and other activities (degrees from other schools?
current work, research studies, awards, etc.)

Publications, offices in professional societies?

Other information, news of other alumni, etc.