

Department of Earth and

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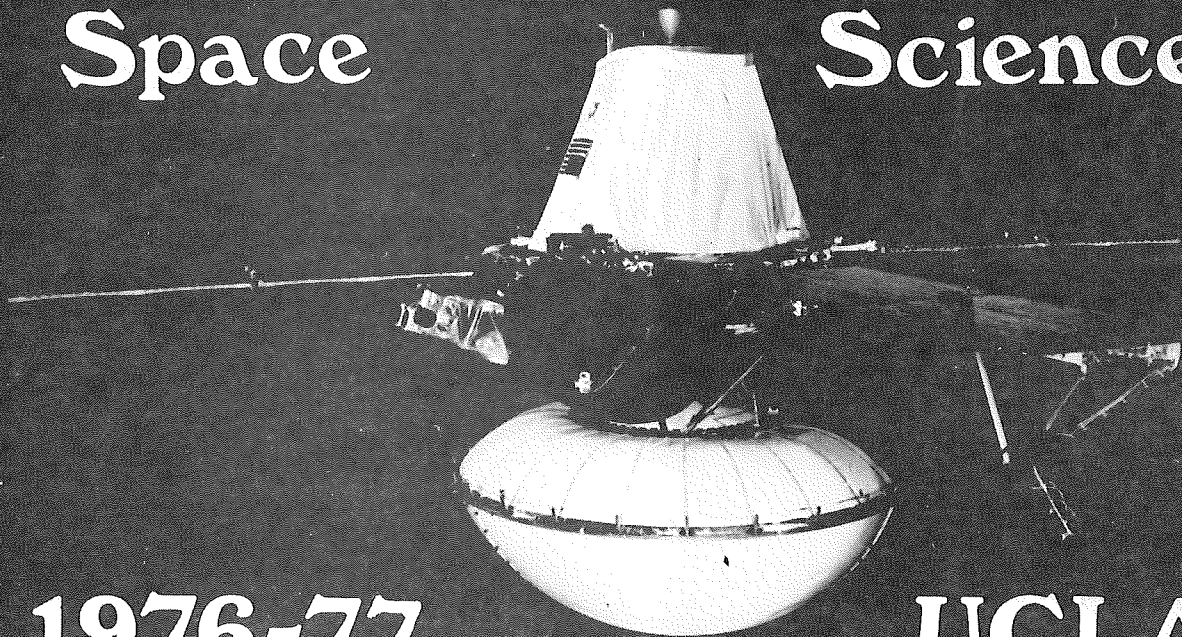


Space

Sciences

1976-77

UCLA



THE COVER

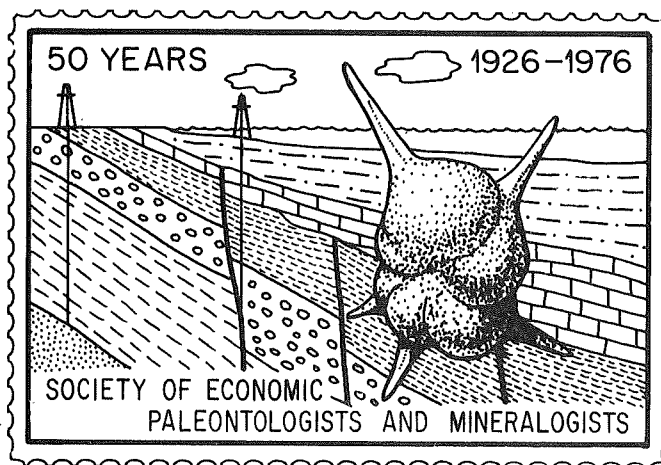
EARTH... (top photograph)

Professor Dave Jackson attempts to measure electrical resistivity on Portal Ridge, California, near the San Andreas fault. Variations in electrical resistivity have been suggested as possible earthquake precursors.

... AND SPACE SCIENCES (bottom photograph)

Two Viking spacecraft were launched from Cape Kennedy on August 20 and September 9, 1975. The bottom cover photo shows the Viking Orbiter with the lander encapsulated in its bioshield. Among the physical and biological instruments on board was the Infrared Thermal Mapper (IRTM), a thermal emission experiment led by Professor Hugh Kieffer and a team of UCLA scientists.

ACKNOWLEDGEMENTS



THE NEWSLETTER was initiated and edited for nine years by Professor Helen Tappan Loeblich. This issue is dedicated to her in thanks for giving us this fine tradition and in hopes that it may continue in future years to keep us in touch with our alumni and they in touch with us.

The drawing at left is taken from the 50th Anniversary Commemorative Stamp and doubloons which Helen designed for the SEPM.

The editors for this year's Newsletter are Susan Werner Kieffer, Assistant Professor, and Vicki Doyle-Jones, Scientific Illustrator. Geopetry throughout the Newsletter is reprinted from "A Dozen Belated Valentines for Geologists" by Charles Wacker from the Earth and Space Sciences WEEKLY INTRUSION, vol. 6, no. 3, February 17, 1977. All illustrations in the text are by Vicki Doyle-Jones; the Viking Logo and SEPM Commemorative Stamp are copied from designs by Julie Guenther, Scientific Illustrator.

We deeply appreciate the continued support of Chevron Oil Field Research Company, La Habra, California, who again printed this Newsletter for us. While at Chevron, Alfred R. Loeblich Jr., Adjunct Professor, initiated and maintained this effort for nine years. This year Floyd Sabins, Regent's Professor, 1975, and Lecturer, 1976, helped continue the Chevron tradition. Without their support the Newsletter would not be possible.



DEPARTMENT OF EARTH AND SPACE SCIENCES
3806 GEOLOGY BUILDING
LOS ANGELES, CALIFORNIA 90024
(Formerly Department of Geology and Department
of Geophysics and Space Physics)

11 April 1977

Dear Alumni:

Since I last wrote to you, the Department of Geology has merged with the Department of Geophysics and Space Physics and is now known as the Department of Earth and Space Sciences. We offer two undergraduate degrees, one is the Bachelor of Science degree in Geology, and the other is the Bachelor of Science degree in Geophysics. There are a number of options for the students under these two degrees. A curriculum specialty in geology, geochemistry, engineering geology, nonrenewable natural resources, or paleobiology is available under the B.S. in Geology; and the specialties of applied geophysics or geophysics and space physics are programs within the B.S. in Geophysics degree. Advanced degrees are provided in all of the above undergraduate options with the exception of engineering geology and paleobiology.

All of the options in Geophysics and Geology require substantial training in the basic or hard sciences of chemistry, math, physics, and biology. Under the new programs the students receive greater direction than in the past. Our core courses at the undergraduate level still exist; and we continue to require a year of mineralogy-petrology, structural geology, a year and a summer of field geology or two quarters of field geology, a quarter of field geophysical exploration, and summer field and paleontology. Students are encouraged to take courses in remote sensing (Sabins and Kieffer), engineering geology (Merifield), petroleum geology (Johnson), and all must take either an advanced course in igneous and metamorphic petrology or sedimentology and a course in exploration geophysics.

In order to insure that all students receiving an advanced degree in Geology from UCLA are well prepared to do geologic mapping, we have recently initiated the requirement that all entering graduate students take a screening field course in the fall of each academic year. The course is on a pass/not pass basis; should the student fail to pass, he or she will be required to take the complete undergraduate field sequence, no matter how many field classes the student may have taken as an undergraduate.

Among the new courses we are planning are:

(1) Evolution of the Solar System, Earth, and Life (utilizing faculty from Geophysics, Geology, and Paleobiology) (Professors Kaula, Ernst, and Schopf);

(2) An advanced remote sensing course to follow the remote sensing course currently taught by Dr. Floyd Sabins. The new course will be taught by Professor Hugh Kieffer;

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- (3) A geophysics course for the physics major;
- (4) An electromagnetic geophysics course as a followup to the beginning course in geophysical exploitation (Professor Robert McPherron);
- (5) A new course in organic geochemistry (Professors Kaplan, Reed, and Schopf); and
- (6) New courses in Coal (Professor O. Anderson) and Geothermal Energy (Professor S. Kieffer).

All of these courses are undergraduate courses, and all but the first are designed to strengthen the Department in the area of applied geology, applied geophysics, and mineral exploration. We have recently developed a Master of Science Program in nonrenewable resources and have a program or option in the same area for the Bachelor of Science degree. However, there will be no decrease in the "pure" scientific research of the faculty.

Our philosophy will be to give the undergraduate students a broad training in the basic sciences and in the fundamentals of geological sciences. We are providing the student with opportunities in courses such as remote sensing, petroleum geology, engineering geology, and mining geology to learn applied skills; and we are bringing in experts from the field to teach these courses, e.g., F. Sabins (Chevron Oil Field Research), B. Johnson (McCulloch Oil), P. Merifield (Calif. Earth Science Corp.). Our geophysicists and space scientists are acutely aware of needs in the minerals and petroleum industry and are bringing their new and innovative space science oriented talents to bear on these earthbound problems. The opportunities are there, and the students are encouraged to take advantage of them, but we feel that the students should have a freedom of choice as to what applied or advanced courses they take.

While on this theme, it has come to my attention that there is a feeling among some alumni that few, if any, of our graduate students have gone to work in industry or in areas other than teaching. Appended to this letter is a compilation of recent Masters or Ph.D. graduates, their affiliation, and what it is they are doing, where known. I may have missed a few graduates, and affiliations may have changed in the last few years. You will note in this list that when jobs were available, e.g., in 1975, in the oil industry, a number of Master of Science students went to work for companies in that area. Furthermore, both undergraduate and Ph.D. graduates have recently gone to work in industry.

Our prime responsibility is to educate students; and, because we feel that we have truly exceptional students, we would like to see to it that they are admitted to graduate schools and that they get good jobs. We have our Careers Day, which brings representatives from industry, government, and small private companies to talk with the students. The participants from industry, industry itself, the faculty, and even the Department staff have contributed substantial funds to Careers Day. We will have Careers Day again next fall and hope that you will

be able to attend, and we will welcome your contributions--checks made out to the UCLA Foundation (Geology Careers Day). Many thanks to those alumni and to Texaco, Exxon, Shell, Union, Gulf, Chevron USA, and Cities Service, who have made contributions to fellowships, scholarships, and to Careers Day.

We are trying to bring the diverse disciplines and faculty and students from the former Departments of Geology and Geophysics and Space Physics together in various ways. I have been meeting with small groups of graduate students in the late afternoon to discuss issues and problems. I will do the same with the undergraduate students during the Spring Quarter; and the faculty and staff have or will have a number of social gatherings during the year besides the departmental field trip and departmental picnics. Another method for people to get to know one another better and to learn of each other's work and specialty is to get together over a cup of coffee. We have what we are calling the Common Room on the third floor of the Department. The room is centrally located and is meant to be a meeting place for informal gatherings. We would like to make this room as comfortable and as attractive a place as possible; however, funds for painting the room, getting a few soft chairs, perhaps some drapes for the windows, etc., are not available. Painting is included in the regular building maintenance, but we are not scheduled to have the room painted for several years. Thus, we are going to paint it ourselves (i.e., students and faculty). We would welcome any donations that you might wish to make to allow us to improve the appearance of the room. Contributions for the Common Room can be made payable to the UCLA Foundation (Geology), noting at the bottom of your check "Common Room," or any other specific use for which you would like to see your money used. The contribution is tax deductible.

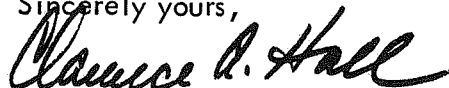
Before I let you escape my request for funds, I'd like to touch on two other matters: One is the summer field course. Cities Service has provided the National Association of Geology Teachers Program with \$600 for the UCLA summer field program. The money is to be awarded to the most deserving students. What we have done is to divide this amount of money among six of the thirty students who will take the course. As you know, taking summer field, using eight weeks of summer, and not being able to work for a major part of the summer is a financial hardship for students. If any of you or your companies would like to make contributions directly to UCLA as awards (scholastic or need) to our students taking summer field, it would be a great help. Finally, some of our graduate students are doing field problems, and the Department does not have funds to support the costs of buying photos, maps, running their vehicles, or helping to defray field costs. Again, contributions would be welcomed and should be made out to the UCLA Foundation (Geology) with a note on your check as to how you want the money to be spent.

Many of the faculty believe that the Nation is entering a period of crisis. Our readily extractable petroleum supplies are dwindling rapidly, our mineral reserves for the future are low, and we are rapidly becoming energy poor. As a Department, we will try to bring new techniques, heretofore reserved for space exploration, to earth problems, we will encourage students to move in directions of

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geochemistry and geochemical prospecting, we will broaden our offering in applied geophysics, and we will try to turn out the best earth scientists anywhere in order to be at the forefront in attacking these problems. We would like your support and constructive suggestions; and when November 10, 1977, rolls around and we have our Careers Day, we would like as many of you as can to come to UCLA and share your professional experiences with the students. If you would like to be a speaker or simply attend, please drop me a note. Also, if you are going to be at the AAPG Convention in Washington, D. C., June 12-16, 1977, Professors Ian Kaplan, Helen Loeblich, and Ted Reed will be the Department's representatives to the meetings and will be glad to chat with you at the All-Alumni Cocktail Party on Monday, June 13.

Sincerely yours,



Clarence A. Hall, Chairman

CAH:vbj

PRESENT AFFILIATION OF RECENT UCLA GEOLOGY GRADUATES

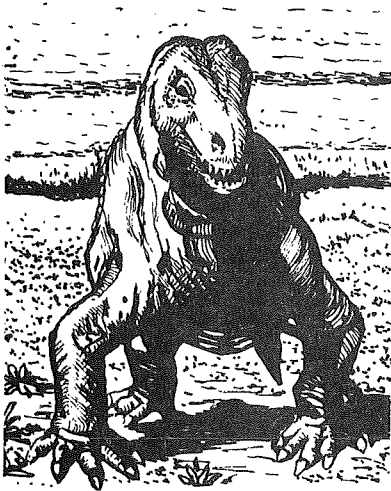
Ph.D. Degree	Affiliation	M.S. Degree	Affiliation or School
<u>1970</u>		<u>1970</u>	
	Asihene Ghana, Int. Assoc. Eng. Geol.	* Heller	Cities Service Oil Co.
	Baker U. Illinois, Chicago		
	Brisbin U. Manitoba		
*	Coates USGS, Denver		
	Fritsche C.S.U., Northridge		
	Gustafson C.S.U., Northridge		
*	Howe Shell Oil Co., Denver		
	Liou Stanford		
	Marzolf West L.A. Junior College		
*	Presley NSF Oceanography		
<u>1971</u>		<u>1971</u>	
	Blacic JD U. Washington	Blacic JM	Ph.D., U. Washington
	Licari East L.A. Junior College	Chriss	Ph.D., Oregon State
	Schmidt Geologisch Inst., Utrecht, Netherlands	* Correa	Texas Petroleum, Bogota
		Johnson	Ph.D., Oregon State(?)
		LeFever	Ph.D., UCLA
		Lister	Ph.D., U. Kansas
		McCoard	?
		* Warner	Amoco, Denver
		Wisehart	U.S. Forest Service
<u>1972</u>		<u>1972</u>	
	Adams C.S.U., Northridge	Brady	Ph.D., Harvard
*	Asquith Consulting--Env. Geol.	Grudewicz	?
	Barrows K Not working	* Hill RL	Cal. Div. Mines & Geol.
	Cornell U. Texas, El Paso	* Lustig	G.S., Argentina
*	Donovan USGS, Denver	* Rodriguez	Oil Co., S. America
	Kuniyoshi ?	Seiden	Bakersfield, HS or JC
*	Post USGS	Tan	?
<u>1973</u>		<u>1973</u>	
	Fonda ?	* Balderman	Eng. & Consult. Co.
	Haugh U. Toronto	Clymer	U.C., Berkeley
*	Redwine Union Oil	Moore	Ph.D., UCLA
	Rosenberg Newcastle-on-Tyne, Post-doc	Tippetts	Religious school
	Semet U. Paris, France		
	Sweeney UCLA		

*Petrologists: To hornfels and blueschist
I offer a toast,
But of facies I fancy,
I fancy yours most.*

Ph.D. Degree	Affiliation	M.S. Degree	Affiliation or School
<u>1974</u>		<u>1974</u>	
* Barron	USGS, Menlo Park	Hoylman	?
Budnik	Postdoc., Lamont	* Putnam	Air Force
Horodyski	Notre Dame U.	Vaughan	Ph.D., U.C., Santa Cruz
* Moir	Exxon		
Neder	West L.A. Junior College		
Oehler DZ	Australia		
Oehler JH	CSIRO, Australia		
Wicander	U. Michigan		
<u>1975</u>		<u>1975</u>	
Alpert	?	* Bachman	Standard Oil Calif.
* Crawford	USGS	* Berger	Continental Oil, Oklahoma
Hallet	Stanford U.	* Gardner	Consulting Eng. Geol.
Hill MH	Santa Monica City College	Lipshie	Ph.D., UCLA
Hurst	U.C., Santa Barbara, Postdoc	Mankiewicz	ES & E, UCLA
Miller	C.S.U., Northridge	* Pausé	Oil company
		* Prior	ARCO Oil Co.
		* Shmerling	Geolabs., Calif., & Pierce Junior College
		* Wilson	Cities Service Oil Co.
<u>1976</u>		<u>1976</u>	
Fairchild	Teaching in Brazil	Balogh	Ph.D., ES & E, UCLA
* Freeborn	USGS, Reston, Va.	Kettenring	Ph.D., UCLA
Garcia	U. Hawaii	Newman	?
Holman	USGS, Postdoc	Schaal	Lockheed at Johnson Space Center, Houston
* Kato	Shell Research, Houston		
* Kirby	USGS, Menlo Park		
* Krishnan	Mining company, Alberta		
Moore	Teaching in Fresno		
* Spear	Carnegie Labs., Postdoc		
Stoddard	N. Carolina State U.		

