BULLETIN

HOUSTON GEOLOGICAL SOCIETY

Houston, Texas

Volume 8, No. 9

May, 1966

Houston Geological Society

1965-1966

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THE BULLETIN

THIS MONTH

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In Memoriam ..... Donald I. Gahagan, Tenneco Oil Company ..... CA 9-2711
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GeoScience Notes . . Walter Sadlick, Department of Geology University of Houston ..... CA 4-1681

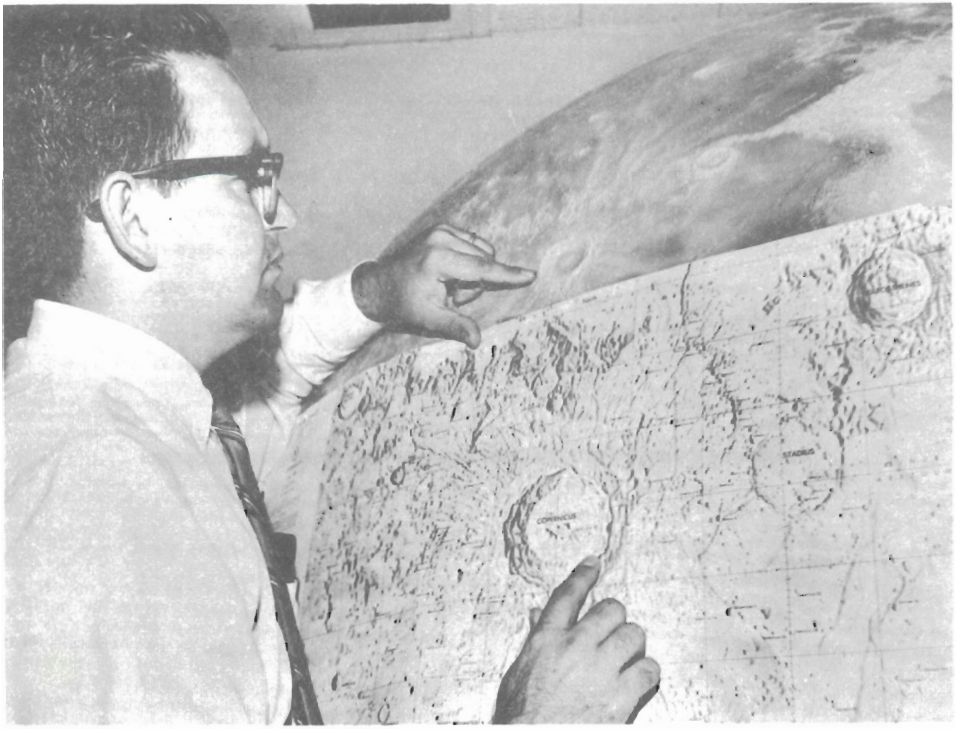
Volume 8, No. 9 May, 1966

MEETING NOTICE

NINTH REGULAR MEETING - May 9, 1966

This meeting will be held Monday evening May 9, 1966 on the 10th floor of the Houston Club Bldg. The social hour will begin at 5:15 p.m. dinner at 6:00 p.m. and the program will start at 7:00 p.m.

The guest speaker for this evening will be Dr. Ted Foss from the Manned Spacecraft Center, Advanced Spacecraft Technology Division, a short biographical resume is given below.



Dr. Ted Foss was born in Chicago, Illinois on January 1, 1935, obtained his B.S. in Geology from the University of Illinois in 1956 and in 1958 his M.S. in Geology from the same University. In 1964 he obtained his Ph.D., Geology from Rice University.

Dr. Ted Foss received special honors by being elected to Sigma Xi, received research grants from Sigma Xi and Geology Society of America and a Graduate fellowship from Rice University.

From 1959 to 1962 Dr. Foss was Assistant Professor of Geology at Lamar State College, previously from

1959 to 1960 Dr. Foss worked as Geologist in Montana for Shell Oil Co. performing Geological Survey in Colorado.

1955 to 1957 Dr. Foss performed Geological Survey in Illinois.

At present Dr. Ted Foss is in charge of astronaut training course in Geosciences. Direct design and construction of lunar surface models. Supervises work of Geology and Geochemistry Section. (Apollo and Apollo Application support).

Dr. Ted Foss has prepared several papers as following:

- "Chemical Variation in Radial Dikes", Geological Society of America.
- "Astronaut Training in Geosciences", Geological Society of America.
- "Structure and Composition of Astraspis and Neuridontiformes" Journal of Paleontology.

Dr. Foss is a member of the following professional societies:

- Geological Society of America, Sigma Xi, American Geological Institute, Mineralogical Society of America

Dr. Foss will present a program for the Houston Geological Society based on the Exploration in the Space Program and show films related to this program.

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H. G. S. GOLF TOURNAMENT
Friday, May 13th

What:	Spring Swat Fest
When:	12:30 p.m. Friday, May 15, 1966 (Shotgun Start)
Where:	The Atascocita Country Club
Price:	$6.00 per person; this includes golf, beer, prizes, Bar-B-Que after golf and gate fee.

Make up your foursome and call RI 8-2000; ask for Polly Colburn. If you wish, we will put you in a foursome.

A reservation will be binding if not cancelled by noon on May 11th.

PRESIDENT'S CORNER

As many of you know, our First Vice-President, Mr. M. Stephen Kovac, has received an excellent promotion. He is moving to Bartlesville to be Exploration Manager for the Cities Service Oil Company. Steve is a very personable and capable geologist and an effective executive. He has been extremely helpful in the executive group of our society and all of us will miss him. Steve is responsible for seeing the advantage of placing our surplus publications with the Cambe Log Library for storage and future sales. This move will result in a savings of $400.00 per year for the Society and should be helpful in improving sales of the surplus material. All of us hope Steve much continued success with his company and in his professional career.