*Sedimentologists: To swift deposition
Are dry times imped'ments;
Your phi sighs epit'mize
My innermost sed'ments.*

*Geochemists: For geomagnetics
Convection's a must;
Be you my mantle
And I'll be your crust.*



Students continue to come to UCLA in record numbers. In the fall of 1975, enrollments reached the all-time high of 33,700. The squeeze on facilities has compelled UCLA to reduce this number; and in the fall of 1977, some 1,800 eligible applicants will be redirected to other campuses of the University of California.

Eight thousand, two-hundred and sixty-four degrees were awarded in the 57th Commencement, held on June 20, 1976. Of these, 4,838 degrees were at the bachelor's level, 2,143 at the master's level, and 1,283 were other advanced degrees.

A study published in the August 20, 1976, issue of Science showed that UCLA stands in eleventh place in the nation in the number of male graduates and in twelfth place in the number of female graduates who later obtained doctoral degrees. The study covers the period from 1910 to 1969 (UCLA's first commencement wasn't until 1923, so we got a late start!). UC Berkeley was first in the nation in male graduates and second in female graduates who later received doctoral degrees.

The skyline to the south of the geology-chemistry complex has been changed with the completion of the new six-storey Molecular Biology Institute. The building, dedicated November 5, contains 67,000 square feet of working space and was constructed at a cost of \$9,300,000, raised through a \$1 million gift from the Albert Parvin Foundation and support from the National Cancer Institute and the University of California Regents. Some 30 faculty, 40 postdoctoral students and 75 graduate and undergraduate students will work on control of cancer and other virus-induced diseases, degenerative diseases of aging, and many other disease-related problems. Other current campus construction includes the Jerry Lewis Neuromuscular Research Center, a new health sciences center, and the James E. West Alumni Center. It's quite dusty around here!

The merger between the Department of Geophysics and Space Physics and the Department of Geology (see Chairman's letter) has resulted in a number of changes in the academic administrative structure. The new Executive Officers of the Department of Earth and Space Sciences are: Clarence A. Hall, Chairman; Robert McPherron, Executive Vice-Chairman; Clemens A. Nelson, Vice-Chairman in charge of Undergraduate Affairs; and Ronald Shreve, Vice-Chairman in charge of Graduate Affairs. Several new faculty have joined us this academic year: Art Boettcher, Professor of Geology and member of the Institute of Geophysics and Planetary Physics; Peter Bird, Assistant Professor of Geology; and Tom Ronan, Assistant Professor of Geology. If you visit our library, you will find that we have a new head librarian, Ms. Nancy Pruett.

In spite of the tightening budget in the University and the Department, we were able to replace 36 of our teaching microscopes with new ones over the last two years. This will greatly help the blood-shot eyes of our mineralogy and petrology students.

Six UCLA Professors were selected for research grants from the Alfred P. Sloan Foundation of New York, the largest number received at any single campus. Sloan winners are chosen "for their exceptional potential to make creative contributions to scientific knowledge in the early stages of their careers. Their research is expected to advance the frontiers of physics, chemistry, mathematics, and neuroscience." The Foundation selected 95 Fellows in the United States and Canada. One of these was Professor Susan Kieffer, who will use the Fellowship to pursue studies of the physics of eruptions of geysers and volcanoes.

Professor Gerald Schubert, who joined the UCLA Planetary & Space Science Faculty in 1966, received the 1975 American Geophysical Union Macelwane Award as a "scientist who has made profound theoretical and interpretive contributions in such varied subjects as plasma oscillation and turbulence, stabilities of flows in stellar interiors and planetary atmospheres, planetary geodesy, evolution of planetary topography, geodynamics of the earth's mantle, and the complex theory of the interaction of the solar wind with the moon...." (Thomas J. Ahrens, A.G.U., November, 1975).

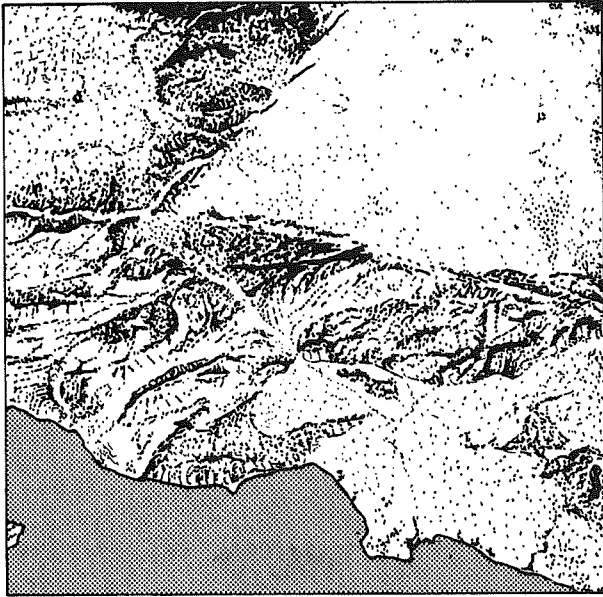
Professor William M. Kaula received an honorary D. Sc. from the Ohio State University in November 1975 for his contributions to "man's understanding of earth and planetary science; the quality, imagination, and originality of his work, which have established him as undisputed leading geodesist; for his interpretations on such topics as the structure of the earth and moon, the origin and evolution of the planets, and the dynamics of the solar system; and for his participation as an adviser to NASA, the National Academy of Sciences, and the International Union of Geodesy and Geophysics...."

Professor J. William Schopf was awarded one of four Distinguished Teaching Awards given by the Faculty and Students of UCLA. This award carries an honorarium of \$500 to each recipient.

THE RUBEY COLLOQUIUM

In the Fall Quarter of 1976, a new undergraduate lecture course, "The Rubey Colloquium: Major Advances in Earth Science," was instituted. The course was named in honor of the late W. W. Rubey, Professor of Geology at UCLA, National Academician, and distinguished earth scientist. This first year the course dealt with "Major Events in the Evolution of Life on Earth," and it attracted noted specialists who discussed various aspects of evolution and the history of life: Dr. E. Mayr (Harvard University), "Evolutionary Biology;" Dr. A. I. Oparin (Moscow State University, Director of the A. N. Bach Institute of Biochemistry, Moscow, and Member, National Academy of Sciences, U.S.S.R.), "Origin of Life;" Dr. J. W. Schopf (UCLA), "Precambrian Evolution;" Dr. S. Stanley (Johns Hopkins University), "Invertebrate Evolution;" Dr. R. Bakker (Johns Hopkins University), "Vertebrate Evolution;" Dr. H. Banks (Cornell University), "Evolution of Higher Plants;" Dr. T. Ronan (UCLA), "Paleoecology;" Dr. E. Olson (UCLA), "Evolution of Mammals;" Dr. J. Birdsell (UCLA), "Hominid Evolution;" and Dr. J. Stebbins (U.C. Davis), "Evolutionary Perspectives." The Rubey Colloquium for the Fall Quarter of 1977, under the direction of Professor W. Gary Ernst, will cover the "Geotectonic Development of California" in an attempt to place this portion of the continental margin in a plate-tectonic framework.

LECTURE SERIES



The Geology Department lectures were sponsored jointly by the Department of Geology and the Geological Society of UCLA. Those for Geophysics and Space Physics were sponsored by GASP and the Institute of Geophysics and Planetary Physics. The new Department of Earth and Space Sciences and the Institute will sponsor these talks in the future. The lectures are open to the public and most are advertised in the University's Weekly Calendar, a flier that is distributed to other institutions and companies in the area as well as to the campus. Lectures for the past academic year are listed chronologically for the pre-merger departments.

Department of Geology

Dr. Ken Crawford, Post-doctoral Fellow, U.S. Geological Survey, Menlo Park, California, "The Geology of the Franciscan Assemblage in the Northern Diablo Range," January 14, 1976.

Dr. Roy A. Schroeder, Department of Geology and Geophysics, Yale University, New Haven, Connecticut, "Amino Acid Racemization in Late Quaternary Lake Ontario and Geochemistry of Purines and Pyrimidines: a Projected Study," January 15, 1976.

Dr. Clayton D. McAuliffe, Chevron Oil Field Research Company, La Habra, California, "Environmental Aspects of Offshore Petroleum Development," January 22, 1976.

Dr. John Hedges, Post-doctoral Fellow in Organic Geochemistry, Carnegie Geophysical Laboratory, Washington, D.C., "Land-derived Organic Matter in Sediments from the Gulf of Mexico," January 29, 1976.

Dr. Heinrich D. Holland, Professor of Geology, Department of Geological Sciences, Harvard University, Cambridge, Massachusetts, "Basalt—Seawater Interaction: a Solution to the Dolomite Problem," February 4, 1976.

Dr. Stephen H. Kirby, U.S. Geological Survey, Menlo Park, California, "Creep of Quartz in the Laboratory and Flow in the Earth's Crust," February 5, 1976.

Dr. James J. Papike, Professor, State University of New York, Stony Brook, New York, "Petrology of Lunar Mare Basalts," February 12, 1976.

Dr. H. Jay Melosh, Division of Geological and Planetary Sciences, California Institute of Technology, Pasadena, California, "Aftershock Pattern and the Rheology of the Asthenosphere," February 20, 1976.

Professor James P. Ferris, Department of Chemistry, Rensselaer Polytechnic Institute, Troy, New York, "Possible Photochemical Transformations in the Atmosphere of the Primitive Earth," February 26, 1976.

Professor J. Tuzo Wilson, American Association of Petroleum Geologists Distinguished Lecturer, Ontario Science Center, Ontario, Canada, "Some Aspects of Plate Tectonics," February 19, 1976.

Marcia Rottman, Department of Geological Sciences, University of Colorado, Boulder, Colorado, "Zooplankton Species Associations in the South China Sea: Ecological Significance and Adaptive Strategies," March 1, 1976.

Dr. James H. Whitcomb, Senior Research Fellow, Seismological Laboratory, California Institute of Technology, Pasadena, California, "Recent Changes of Geophysical Parameters in Southern California," March 4, 1976.

Dr. Karl W. Flessa, Assistant Professor, Department of Earth and Space Sciences, State University of New York, Stony Brook, New York, "Fossil Extinctions: Some New Approaches to an Old Problem," March 5, 1976.

Peter Bird, Department of Earth and Planetary Science, Massachusetts Institute of Technology, Cambridge, Massachusetts, "Mechanics of Continental Collision: the Formation of the Zagros, Himalayas, and Tibet," March 8, 1976.

Dr. Roger N. Anderson, Research Associate, Lamont-Doherty Geological Observatory, Columbia University, New York, New York, "Evidence and Implications of Massive Hydrothermal Circulation in the Oceanic Crust," March 12, 1976.

Dr. Thomas E. Ronan, Acting Assistant Professor, Department of Geology, University of California, Los Angeles, California, "Species Abundance Pattern in a Marine Soft-sediment Environment: the Importance of Biological Interactions," March 15, 1976.

Professor Arthur G. Sylvester, Department of Geological Sciences, University of California, Santa Barbara, California, "The Heimaey, Iceland Volcanic Eruption of 1973," March 18, 1976.

Arend Meijer, Research Associate, California Institute of Technology, Pasadena, California, "Pb and Sr Isotopic Studies Bearing on the Origin of Volcanic Arc Lavas in the Marianas," April 8, 1976.

Dr. D. G. Bishop, New Zealand Geological Survey, Dunedin, New Zealand, "Recent Work in the Mesozoic Graywacke Terrain of the New Zealand Geosyncline and its Implications for a Plate Tectonic Model," April 26, 1976.

Dr. James B. Thompson, Jr., Professor of Mineralogy, Harvard University, and Fairchild Professor, California Institute of Technology, "Biopyriboles, Polytypes and Polysomes," April 29, 1976.

Dr. Jim Hinthorne, Hasler Research Center, Applied Research Laboratories, Inc., Santa Barbara, California, "Secondary Ion Mass Spectrometry with an Ion Microprobe," May 5, 1976.

Dr. J. William Schopf, Professor of Geology and Geophysics, University of California, Los Angeles, California, "Travelogue: Six Months in the Soviet Union," May 6, 1976.

Steve Weiner, Division of Geological Sciences, California Institute of Technology, Pasadena, California, "Shell Proteins: Implications for Molecular Evolution," June 10, 1976.

Professor S. Akimoto, Institute for Solid State Physics, University of Tokyo, Tokyo, Japan, "Phase Transformation Studies by Means of High-Pressure and High-Temperature X-ray Diffraction," September 9, 1976.

Dr. Hugh Kieffer, Associate Professor of Planetary Physics; Principal Investigator Viking Infrared Thermal Mapper, University of California, Los Angeles, Department of Earth and Space Sciences, Los Angeles, California, "Viking: Infrared Mapping of the Martian Surface and Atmosphere," September 30, 1976.

Dr. Michael Schulz, Space Sciences Laboratory, Aerospace Corporation, "Charged-particle Absorption by Io," October 7, 1976.

Professor Donald B. McIntyre, Geology Department, Pomona College, Claremont, California, "The Lost Drawings for James Hutton's THEORY OF THE EARTH," October 14, 1976.

Gordon Henderson, Amoco Production Company, Denver, Colorado, "Red Wing Creek Field: a Meteorite Impact Structure," October 19, 1976.

Dr. Bruce Hobbs, Lecturer in Geophysics on leave from Edinburgh University, Edinburgh, Scotland, "Induction in the Oceans, a Method for all Frequencies," October 28, 1976.

Professor Kurt Marti, University of California, San Diego, Department of Chemistry, San Diego, California, "Extinct Radioactivities as Timepieces in the Early Solar System," November 4, 1976.

Dr. James B. Pollack, NASA Ames Research Center, Moffett Field, California, "The Martian Sky as Seen by the Viking Lander Cameras," November 9, 1976.

Ze-ev Reches, Graduate Students at Stanford University, Stanford, California, "Theoretical Analysis of Monoclines," November 18, 1976.

*Glaciologists: Most till slopes are shallow,
Moraine drops quite steeply;
For you I'd wade into
An ice flow knee-deeply.*

Professor W. Gary Ernst, Department of Earth and Space Sciences, University of California, Los Angeles, California, "Mineralogy, Petrology and Plate Tectonic Implications of Eclogitic Rocks, Gruppo di Voltri, Western Ligurian Alps," November 23, 1976.

Dr. E. Litov, Institute of Geophysics and Planetary Physics, University of California, Los Angeles, California, "Ferroelectric Phenomenon and the Anomalous Electric Conductivity in the Mantle of the Earth," November 30, 1976.

Professor Andrew Ingersoll, Division of Geological and Planetary Sciences, California Institute of Technology, Pasadena, California, "Atmospheric Tides and the History of the Rotation of Venus," December 7, 1976.

Professor Bruce Luyendyk, Department of Geological Sciences, University of California, Santa Barbara, California, "The Rift Valley Floor Famous Area Mid-Atlantic Ridge," January 13, 1977.

Professor Hiroo Kanamori, Division of Geological and Planetary Sciences, California Institute of Technology, Pasadena, California, "Importance of Physical Dispersion in Surface Wave and Free Oscillation Problems," January 18, 1977.

Professor Art Boettcher, Department of Earth and Space Sciences; Institute of Geophysics and Planetary Physics, University of California, Los Angeles, California, "Amphiboles, Subduction and Magmas," January 27, 1977.

Professor Jonathan I. Katz, Institute of Geophysics and Planetary Physics; Department of Astronomy, University of California, Los Angeles, California, "Magnetic Binary Stars," February 3, 1977.

Dr. Michael Sorey, U.S. Geological Survey, Menlo Park, California, "Hydrothermal System of the Long Valley Caldera," February 8, 1977.

Professor Ta-Liang Teng, Department of Geological Sciences, University of Southern California, Los Angeles, California, "Seismotectonic Studies of the Los Angeles Basin," February 17, 1977.

Professor Thomas A. Mutch, Department of Geological Sciences, Brown University, Providence, Rhode Island, "Six Months on the Martian Surface: A Pictorial Review," February 24, 1977.

Dr. Priestley Toulmin III, U. S. Geological Survey, Reston, Virginia, "Mineralogy and Geochemistry of the Martian Surface," March 3, 1977.

Dr. Michael Carr, U. S. Geological Survey, Menlo Park, California, "Re-assessment of the Geologic History of Mars as the Result of Viking Data," March 10, 1977.

Dr. Marjorie Mulcahy, Geonomics, Inc., Berkeley, California, "Seismicity and Physical Properties of Geothermal Areas," March 15, 1977.

Geophysics and Space Physics

Dr. Fraser P. Fanale, Deputy Manager, Planetology and Oceanography, Jet Propulsion Laboratory, "Io: The Enigma of the Solar System," January 13, 1976.

Dr. Brian Fraser, Senior Lecturer, The University of Newcastle, New South Wales, Australia, "Propagation of Pcl Pulsations in an Ionospheric Duct," January 27, 1976.

Dr. Naohiro Soga, Visiting Fellow, Cooperative Institute for Research in Environmental Sciences, University of Colorado, "Experimental Studies on the Effects of Antiferromagnetism and Cracks on Elastic Constants," February 4, 1976.

Dr. James J. Papike, Professor, State University of New York, Stony Brook, New York, "Petrology of Lunar Mare Basalts," February 12, 1976.

Brian Gallagher, Doctoral Candidate, Environmental Science and Engineering, University of California, Los Angeles, California, "Water for Human Needs," February 12, 1976.

Dr. Kenneth Poehls, Assistant Research Geophysicist, Department of Geophysics and Space Physics, University of California, Los Angeles, California, "Electrical Conductivity of the Oceanic Lithosphere South of Bermuda," February 24, 1976.

Dr. Malcolm Johnston, Geophysicist, U.S. Geological Survey, Menlo Park, California, "Earthquake Prediction: Some Comments, Techniques, and Results," March 16, 1976.

Dr. M. E. Baur, University of California, Los Angeles, California, "Evolution of the Earth's Atmosphere: A Physical Chemical Perspective," April 13, 1976.

Dr. Peter Bodenheimer, Board of Studies in Astronomy and Astrophysics, University of California, Santa Cruz, California, "Hydrodynamic Calculations of Rotating Protostars," April 19, 1976.

Dr. J. R. Arnold, Department of Chemistry, University of California, San Diego, California, "Some Thoughts on Condensation and Agglomeration in the Early Solar System," April 27, 1976.

Dr. Z. H. Cho, Laboratory of Nuclear Medicine & Radiation Biology; Electrical Science & Engineering Department, University of California, Los Angeles, "Advances on Three-dimensional Imaging with Positron Emitting Radionuclides," April 28, 1976.

Dr. Robin Brett, U.S. Geological Survey, Reston, Virginia, "The Status of Speculation on the Chemical Composition of the Core of the Earth," May 3, 1976.

Dr. Amos Nur, Department of Geophysics, Stanford University, Stanford, California, "The Mechanical State and Deformation of the Earth's Crust," May 4, 1976.

Dr. Viktor S. Safronov, Institute of Physics of the Earth, Academy of Sciences, Moscow, U.S.S.R., "The Temperature of the Earth from Its Accumulation," May 6, 1976.

Dr. J. A. Burns, Cornell University, Ithaca, New York, "The Rotation of Asteroids," May 11, 1976.

Dr. D. M. Hunten, Kitt Peak Observatory, Arizona, "Hydrogen Escape and Its Implications for Atmospheric Evolution," May 18, 1976.

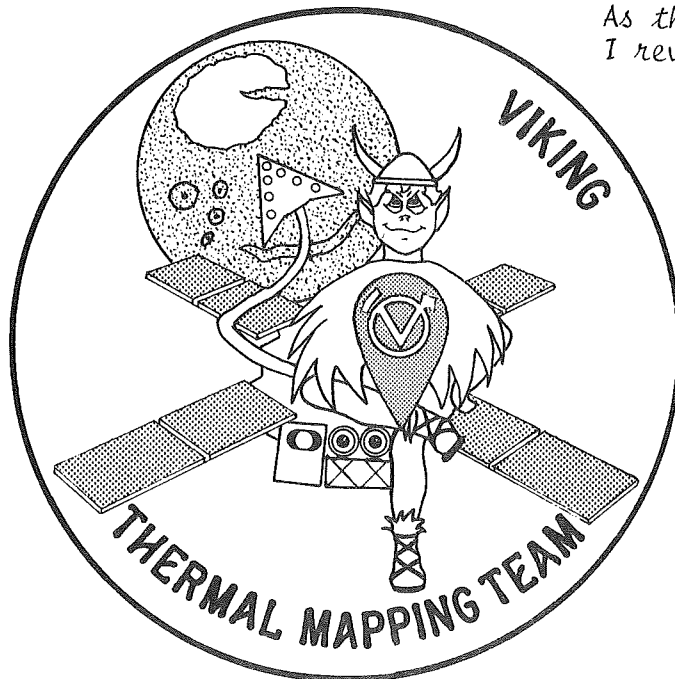
Dr. D. H. Chung, Lawrence Livermore Laboratories, University of California, Berkeley, California, "Recent Progress in the Determination of the Elasticity and Equation of State of Mantle Materials," May 25, 1976.

Dr. Ari Ben-Menahem, Adolpho Bloch Geophysical Observatory, Weizmann Institute of Science, Rehovot, Israel, "Structure, Seismicity, and Tectonics of Continental Eastern Mediterranean," June 1, 1976.

Dr. W. Richard Peltier, Department of Physics, University of Toronto, Toronto, Ontario, Canada, "Ice Sheets, Oceans, and the Shape of the Earth: Their Response to Climatic Change," June 8, 1976.

Professor Fred L. Whipple, Director Emeritus, Smithsonian Astrophysical Observatory, Cambridge, Massachusetts, and UCLA Alumnus of the Year, "Comets and the Earth," June 18, 1976.

*Space scientists: Mar's sky is red,
Earth's is fair blue;
As the planets the sun,
I revolve around you.*





EARTH AND SPACE SCIENCES FACULTY NEWS

ORSON L. ANDERSON, Ph.D., University of Utah, Professor of Geophysics

Orson taught "Mineral Physics," "Physics of the Earth," and "Siting a Coal-fired Powerplant in California" (in Environmental Science and Engineering) this past year while continuing research on stress corrosion effects in geophysics, electrical conductivity in the earth, and sound velocities in compounds at very high pressure. His group is also working on coal reserves in the upper Colorado River basin, Utah; and they made many trips into that area during the year.

He attended a conference on physical properties in Liblice, Czechoslovakia in May and the IUGS Congress in Sydney, Australia, in September of 1976. Orson is the Chairman, Working Group 5, Interunion-Geodynamics Commission; is a member of the University of California Energy Council and the Lawrence Livermore Laboratory and Los Alamos Scientific Laboratory Review Committee for the University of California.

Dr. Yoshida Sato, graduate of the University of Tokyo and former student of Dr. S. Akimoto, will join Orson's Mineral Physics Laboratory as a post-doctoral fellow in April of 1977. Dr. S. Akimoto will spend two weeks visiting the laboratory in May of 1977. H. Demarest, a former student, has become a Research Associate at the University of Chicago; and R. Liebermann has been appointed Associate Professor at SUNY, Stony Brook.

G. PETER BIRD, Ph.D., Massachusetts Institute of Technology, Assistant Professor of Geophysics and Geology

Peter joined the Department in the fall of 1976. He received his Bachelor's degree from Harvard in Geology, where he developed an interest in large-scale structures. He went to study geophysics at M.I.T., "in hopes of learning what mechanisms and forces created the geology we see, especially mountains."

In the fall of 1976 Peter taught the "Introductory Oceanography" course to 190 students. During the winter he introduced a new course, "Stress in the Lithosphere," and in the spring he shared "Plate Tectonics" with Gary Ernst.

Peter's research involves modeling of tectonic deformation in Southern California, the Tonga Trench, and the Himalayas. He uses finite-element modeling to reproduce seismicity patterns and learn about stresses. He is also beginning a lab project to find the coefficient of friction in the San Andreas Fault Gouge. His paper, "Strong attenuation of Rayleigh Waves in Tibet," which appeared in Nature, v. 266, argues that the whole plateau is lying over a layer of molten crust, supporting the idea that high Tibet is a "pressure gouge" for all of Asia.

Peter attended his first western A.G.U. meeting in San Francisco, where he went to "meet people, talk about mountain-building, and try out the cablecars;" and he went to Stanford and U.C. Santa Cruz to give seminars on the continental collision in Iran.

Peter and his wife, Jean Campbell, enjoy tennis and hiking when "the sun is out, and indoor ping-pong when it's not. Keeping our old Subaru running was another amusing pastime."

FRIEDRICH H. BUSSE, Dr. rer. nat., University of Munich, Professor of Geophysical Fluid Dynamics.

Fritz spent the period from September 1975 to March 1976 on sabbatical leave at the University of Karlsruhe, Germany, where he taught a course on "Geophysical Fluid Dynamics" and interacted with Drs. W. Zürm and G. Müller on problems of the earth's core. He also gave numerous lectures at other German universities and "found it actually harder to lecture in my mother tongue than in English."

His research continues to progress in three main areas: (1) dynamic theory directed toward the explanation of the origin of the earth's magnetic field; (2) dynamics of rotating systems with experimental and theoretical investigation of convection in the earth's core and in planets; and (3) transition to turbulence in thermal convection, with experimental and theoretical research (in cooperation with post-doctoral fellow Richard Clever) devoted to the understanding of transitions from one convection pattern to another.

He gave an invited review lecture on planetary magnetism at the IAGA Assembly in Grenoble in September of 1975 and was a member of the organizing committee for the IAU Colloquium on Stellar Convection in Nice (August 1976) where he also gave a review lecture.

Among his students, Charles R. Carrigan is about to finish his Ph.D. thesis on buoyancy-driven flows in rotating spherical shells; Lonnie Hood has been involved in measuring the differential rotation generated by convection in a cylindrical annulus, and Pham Cuong collaborated with Fritz in solving the problem of convection in rapidly rotating spherical shells.

DONALD CARLISLE, Ph.D., University of Wisconsin, Professor of Geology and Mineral Resources

In addition to teaching the basic course and the seminar in mineral deposits for majors and "Earth Science and Society (Mineral Resources)" for nonmajors and his participation in the Geology 111 field sequence, two activities have taken up much of Don's attention:

The first has been helping to organize the new program in "Nonrenewable Natural Resources" leading to the Master of Science Degree in Earth and Space Sciences. Eight faculty members (Anderson, Carlisle, Jackson, Kaplan, S. Kieffer, McPherron, Reed, and Watson) are directly involved. Some 20 courses are listed as particularly relevant to the program, including new courses in coal, geothermics, electromagnetic techniques in geophysical exploration, a field course to accompany the course in seismic, magnetic, and gravity techniques, another in resource evaluation field methods, a course in the elements of mining and recovery methods for the geologist, and a seminar in resource analysis. Requirements for entry in the program and for completion of the degree are the same as those for graduate study and for the Master of Science degree in the Department. Three of the new courses are scheduled and others will be introduced as soon as possible.

Don's second activity has been an intensive study of calcrete/gypcrete uranium, a new kind of uranium occurrence in Yeelirrie, Western Australia, and Swo-kupmund in South West Africa, which may or may not have analogues in the Americas. He spent much of August, September, and part of October examining the first viable ore body of this type, submarginal occurrences in arid Western Australia, and still others occurrences in South West Africa (Namibia), "at least one of which will be an ore body if the political situation permits. These are unusual deposits in that the host is something akin to caliche; they are large and essentially at the surface."

Don's schedule permitted him to attend the International Geological Congress in Sydney and to visit several other kinds of deposits and obtain ore suites for departmental collections. He writes "CSIRO people in Perth--and for that matter everyone along the way--were most hospitable and helpful. Namibia (which literally means 'nothing place') and Tsumeb are remarkable places. Namibia is the locale for the new huge Rössing porphyry uranium mine; Tsumeb is a cool desert bathed in fog nightly, has the largest sand dunes in the world, H₂S explosions from near-shore muds, calcretes and gypcretes tens of meters thick, a thousand-year-old plant (*Welwitschia mirabilis*), and a fauna and people, including Europeans, that are absolutely amazing. Paul Merifield, Tony Orme (Geography), and Ray Lunt (Soils--Nuclear Medicine) are working on our stateside efforts in this program, which is funded by ERDA."

*Mineralogists: Rubies are red,
Azurite blue,
Body centered's preferred
But close packing will do*

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

John's research has been in experimental deformation of quartz (with Steve Kirby, Ph.D., 1976, of the USGS Menlo Park, and John McCormick); in etching of defect structures (with Mary Wegner); and in studies of microstructures in lunar rocks with scientists at the U.S. Steel Research Labs in Pennsylvania and at Case Western Reserve University. John and Alan Ardell (Materials Science, UCLA) have just received NSF funding to purchase a new transmission electron microscope for UCLA. John was coeditor of a book, Electron Microscopy in Mineralogy (Springer-Verlag, 1976).

He taught "Structural Geology" in the fall, "Structural Petrology of Deformed Rocks" in the winter, and the newly devised "Rheology of the Crust and Mantle" (which he shared with Gerry Schubert) and field geology during the spring of 1976.

John attended annual meetings of the Electron Microscopy Society of America in Las Vegas in August; the First Chemical Congress of the North American Continent, November 30 to December 5, in Mexico City; presented a paper on "Shock-induced glass formation in lunar rocks and minerals" at the Symposium on Electron Optical Methods for Characterizing Opal and Other Minerals; presented an invited lecture at the quarterly meeting of the Southern California Society for Electron Microscopy in February on "Transmission electron microscopy of the Lunar rocks," and attended the Seventh Lunar Science Conference in Houston.

PAUL J. COLEMAN, Ph.D., University of California, Los Angeles, Professor of Geophysics and Space Physics

Paul is the head of a team of UCLA space scientists participating in the International Magnetospheric Study (IMS), a three-year scientific effort that has mobilized researchers from 50 nations to study the magnetic envelope surrounding the earth. Two six-pound magnetometers, designed by UCLA research geophysicist Chris Russell, were launched riding piggyback on a single vehicle from Kennedy Space Center Explorer Satellites in October. These satellites will measure fluctuations in the magnetosphere due to solar wind.

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

Wayne is hiding in Room 3642, trying to rediscover research, so we've been postponed until next year on his news (he said that the editors of this Newsletter were "just like bill collectors").

He taught Geology 51A-51B (the mineralogy/petrology sequence) and "some advanced courses and seminars in crystal chemistry and x-ray crystallography." His research involves crystal structure analysis, Mössbauer spectroscopy of pyroxenes, single-crystal Mössbauer spectroscopy, optimum interatomic-distance modeling of crystal structures, and crystal defects.

Wayne's student, Glen A. Waychunas is nearing completion of a Ph.D. dissertation involving structural and chemical characterization of solid solutions in the system $\text{Fe}_{1-x}\text{O}-\text{MgO}-\text{Li}_{1-x}\text{Fe}_{1-x}\text{O}_2-\text{Li}_2\text{TiO}_3$. Glen's emphasis is on understanding the nature

of local ionic interactions between ions of dissimilar valence but similar crystallographic positions. In addition he is working on nonstoichiometry in NaCl-structure oxides; clustering and ordering in solid solutions; and computer modeling of defect structures. Glen gave talks at Corning Glass Works in Corning, New York, and at the Geophysical Laboratories of the Carnegie Institution of Washington, D. C.

W. GARY ERNST, Ph.D., Johns Hopkins University, Professor of Geology and Geophysics

Gary was on sabbatical leave during the past year, spending ten months at the Eidgenössische Technische Hochschule (ETH) in Zürich. Support for his sabbatical came from UCLA and from the Guggenheim Memorial Foundation. His studies involved limited field work, but chiefly electron microanalysis of coexisting minerals from western Alpine eclogites and peridotites. He taught two short courses at the ETH, one on elementary thermodynamics for petrologists, the other dealing with circumpacific plate tectonics. In addition he gave thirteen lectures "harranguing unwary earth scientists" at the University of Genoa, the Swiss Metamorphic Colloquium, Zürich, the Universities of Torino (2) and Geneva (2), Bern University, the ETH, and the Universities of Torino (2) and Geneva (2).

After returning to UCLA at the end of June, "where five Ph.D. theses were waiting for me in various stages of disarray," Gary went back again to Europe in September to give principal addresses to the German and Italian Mineralogical Societies (Braunschweig and Genoa, respectively); the three-week trip also included field excursions to the western Alps, culminating in a day on the flanks of the Matterhorn. "It was fantastic, but a little depressing to realize that it only takes a day to go from Chervinia to Los Angeles."

Five of Gary's Ph.D. students finished up this past year: Phelps Freeborn, Skip Stoddard, Terry Kato, Frank Spear, and Tony Finnerty.

Gary's new W. H. Freeman textbook, Petrologic Phase Equilibria, appeared in the fall, and Gary and Clarence Hall published a paper in the American Mineralogist dealing with geodes in San Luis Obispo County. He has six papers in press or in the editorial mill.