The Houston Geological Society's annual dance which was held on March 25th at the Petroleum Club was quite successful. Approximately 268 people attended the dance and sufficient money was taken in to just about equal expenditures making it possible for the Entertainment Committee to live within its budget. The Society extends its thanks to George Harcourt and his assistants for an excellent party.

The purchase of the logs of the Texas Well Log Service Company has now been completed. These files consist of some 500,000 driller's logs dating back to around 1920. The logs were purchased by the Houston Geological Society with funds contributed by the Piper Foundation, the Brown Foundation, and other organizations and individuals. The logs will be extremely useful to all geologists interested in subsurface work in the State of Texas. For the most part, driller's logs constitute the only records generally available on wells drilled prior to the advent of electric logs which was in the middle 1930's. Driller's logs on the more recent wells are also useful in that they furnish information on locations, elevations, oil and gas shows, drill stem tests, completion data, etc., which is not always shown on the electric logs. The Society is deeply indebted to Frank Hardin and Harold Vance for assisting in the raising of funds used to purchase these logs. Harold Vance deserves particular thanks for bringing this matter to a successful completion. The Society is also indebted to Mrs. Harriet Dickson Reynolds, Director of the Houston Public Library, and to Mayor Louie Welch for allowing the logs to be placed in the library, thereby making them available for public use.

Plans have been formulated for participation by the Houston Geological Society in the Continuing Education Program which is sponsored by the A.A.P.G. Following the wishes of the majority of our members who replied to the questionnaire which was mailed to all Houston Geological Society members in February of this year, plans have been made to hold a seminar on sandstones during the last two weeks of May. Mr. E. H. Rainwater will be the speaker, and the program will consist of four 3-hour lectures spread over two weeks time. The lectures are scheduled for May 17, 19, 24 and 26, from 7 to 10 PM in the auditorium on the lower concourse level of the Humble Building. Tentative plans also call for a seminar on structural geology for this fall, probably in October.

The Houston Geological Society is very fortunate in that a number of new members have been secured since last summer. Approximately 155 geologists have joined the society in the past ten months and the total membership now is around 1500. We wish to cordially welcome all geologists who have been transferred to the Houston area in recent months and encourage them to join our Society. Application forms can be secured by calling the membership chairman, Mr. A. H. Wadsworth at CApital 7-8151. In connection with new members, Max Bornhauser has just completed a study of the roster of the Houston Geological Society which reveals that approximately 125 members of our Society who are qualified for membership in A. A. P. G. are not members of that organization. We would like to join the A. A. P. G. officers in urging those of you who fall in this category to become members of this fine organization also.

... J. Ben Carsey

NEWS . . . . . of other societies

WELL LOG FILES

The files of the Texas Well Log Service, have been delivered to the Houston Public Library. A formal ceremony regarding this gift is scheduled with the city council and Mayor of Houston, April 20th. At this time Mrs. Harriet Dickson Reynolds, who is in charge of the Houston Public Library, will be present along with other representatives of the library and officers of the Houston Geological Society.

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The University of Tulsa announces a short course in "New Exploration Techniques" to be given June 6-17, 1966 at the University. The tuition is $300.00 for the course including all instruction materials payable after acceptance.

Registration blanks can be obtained from:

Dr. Parke A. Dickey, Earth Science Dept., U. of Tulsa, Tulsa, Okla. 74104

BUREAU OF ECONOMIC GEOLOGY

Publication Announcement

Geologic Quadrangle Map No. 31. GEOLOGY OF THE STONEWALL QUADRANGLE, GILLESPIE AND KENDALL COUNTIES, TEXAS, by V. E. Barnes. Map with 10-page text. Scale: 1:24-000. February 1966...$1.50+ 3¢ tax.

The Stonewall quadrangle includes part of the southern margin of the Llano region and part of the eastern margin of the Edwards Plateau; the area is mostly drained by the Pedernales River and its tributaries with some drainage southward to Blanco River. The one fault in the quadrangle is related to the subsurface Ouachita structural belt and trends northeast-southwest.

Elevations in the Stonewall quadrangle range from about 1,395 to 1,995 feet. Mineral resources of the quadrangle are limited to construction materials and water, much of the area being ranch land. A stratigraphic section along South Grape Creek, 2.25 miles south-southwest of Blumenthal is given in the text.

GRADUATE PETROLEUM GEOLOGY AT UNIVERSITY OF HOUSTON THIS SUMMER

Dr. DeWitt Van Siclen will teach GEO 635-Petroleum Geology from 6 to 8 p.m. Monday, Wednesday, and Friday evenings throughout June and July in Room 106, Geology Building. This course replaces a former one entitled Reservoir Geology; it will emphasize the behavior of fluids in rocks underground and how this affects petroleum exploration and development. Persons wishing to obtain graduate credit for this course must have applied for admission to the University of Houston Graduate School before May 10, 1966.

CONTINUING EDUCATION PROGRAM BEGINS TUESDAY EVENING, MAY 17TH

Reserve the last two Tuesdays and Thursdays of this month, May 17, 19, 24, and 26, from 7 to 10 p.m., for the first series of lectures under the Continuing Education Program of the H.G.S. and A.A.P.G. These will help you, as a professional geologist, to keep abreast of some of the advances in knowledge and understanding in our field. This first series will be presented by Mr. E. H. Rainwater, geological consultant with Tenneco Oil Company here in Houston, "Sandstones: Applied Subsurface Stratigraphy: Significance and Methods of Reconstructing Paleo-depositional Environments."