C. THOMAS FOSTER, Ph.D., Johns Hopkins University, Acting Assistant Professor of Geology

Tom spent much of the last year developing and testing thermodynamic models to explain diffusion controlled processes in pelitic schists. He presented a paper on "Diffusion controlled growth of sillimanite segregations" at the Geological Society of America meetings in Denver and also submitted a manuscript describing mass transfer in pelitic schists near Rangeley, Maine, to the American Mineralogist during the summer. Tom taught several quarters of Geology 1, a seminar in irreversible thermodynamics and metamorphic rocks, and summer field in the "glorious Poleta Folds" with Clem Nelson and Johnnie Moore.

CLARENCE A. HALL, JR., Ph.D., Stanford University, Professor of Geology and Paleobiology and Chairman, Department of Earth and Space Sciences

Clarence has been working on various aspects of the merger of the Department of Geophysics and Space Physics and the Department of Geology, but he found time to continue with his research in the central California Coast Ranges. He has recently been mapping in the Santa Maria area and is currently trying to convince all of us that the Lompoc - Santa Maria Tertiary basin is a pull apart structure and that an understanding of the onshore geology will provide a means for interpreting the borderland and the development of Tertiary basins along California's tectonically active coast. Clarence's work on the San Simeon - Hosgri fault and proposed 80 km late Tertiary offset generated considerable interest during the year, and he was busy with press and TV interviews for a while.

This academic year the Department has instituted a new field course for entering graduate students, and Clarence is introducing the glories of Tick Canyon to the uninitiated. He also continues to teach the popular "Natural History of Southern California" course during the spring. There are commonly 60 to 70 students who would like to take this course each spring, but there is space and funding only for 17 to 25 each quarter.

Clarence's publications during the last year were: "Latitudinal variation in shell growth patterns of bivalve molluscs: implications and problems," in Growth Rhythms and the History of the Earth's Rotation, G. D. Rosenberg and S. K. Runcorn, Eds; "Geologic map of the Cayucos - San Luis Obispo region," U. S. Geol. Survey Misc. Field Studies Map MF 686, 1:24,000; "San Simeon - Hosgri fault system, coastal California: economic and environmental implications," Science; "Feldspathic geodes near Black Mountain western San Luis Obispo County, California," American Mineralogist (with W. G. Ernst); and "Geologic map of the San Simeon - Piedras Blancas region, San Luis Obispo County, California," U. S. Geological Survey Misc. Field Studies Map, MF 784, 1:24,000.

ROBERT HOLZER, Ph.D., University of California, Berkeley. Professor Emeritus of Geophysics

After serving his last year of regular service before retirement as Dean of Physical Sciences, Bob returned to the particles and fields problems that have so long interested him. He is spending a good share of his time in a magnetospheric physics problem studying the development of waves in the magnetosphere associated with substorm activity. In the first phase of this work, he is studying the erosion and recovery of the sunward portion of the magnetosphere as manifested in motion of the magnetopause during substorm activity. Data on solar wind activity "upwind" from the Earth's bow shock is taken from a number of satellites. A graduate student, James Slavin, is working with him on these problems.

DAVID D. JACKSON, Ph.D. Massachusetts Institute of Technology, Associate Professor of Geophysics

David writes, "As a former GASP'er [Department of Geophysics and Space Physics], I feel strongly involved in the merger because of my interests in solid

earth geophysics and the application of geophysical techniques to geological problems." As a manifestation of this interest, a large fraction of Dave's time is currently spent in planning and trying to implement some courses in applied geophysics for undergraduates. One such course was "Geophysical Exploration," a lecture course. This course was made a requirement for a large number of students for the first time this year, and "it proved to be a memorable occasion for all of us."

Other courses Dave taught included a field course in applied geophysics, a lower-division course in earthquakes, a graduate course in geophysical data analysis and inverse problems, a graduate seminar in time-series analysis, and a seminar in seismology and the earth's interior.

Dave's research has been divided into two general categories, inverse problems and earthquake predictions. "By inverse problems, I mean determining unknown parameters from a set of data, with a description of the existence and imagined properties of the solution. Specific problems have included the determination of density variations in the earth from gravity data, determinations of the anelastic properties of the asthenosphere from quasi-static displacements following earthquakes, and determination of anelastic properties of the mantle from the attenuations of seismic waves." His earthquake prediction research has included a search for velocity variations using arrival times from local earthquakes, and a search for variations in magnetic susceptibility using data from a USGS magnetometer array in central California. In addition, he has just been awarded a contract from the USGS to establish a magnetic array in the "Palmdale Bulge" region to look for earthquake precursors closer to home. He adds, "If you don't hear from me at this time next year, don't worry, it's only a coincidence...."

In addition to serving on various Ph.D. committees "and giving most of the candidates a rough time," Dave is chairman of the new Earth and Space Sciences subcommittees on curricular matters relating to seismology and solid earth geophysics. He also accepted an appointment on the U.S. Committee on Seismology which is run through the National Research Council and National Academy of Sciences and which makes policy recommendations concerning new directions in seismological research.

Dave's wife, Kathy, is currently finishing a Ph.D. thesis in English and American literature; and Dave and Kathy have a one-year-old daughter, Kelly, "who has not yet begun her thesis." Dave makes "some attempt to share the child-care duties, but would never claim to share them evenly. Together we are all pretty happy and cozy, which is more-or-less how I hope we will be remembered."

BRADFORD K. JOHNSON, Ph.D., University of California, Los Angeles,
Lecturer in Geology

Brad taught the "Petroleum Geology" course during the Spring Quarter of 1976. "It had been more than twenty years since I was on campus regularly, and I found the return pleasantly nostalgic and stimulating. The course proved to be successful, I believe, and is offered again in 1977 during the winter and fall quarters."

Brad's regular fulltime work continued to be that of Chief Geologist with McCulloch Oil Corporation in Westwood. "Our aim in the Exploration Department

at McCulloch is to find oil and gas by drilling exploration wells using our collective geologic and geophysical talents. As of this writing, these talents have yielded only dry holes for several months running. And that's why most of us in petroleum geology are eternal optimists."

ROBERT E. JONES, B.S., California State University, San Diego. Lecturer in Geology

Bob taught Geology 297, "Advanced Techniques in Geologic Research," during the fall and winter quarters, but spent most of the year in tangling with the new on-line computer system he added to the microprobe in January of 1976 and in upgrading "our 1964 vintage instrument." Bob and Gary Ernst submitted a proposal and a statement of intended projects from all potential users in Geology and Geochemistry and other departments on campus to the National Science Foundation, and after six months of reviews and resubmittal, the NSF granted funds for equipment in July of 1975. Bob writes, "the first step was to decide what system would best fit our needs and budget. We considered two basic systems: (1) automation for our existing wavelength dispersive spectrometers (WDS) and data gathering devices; and (2) a new energy dispersive system (EDS). We received quotes from over a half dozen manufacturers during 1974 and 1975 and finally decided on both systems from one company who gave us a very reasonable price."

The energy dispersive system includes a liquid-nitrogen-cooled detector, all the detector electronics, and a multi-channel analyzer. The computer is shared by both the WDS and EDS systems to help keep the cost down. The wave dispersive spectrometer automation includes the computer, spectrometer drive, and readout electronics, drive motors, and a teletype output device.

By the end of the first week in January 1976, installation of all the hardware was complete. Bob spent the first three months learning how to use the programs supplied by the manufacturer and getting "bugs" out of the systems, but progress came to a halt during the spring quarter of 1976 while the regular microprobe class was in session. "Those students certainly learned new but highly disorganized techniques."

"More specific programs than those supplied by the manufacturer needed to be developed. One graduate student in particular needs special thanks: Frank Spear took time out from his thesis writing to help during the summer of 1976. My most recent efforts (interrupted by a more organized Fall 1976 microprobe class) have been to get both EDS and WDS systems to work simultaneously.

"Highlight of the new capabilities are as follows: standardization for quantitative analysis with the WDS is the slowest step, often taking over an hour for nine or ten elements. However a complete analysis is possible at a single point for nine to ten elements and includes data reduction and printout of weight percents. The total time for the analysis is typically four to five minutes. With the EDS, qualitative identification of every element from Na to higher atomic numbers can be done in only ten seconds. Quantitative analysis with the EDS has also been successful."

Bob coauthored a paper, "The San Juan Capistrano Meteorite," Meteoritics, vol. 10, with R. C. Finkel and K. Marti.

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

Ian taught "Introduction to Oceanography," "Marine Geology," and "Isotope Geochemistry." "Introduction to Oceanography" is drawing nearly 250 students per quarter.

His group is involved primarily in marine geochemistry and is undertaking several projects. These are processes occurring in the water column, diagenesis in sediments, and the origin of petroleum by simulated maturation studies of organic-rich sediment. In addition, studies of lunar material are continuing. Research support for their work has been received from NASA, NOAA, NSF, BLM, ERDA, and the USGS, including substantially large awards for studying the fate and distribution of hydrocarbons in the outer continental shelf. Funds received have permitted them to purchase additional equipment, including a computerized gas chromatograph-mass spectrometer.

Publications during the year include: "Isotopic fractionation of dissolved nitrate during denitrification in the eastern tropical North Pacific Ocean," Marine Chemistry, vol. 1 (with J. D. Cline); "Evidence for meteoritic sulfur in the lunar regolith," Proc. 6th Lunar Sci. Conf. (with J. F. Kerridge and C. Petrowski); "Sulfur and carbon isotopic evidence for biogeochemical processes in the Dead Sea ecosystem," Proc. 2nd International Symposium on Environmental Biogeochemistry, vol. 1: Carbon, Nitrogen, Phosphorus, Sulfur and Selenium Cycles (J. O. Nriagu, Ed.), Ann Arbor Sciences Publishers, Inc. (with A. Nissenbaum); "Micro-determination of C, N, S, H, He, metallic Fe, $\delta^{13}\text{C}$, $\delta^{15}\text{N}$, and $\delta^{34}\text{S}$ in geologic samples," Geochem. Jour., vol. 10 (with H. Sakai, J. W. Smith, and C. Petrowski); and "Thermal alteration of young kerogen in relation to petroleum genesis," Nature, vol. 264 (with R. Ishiwatari, M. Ishiwatari, and B. G. Rohrback).

Members of Ian's research group traveled quite widely during the year: to Walvis Bay in South West Africa, the Arctic Ocean, and the Gulf of Alaska. Ian traveled to Sweden, Germany, and New Zealand to attend conferences. Ian also gave several guest lectures throughout the U.S. and this year is serving as Chairman of the Organic Geochemical Division of the Geochemical Society.

Some ten graduate students and eight research associates and post-doctoral fellows are involved in the various projects, and the lab has a distinctly international flavor this year with members of the group from Israel, Norway, India, and Taiwan. The laboratory also had numerous visitors, including scientists from Europe, Australia, New Zealand, Japan, and Israel, enabling them to have a large number of stimulating informal seminars.

Ian's family and several students rented a motorized raft and spent three days on the Colorado River floating through the lower reaches of the Grand Canyon, "a wonderful experience for everybody."

WILLIAM M. KAULA, D.Sc., Ohio State University, Professor of Geophysics

Bill continued research on the dynamics of solar system origin and evolution, on thermal and tectonic evolution of the moon and planets, anelastic deformation

and convection in the earth, analysis and interpretation of the earth's gravity field, and on lunar altimetry and photo analysis. In addition he taught the "Introduction to Geophysics and Space Physics," "Physics and Chemistry of the Planet Interiors (with Orson Anderson), "Origin and Evolution of the Solar System" (with John Wasson and M. Jura), and the freshman seminar, "Origin and Evolution of the Solar System."

"The seven ages of a planet" and "Comments on the origin of Mercury" appeared in Icarus, vols. 26 and 28, respectively.

Bill attended the IUGG in Grenoble in August of 1975 as well as a large number of symposia, meetings, etc., within the USA, and he gave invited seminars at the University of California, Santa Barbara, the University of Chicago, and Ohio State University. He received an honorary Doctor of Science degree from Ohio State University in November of 1975, and is a member of many working groups and committees.

Bill currently has students in a number of fields working under his direction: John D. O'Keefe (thermo- and hydrodynamics of impacts), Paul Weissman (comet orbits), Michael Koblrick (tidal effects on proto solar nebula), Gary Ransford (initial thermal state of the Moon), Steve Croft (cratering), Robert Abelson (mantle convection), and Glen Stewart (planetesimal dynamics).

HUGH KIEFFER, Ph.D., California Institute of Technology, Associate Professor of Planetary Physics

Hugh's research interests have centered about laboratory studies and spacecraft observations. In his lab at UCLA there is a continuing program of measuring the spectral reflectances of materials, particularly frosts, which are possible candidates for the clouds and surfaces of planets and satellites. Samples are grown under the appropriate low temperature, low pressure conditions and then spectra obtained without disturbing the samples. Special photographic techniques are used to take pictures of the frost crystals at low temperatures. One of Hugh's graduate students, Larry Pleskot, is working on determining the way in which light reflected from frosts of geologic soils varies with viewing direction. Hugh feels one of the most notable problems in planetary astronomy is a brightening of Saturn's Rings near opposition, for which knowledge of the scattering behavior of rough surfaces would be very helpful. Another problem which interests him is trying to form carbonates without an aqueous solution. This is particularly relevant to the geochemistry of the Martian surface and the peculiar results reported by the Viking Lander.

Hugh's efforts for the past several years have been largely associated with the Viking Project. "When the planetary observations of Mars started in June, life became very hectic and pretty much stayed that way through the end of the Viking nominal mission in mid-November. The thermal mapping instrument worked very well and has returned a large amount of data, a good fraction of which still has the Science Team baffled. At the peak of the mission the Science Team for the experiment involved a dozen people with an enormous supporting cast of engineers and mission planning specialists. Postdoctoral Research Fellow Terry Martin and two undergraduates, Bruce Jakowsky and Phil Christensen, contributed mightily to the Viking effort. My wife perceived in advance what life would be like during the Viking operations, so she and our son left on their own field trip immediately after

the spacecraft arrived at Mars (Sue adds: the leave was not permanent!). The spacecraft are still operating, and we expect observations of Mars to continue for another year or two. The Viking Project has been quite an experience, and I have enjoyed working with a large number of scientists and very capable managers. It has, however, left me with a renewed desire to 'get my hands dirty' working a little more directly with geophysical problems than is possible when there are tons of documents, hundreds of people, dozens of computers, and hundreds of millions of miles between oneself and the object of all this effort."

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

I have had an interesting and hectic year, highlighted by good field trips to Europe, Mexico, and Wyoming. The European trip was to collect samples of suevite ejecta from the Ries Crater in Bavaria for my studies of high-pressure shock processes, particularly on the role of volatiles in the impact process. I couldn't let my first trip to Europe pass without a look at the Alps, and so I climbed the Jungfrau on a beautifully clear Alpine day. Sunrise over the Grosser Aletschgletscher illuminating the summit of the Jungfrau is a memorable sight. The trip to Mexico was for reconnaissance field geology of a prospective geothermal area at Los Humeros Caldera. During the summer I spent six weeks in Yellowstone National Park filming geyser eruptions to obtain data against which to test a model for eruption hydrodynamics. Two undergraduates, Steve Ihnen and Chuck Lehotsky, are helping me analyze the films. Chuck is planning to spend a month in Yellowstone next summer (after summer field camp) obtaining more data. I am considering geysers as volcanic analogues and have hopes that this work will lead to a new model for fluid flow during volcanic eruptions.

I taught "Introductory Geology;" "Field Geology" at Tick Canyon with Hall, Reed, and Merifield; "Thermodynamics of Crystals;" and "Astrogeology" last year. During the spring quarter this year I'm teaching a new upper division course in "Geothermics" which is part of our new Natural Nonrenewable Resources Program. My students have been "shocking": Rand Schaal completed a Master's thesis on shock metamorphism of basalt from Lunar Crater, India; and Peter Juda is currently working on oblique shock experiments, jointly with Tom Ahrens of Caltech and myself. The transmission electron microscope study of high-pressure phases in naturally shocked Coconino Sandstone from Meteor Crater, Arizona, that John Christie, Prem Phakey and I did, was published in Contr. Min. Pet. before Christmas. I've been appointed to the Lunar Sample Analysis Planning Team (LSAPT) and so spend a few weekends each year in Houston. I've been dabbling in far infrared spectroscopy to obtain some data that I need for a thermodynamics model for minerals, a model that has been evolving for six or seven years--a leisurely pace; why rush now?

MARGARET G. KIVELSON, Ph.D., Harvard University, Associate Professor
of Space Physics in Residence

Margaret taught "Electrodynamics" in the winter quarter. In the spring quarter, she organized a seminar on "Magnetic Merging," in which participants examined the theoretical and experimental pictures of the processes associated with plasma flows near a magnetic field null-point and discussed the importance of the process in the laboratory, the magnetosphere, and elsewhere.

She studies the dynamics of charged particles and fields in space, particularly in the magnetospheres of the Earth and Jupiter. This year her group has developed new ways of analyzing waves whose wavelengths are of the order of an Earth's radius or more by using indirect evidence from the properties of relativistic charged particles that interact with the wave. They are studying the structure of the Jovian magnetosphere to learn how it differs from the Earth's.

Last fall she attended the meeting of the International Union of Geodesy and Geophysics at Grenoble, France, and the meeting of the International Union of Radio Science and gave invited talks on waves in the magnetosphere at both of them. During the summer she gave an invited talk on Jupiter's distant environment at the American Geophysical Union International Symposium on Solar Terrestrial Physics in Boulder, Colorado. "Just for fun I visited Afghanistan following the meeting and startled colleagues by telling them I'd call them when I returned from Afghanistan." Margaret is scheduled to present a departmental colloquium on Jupiter for the Physics Department, Imperial College, London, in December.

During the past two years she has served as the Chairman of the Chancellor's Advisory Committee on the Status of Women and on the Committee on Women's Studies of the College of Letters and Science. She is President-elect of the Association of Academic Women, the Treasurer of the UCLA Chapter of Sigma Xi, and is involved in running a Careers Day for Women in Science under NSF auspices, scheduled to take place on November 6.

Among her students, Howard Singer is working on long period (1-10 minute) waves, using both field and particle data to establish their properties fully and to determine generating mechanisms; Stan Kaye is studying waves near 1 Hz, and studying proton dynamics to understand generation mechanisms for these waves; and Lucien Froidevaux is investigating the current sheet in the Jovian magnetosphere.

She writes that David Southwood of Imperial College, London, visited for a month during the summer and worked closely with all those interested in wave-period interactions in space plasma.

RICHARD E. LINGENFELTER, B.A., University of California, Los Angeles,
Professor of Astrophysics, Geophysics, and History in Residence

Over the last two years, Dick has taught a variety of courses: "Introduction to Geophysics and Space Science," "Planetology Seminar," "The Nature of the Universe," "The Solar System," "Cosmic Ray Physics," "History of the American West," and a Freshman Seminar, "Wasting the West" (an environmental history of the West).

He is working on planetary surface processes as applied to crater modification, looking primarily at changes in rim-height/depth ratio. These seem to reflect evolutionary processes, "making a sort of a Hertzsprung-Russell diagram for crater evolution." He is also working on a variety of gamma-ray astronomy problems, a theory to explain gamma-ray and charged-particle emissions from solar flares.

*Geophysicists: When liquids confront them,
S-waves start slowing
With you, I'm a P-wave.
I keep right on going.*

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

Al's research and teaching have both concerned the microfossils. He taught a course in "Paleobiology of Plant Microfossils" and helped Helen Loeblich by teaching the laboratory for the "Micropaleontology" course while she was still serving as Graduate Advisor.

Post-doctoral Fellow E. Reed Wicander spent two years working with Al under an American Chemical Society grant, with the result that two large papers were completed on the Devonian microplankton. Reed is now teaching at Central Michigan University. Al continued his work on some Ordovician microplankton and has nearly completed a paper on this material (jointly with Helen Tappan Loeblich). He is currently directing graduate student theses on Ordovician microplankton and Cretaceous dinoflagellates. He has recently returned to a study of the Foraminiferida, presently working on some Late Cenozoic benthic forams from the Gulf of Mexico. Some of his publications since the last Newsletter include: "Some new and revised organic-walled phytoplankton microfossil genera," J. Paleontology (with Helen Tappan) and "Organic-walled microplankton from the Lower Devonian Late Gedinnian Haragan and Boid d'Arc Formations of Oklahoma, U.S.A.," Palaeontographica, B. (with E. R. Wicander).

Al has continued to serve on the Editorial Board for Micropaleontology and as an Honorary Collaborator of the Revista Espanola Micropaleontologia, and he is a member of the Information Handling Panel for the Deep-Sea Drilling Program and the Algal Committee of the International Association for Plant Taxonomy.

HELEN TAPPAN LOEBLICH, Ph.D., University of Chicago, Professor of Paleontology and Geology

Helen spent her last quarter as Graduate Advisor during the fall of 1975, "a job that was time-consuming yet interesting, as there are all too few opportunities to become well acquainted with all the graduate students in view of their many and varied interests."

Since the last Newsletter she has taught the "Earth History" course each year, the "Micropaleontology" course (animal protists in particular) during the fall of 1975, and the introductory "Principles of Paleontology" in the spring quarter of 1975. She is currently directing graduate students whose theses or dissertations involve dinoflagellates and foraminifera.

Having attended the First International Symposium on Benthonic Foraminifera of the Continental Margins at Halifax, Nova Scotia, in August 1975 as a Keynote Speaker, she was asked to edit some of the foreign contributions prior to their publication. Her own contribution on "Systematics and the species concept in benthonic foraminiferal taxonomy," appeared as part of the Proceedings, Special Publication 1 of Maritime Sediments, Part A. Other publications include "Possible eucaryotic algae (Bangiophyceae) among early Proterozoic microfossils," Geological Society of America Bull., vol. 87 (in which Eosphæra was compared to the unicellular red alga Porphyridium); and, jointly with Al Loeblich "Some new and revised organic-walled phytoplankton microfossil genera," Journal of Paleontology, vol. 50. She

also completed the compilation and editing of the Geology Department 1975 Newsletter, the ninth and last of these to appear, as "this and future Newsletters will be from the newly enlarged Department of Earth and Space Sciences and will be compiled by Sue Kieffer--to whom I gladly and gratefully relinquish the duties."

As Councilor for Paleontology for the Society of Economic Paleontologists and Mineralogists, she attended SEPM council meetings held both at the SEPM annual meetings and at the GSA-PS annual meetings in Salt Lake City (1975), Denver (1976), and New Orleans (1976), the latter celebrating the 50th anniversary of the SEPM (for which she designed the 50th Anniversary Commemorative Stamp, which was also reproduced on the souvenir doubloons "coined" by SEPM. She was one of the six speakers at the special SEPM 50th Anniversary Symposium held during the GSA meetings in Denver, talking on "Fifty years of progress in micropaleontology," which she says is "a lot to cover in 30 minutes!"

She gave invited lectures this fall at U.C. Riverside and Pomona College on "The effects of microplankton on the oceanic ecosystems through geologic time," and is continuing as West Coast Correspondent for Micropaleontology, on the Editorial Board for Palaeogeography, Palaeoclimatology, Palaeoecology, and as Honorary Collaborator for the Revista Espanola Paleontologia.

"After relinquishing my duties as Graduate Advisor, I have been able to get back to research a little more, and in particular to the micropaleo text that has been in progress for about ten years. I hope to have the volume on the Paleobiology of the Plant Protists at the publisher very shortly now. Like Topsy, it seems to continue to grow, as the field has expanded so rapidly, but nothing later than 1976 is going to be included or it would never be finished."

ROBERT L. McPHERRON, Ph.D., University of California, Berkeley, Associate Professor of Space Physics and Geophysics

Bob is on sabbatical leave this year, but a UCLA team consisting of Bob, graduate student Robert Clauer, and project engineer Robert C. Snare is now preparing to establish, by June, geomagnetic observations at Wake Island, Midway Island, Tahiti, and Eusebio on Brazil's Atlantic Coast. UCLA will be responsible for the coordination of the stations and for the later analysis of scientific data. These observations will monitor the time, location, and strength of disturbances in the magnetosphere.

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

Paul's family spent the summer touring California's Highway 1, Napa Valley, and the Mother Lode along Highway 49 in a rented motor home: "We are particularly impressed with Point Lobos, south of Carmel, a must for anyone traveling in that area."

In January he completed a two and one-half year study of Skylab and Landsat imagery of Southern California under contracts with NASA and the U.S. Geological Survey. Results of these studies, including the discovery of several new faults in the Peninsular Ranges of San Diego County and a new technique for distinguishing soil and rock types in desert terrain, were published in several papers and presented at

the NASA Earth Resources Symposium, annual meeting of the American Geophysical Union, Cordilleran Section of the Geological Society of America, the Tenth Symposium on Remote Sensing of the Environment, and an image processing symposium in Sweden. He also gave talks to the Association of Engineering Geologists, the Association of Federal Appraisers, and the California State University, Long Beach.

He continued as Graduate Advisor for the Environmental Science and Engineering Program and helped teach the problems courses dealing with Southern California offshore oil development and water-quality monitoring in the Inyo National Forest. The 34 lakes and streams they sampled led him on a number of Sierra trails he had not hiked before: "If you are seeking a challenging one-day hike, try the one up appropriately named Bloody Canyon to Upper Sardine Lake, just south of Lee Vining."

During the current academic year he will be working on a contract from the Office of Earthquake Studies, U.S. Geological Survey, monitoring water levels in wells on the Palmdale Bulge "as a possible precursor to the Big Quake(?)" a contract from ERDA/Bendiz to determine the uranium favorability of calcretes in the southwestern U.S. (with Don Carlisle), and power plant siting problems under contract to the California Energy Commission. He is also serving on a NASA Earth Resources Panel and the Los Angeles County Engineering Geology Board.

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

Clem taught "Introductory Geology" in the winter quarter 1976 and, while on sabbatical-in-residence during the spring, taught a freshman seminar field course on the "Geology of California." He participated in the first half of the Summer Field Course in the Sierra-White-Inyo Mountain area with Johnnie Moore and Tom Foster.

In August he departed for Australia and the International Geological Congress, including a field excursion to the Flinders Ranges of South Australia searching for the elusive Precambrian-Cambrian boundary. As soon as he gave a paper on that boundary here in California, he departed for points eastward, including Samoa, Tahiti, Bora Bora, Cuzco, and Machu Picchu. While in Bora Bora, "the loveliest place on Earth, I managed to investigate the barrier reefs to see if Darwin was right. He was."

"While I don't expect anyone to believe it, assuming that anyone cares, it is a relief to say that the Papoose Flat manuscript, with Sylvester, Oertel, and Christie, has been submitted."

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

Gerhard taught "Structural Geology" and "Introductory Geology" and continued his research on preferred orientation of platy minerals as a measure of strain and on his investigation of folds, metamorphic suites, and sedimentary suites.

He took a trip to the Vintah basin, Utah, during the summer of 1976, and was visited by Douglas Rumble III (now at the Geophysical Laboratories, Washington, D.C.) who came to work with Gerhard on problems of preferred orientation of mica and chlorite in phyllites and schists of New England.

His student, Steve Lipshie, wrote a 184-page Geological Guidebook to the Long Valley - Mono Craters Region of Eastern California and led the Geological Society of UCLA field trip to that region during the fall of 1976. Steve also published (with Gerhard and John Christie) "Measurement of preferred orientation of phyllosilicates in schists," Tectonophysics, vol. 34, while working on his thesis "Limits of Use of Preferred Orientation as a Measure of Strain in Metamorphic Rocks." Nurit Hildebrand is studying the strain around the termination of a fault.

In his spare time, Gerhard reads, "with the effect that I sometimes know this or that (outside geology)," and he likes to go to committee meetings, "provided it is a committee of one, meeting in my office."

WILLIS PARKISON POPENOE, Ph.D., University of California, Los Angeles, Invertebrate Professor of Emeritus Paleontology

Parky is continuing his work on the Turonian gastropods of the Pacific Coast; "the hottest line at the present is a comprehensive study of a couple of Aporrhaid genera which have been called the single genus Pugnellus; but which ain't. This in turn has led to a consideration of what is the genus Pugnellus--which has been heretofore with tiresome reiteration considered a relative of Strombus--but ain't. As things now stand, this has led to a reexamination of what are the distinctive characters of the Family Aporrhaidae. That's the immediate problem." He adds that he is "pushing on publication of the joint job with Bob Kleinpell," and is happy to relate that "the Forces of Darkness are yielding gradually before our joint attack."

He made two trips to Redding, one in May, one in October, and "picked up a few interesting but hardly exciting things." He also "made my usual social trip East to visit friends and relatives, especially my son Willis at Lexington, Kentucky."

Parky writes that most of his community service "consisted in trying to keep my front lawn mowed and presentable, with something less than 100% success; also in tending to the importunate demands of Bubastis and Ramses, my two cats."

Dr. Mitsuo Nakano from Japan visited him during the year, as did Dr. Peter Ward, "diligent student of Cretaceous ammonites from Ohio State," and John Alderson, "diligent collector and student of Cretaceous ammonites from California."

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

Ted taught "Earth Science and Society," "Sedimentology," "Field Geology" ("actually I simply helped along with a squad of other T.A.'s), "Sedimentary Petrology," and, along with Bill Schopf and Ian Kaplan ("the leader of the band"), he attempted to get a new course (Geology 132, "Biogeochemistry") into operation. "Hopefully next year it will go."

His group has been working on Holocene marine sediments, both benthic and intertidal, characterizing the grain-size textural parameters and the organic contents. A research associate, Natalie Shaltiel, has joined the lab group to work on a project, "the goal of which is to differentiate by chemical means the many different oil seeps and oil fields in the southern California borderland."

"Evaluation of extraction techniques for hydrocarbons in marine sediments," National Bureau of Standards Technical Memo; "Molecular compositions of weathered petroleum and comparison with its possible source," Geochimica et Cosmochimica Acta, vol. 40; "Petroleum and anthropogenic influence on the composition of sediments from the southern California bight," Proc. EPA/API/USCG Oil Spill Conference, 1977; "The chemistry of marine petroleum seeps," Jour. Geochem. Exploration, vol. 7; and "Biogeochemical studies of intermontaine lacustrine sequence: an independent appraisal of climatic fluctuations," Geological Society of America Annual Meeting Abstract are all currently in press.

Ted has participated in several conferences (sponsored by NOAA, BLM, ASTM, and NBS) regarding the standardization of analytical procedures for the determination of small concentrations of petroleum hydrocarbons in environmental samples, and he is now serving as the Chairman of one of the Task Groups of the ASTM Subcommittee D-19 and as a member of other task groups.

THOMAS E. RONAN, Ph.D., University of California, Davis, Assistant Professor of Geology

Tom taught "Introductory Oceanography" twice during the academic year and gave graduate level seminars in "Paleontology" and "Sedimentology."

His research interests are in the ecology of marine subtidal communities, with special emphasis on the structural and functional aspects of marine soft-sediment communities. SCUBA is the basic tool for his research, and the Santa Catalina Marine Laboratory serves as a base for his field studies. He has a paper describing the feeding behavior and the biogenic sedimentary structures produced by six species of marine polychaetous annelids currently in press. Much of his research effort consists of field natural history experiments designed to test specific hypotheses about the organization of marine communities. Many hours are spent under water (at depths of 35 to 135 feet) documenting the distribution and abundance of specific organisms and observing the interactions that occur among community members.

Tom gave research seminars at the University of California Davis, Irvine, and Los Angeles (Biology), the Catalina Marine Laboratory, the University of California Bodega Marine Laboratory, and Claremont College, Pomona. He was involved in consultation sessions with the staff of the Santa Barbara Museum of Natural History and the Cabrillo Marine Museum with regard to the design of museum exhibits for public education. He was also a participant in the UCLA program with mentally gifted children from local high schools, and he taught two UCLA extension oceanography classes.

Molly Miller, Tom's student, has continued her ecological studies of the soft-sediment communities of Mugu Lagoon and hopes to complete her Ph.D. this coming June. Kathy Behr, an undergraduate, has spent two quarters in independent research on the dynamics of nocturnal/diurnal activity in small infaunal metazoan communities.

Tom's lab was visited by Dr. Jere Lipps (Ph.D., 1966) of the University of California, Davis, and Dr. Vern T. Bowen, Senior Scientist, Woods Hole Oceanographic Institute.

For recreation, Tom enjoys underwater photography and SCUBA diving at night (without the aid of illumination), which he says "provides a real sensation in that it allows observation of the biological production of light and contemplation of the functional significance of bioluminescence."

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

John's teaching during the past year was in the introductory "Field Geology" course, the "Petrology Seminar," and "Metamorphic Petrology." His research emphasis has been in analyzing and writing up experimental results which he and Lew Cohen (U.C. Riverside) obtained in their study of stress effects around garnet inclusions in diamond as a tool for pressure-temperature measurement in the mantle. He also initiated similar work on sillimanite inclusions in garnet "with promising results using some fantastically coarse-grained sillimanite crystals from Antarctica provided by Ed Grew (here in a post-doctoral capacity)." He is also reviving an old interest in the recrystallization process in metamorphic rocks based on some new observations and reexamination of old ones.

John's usual summer field work in southeastern Vermont in 1975 was interrupted by a stint in the hospital, but his 1976 season in the same area was more successful; he and J.B. Thompson of Harvard (who visited John during tenure as a Fairchild Fellow at Caltech during the summer of 1975) are trying to figure out the jigsaw puzzle resulting from their joint efforts in the area. In 1976 John served on a committee that was charged with recommending the recipient of the Roebling Medal for the Mineralogical Society of America for 1977. John has also been helping his wife, Nita, with geological advice in her efforts to get a bill through the Legislature for comprehensive planning in the Santa Monica Mountains. Assembly Bill 163 was passed in 1976, and a commission is now being appointed to develop a comprehensive plan.

The Rosenfeld/Cohen sillimanite inclusion project is funded by NSF and helped to support the work of graduate students Carl Nelson and Carl Jacobson. Carl Jacobson spent most of the summer of 1976 in the Swiss Alps on a collecting program related to their research, and Bernard Hallet (Ph.D., 1975) collected suites of specimens from the Himalayas and the Alps for John's inclusion studies during the summer of 1975.