"Rainey" was born in Mississippi. He studied geology at Mississippi State University, Northwestern University, and Indiana University. His experience includes teaching at Mississippi State; working as micropaleontologist, stratigrapher, and research geologist for the Royal Dutch Shell, Caribbean Petroleum Company, and Shell Oil Company; lecturing on micropaleontology at the University of Houston; and working as full-time consultant in stratigraphy for Tenneco. His publications deal mainly with stratigraphy and the habitat of oil and gas. He was Distinguished Lecturer for A.A.P.G. and Visiting Scientist for A.G.I. His papers have won First Place Awards at the G.C.A.G.S. Conventions and at the National S.E.P.M. Meeting. He is a Fellow of the G.S.A., member of the A.A.P.G., S.E.P.M., Sigma Xi, several local geological societies, and on academies of science. THE lectures will be held downtown in the auditorium of the Humble Building, located in the upper basement level. Parking is available in the Humble parking garage across the street, in closed parking lots nearby, and on the streets.

Charge for the entire series of four lectures will be $10.00, payable at the door.

Brief Outline of the Lectures

The main objectives of this series of lectures are to describe the characteristics of terrigenous clastic sediments in various marine, transitional, and continental environments; discuss the criteria useful in identifying the environments of geologically ancient rocks; show how predictions can be made of sediment distribution; and to point out the relationship between mineral (mainly oil and gas, but also ground water, phosphate, bauxite, coal, etc.) occurrence and the depositional environment. It is expected that the geologists who attend the lectures will have a firmer basis for scientifically exploring for minerals which occur in sedimentary rocks.

Lecture 1. Recent sediments, the key to understanding the depositional history of ancient sedimentary rocks.

The kinds, distribution, and characteristics of sediments which are now being deposited in the main continental, transitional, and marine environments will be described. The application of this knowledge in reconstructing paleodepositional environments, and thus in predicting the occurrence of favorable sands, will be pointed out.

Lecture 2. Modern and ancient deltas.

Many of the known accumulations of oil and gas are in sands which were deposited in deltas; therefore, petroleum geologists should know something of the geology of deltas. Several modern deltas will be discussed; the size and shape of the deltas, their rate of growth, fauna and flora, sedimentary structures, vertical and lateral distribution of sand and clay will be pointed out. Examples of Paleozoic, Mesozoic, and Cenozoic deltas will be described and contrasted with adjacent areas of interdeltaic deposition. "Turbidites", which are associated with seaward prograding deltas, will be discussed. Special emphasis will be placed on criteria useful in finding ancient deltas.

Lecture 3. Sedimentation history of the Gulf Coast Tertiary.

The Gulf Coast is the best known of all sedimentary basins, and its Tertiary history can serve as a model to guide petroleum exploration in many of the world's sedimentary basins. In describing the history, the application of many stratigraphic and sedimentologic "principles" will be evident:

Tectonic control of sedimentation
Causes for the many marine transgressions
Rate of sedimentation during the transgressions and regressions
Bases for correlation of strata
Significance of "stratigraphic breaks"
Presence of multicycle sands in the Tertiary
Association of hydrocarbons with environments which had rapid sedimentation and great organic production.

The mehtod and significance of mapping time-stratigraphic units will be described.

Lecture 4. Stratigraphic evaluation of sedimentary basins, areas, prospects for petroleum potential

V. C. Illing stated in 1945, "Stratigraphy is the foundation of the geologists' evaluation of any general region." Scientific exploration for and development of any mineral deposit require that the geological events which determined the formation and location of the deposit be known so far as it is possible to determine the events. The petroleum potential is dependent mainly on a favorable depositional history, which should be known before any prediction is made about our future petroleum reserves.

Some topics to be discussed under stratigraphic evaluation are:

Sedimentation history: Geologic age of sediments -- Environments of deposition -- Kinds and amounts of organic material developed -- Rate of sedimentation -- Extent of sediment source area, and kinds of rocks furnishing the sediments

Tectonic history: Structural framework of basin and adjacent areas -- Kinds of local structural traps formed -- Geologic age of the local structures -- Environments in which the structures developed.

HOUSTON'S BURKE BAKER PLANETARIUM

by

Armand Yramategui, Planetarium Curator

Gracefully nestled on a 4.5 acre tract of moss-draped oak and pine in Herman Park, the Burke Baker Planetarium is one of the most esthetically beautiful structures in Houston. The glass and granite structure, crowned by golden tile, was designed by architects Pierce and Pierce, and Staub, Rather and Howze. Out of state visitors planning a major planetarium for their own areas frequently have described Houston's Burke Baker planetarium as the most beautiful they have seen. The late Burke Baker donated a quarter of a million dollars to establish the planetarium and other foundations and individuals gave an additional half million dollars. The planetarium is part of the Houston Museum of Natural Science complex.

Members of the Houston Geological Society and the Houston Geophysical Society have been instrumental in guiding the museum and planetarium as officers, members of the board, or have made other contributions. Dr. J. Brian Eby was president at the time the offer was first made by the late Burke Baker. The current president is Wallace Thompson and the incoming president will be Morgan Davis. Other members that have been on the board include: Ben Belt, Dr. A. A. Matthews, and Orval Brace.

Public shows are designed to instruct the layman concerning astronomical subjects in a manner that is pleasant, enjoyable, and informative. These programs constitute more than half the total attendance. All fourth and eighth grade students of the Houston Independent School District as well as private, parochial, and county schools are given special planetarium shows. Special programs have also been given to students from Rice University of Houston, Texas Southern, St. Thomas, and the Texas Maritime Academy in Galveston. Special demonstrations using selected orbital paths have been conducted for the astronauts. Overall attendance for the first year was 140, 000 and it is expected that the attendance will exceed this figure during the second year of operation.

The glassed-in outer lobby is the James S. Abercrombie Hall and the central object on exhibit there is a celestial sphere donated by members of the Petroleum Club of Houston. It is a fine museum piece and was made in 1693 in Paris. Also of interest to geologists is a 26 inch Brazilian amethyst given to the museum by Dr. Eby. This may well be one of the most magnificent specimens of a Brazilian amethyst on display anywhere in the world.