Publications during the year were "Solid inclusion piezothermometry I: Comparison dilatometry," (with H. G. Adams and L. H. Cohen); and "Solid inclusion piezothermometry II: Geometric basis, calibration for the association quartz - garnet, and application to some pelitic schists," (also with Adams and Cohen) which appeared in the American Mineralogist, vol. 60.

FLOYD F. SABINS, Jr., Ph.D., Yale University, Lecturer in Geology and Remote Sensing

After many years of teaching a seminar on remote sensing at USC, Floyd was appointed Regent's Professor of Geology at UCLA for the Fall Quarter 1975, and he is now serving as a half-time lecturer for the Fall Quarter 1976. His course, "Remote Sensing for Earth Scientists," covers the fundamentals of remote sensing plus image interpretation techniques and a field trip. His research at Chevron Oil Field Research

Company concentrates on digital processing of Landsat imagery to enhance the geological information content. Floyd has completed the final text and illustrations for his book, Remote Sensing—Principles and Applications, to be published by W. H. Freeman by mid 1977. He has also contributed chapters for two multi-author books due for publication in 1977.

Floyd serves on the NASA Application Survey Group to provide user recommendations for sensor systems on the next generation of satellites. He is a lecturer for the American Association of Petroleum Geologists and serves on the Research Committee and Publication Committee of that organization. He served as a reviewer to proposals to NSF and ERDA.

J. WILLIAM SCHOPF, Ph.D., Harvard University, Professor of Paleobiology

Following Bill's return in June 1975 from sabbatical leave in the Soviet Union, he has twice again had an opportunity to visit his Soviet colleagues: August was spent carrying out field work in the Ural Mountains of Bashkiria, and two weeks of May 1976 were spent in Leningrad as the U.S. representative at an All-Soviet Union Symposium on Precambrian Life. During the past year he has also attended and participated in the International Geological Congress in Sydney, Australia; the 1975 and 1976 annual meetings of the Geological Society of America; a USGS-sponsored symposium on Precambrian uraniumiferous gold deposits; the International Botanical Congress in Leningrad; a colloquium on Precambrian evolution held at the University of Maryland; the annual meeting of the American Association for the Advancement of Science in Boston; and a colloquium dealing with the early history of life held at the University of California, Santa Barbara. During the year he gave invited lectures at the University of Michigan, Arizona State University, Pomona College, Oberlin College, Bowling Green State University, and the NASA-Ames Research Center at Moffet Field, California. He also spent considerable time in Washington and in Pasadena as a member of NASA's Terrestrial Bodies Science Working Group and the Life Sciences Committee of the Space Program Advisory Council.

Items published since the last Newsletter include seven abstracts and the following papers: "Evidence of Archaean life: a brief appraisal," in B. F. Windley, Ed., The Early History of the Earth (Wiley, New York); "How old are the eukaryotes?", Science, vol. 193; "Microfossils in Conophyton from the Soviet Union and their bearing on the Precambrian biostratigraphy," Science, vol. 193; "Are the oldest fossils, fossils?", Origins of Life, vol. 7; and a short note acknowledging receipt of the Schuchert Award of the Paleontological Society (Jour. Paleontology, vol. 49).

Bill's fall quarter of 1976 was almost completely monopolized by two new courses: the first, a weekly seminar dealing with the origin and early evolution of life on earth, given jointly with Academician A. I. Oparin (Director of the Bach Institute of Biochemistry, Moscow), who was a visiting Professor in the Department during the quarter; and the second, the newly instituted Rubey Colloquium, this year dealing with major events in the history of life on earth (see page 8).

GERALD SCHUBERT, Ph.D., University of California, Berkeley, Professor of Geophysics and Planetary Physics

Gerry taught "Classical Mechanics" and "Oceans and Atmospheres" during the 1976 academic year. His research involves viscosity depth profiles of the earth's

mantle, crater morphology and evolution, models of mantle circulation, convection of water in a porous medium, structure of lithosphere and asthenosphere, Alfvén wave scattering from the Moon, and wave phenomena in the Venus atmosphere.

He spent one month in Orsay, France, to work on lithosphere-asthenosphere modeling with C. Froidevaux during the summer of 1975, and received visits from C. Froidevaux and Luce Fleitout (both from the University of Paris, Orsay). A water-skiing trip to Lake Powell was strictly for fun.

Gerry received the James B. Macelwane Award from the American Geophysical Union, and he was Chairman, UCLA Research Committee on Intramural Funding.

There are five students currently working under Gerry's direction: David Yuen, who is doing lithosphere-asthenosphere modeling; Bernard Lichtenstein, working on Alfvén wave scattering; Tony DelGemo, studying the Venus atmosphere; Aaron Tovish, researching mantle circulation; and Walt Brown, who is studying radar scattering.

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

As usual, Ron taught field geology in the fall, and as usual they went to Tapia Park and Rainbow Basin. He adds that "former students in the course will be interested to learn that Rosita's has moved to palatial new quarters on the hill a few blocks west of the old establishment, but the prices are the same, and the food as good as it always was."

Several of his graduate students finished during the year. Bill Holman completed his Ph.D. dissertation on The Origin of Sheeting Joints: A Hypothesis and is now enjoying a National Research Council Fellowship with the USGS at Menlo Park. Dave Thompson finished his Ph.D. on Application of Fluid-instability Analysis to Glacial Flow and went on full-time at the Jet Propulsion Laboratory, where he had been working part-time on such "arcane" matters as possible glacier-flow on the moons of Jupiter. Rick Balogh finished his M.S. thesis on Subglacial Fluvial Erosion in the Vicinity of Tuolumne Meadows, Yosemite National Park, California and is now enrolled in the Doctor of Environmental Science and Engineering Program at UCLA. Dwight Carey finished his M.S. thesis on Form and Processes in the Pseudokarstic Topography, Arroyo Tapiado, Anza Borrego Desert State Park, California and is about to start his internship in the Environmental Science and Engineering Program.

Ron continued his work on a finite-element calculation of glacier flow and started a new project on the theory of the longitudinal profiles of rivers. He also served as Undergraduate Advisor for a quarter, then took over as Graduate Advisor. He gave lectures at the School of Engineering on the Berkeley campus and in the Department of Geography of California State University at Northridge, organized a session of invited papers for the Washington meeting of the American Geophysical Union, was a panelist at a Caltech Environmental Quality Laboratory conference, served on various committees of the American Geophysical Union and the Geological Society of America, and worked as a consultant to the U.S. Geological Survey on the Mount Baker Avalanche hazard and to Kern County on the San Joaquin Nuclear Project.

JOHN T. WASSON, Ph.D., Massachusetts Institute of Technology, Professor of Geochemistry and Chemistry

John's research, as it has been for the past few years, was divided between meteorite and lunar topics. The chief meteorite problems have to do with the use of chemical data to improve their detailed classification and a search for connections between the composition of primitive meteorites and the distances of their formation locations from the sun. His lunar research was mainly concerned with the composition of magmatic vapor phases and the definition of transport and re-volatilization processes on the Moon's surface.

His teaching consisted of Chemistry 184, "Instrumental Analysis," one-third of "Origin and Evolution of the Solar System," and supervision of the student seminar in Geochemistry. A fair amount of his time was spent "shepherding the graduate students enrolled in the interdepartmental curriculum in geochemistry," of which he is Chairman.

Among the many papers published by John and his research group during July 1975 to December 1976 are: "Classification and properties of iron meteorites," Rev. Geophys. Space Phys., Vol. 13 (with E. R. D. Scott); "Allende inclusions: volatile-element distribution and evidence for incomplete volatilization of presolar solids," Geochim. Cosmochim. Acta, Vol. 40 (with C.-L. Chou and P. A. Baedecker); "Element distribution in size fractions of Apollo-16 soils: Evidence for element mobility during regolith processes," Earth Planet. Sci. Lett., Vol. 29 (with W. V. Boynton, C.-L. Chou, R. W. Bild, and P. A. Baedecker); "Classification of and elemental fractionation among ureilites," Geochim. Cosmochim. Acta, Vol. 40 (with C. L. Chou, R. W. Bild, and P. A. Baedecker); "Volatile compounds released during lunar lava-fountaining," Proc. 7th Lunar Sci. Conf., Vol. 2 (with W. V. Boynton, G. W. Kallemeyn, L. L. Sundberg, and C. M. Wai); and "Trace element evidence regarding a chondritic component in howardite meteorites," Proc. 7th Lunar Sci. Conf., Vol. 3 (with C.-L. Chou, W. V. Boynton, R. W. Bild, and J. Kimberlin).

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

Ken spent part of the summers of 1975 and 1976 continuing studies of gold deposits and volcanogenic stratiform sulphide deposits in the Superior Province of the Canadian Shield. During this time, he also made visits to tungsten, copper, molybdenum, uranium, barite, and metallurgical coal deposits in the Northwest Territories, Alaska, Ungava, Saskatchewan, Utah, and the Canadian Rockies.

In September 1975 Ken participated in a Canadian Institute of Mining field excursion to uranium deposits at Rabbit Lake, Beaverlodge (Lake Athabaska), and Cluff Lake in northern Saskatchewan. Then in November 1975, he spent several days on a Canadian Institute of Mining field trip visiting Mexican silver mines at Pachuca in Hidalgo; Las Torres, Peregrina, Valenciana, and Rayas near Guanajuato; and at Guerrero near Taxco.

*Mining Geologists: I'm on the level
When I firmly maintain
That I'd stoop at nothing
To plunder your vein.*

MUSEUM ACTIVITIES

LOUELLA R. SAUL, Senior Museum Scientist

Lou writes, "Extra-departmental use of the collections spices the usual routine. Questions by elementary school pupils, fossil or shell information for EIR's, mollusk identifications for anthropologists--even the old catastrophy/evolution controversy can be intriguing. But, please don't bring your 40-foot dinosaur over at 5:00 this afternoon...; and, yes, that sounds like one of those Brazilian lungfish; and it does sound remarkably well preserved; but don't bring it over here Sunday at 8:00 a.m...; and, we do not and cannot appraise your fish, dinosaur, or whatever it is momentarily. No matter to what length it is described I am not able to identify it over the telephone.

"Surprisingly, reprints of a short short on the hinges of two Devonian bivalves have been requested from North and South America, Europe, Africa, and New Zealand. There must be some obvious flaw in the paper; and they're all going to jump on it. Just now I'm lost in the Turritella chicoensis group. Hope to turn the corner soon and see each species clearly restricted to a short time while foraging widely along the Cretaceous West Coast."

TAKEO SUSUKI, Senior Museum Scientist

Takeo attended the First International Congress on Pacific Neogene Stratigraphy in Tokyo, Japan, May 16-21, 1976. A meeting, he says, that will be hard to top, as the hosts extended outstanding hospitality, courtesy, and kindness to the visitors from abroad. The Congress was extremely well planned and Takeo says even with the language barrier, the meeting went smoothly. Participating members were guests of the Japan Science Council and the Mayor of Tokyo for two unforgettable, elaborate banquets.

Takeo's paper, written jointly with Carol J. Stadum, Huntington Beach, California, on "A Neogene Section, Northeastern San Clemente Island" will soon appear in the Contributions to Science series of the Los Angeles County Museum of Natural History. Takeo is also continuing work on his monograph of the Type Topanga Fauna and hopes to complete it by the end of 1977.

MINERALS MUSEUM, Robert L. Countryman, Museum Curator

Bob took over duties from Glen Waychunas in November of 1976. High on his list of priorities for this year has been the addition of fluorescent lighting for the third-floor display cases for better visibility. Numerous additions to the various collections have been made this year thanks primarily to donations by both faculty and students. Some notable additions are ore mineral suites donated by Don Carlisle from the Telluride district, Colorado; Kambalda massive sulfides from Australia, and several copper deposits from both Canada and the U.S. Others include specimens from the Cerro Gordo Mine donated by John Christie and borate minerals from several new borate mines in the Death Valley region donated by Bob Countryman. Suites of authigenic zeolites from the western U.S. and several rock suites from Nova Scotia have been purchased from various sources.

EARTH AND SPACE SCIENCE STAFF THINGS

RAM ALKALY, Senior Laboratory Mechanician, is our devoted thin-section technician.

HESSIE AXELROD, Administrative Assistant, is our departmental purchasing agent, bookkeeper, and balabohsteh.

JOHN DEGROSSE, Senior Laboratory Mechanician, thin section technician, is completing his 30th year in the Department.

VICKI DOYLE-JONES, Scientific Illustrator, is racing and has won several medals for being the only girl entrant....

JULIE GUENTHER, Scientific Illustrator, is donating vast sums of money to her favorite charity—SITMAR CRUISES.

DIANE HUNTER, Administrative Assistant, manages the funds for contracts and grants in the Department. She lives in the main office (3806) with Sue and Susan (see Schuman and Scranton).

JOAN KAUFMAN, Editor, types and edits manuscripts and is part-time secretary to Professors Busse, Carlisle, Coleman, Helen and Al Loeblich, McPherron, Reed, Ronan, Wasson, and Jackson. In off hours she trips the light fantastic.

JULAINÉ KNAACK, Secretary, is beholden to Professors Carlisle, Ernst, Foster, Johnson, Lorenz, Merifield, Sabins, and Schopf.

GEN KURTIN, Secretary, is a half-time do-all for Professor Schubert and splits the other half of her time between Professors Ernst, Holzer, Jones, Kaplan, Hugh Kieffer, Kivelson, Lingenfelter, and Anderson. Whew!

GEORGE LAPINS, Management Service Officer, is the supervisor to all non-academic personnel and supervises departmental physical facilities, equipment, contracts, and grants. In his spare time he breaks piers with his boat on Lake Tahoe.

ELLEN LEDEBOER, Administrative Assistant, is the Department's bookkeeper for personnel and payroll for contracts and grants. Meet her in friendly Office Number 3807.

ELOISE LUERA, Secretary, one of the departmental indispensables, is secretary to the Curriculum Committee Chairman, and Professors Jackson and Kaula.

BARBARA NIELSEN, Secretary, works for Professors Bird, Christie, Foster, Sue Kieffer, Nelson, Oertel, Rosenfeld, Shreve, and Watson and has coffee with Guenther and Doyle-Jones between nervous breakdowns.

SUE SCHUMAN, Administrative Assistant, handles matters relating to academic personnel, promotions, etc., and plans terrific parties.

SUSAN SCRANTON, Secretary, is gopher for the Chairman and Management Service Officer and is the departmental receptionist. She attends terrific parties.

GERRY STUMMER, Staff Research Associate, supervises the X-ray units and analyzes samples for the faculty.

TERRY THOMAS Senior Laboratory Mechanician, is the departmental machinist and contriver of goodies.

LOWELL WEYMOUTH, Senior Photographer, having completed 20 years with this outfit is going to try for 22. He is into Santa Barbara Hot Tubs — a lot. (Regular prune.)



STUDENT ACTIVITIES

GSUCLA (the Geological Society of UCLA) has been absorbed by ESSSO (Earth and Space Sciences Student Organization), which like its precursor, is designed to promote communication and fellowship among the members of the Department. The new organization will continue to hold the Friday night "Phase Liquidus" event in the Common Room; to host the Department picnics (a Fall, get-acquainted picnic, generally held at the Sunset Canyon Recreation Center, and a Spring Picnic, usually at the beach or Tapia Park in Malibu); and to sponsor the Department's field trips. Instant Seminar (now called ESSeminar) will be continued as a Tuesday noon meeting, but the talks given by students, staff, and faculty will now be on a strictly voluntary basis. The students have added a few new social events, such as the weekly ice-skating trip (organized by Robbie Score); and Cherylene Lee has instituted potluck dinner parties to which ten randomly chosen graduate students and/or postdoctoral fellows are invited each week. ESSSO also publishes a Graduate Student Directory in which each student's research interests, office number, and hobbies are given.

ESSSO is coordinated by three cochairs who are elected each December to serve for the following calendar year. All graduate and undergraduate students enrolled in any of the specialties of the Department of Earth and Space Sciences are members and are eligible to run for cochairship. This year's officers are: Kent Colbath, K. N. Ketterring, and Dave Kosior. The Graduate Student Association Representatives are Cherylene Lee and Howard Weiss.

THE WEEKLY INTRUSION

In the fall of 1976, one of the undergraduate students, Brian Dicker (B.S., 1976), decided to start a departmental newspaper, The Weekly Intrusion. Not unlike Our Gangue (the mid-sixties product of hilarious nights at the local Pizza Palace and such minds as Tom Ovenshine, Phil Kern, Al Barrows, and Gary Webster), the Intrusion bears news of departmental happenings, including legitimate school business and a smattering of jokes, cartoons, and local gossip. Brian turned the rag's editorship over to Marin Popoff, who writes: "The WEEKLY INTRUSION--combine the credibility of the New York Sun, the circulation of the New York Times, the dogged determination of the Washington Post, the flair and often controversial zest of the National Enquirer, the bulk content of the Los Angeles Sunday Times, and the intellectual merit of Playboy, and you have created a periodical potpourri that would monopolize the printed page. Until that time, however, the wholly undergraduate-misproduced biweekly Intrusion, replete with delightful artwork, will have to do. Geological events crystallizing in the Department of Heaven and Earth, such as field trips, seminars, social affairs, geosports, and other assorted trivia are uncovered and often dispatched with misguided exuberance."

*Seismologists: Though earth may be shaken
and tremors constrict her,
You'll always rate 10
On my personal Richter.*



The Geological Society of UCLA has sponsored occasional spring and fall field trips (Papoose Flat, 1971; Southern Coast Ranges, 1971; the Peninsular Ranges, 1972; and the San Gabriel Anorthosite, 1973). The three-day 1976 Fall Field Trip was conceived and organized by Geology graduate student Steve Lipshie—and all 60 participants agree that it was one of the best ever. Steve wrote, typed, and illustrated a 184-page Geological Guidebook to the Long Valley—Mono Craters Region of Eastern California, a masterpiece well worth its \$6.00 cost (copies were so popular that a reprinting was made a month after the trip (a few of these are available through the Earth and Space Sciences Student Organization, Department of Earth and Space Sciences, University of California, Los Angeles, California 90024; \$8.50).

"Five years have passed since the last fall field trip took place under the auspices of the Geological Society of UCLA. This guidebook has been written in an effort to revive this pleasant tradition and to encourage others to continue it in coming years. The fall field trips have provided opportunities for incoming students to enter the mainstream of departmental activities and to meet faculty and fellow students in an informal environment. Participants in past trips have taken advantage of the opportunity to get away from Los Angeles for a few days and cavort in the Great Outdoors, occasionally taking note in passing of various features of geological interest. I hope that others will take up the gauntlet and prepare field guidebooks for future GSUCLA fall trips (or spring trips, if you are thus inclined). This guidebook, by the way, is the first to bear the name of the new Department of Earth and Space Sciences, which was formed this fall by the merger of the Department of Geology and the Department of Geophysics and Space Physics.

"This booklet is a geological guide to God's Country—the Eastern Sierra region between Bishop and Lee Vining. Be warned, therefore, that native (or naturalized) Angelenos will be subjected to a most insidious peril: Those persons who don't trust the air they breathe unless they can see it and who believe that the Garden of Eden was situated somewhere around Griffith Park will be disillusioned to find that the geologists' Paradise is about 300 miles farther north than they thought. So let the reader beware...." (S. Lipshie, "Foreward" to Geological Guidebook to the Long Valley—Mono Craters Region of Eastern California).

GEOLOGY TEACHING ASSISTANTS, WINTER 1976 - WINTER 1977

Apted, Michael J.
Bruner, William M.
Crews, Anita L.
Demassa, Sarah P.
Delany, Joan M.
Donnelly, Brian J.
Ehrenberg, Stephen N.
Finch, Christian C.
Hildebrand, Nurit
Jacobson, Carl E.
Jacobson, Sara S.
Juda, Peter J.
Juroszek, John O.

Katz, Marvin M.
Kettenring, Kenneth N.
Lincoln, Beth Z.
Lincoln, Timothy N.
Lipshie, Steven R.
Mankiewicz, Carol
Miller, David M.
Miller, Molly B. F.
Moore, Johnnie N.
Nyberg, Albert V.
Saunders, Margaret J.
Thomas, Warren M.
Wegner, Warren W.

UNDERGRADUATE AWARDS

Standard Oil Scholarship in Petroleum Geology: Kristian Meisling (B.S., 1977)

Phi Beta Kappa: Richard Lewis (B.S., 1976)

N.A.G.T.—U.S.G.S. Summer Geologist: Edward Fall (B.S., 1976), 1976
Kristian Meisling (B.S., 1977), 1977

President's Undergraduate Fellowship: Edward Fall (B.S., 1976)

Recipients of 1976 Cities Service — N.A.G.T. Geology Summer Field Camp Scholarships: Gary Abrams, Mike Gjerde, Marin Popoff, Teresa Ruffner, John Vaitl, Charles Wacker

GRADUATE FELLOWSHIPS AND AWARDS

Carl E. Jacobson: Chancellor's Intern Fellowship

Mark P. Cloos: Regents' One-Year Fellowship and Shell Award

Patricia J. Koehnken: Regents' One-Year Fellowship and Shell Award

Carl V. Mendelson: Regent's One-Year Fellowship and Shell Award

Sarah P. Demassa: Shell Award

William D. Carlson: NSF Fellowship

G. Kent Colbath: NSF Fellowship

Allen Glazner: NSF Fellowship and Shell Award

Peter J. Juda: Chancellor's Dissertation Fellowship

Warren M. Thomas: Chancellor's Dissertation Fellowship

GEOLOGY GRADUATES FOR THE ACADEMIC YEAR ENDING JUNE 1976

Doctor of Philosophy

Fairchild, Thomas Rich

The Geologic Setting and Paleobiology of a Late Precambrian Stromatolitic Microflora from South Australia (Professor Schopf)

Freeborn, W. Phelps

The Distribution of Iron and Magnesium between Olivine and Calcic Clinopyroxene--An Experimental Study with Some Comments on Natural Occurrence (Professor Ernst)

Holman, William Rudolph

The Origin of Sheeting Joints: A Hypothesis (Professor Shreve)

Kirby, Stephen Homer

Creep of Synthetic Alpha Quartz (Professor Christie)

Krishnan, Thekkey Kotiezth

Structural Studies of the Schefferville Mining District, Quebec-Labrador, Canada (Professor Oertel)

Moore, Johnnie Nathan

The Poleta Formation: A Tidally Dominated, Open Coastal and Carbonate Bank Depositional Complex, Western Great Basin (Professor Nelson)

Master of Science

Balogh, Richard Stephen

Subglacial Fluvial Erosion in the Vicinity of Tuolumne Meadows, Yosemite National Park, California (Professor Shreve)

Kettenring, Kenneth Norman

The Paleoenvironments and Paleoecology of an Ordovician Brachiopod Community in Southern Nevada and Eastern California (Professor Lorenz)

Newman, Bradford Scott

Geology and Water Chemistry, North Fork Drainage, Bishop Creek, California (Professor Reed)

Schaal, Rand Brian

Shock Metamorphism in Basalt from Lunar Crater, India, and in Six Lunar Microcraters (Professor Kieffer)

Bachelor of Science

Anderson, James N.	(75)	Engineering Geology
Baele, Stephen M.	(76)	
Chase, Daniel S.	(76)	
Christensen, Philip R.	(76)	
Corvino, Claude	(75)	Engineering Geology
Dicker, Brian S.	(76)	
Dumas, Steven P.	(76)	
Fall, Edward W.	(76)	
Fenton, Scott B.	(76)	
Grover, David J.	(75)	
Guyon, Stephen J.	(75)	
Heitman, Hal L.	(75)	
Hochstrasser, Karen R.	(76)	
Houtman, Bauke H.	(75)	
Latiolait, Paul T.	(75)	
Mackenzie, Donald J.	(76)	
Mankiewicz, Carol	(75)	
McCarthy, Conrad J.	(75)	Applied Geophysics
Morrison, Lowell R.	(76)	
Richardson, Marcelle F.	(76)	
Shamlan, Robert	(75)	
Smith, Jeffrey L.	(75)	
Snavelly, Parke D.	(75)	
Stetler, Charles F.	(75)	
Walsh, Timothy J.	(76)	
Yapkowitz, Richard	(75)	

GEOLOGY GRADUATES, SUMMER 1976 — WINTER 1977

Doctor of Philosophy

Garcia, Michael O.

Petrology of the Rogue River Area, Oregon: Problems in the Recognition of Old Volcanic Arcs (Professor Watson)

Kato, Terence T.

The Relationship Between Low-Grade Metamorphism and Tectonics in the Coast Ranges of Central Chile (Professor Ernst)

McCormick, John W.

Transmission Electron Microscopy of Experimentally Deformed Synthetic Quartz (Professor Christie)

Spear, Frank S.

Phase Equilibria of Amphibolite (Professor Ernst)

Stoddard, Edward F.

Granulite Facies Metamorphism in the Colton-Rainbow Falls Area, Northwest Adirondacks, New York (Professor Ernst)

Thompson, David E.

Application of Fluid-Instability Analysis to Glacier Flow (Professor Shreve)

Master of Science

Anderhalt, Robert W.

Stratigraphy of the Crowder Formation and the Santa Ana Sandstone, San Bernardino Mountains, California (Professor Reed)

Carey, Dwight L.

Form and Processes in the Pseudokarstic Topography, Arroyo Tapiado, Anza Borrego Desert State Park, California (Professor Shreve)

Bachelor of Science

Abrams, Gerard J.	(76)	
Blanck, Eugene L., Jr.	(76)	Engineering Geology
Bliss, Douglas A.	(76)	
Callian, James T., Jr.	(76)	
Cinque, Mark J., Jr.	(76)	
Consort, James J.	(76)	
Erskine, Bradley G.	(76)	
Farrell, Keith G.	(76)	
Gallagher, Christopher J.	(77)	Applied Geophysics
Gingell, Thomas W.	(76)	
Lewis, Richard E.	(76)	
Mackenzie, Donald J.	(76)	
Morikawa, Daniel J.	(76)	Engineering Geology
Nelson, Marcia L.	(76)	
Ross, Robert	(76)	
Schatz, Paul M.	(76)	
Usdansky, Steven I.	(76)	
Wutke, William B.	(77)	

*Structural Geologists: I bend to your will,
Your strain's the piper's.
For you, let me stress that
I'd e'en change my diapirs.*

ALUMNI NEWS



From now on, we would like to have news about every Alum in each Newsletter. Please note the back page; fill it out and return it to us, letting us know about your work, interests, and general whereabouts. If you know the whereabouts of any of the other Alumni, please add that too. We are trying to go over the files very carefully to find everyone, but our records are incomplete. This year we have added the Geophysics and Space Physics Alumni to the list as well, but unfortunately, we don't have adequate information on them. Where are you, GASPer's?

In addition, we've added a "Comments" section on the bottom of the last page of the Newsletter. If there is something you would like to see more/less of, if we left something out, misquoted, misrepresented, misspelled, misinformed or confused you, let us know.

*Field Geologists: The denser the contours
The more I'm inclined
To map with my fancy
And keep you on my mind.*

INTRODUCING THE GEOPHYSICS AND SPACE PHYSICS ALUMNI
SEPTEMBER 1965 THROUGH APRIL 1977

Coleman, Paul J.	9/65
Irregularities in the Interplanetary Magnetic Field	
Wood, Lowell L., Jr.	9/65
Hyperthermal Processes in the Solar Atmosphere	
Moe, Osborne K.	1/66
Atmospheric Densities Determined from the Spin Decay of Explorer VI	
Cohlan, Bernard F.	5/66
A Treatise on the Terrestrial Lower Thermosphere and its Sustained <u>in situ</u> Exploration	
Currie, Robert G.	6/66
The Low Frequency Components of the Geomagnetic Field	
Gupta, Jagdish C.	6/66
The Gravitational Tide Control and the Solar Radiation Control of the Geomagnetic Field	
Ramaty, Reuven	6/66
The Modulation of Electrons, Protons, and Alpha Particles at Solar Minimum	
Fehr, Uri	9/66
New Infrasonic Techniques and Measurement of Rocket Engine Noise	
Winter, Thomas C.	9/66
The Determination of the Profile of the Night Sky Hydrogen Lyman Alpha Emission Line	
Lee, William H. K.	1/67
Thermal History of the Earth	
Intriligator, Devrie S.	3/67
Measurements of Cosmic-Ray Neutrons in the Atmosphere	
Grobecker, Alan J.	8/67
X-ray and EUV Photometric Determination of the Latitudinal and Temporal Variations of the Total Particle and O ₂ Molecule Density Distribution in the Region 70-150 Kilometers in the Earth's Atmosphere	
Russell, Christopher	11/68
The Measurement of the Distribution of Magnetic Noise in the	

Magnetosphere from 1 to 1000 Hertz and its Relationship to Electron Pitch Angle Scattering	
Olson, Willard P.	5/68
The Magnetopause Surfaces and Fields for Various Inclinations of the Earth's Dipole Axis to the Solar Wind	
Wilson, Robert C.	9/68
Decametric Radiation from Jupiter	
Randall, Michael J.	10/68
The Radiation Pattern of the Long Period P-Wave Pulse: A Measure of Strain at the Focus of Deep Earthquakes	
Suess, Steven T.	6/69
Some Effects of Gravitational Tides on a Rotating Fluid	
Williams, James G.	6/69
Secular Perturbations in the Solar System	
Barry, James Dale	8/69
Stimulated Secondary Resonances in the Ionospheric Plasma	
Stoops, Emerson	6/70
A Dust Comet in the Solar System	
Pang, Kevin	6/70
Determination of Some Optical Properties of the Earth's Atmosphere by Inversion of Scattered Radiation Measurements	
Brody, Kenneth	6/70
A Study of Magnetic Noise, Magnetic Field Structure and Magnetic Ray Generation in the Magnetotail	
Younkin, Robert	6/70
Spectrophotometry of the Moon, Mars, and Uranus	
Nyland, Edo	12/70
Low-rate Aspects of Focal Mechanisms from Permanent Deformation in the Near Field	
Olson, John	12/70
Electromagnetic Radiation in the Earth's Bow Shock	
McLeod, Malcolm	4/71
Magnetic Fluctuations in the Earth's Magnetosheath in the Frequency Range 0.01 to 140 Hz	

Biswas, Nirendra N.	12/71
The Upper Mantle Structure of the United States from the Dispersion of Surface Waves	
Winge, Clarence R., Jr.	6/71
Latitude Effects in the Solar Wind	
Tomassian, Albert D.	5/71
Radial Diffusion of Electrons in the Inner Zone Following a Geomagnetic Storm	
Winter, Edwin M.	4/72
The Interaction Between the Solar Wind and Interstellar Neutral Particles	
Burton, Rande K.	12/72
The Origin and Propagation of Chorus in the Outer Magnetosphere	
Barfield, Joseph N.	3/72
Pc5 Geomagnetic Micropulsations Observed at the Synchronous Equatorial Satellite ATS 1 During Magnetic Storms	
Young, Richard E.	6/72
Mean Motions Induced in a Layer of Fluid by Travelling Periodic Therman Sources, with Applications to the 4-Day Zonal Circulation of the Upper Venus Atmosphere	
Straus, Joe M.	9/72
Finite Amplitude Doubly Diffusive Convection	
Leeds, Alan	5/73
Rayleigh Wave Dispersion in the Pacific Basin	
Walker, Raymond	10/73
Energetic Electrons in the Near Geomagnetic Tail	
Chan, King-Wang	3/74
Extremely Low Frequency Hiss Emissions in the Magnetosphere	
Higdon, James	8/74
Where are they now? Cosmic Rays from Supernovae	
Demarest, Harold	5/74
Lattice Model Calculations and the Properties of Solids at High Pressure and High Temperature	

Horning, Bryan	1/75
Asymmetric Planetary Electrical Induction	
Harris, Alan W.	2/75
Dynamical Studies of Satellite Origin	
Schlue, John W.	7/75
Anisotropy of the Upper Mantle of the Pacific Basin	
Rundle, John B.	4/76
Anelastic Processes in Strike Slip Faulting: Application to the San Francisco Earthquake of 1906	
Arthur, Carlene W.	8/76
Magnetic Pulsations in the Morning Sector: Ground and Satellite Observations of 10- to 45-sec Period Waves	
Caan, Michael N.	8/76
Magnetic Effects of Magnetospheric Substorms	
Kobrick, Michael	1/77
Tidal Effects of Protostars on Formation of the Solar Nebula	
O'Keefe, John D.	2/77
Impact Phenomena in the Terrestrial Planets	
Mitchel, Robert G.	3/77
The Structure of the Upper Mantle of Western North America from Multimode Rayleigh Wave Dispersion	
Carrigan, Charles R.	4/77
A Study of Buoyancy Driven Flows in Rotating Fluids Motivated by Planetary Applications	



GEOLOGY ALUMNI

GERARD J. ABRAMS (B.S., 1976) is a graduate student in geology at the Mackay School of Mines, University of Nevada, Reno. He is taking courses from Dr. Liang-Chi Hsü (Ph.D., 1966).

HERBERT G. ADAMS (M.S., 1968, Ph.D., 1972), recently promoted to Associate Professor, is teaching engineering geology and computer applications at California State University, Northridge. Home address: 1446 Bonnell Drive, Topanga, California 90290.

EMANEL AXMON (B.A., 1954; M.A., 1956) is now Professor of Geology and Director of the Division of Ceramics and Glass at the Ben Gurion University of the Negev, Beer-Sheva, Israel. He obtained his Ph.D. at U.S.C. in 1960. He was employed by the Hancock Foundation (1959-1960) and by Northrop Space Labs. (1960-1968) before joining the Ben Gurion University in 1968. At present he is on leave for a year to conduct investigations in ceramics in the U.S. and Europe.