The Isaac Arnold Hall of Space Science is a beautiful chamber that presently houses a Mercury Spacecraft and other NASA exhibits. The Verson orrery, an electrically powered model of the solar system, is an excellent display for understanding planetary motion. In the hall that surrounds the planetarium chamber is a tektite and meteorite exhibit. A siderite, weighing more than 500 pounds -- on loan from Mr. and Mrs. Ernest Fay, is also shown in this hall. A black light gallery displays various astronomical objects, a moon mural, and the zodiac constellations.

The fifty foot perforated geodesic dome serves as the "sky" for the planetarium chamber. The perforations are for acoustical and air conditioning purposes and for both of these purposes, the dome is well designed. In the center of the chamber is the Spitz Laboratories Space Transit Planetarium Projector. Unlike other large planetarium instruments which rotate about two axes and contain only a built-in precessional tilt, the Spitz projector moves around three mutually perpendicular axes. One, passing through the two star hemispheres and pointing to the celestial poles, is the axis that represents daily motion. The other two axes form an altazimuth mounting. Because of the added vertical axis, that part of the sky which is used for demonstration can be moved to the front of the planetarium chamber at the will of the lecturer and this in turn permits one-way seating. At present, there are only three other modern planetaria that have one-way seating and the vertical axis; these are located at East Lansing, Salt Lake City, and Trenton. Conventional major planetaria throughout the world use concentric seating and the lecturer tries to conduct most of the demonstration in the area directly overhead whenever possible, because if something is pointed out close to the horizon, part of the audience must strain to observe the sky behind it. The three axes, when computer controlled, present an additional advantage in that the sky can be rotated about any selected celestial point. When properly set by the lecturer, the analog computer calculates the amount of motion needed by each of the three axes of the planetarium instrument. This permits the sky to turn about the selected pole of the orbit, spacecraft, or if a planet, about the planet's pole for any preselected latitude on the planet.

The stars which we see in the planetarium sky are really projected images of the xenon arc that is at the center of each star hemisphere. Projection of the arc image is carried out by individual lenses or pin holes that act as lenses; these are of the proper diameter and precisely positioned on the hemispheres. Since the hemispheres are about seven feet apart, there had to be considerable corrections for parallax.

The instrument projects 4,170 stars down to magnitude 5.5. The planets are projected on the dome by means of mirrors which are turned at the appropriate rate by synchronised gearing mechanisms. Even the apparent backward or retrograde motion of a planet takes place at the appropriate time in the orbit. The computer, sound system, annual motion generators, and most of the other equipment is located in the control room and is remotely operated by the lecturer at the console. The console looks like the instrument panel of a spacecraft. Auxiliary projectors produce the many special effects that simulate celestial phenomena.

Our current show -- THE STORY OF THE SUN -- includes some spectacular effects that supplement the star field demonstrations, such as a "drape" type aurora, an eclipse, and a panorama of the sun's surface. Public shows given by the planetarium during this past year include: A TRIP TO THE MOON, A WALK IN SPACE, THE CHRISTMAS PROGRAM, AND MARINER TO MARS. The subject areas of the public shows illustrate the changing nature of astronomy and space science and reflect the advances made in our knowledge of the heavens.

COMMITTEE REPORTS

Academic and Liaison Committee

The Academic and Liaison Committee needs 4 volunteers to judge Earth Science papers for Engineers Council Science Fair on Saturday, May 14. Contact Orville Lundstrom - CA 7-6015.

H.G.S. ELECTION OF OFFICERS

The following have been nominated for Officers of the Houston Geological Society for the coming year 1966-1967.

For President:	Jesse L. George	Newmont Oil Company
	Alan Lohse	Monsanto
For 1st Vice President:	Jed B. Maebius	Tidewater Oil Company
	Fred L. Smith, Jr.	Consultant
For 2nd Vice President:	Edward G. Lipp	Crown Central
	P. Barkley Souders	Geo Map Company
For Secretary:	D. C. Gilkison	Allen & Gilkison
	James A. McCarthy	Consultant
For Treasurer:	James O. Lewis, Jr.	Consultant
	James W. Roach	Sohio
Executive Committee: (Elect 2)	Reece L. Berry	Trunkline Gas
	Hal H. Bybee	Continental Oil
	Lewis J. Hubka, Jr.	Ashland Oil & Refining Co.
	John J. W. Rogers	Rice University

NEWS . . . . . of members

HAROLD C. HERBERT AND N. COURTNEY SURBER (Herbert & Surber) have moved their office from 2422 Bank of the Southwest to 1422 Bank of the Southwest.

Photogravity Company, Inc., also has a new address. They moved to 402 Adair Center, 6440 Hillcroft, Houston, Texas. Their new phone number is PR 1-1248. The following HGS members are affected by the latter move: Edward F. Haye, Donald W. Keairnes, David J. Noser, William R. Scott and George W. Hinds.

Sun Oil Company has moved their domestic offshore geological department from Beaumont to Houston, Texas. It is located on the 14th floor of the Mellie Esperson Building.

Involved in this transfer are DR. EDWARD W. HARD, Chief Offshore Geologist in Charge; H. L. Durgan, Senior Research Geologist (a former Houstonian); and D. C. MENUT, Geologist.

The HGS is honored to have in its midst one of the distinguished founders of the AAPG. Mr. Grady Kirby with 93 other founders of the AAPG were honored at the Golden Anniversary celebration of the AAPG at the convention on April 25-28, 1966, in St. Louis. I am sure that Mr. Kirby could tell us some real tales.

MERLE C. ISRAELSKY retired from the U.S.G.S. late in January, his address is 1180 Russell Ave., Los Altos, California 94022.

NEW MEMBERS

The Houston Geological Society welcomes the following new members:

Francis L. Raspberry	Ashland Oil & Ref. Co.
Harry M. Buchner	Esso Prod. Research Co.
Alan M. Warren	Humble
Charles R. Mooney	Humble
Felix D. Richardson	Humble
Stuart T. Watson	Sinclair
Glen M. Ford	Texaco
Francis J. Williams	Texas Eastern Transmission
Robert D. Odell	Tidewater
Robert R. McConnell	Tidewater
Walter D. Clinch	Union Carbide Corp.

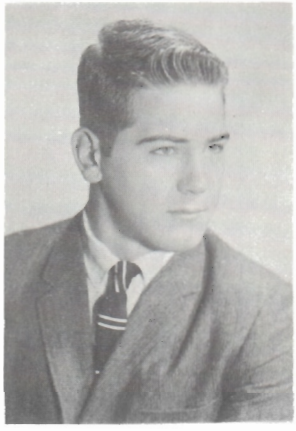
1966 OUTSTANDING STUDENT AWARDS

Following the custom of many years, the Houston Geological Society will again present an Outstanding Award to five geology students, one slected by the faculties of each of five institutions of college level in this section of Texas having geological departments. These students are selected on the basis of demonstrated academic work, character and leadership.

Ben L. Wicker, Jr.
Lamar Tech

Fred Eugene Fisher
University of Houston

William E. Galloway
Texas A&M University



John L. Livingston
Rice University

John William Parker
University of Texas

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Space for Professional Cards of Members

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LAMAR STATE COLLEGE OF TECHNOLOGY

Nominee BEN L. WICKER, JR.
To be introduced by: Mr. William H. Matthews, III

Mr. Wicker graduated from Port Neches-Groves High School in 1960. He married Miss Carolyn Philen in 1963 and has a son, Orrin Dawson, two years old. At Lamar Tech, Mr. Wicker, in addition to doing outstanding academic work, has been employed for the past two years as a laboratory Teaching Assistant. He has been employed part-time in the offices of Mr. Bryan Beck, a local independent geologist. Currently, he holds one of two Randolph Yost scholarships. He is the current president of the Lamar Tech (student) Geological Society. He has been active in the affairs of the Collegiate Academy of the Texas Academy of Science. Upon graduating this May, he will enter employment with the Pan American Petroleum Corporation.

UNIVERSITY OF HOUSTON

Nominee FRED EUGENE FISHER
To be introduced by: Dr. Walter Sadlick

Although born in Santa Barbara, California, Mr. Fisher was raised in Houston and in Venezuela. He graduated from Peacock Military Academy in 1958 and attended the University of Houston for one year as a Pre-Law Business major. From 1960 to 1964 he served with the United States Marine Corps as a navigator. In 1964 Mr. Fisher returned to the University of Houston, as a Geology major, where he expects to complete his undergraduate work this summer. He has been working for the Geology Department this year as an undergraduate assistant, and has been awarded a National Science Foundation Graduate Traineeship for graduate study at the University of Houston next year. His field of special interest in geology is Invertebrate Palentology with an emphasis on the mathematical aspects.

In his spare (?) time Mr. Fisher enjoys collecting cacti and reading historical and science fiction.

TEXAS A&M UNIVERSITY

Nominee WILLIAM E. GALLOWAY
To be introduced by: Dr. Karl J. Koenig

EDUCATION: Graduate from High School in Vienna, Virginia, 1962
Enrolled Texas A&M University Fall, 1962
Phi Eta Sigma, 1962
Outstanding Sophomore, Second Wing Corp of Cadets, 1964 (spring)
Tau Beta Pi, 1964 (As Honor Junior)
N.S.F. Student Research Grant, 1964-65
Vice-President, Hart Hall, 1964 (Fall)
President, Hart Hall, 1965 (Spring)

Representative of College of Geosciences to Student Intercouncil, 1965-66
Mobil Oil Company Award and Scholarship - 1964-66
Senior Honor Council - 1965-66
Who's Who in American Universities and Colleges - 1965
Senior Summer Assistant in Geology, Mobil Oil Company, Shreveport Exploration Division - 1965

PUBLICATIONS: Author or co-author of papers presented at

(1) Texas Academy of Science, Waco, Texas, Fall 1964
(2) Southwest Division, American Physical Society, Norman, Oklahoma, 1965.

RICE UNIVERSITY

Nominee: JOHN L. LIVINGSTON
To be introduced by: Professor B. C. Burchfiel

John Livingston was born on April 25, 1940 in Boston, Massachusetts. He is married and has two children.

Mr. Livingston graduated from the Mt. Hermon School in Massachusetts and entered Yale University in the fall of 1958. He began a major in geology during his sophomore year and during his under-graduate study gained geologic experience in the Brooks Range, Alaska and conducted an independent study of the metamorphic rocks in the western highlands of Connecticut. During the summer of 1962, he worked as a production geologist for the Humble Oil Company in offshore Louisiana.

In the fall of 1962 he entered Rice University. He was awarded the masters degrees in 1964 upon completion of his study of stratigraphic and structural relations of lower Paleozoic rocks in southern Nevada. At the present time he is continuing his study for the Ph.D. degree under a Rice University Assistantship-Fellowship. His research interests concern the structural geology and metamorphic petrology of a portion of the Blue Ridge geologic province in the southern Appalachians. He has served as a teaching assistant for three years at Rice and has been acting president of the Rice University chapter of Sigma Gamma Epsilon.

Mr. Livingston is a member of Sigma Gamma Epsilon and an associate member of the Society of the Sigma Xi.

UNIVERSITY OF TEXAS

Nominee: JOHN WILLIAM PARKER
To be introduced by: Dr. Samuel P. Ellison, Jr.

Born November 26, 1920 at Cleveland, Ohio.

Served in the U.S. Army, 1942 through 1945, Europe.

Married Laura B. Gallaher, 1948.
4 children: Martha Clare, 14; Christopher John, 13; Kevin Wm., 9; and Laura Beth, 6.

Academic Background:
Western Reserve University, 1946 to 1949. B.S. in Geology, with a minor in Biology.
University of Michigan, 1949 to 1951. M.S. in Geology. Summer field camp at Jackson Hole, Wyoming.
University of Texas, 1963 to present, G. M. Knebel Fellow. Presently working on dissertation: Subsurface Fluid Relationships in Some Cretaceous Reservoir Rocks, East Texas Basin.

Geological Experience: Employed 12 years as an exploration geologist by Pan American Petr. Corp., 1951 to 1963. Of this time 3 1/2 years were spent in surface mapping, 4 1/2 years in well sitting and subsurface geology, and 4 years in special geologic projects. Most of this experience was in the Colorado Plateau region. Carbonate seminar in the Bahama Is. and the Florida Keys about 1961.

Awards: G. M. Knebel fellowship, 1963 to 1966. Beginning geology laboratory teaching, Spring, 1965. Lecturer in introductory engineering geology, Fall 1965 and Spring, 1966. Sigma Xi research grant toward dissertation, Jan., 1966.

Memberships: AAPG, GSA, SGE. Past President of Farmington, New Mexico Geol. Soc., 1961; Secretary of 4Corners Geol. Soc., 1962 to 1963. Member, then Chairman, Comm. on Radioactive Waste Disposal, San Juan Basin (for AAPG in behalf of AEC), 1961-1962. Member, then Chairman, Stratigraphic Momenclature Comm., 4 Corners GS, 1962-1963. President, Zeta chapter, Sigma Gamma Epsilon, 1965-1966.

Publications: 1957, Nacimiento Mts., Geologic History & Relationship to San Juan Basin, p. 73-76 of 4 Corners GS Guidebook, Geol. of the Southwestern San Juan Basin. 1960, as jr. author w/ M. D. Picard, B. R. Brown & A. J. Loleit, Geol. of Penn. Gas in the 4 Corners Region, AAPG Bull., V. 44. p. 1541-1569.

1960, Big Flat Field, Utah, p. 127-132 in 4 Corners G.S. Guidebook, Geol. of the Paradox Basin Fold & Fault Belt.
1961, Barker Dome Gas Field, Dakota and Pennsylvanian Pool, p. 36-39 in Colo.-Nebr. Oil & Gas Field Vol., RMAG, Denver. 1963, w/ J. W. Roberts, Devonian & Miss. Stratigraphy of the Central Part of the Colo. Plateau, p. 31-60 in 4 Cor. GS Symposium, Shelf Carbonates of the Paradox Basin. 1963, as Jr. author w/ Paul D. See, Stratigraphic Nomenclature of the Paradox, Black Mesa, and San Juan Basins, p. 5-12 of the 1963 4 Cor. Symposium cited. In Press, AAPG Bull., w/ J. W. Roberts, Regional Devon. & Miss. Stratigraphy, Colorado Plateau.
In Press, AAPG Bull., as Jr. author w/ D. L. Baars, Pennsylvanian Stratigraphic Nomenclature, Paradox Basin.

GEOSCIENCE NOTES

GEOLOGY OF PRESIDIO AREA, PRESIDIO COUNTY, TEXAS

John W. Dietrich

University of Texas, Ph.D. thesis, 313 p., 18 sections
28 diagrams.
June 1965

ABSTRACT

The first detailed geologic map of the Presidio Area shows the distribution of stratigraphic units with ages ranging from Permian to Recent and total thickness greater than 8,000 feet. Guadalupian and Comanchean rock crop out only along a broad, southeast-plunging fold that extends from the Chinati Mountains into eastern Presidio Area and laps onto the northeast flank of the eroded fold. Late Cenozoic normal faults southwest of the Cretaceous outcrops are part of the boundary of the Presidio Bolson; fine-grained bolson deposits and overlying pediment gravel and alluvium crop out southwest of the faults.

An early Guadalupian near-shore deposit, the only Paleozoic formation exposed in the Presidio Area, was slightly deformed and truncated before the Cretaceous episode of marine deposition began. The five Comanchean formations that crop out in the Presidio Area are, in ascending order: Presidio Formation, Shafter Limestone, 'Del Carmen Limestone,' 'Sue Peaks Formation,' and 'Santa Elena Limestone.'

Laramide deformation produced the broad, gentle fold that extends southeastward from the Chinati Mountains into the Presidio Area. Erosion stripped Gulfian and uppermost Comanchean strata from the fold and cut deeply into older rock; but the eroded remnant stood as as high, dissected ridge when Tertiary volcanism began.

Tertiary volcanic rock exposed in the Presidio Area is divided into six formations: (in order of decreasing age) Morita Ranch Formation (new name), Mitchell Mesa Tuff, the Correlative Tascotal and 'Fresno' Formations, "Perdiz Conglomerate," and Rawls Formation.

The Morita Ranch Formation and "Perdiz Conglomerate," separated by an angular unconformity, crop out in north-central Presidio Area. Lavas extruded from vents near the southeast end of the Chinati Mountains after several hundred feet of volcanic rock blanketed part of Trans-Pecos Texas make up the

Morita Ranch Formation. The Perdiz Conglomerate,' deposited as a fan, is composed of coarse detritus from the Chinati Mountains.

The Mitchell Mesa, 'Fresno,' and Rawls Formations crop out in southeastern Presidio Area. The Mitchell Mesa Tuff, deposited from an ash flow that spread over most of Presidio County, overlies more than 2,000 feet of volcanic rock at some places. Lava and ash-flow tuff in the 'Fresno' and Rawls Formations accumulated around vents in the Bofecillos Mountains. A porphyritic basalt (Tr9) in the Rawls Formation is the youngest volcanic rock in the Presidio Area and may be the youngest in Trans-Pecos Texas.

The Tascotal, "Perdiz," and Rawls Formations crop out in northeastern Presidio Area. The Tascotal is the northern facies of the 'Fresno Formation.' The overlying Perdiz thins eastward from the Chinati Mountains and pinches out within the map area. The Rawls Formation extends northward from the Bofecillos Mountains and overlies the "Perdiz Conglomerate" or Tascotal Formation.

The West Chinati zone of late-Cenozoic normal faults is the northeastern boundary of the Presidio Bolson. Post-Rawls displacement has depressed the bolson block several hundred to a few thousand feet. As much as 3,000 feet of sediment accumulated in western Presidio Area before Pleistocene integration of the Rio Grande drainage system ended the episode of basin filling. Since it became a through-flowing stream, the Rio Grande has cut 500 to 1,000 feet into the bolson deposits. Remnants of four widespread, gravel-covered pediments form broad steps rising from the river. The pediments and their overlying gravel sheets probably represent pluvial episodes in the Pleistocene.

GEOLOGY OF SIERRA TINAJA PINTA AND CORNUDAS STATION AREAS, NORTHERN HUDSPETH COUNTY, TEXAS

by

Robert O. Gross
University of Texas, M.A thesis, 119 p., 20 diagrams, 21 photos
June, 1965

ABSTRACT

Igneous rocks in the Sierra Tinaja Pinta and Cornudas Station areas are part of a group of intrusions of Tertiary age that outline the northeastern margin of the Diablo Plateau; they are part of the larger alkalic petrographic province of Trans-Pecos Texas. Laccoliths, dikes, sills and a cone sheet were intruded into the Hueco and Victorio Peak Limestones of Permian age and into sandstone and limestone of Cretaceous age, which are paleontologically correlative with the Fredricksburg and Washita Groups of central Texas.

The igneous rocks are of four types: (1) porphyritic analcime syenite and associated dike and contact rocks, (2) pyroxene trachyte, (3) porphyritic and analcime-nepheline syenite, and (4) olivine-analcime trachyte. When magma reached crustal levels presently exposed in the Sierra Tinaja Pinta-Cornudas

Station vicinity, it was in an advanced stage of differentiation and crystallization. Hypersolvus feldspar, augite, and a minor amount of olivine and nepheline in a liquid were intruded near the base of the Hueco Limestone, and formed the Mayfield Valley intrusion. Filer pressing resulted in squeezing a liquid that contained a few microphenocrysts of hypersolvus feldspar and nepheline into fractures overlying the Mayfield Valley intrusion. This liquid consolidated to form the porphyritic analcime-nepheline syenite of the Miller Mountain, Cerro Diablo and East Mountain intrusions.

Experimental evidence suggests that nepheline syenites can be formed by two mechanisms: (1) differentiation from a magma of different composition, or (2) partial melting of pre-existing rocks to produce magma of nepheline syenite composition. The second mechanism is questionable because partial melting of most sedimentary rocks would produce granite rather than nepheline syenite; the hypothesis of partial melting of subsilicic igneous rocks to explain the origin of nepheline syenites merely postpones the problem of origin of subsilic rocks.

Fractional crystallization in the alkali olivine basalt series can produce phonolites. This mechanism is favored as the origin of feldspathoidal igneous rocks that lie along the northeastern margin of the Diablo Plateau. Block faulting in the northern Trans-Pecos is thought to be related to the initiation of melting at depth.

SEDIMENTOLOGY OF THE AGUJA FORMATION BIG BEND NATIONAL PARK, BREWSTER COUNTY, TEXAS

by
Edgar Member Hopkins
University of Texas, M.A. thesis, 165 p., 8 sections, 29 diagrams, 47 photos, June, 1965

ABSTRACT

The aguja formation consists of approximately 800 feet of littoral marine and continental sandstones, claystones, and lignitic shales. The abundance of fossils and sedimentary structures makes it ideal for a study of paralic sedimentary environments. The upper part of the underlying Terlingua formation was deposited in a nearshore marine environment; it consists of mottled, silty claystones with marine fossils, and widely separated thin sandstone beds. The lower part of the Aguja formation was deposited in a tidal flat environment. Ripple marks, Lebenspuren, marine fossils, and small channel-fillings are characteristic of the interbedded sandstone and claystone units in this part of the formation. Lignitic shale and coal beds in the middle part of the formation were deposited in a swamp or marsh environment. The homogeneous and laminated claystones with abundant sharks teeth and oysters probably represent a lagoonal environment, whereas sandstones with oysters and crocodile remains come from an estuarine environment. Finally, mottled maroon and green claystones, limestone-pebble conglomerates, and sandstone beds and channel-fillings in the upper part of the formation suggest deposition in coastal river flood-plains.

The regional cross-bed dip direction, and thus, the predominant paleocurrent direction, is to the northeast. It is inferred that the regional paleoslope was also in this direction. Local bimodal cross-bed patterns support the interpretation that some sandstone units in the lower part of the formation were deposited by tidal currents.

The abundance of feldspar and volcanic-rock-fragments in the sandstones indicates a source area of mixed lithology, predominantly volcanic and hypabyssal rocks, with minor amounts of sedimentary, plutonic igneous, and metamorphic rocks. The bentonitic composition of the claystones suggests that at times volcanic ash-falls occurred in the source area.

The remarkably uniform fine grain size of the feldspar, quartz, and volcanic-rock-fragment grains suggests that the source area of the detritus was a great distance from the site of deposition. The climate seems to have been semi-arid as evidenced by the presence of detrital grains of limestone and by feldspar grains that are only slightly altered.

STRUCTURAL GEOLOGY OF BLACK GAP AREA, BREWSTER COUNTY, TEXAS

by

Billy Eugene St. John
University of Texas, M.A. thesis, 132 p., June, 1965

ABSTRACT

The outcropping strata of the Black Gap area are principally Cretaceous, but include Tertiary volcanic rock and Quaternary alluvium. No rocks older than the Cretaceous Glen Rose Limestone crop out within the map area, although Paleozoic strata of the Ouachita System are exposed near the northwest corner.

The area is on the plunging northwest end of the Serrania del Burro and astride the frontal and interior zones of the Ouachita System. To the north, northwest-trending monoclines and an east-trending igneous belt border the Marathon Basin; to the south lies the block-faulted and reverse-faulted eastern margin of the Big Bend structural belt.

The mosaic of structural features is the result of several events. Uplift of the Sierra del Carmen followed by decollement to the northeast across the Black Gap area formed the asymmetric Stillwell anticline and other folds. Rejuvenation of northeast-trending Paleozoic faults is probably the cause of the northeast-striking Dove Mountain Ranch anticline and associated faults. The re-occurrence of northwestward thrusting of the underlying Paleozoic strata, possibly resulting from sub-crustal activity, compressed the strata, forming conjugate shear sets striking approximately N. 20° W. and N. 75°W. in the massive Cretaceous limestones. Release of compression resulted in block faulting along the zones of weakness set up by the compression. A left-lateral rift movement accompanied the normal faulting.

GEOLOGY OF APACHE MOUNTAINS, TRANS-PECOS TEXAS

by

John William Wood

University of Texas, Ph.D. thesis, 241 p., 10 sections, 6 diagrams, 40 photos, June, 1965.

ABSTRACT

The Apache Mountains of southeastern Culberson County, Texas, are composed of Permian marine rocks deposited over truncated Paleozoic formations along part of the southwest margin of the Delaware Basin.

The western sector of the range, a broadly developed half-dome, is dominated by modified horst-and-graben structure superposed on shelf, shelf-margin, and basin facies ranging in age from Leonardian to Ochoan. The eastern two-thirds of the range is an exhumed Guadalupian reef complex, the surface structure of which is the elongate, southeast-plunging Apache anticline.

The oldest exposed rocks are Leonardian in age and compose the upper part of the Victorio Peak Limestone. The Victorio Peak crops out in an isolated ridge at the western end of the range. The siltstone, dolomite, and limestone within the unit probably formed as shallow-watershelf-margin deposits. In the same ridge, the Victorio Peak is conformably overlain by shale, silt stone, and limestone of the Cutoff Shale. The age of at least the upper part of the Cutoff is Guadalupian. As a result of uplift, erosion, and subsequent subsidence a tongue of Cherry Canyon basin-facies oversteps trucated Cutoff beds.

The Munn Formation crops out along the western base of the range and makes up the southwestern ridges. The two members of the Munn are composed of dolomite, siltstone, and limestone deposited as shelf and shelf-margin facies.

The "backbone" of the Apache Mountains is a southeast trending, massive carbonate lithosome, the Capitan Limestone, which is flanked on the northeast by a fault-line scarp and on the southwest by ridges composed of bedded back-reef dolomite and siltstone of the Seven Rivers, Yates, and Tansill formations. The Seven Rivers and lower part of the Yates merge northeastward into the Capitan reef. In contrast to the dolomite and limestone of the Seven Rivers, alternating siltstone or very fine-grained sandstone and dolomite characterize the Yates in the backreef lagoonal area. Abrupt facies changes are common within the Yates Formation. Dolomite beds composing the Tansill Formation crop out only in the eastern third of the Apaches, because erosion has stripped it from the topographically and structurally higher parts of the range to the northwest.

Small, downfaulted segments of the Castile and unconformably overlying Rustler formations of Ochoan age occur at the northwest base of the range in the Seven Heart Gap area; here also the Capitan reef talus intertongues with Bell Canyon basin facies.

South of the Apache range, the Yearwood Formation oversteps progressively

older Permian units from east to west. Pre-Cretaceous uplift resulted in the beveling of older rocks. The age of the Yearwood Formation is probably Cretaceous, of the Cox, Finlay, and Boracho formations, definitely Cretaceous. The cross-bedded Cox sandstone and conglomerate probably were shoreline deposits of an advancing sea; the Finlay limestone and Boracho marl were probably deposited in somewhat deeper water.

Tertiary tectonism formed most, if not all, of the present surface structural features of the Apache Mountains and adjacent areas. Large-scale block faulting formed the ranges and intermontane basins of the present landscape. Subsequent erosion and deposition, during the Quaternary Period, were largely climate-controlled.

The major economic resource of the Apache is ground water. Seven Heart Gap just north of the map area has the largest known barite deposits in Texas.

On The Distaff Side

Guess who bakes about the tastiest bread in town? Mr. Harry Spoor, that's who! And he's generous enought to share his recipe with all who request it.

The John Flannerys are off on a European vacation, and the Sid Schafers returned from their long trip in April. The Schafers older son and his wife have moved to California.

The Ed J. Smiths are enjoying having daughter Sue Wachendorfer, her husband, and their children living in Houston.

Beth and Bob Moore's daughter, Eva Lynn and husband Will Chapman, have moved to Conn. after living abroad for several years. Eva Lynn and children visited here in March.

The Paul Farrens recently announced the engagement of their daughter Jill to Tom Kuechel. Our best wishes!

The auxiliary is losing another lovely hard working member -- Shirley & Tom Kelliher, Jr. are moving to Victoria.

The May activities for both the Geo-Wives and the auxiliary are business meetings.

Marian (Mrs. Owen B.) Wood entertained the board members and committee chairmen with a beautiful luncheon on Monday, April 18th at her home. She is not only a wonderful president, she is also a marvelous hostess and cook!

... Grace Chambers

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