BRUCE BARRON (B.A., 1953) is Manager, Oil Well Research Inc., 1539 W. 16th Street, Long Beach, California 90813. He is active in the AAPG, APGS, AIME, and NACE.

BYRON R. BERGER (M.S., 1975) has been an Exploration Geologist for Continental Oil Company, Reno Nevada, since 1971, working mainly on disseminated gold and porphyry copper deposits. He is being transferred to Continental's Exploration Research Division, Research and Development Department, Ponca City, Oklahoma, as a Research Scientist.

HAROLD W. BERTHOLF (M.S., 1967) was promoted to State Oil and Gas Supervisor in August of 1975. Address: 1601 Carmela Drive, Carmichael, California 95608.

COLVER R. BRIGGS (B.A., 1937) retired from Ford Motor Company in April of 1976 after 24 years in various executive positions in research and product development, the last of which was Director of Automotive Safety Planning and Research. Address: 446B Heritage Village, Southbury, Connecticut 06488.

ROY T. BUDNIK (Ph.D., 1974) is enjoying the life of a gentleman farmer, turning a piece of New York land into a working farm. He's been traveling around the U.S. and Canada buying cattle, tractors, and other farm equipment and learning farm management. Home address: 156 Maple, Englewood, New Jersey 07631.

ALICE CAMPBELL (JACOBY) (B.S., 1974) has been working part-time for James Brown and Associates while attending graduate school in geology at California State University, Northridge. Home address: 3338 Sawtelle #21, Los Angeles, California 90066.

MARK J. CINQUE (B.S., 1976) is a graduate student at the Mackay School of Mines, University of Nevada, Reno, and is taking courses from Dr. Liang-Chi Hsü (Ph.D., 1966) with Gerard J. Abrams.

DONALD COATES (Ph.D., 1970) is working for the USGS in Denver. A daughter was added to the Coates family shortly before Christmas in 1976. Home address: 9835 West 35th Street, Wheat Ridge, Colorado 80033.

SIMON CORDOVA (A.B., 1954; M.A., 1956) was promoted to Senior Oil and Gas Engineer, California Division of Oil and Gas, 1416 Ninth Street, Room 1316, Sacramento, California 95814, in September of 1975. He is an administrative officer for the Division of Oil and Gas and is responsible for the Division's administrative regulations. He has published several articles on California oil fields in "Summary of Operations--Calif. Oil Fields," from 1961 to 1972. His "Principles of Stratigraphic Nomenclature Used by the Division of Oil and Gas" appeared in the California Division of Oil and Gas Manual No. AM09 (1974). Home address: 5904 Yeoman Way, Citrus Heights, California 95610.

FRANK DICKSON (Ph.D., 1955) is a Professor of Geochemistry and Chairman of the Geology Department at Stanford University. He just returned from a one-year sabbatical with the Geochemistry Section, Chemistry Division, DSIR, New Zealand. His research involves rock-water reactions at elevated temperatures and pressures. Address: 960 Mears Court, Stanford, California 94305.

J. JAMES EIDEL (M.A., 1963) is an Exploration Manager, Eastern United States, for the Hanna Mining Company. He returned to the U.S. after seven years in Australia, New Zealand, and New Guinea, where he had served on a panel of three for the Australian Tertiary Education Committee to accredit and redesign courses for the West Australian Institute of Technology and Kalgoorlie School of Mines. He lectured at the University of Western Australia and James Cook University. Address: The Hanna Mining Company, P. O. Box 28308, St. Louis, Missouri 63141.

TONY FINNERTY (Ph.D., 1976) is a postdoctoral fellow at the Geophysical Laboratory, Carnegie Institution, 5008 Columbia Pike #6, Arlington, Virginia 22204.

W. PHELPS FREEBORN (Ph.D., 1976) is at the USGS, Mail Stop 959, Reston, Virginia 22092.

MICHAEL O. GARCIA (Ph.D., 1976) is now an Assistant Professor in the Department of Geology and Geophysics, University of Hawaii at Manoa, Honolulu, Hawaii 96822.

DONALD W. HAGEN (B.A., 1953; M.A., 1957) is a Special Projects Geologist, Texaco Exploration Canada Ltd., Box 3332, Calgary, Alberta, Canada. He returned to Canada in December of 1975 from a two-year loan to Aramco to do a study of the Lower Cretaceous in eastern Saudi Arabia. He writes that he is currently trying to develop petroleum play trends in the Lower Cretaceous of the western Canadian plains. Address: 547 Willowbreak Drive, SE, Calgary, Alberta T2J-1N6, CANADA.

WALTER HARRIS (B.S., 1955; M.A., 1958) is now a consulting petroleum geologist. He worked for Texaco for nine years, for Occidental for seven years, and for Cleary Petroleum in Oklahoma for two years. Most of his current work is in Alaska and in California. Address: 2131 Banbury Road, Walnut Creek, California 94598.

ALLEN HATHEWAY joined Haley & Aldrich, Inc., Consulting Geotechnical Engineers and Geologists as an Associate and Chief Geologist after fifteen years in geotechnical

engineering firms, education, the Forest Service, and the Army. He received his graduate degrees in geological engineering from the University of Arizona. From 1971 to 1974, concurrent with his employment with a geotechnical engineering firm, he was Adjunct Assistant Professor of Civil Engineering at U.S.C. He has authored numerous professional papers and is coeditor of the Geological Society of America volume Geology in the Siting of Nuclear Power Plants. In 1972 he was chosen "California's Outstanding Young Civil Engineer" by the ASCE. In 1975 he received the ASCE Daniel Mead Prize. Address: c/o Haley & Aldrich, Inc., Consulting Geotechnical Engineers and Geologists, 237 Main Street, Cambridge, Massachusetts.

L. A. HEINDL (A.B., 1938) returned to the USGS as Executive Secretary, U.S. National Committee for Scientific Hydrology, after nearly ten years with the National Academy of Sciences--National Research Council. He had received his Ph.D. from the University of Arizona in 1958. His current USGS assignment includes activities related to U.S. participation in UNESCO's International Hydrological Program and related activities of other international organizations. He is the Editor of the AGID News (official newsletter of the Association of Geoscientists for International Development) and is active in several geological and hydrological societies and associations. Address: 3577 N. Powhatan Street, Arlington, Virginia 22213.

RICHARD H. HOPPER (B.A., 1935; M.A., 1936; Ph.D., Caltech, 1939) has become Vice President, American Overseas Petroleum Ltd., 380 Madison Ave., New York, New York 10017. Recent publications include "The Discovery of Indonesia's Minas Oilfield" in Oil—Lifestream of Progress, Number One 1976, Published by Caltex Petroleum Corporation.

RICHARD HURST (Ph.D., 1975) is an Assistant Professor of Geology in the Department of Geological Sciences, U. C. Santa Barbara. Home address: 2906 Paseo del Refugio, Santa Barbara, California 93105.

GORDON S. JONES (B.S., 1959) has been moved to Washington, D. C. as "Officer Detailer" for the U.S. Navy. His last tour of duty was as Captain of the U.S.S. Alwyn, based in Norfolk, Virginia. Home address: 3813 Haynesworth Place, Fairfax, Virginia 22030.

DOUGLAS C. KINZLE (B.S., 1969) obtained his M.B.A. degree following military service. He is now a Cost Analyst at the Eagle Mountain Iron Mine of Kaiser Steel Corporation at Eagle Mountain, California.

THEKKEY KRISHNAN (Ph.D., 1976) has a contract with Syncrude Corp. to work on a method of remote surveying for hydrocarbon contents of an open pit well in the Athabaska Tar Sands of Alberta, Canada.

PAUL T. LATIOLAIT (B.S., 1975) is employed as an engineering geologist with Geolabs, Westlake Village, California

HAROLD M. LIAN (B.A., 1949; Ph.D., 1952) is an editor of a recent Memoir of the American Association of Petroleum Geologists on Circum-Pacific Energy and Mineral Resources.

ROBERT F. MARTIN, Jr. (B.A., 1958) works as an insurance agent for New York Life Insurance Company. He is a member of the Los Angeles Insurance and Trust Council and life member of the Million Dollar Round Table. He also received his C.L.U. designation. Address: 2801 West Sixth Street, Los Angeles, California 90057.

ARTHUR MIRSKY (B.A., 1950) received his M.S. in 1955 from the University of Arizona (Tucson) and his Ph.D. in 1960 from Ohio State University. He is currently Professor and Chairman, Department of Geology, Indiana University--Purdue University at Indianapolis.

STANLEY MITCHELL (B.A., 1933) retired from a consulting foundation engineering firm in Honolulu in 1967 and is presently living in the Santa Monica Mountains with his wife and enjoying travel in the USA, Europe, Central America, and Mexico. He writes that he started applying geology to engineering projects with the Corps of Engineers during the Second World War. "Did the same for California State Highways in 1946 and later became one of their first engineering geologists. Joined a foundation engineering concern in Los Angeles in 1955. In 1958 became the first engineering geologist for Colorado State Highways and became their first Chief Engineering Geologist. In 1966 became engineering geologist for a large consulting engineering firm in Denver designing highways in Colorado, Montana, and Washington." He is a member of the Association of Engineering Geologists and the Geological Society of America. Home Address: 1147 Apache, Topanga, California 90290.

ROBERT M. NORRIS (A.B., 1943; M.A., 1949; Ph.D., Scripps Institution of Oceanography, 1951), Professor of Geology, Department of Geological Sciences, University of California, Santa Barbara, just completed a sabbatical year at the New Zealand Oceanographic Institute in Wellington where he did a couple of studies of the Quaternary geology of the western shelves and completed a new bathymetric chart (Foulwind Sheet) in the New Zealand coastal series. He recently succeeded Robert Webb (UCLA, 1931) as Undergraduate Advisor in Geological Sciences, "Bob having retired by degrees from active duty." He shares the advising job with Art Sylvester (Ph.D., 1966). "Structure and Quaternary History of Karamea Bight, South Island, N.Z." appeared in the New Zealand Jour. Geol. & Geophysics, v. 17, no. 2, p. 375-388 (with J. M. van der Linden). Address: Geological Sciences, University of California, Santa Barbara, California.

A. THOMAS OVERSHINE (Ph.D., 1965) was promoted in February 1976 from geologist to Chief, Branch of Alaskan Geology, U. S. Geological Survey. He will investigate coastal sedimentation in Alaska, especially the determination of earthquake recurrence intervals using intertidal sediments. Address: U. S. Geological Survey, 345 Middlefield Road, Menlo Park, California 94025.

RICHARD J. PROCTOR (M. A., 1958) Chief Geologist, The Metropolitan Water District of Southern California, P.O. Box 54153, Los Angeles, California 90054, is on a part-time loan to Caltech as Visiting Associate Professor of Geology, 1975-77. He taught a course in engineering geology and is part of the USGS-funded Caltech team (with B. Kamb, C. R. Allen, and C. M. Payne) to map and evaluate seismic hazards of the Sierra Madre and Raymond Hill faults. Address: 327 Fairview Avenue, Arcadia, California 91006.

RICHARD B. SAUL (B.A., 1956; M.A., 1959), Associate Geologist with the California Division of Mines and Geology, recently had some mapping along the base of the San Gabriel Mountains in the Altadena - Sierra Madre area published (Map Sheet 28). The geology of the southeast quarter of the Oat Mountain quadrangle (north edge of the San Fernando Valley) is in processing for publication, and the south half of the Mint Canyon quadrangle is in the writing and field checking stage. He is currently serving as California-Oregon-Washington coordinator for a chapter in a USGS Professional Paper on the Carboniferous to be published in advance of the Ninth International Congress of Carboniferous Stratigraphy and Geology to be held in 1979. Home address: 14713 Cumpston Street, Van Nuys, California 91401.

RONALD Z. SHMERLING (M.S., 1975) is now Staff Geologist with Geolabs of Westlake Village, California, a consulting firm specializing in engineering geology. He is also teaching part time in the Department of Life and Earth Sciences at Pierce Junior College.

WILLIAM V. SLITER (B.A., 1958; Ph.D., 1966), Paleontology and Stratigraphy Branch, U. S. Geological Survey, 345 Middlefield Road, Menlo Park, California 94025, was elected to the Board of Directors of the Cushman Foundation for Foraminiferal Research and Editor for Special Publications (since 1976). Summer and fall of 1976 were spent on the Glomar Challenger for Leg 50 of the Deep Sea Drilling Project that drilled into Jurassic strata off Morocco. His research continues to involve Cretaceous foraminifers from such far-flung areas as the South Atlantic--Falkland Plateau, Arctic Islands of Canada, and northern Alaska, as well as modern foram studies from continental shelf and slope areas off the western U.S. and Africa. Several publications have evolved from the South Atlantic studies for the Deep Sea Drilling Project, Legs 36 and 39.

HARVEY L. SOBEL (graduate student 1950151) is now Manager of Exploration for Contratista Tormex, South America. He lives in Mexico City and carries out exploration for metal deposits throughout Mexico and Central America.

FRANK SPEAR (Ph.D., 1976) is a postdoctoral fellow at the Geophysical Laboratories, Carnegie Institution of Washington. Home address: 212 W. Montgomery Ave #3, Rockville, Maryland 20850.

MICHAEL P. STARK (B.S., 1970) received an M.S. at Iowa State University in 1973 and went from there to work for Texaco, P.O. Box 60252, New Orleans, Louisiana 70160, doing onshore exploration. Address: 101 East Queens Drive, Slidell, Louisiana 70458.

EDWARD (SKIP) STODDARD (Ph.D., 1976) is an Assistant Professor, Department of Geosciences, North Carolina State University, Raleigh, North Carolina 27607.

J. D. TRAXLER (A.B., 1942; M.A., 1947) retired from (Signal) Burmah Oil and Gas Company after 29 years service and is now a partner (with W. K. Karker and R. L. Nelson) in the Brea Oil Company, 1901 Avenue of the Stars, Suite 251, Los Angeles, California 90067. Home address: 15510 Friends Street, Pacific Palisades, California 90272.

JERRY TREIMAN (B.S., 1972) is employed in engineering geology, soil mechanics, and foundation studies in Southern California by Robert Stone and Associates, Inc.

(Ph.D., 1955). Jerry and his new wife live at 19200 #5 Haynes Street, Reseda, California 91335.

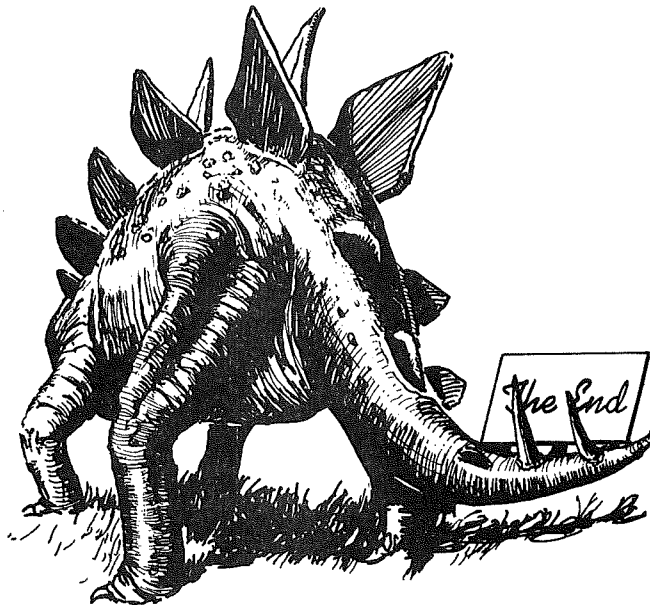
MARTIN VAN COUVERING (M.A., 1941), consulting geologist, founder of the American Institute of Professional Geologists, former chief petroleum engineer at the Los Angeles office of California Department of Oil and Gas, passed away in December of 1976 at the age of 88.

RAY WALDBAUM (B.S., 1966) was promoted to Principal Engineering Geologist for the L.A. County Engineer in June of 1976. Ray is Associate Newsletter Editor for the Association of Engineering Geologists Southern California Section. He recently published "Study Manual for California Geology and Engineering Geology Registration Examinations." Address: 1610 Loma Crest, Glendale, California 91205.

EDWARD WARNER (M.S., 1971) is working as an exploration geologist for Amoco in Denver. Ed and Joyce have a new daughter, Erin. Home address: 9363 West Kentucky Place, Lakewood, Colorado 80226.

JACK C. WEST (B.S., 1943), Consulting Petroleum Geologist, recently moved his offices from Buena Park, California, to 515 West Commonwealth Avenue, Fullerton, California 92632.

JOSEPH ZIONY (B.A., 1956; M.A., 1959; Ph.D., 1966) has returned from a period of service in Reston, Virginia, to the USGS, 345 Middlefield Road, Menlo Park, California 94025.



*Paleontologists: Creatures forgotten
Now sleeping in stone...
Were you and I fossils
We'd share the same zone.*

Newsletter Editors
Department of Earth & Space Sciences
University of California
Los Angeles, California 90024

NAME:

ADDRESS:

UCLA DEGREE AND DATE:

PRESENT POSITION; COMPANY OR INSTITUTION; COMPANY 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.:

COMMENTS: