HOUSTON
GEOLOGICAL
SOCIETY

BULLETIN
1958 - 1959
HOUSTON, TEXAS

James A. Miller
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Houston 2, Texas
Houston Geological Society

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TENTH REGULAR MEETING - JUNE 8th

The tenth regular meeting of the 1958-1959 year will be held on Monday evening, June 8th, on the tenth floor of the Houston Club. Social Hour will begin at 5:15 p.m., and dinner will be at 6:00 p.m.

MR. G. C. CLARK, Consulting Geologist of Tyler, Texas, will speak on "INTERIOR SALT DOMES OF TEXAS, LOUISIANA AND MISSISSIPPI."

Mr. Clark will discuss the changes which the results of recent drilling have brought about in theories as to age and origin of these 90 interior domes. Both piercement and deep-seated domes occur in a narrow basin extending 120 miles in East Texas and across the entire width of Southern Mississippi and Northern Louisiana.

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Members are reminded that this is the last regular meeting for the 1958-1959 year, and results of the current election of officers and the voting on a number of Constitution changes will be announced.

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HONOR ROLL

Outstanding geology students of 1959, who received HGS awards at May meeting:

Richard T. Buffler, Austin - Univ. of Texas*
James P. Costa, Ft. Worth - Texas A&M
Walter D. Gregory, Houston - Univ. of Houston
Franklin R. Horton, Diboll - Lamar Tech
Lawrence D. Meckel, Baytown - Rice Institute

*This award had been announced earlier, together with the Terra Club Scholarship to Stephen E. Blesch, at University of Texas Honors Day Convocation and the HGS received grateful acknowledgment.

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Reverend Linehan's summary of the May lecture appears under Scientific Notes.
With this issue, the first volume of the Houston Geological Society Bulletin is completed. A logical expansion from our "Newsletter" of previous years, the Bulletin has met with firm approval, first from our membership, then later from a number of colleges and universities, and more recently from the U.S. Geological Survey. Credit for the excellence of our new publication goes to our Editor, Dr. Shirley Mason, who has devoted much of his time to securing material, editing it, and meeting deadlines. Able assistance was provided him by E. H. Rainwater, James S. Critz, and others. The Bulletin also, as recommended by last year's Finance Committee, has served as a successful vehicle for advertising. Through the determined efforts of Managing Editor Carter Robinson, and the loyal support of more than a hundred individuals and business firms, funds were raised to help publish the Bulletin and support the social hour at our technical meetings and other functions.

During my term as President this past year, I have enjoyed the full cooperation of the other officers and the Executive Committee members. The several key committees of the Society have been most industrious and the results of their work this year have been outstanding. Through their efforts we have succeeded in aiding in finding places for a number of men in the profession, instituted a Committee for hospital visiting, etc., continued our important work with student loans and awards, conducted three highly instructive field trips, published the excellent report of the Frio Study Group and two very complete field trip guidebooks, advanced with work on four other publications—all in addition to conducting our regular technical meetings with well attended programs and enjoying a series of very fine social functions. Finally, my employer, Humble Oil & Refining Company, has extended me the fullest support and understanding in the conduct of my work for the Society.

...Ralph E. Taylor
Personnel Placement

Vacancy - The Committee has a request for an unemployed geologist, now living in the Houston area, with PHOTO-GEOL OGY experience or training.

Since July 1958 your Committee has received 61 inquiries from employers resulting in the placement of 49 men. 322 men have registered with us and at the present time (May 21, 1959) our active files contain 101 names. Approximately 350 individual notifications of openings in geophysics and logging have been mailed to registrants. A final accounting to the membership of the Society is planned for the first Bulletin in September.

Removals from active to inactive files through May 21, 1959:

8 now in school
6 now in armed forces
116 found their own jobs
42 did not reply to postal survey questionnaires
49 placed by the Committee
221 total names removed from active files since July 1, 1958
101 names in active files as of May 21, 1959
322 total number registered with Committee since July 1, 1958

Present active files by categories:

7 advanced degree - experienced (3 to 29 years) in geology
25 advanced degree - no experience
25 Bachelor's degree - experienced (2 to 16 years) in geology
34 Bachelor's degree - no experience
10 Bachelor's degree and advanced degree-experienced (2 to 35 years) in geophysics

101 total men in active file May 21, 1959
Personnel Placement - (Cont'd)

The present Committee will function until a new Committee takes over in July. If you need a man in GEOLOGY, GEOPHYSICS or LOGGING,

Call - Glenn C. Tague, Chairman, CA 4-7591
John H. Clements, Vice-Chairman, CA 2-6325
Earl H. Bescher, CA 5-4411, Ext. 2019
Morton R. Yust, CA 7-2181

Study Course

FIELD STUDIES

This committee has received promises to write studies of 61 fields for the proposed volume on the Occurrence of Oil and Gas in Southeast Texas. This number is still insufficient and not fully representative of the varied types of hydrocarbon traps in the upper Gulf Coast. Consequently, the committee plans to continue to obtain commitments for more fields and also more varied representative fields, especially salt domes.

"Suggestions to Authors" and examples of write-ups will be sent to those who have volunteered as soon as a firm decision is made to proceed with the volume.

Anyone interested in making a field study should contact Elmer Musselman with Shell, Jack Craig with Josey Oil Co., Sam Udden with Continental, Charlie Barnes with Pan American, Claude Watts with Texaco, George Sealy with Humble, LeRoy Woollett with Gulf, or Dick Hohlt with San Jacinto Petroleum.
Entertainment

The Annual HGS Golf Tournament was held May 18 at The Champions Golf Club. There were 136 players participating.

Charles Atchison won low gross with a score of 78. Al Boatman won low gross runner-up with a score of 81.

Jim Wheeler won the low net handicap with a low net of 59. Bill Mattingly was low net runner-up with a 63. Each of the above received an engraved trophy.

Six of our ladies participated and June Farren won low gross with a 91. Vivian Smith won low net handicap with a 63. These ladies also received prizes.

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NEWS OF MEMBERS

Tom O'Donnell resigned from Texaco to become Texas Gulf Coast Geologist for Maverick Exploration Co.

John D. Taliaferro, Jr. has opened an independent consulting office at 960 San Jacinto Building (CAPitol 7-5354).

Glen Petrick's daughter Jean is recovering from concussion incurred when thrown from her horse.

Tom Barber left his position as Asst. Division Exploration Superintendent with Pan American to become Manager of Exploration for Michel Halbouty. George Hardin was promoted to General Manager in that organization.

John Adams will spend five weeks in Scandinavia collecting Ordovician bentonites in connection with the Rice Institute work on the geologic time scale.

Alva Ellisor is planning an extended European tour this summer.
Notice

A large number of foreign oil men attending the 5th World Petroleum Congress will be on the Gulf Coast field trip and stopping at the Shamrock-Hilton Sunday, June 7th. Members with friends from abroad who might be here can check the tour list by getting in touch with Mr. Charles Gaudin at the American Express Co. office.

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THE AUXILIARY

To the members of the Auxiliary who missed our May 6th Business Meeting, I want to extend my thanks to you also for the honor bestowed on me, and to bring you up to date on your new Officers. It will be our endeavor to approach the success of the past year and to make the 10th year an enjoyable one.

Following are the new Officers selected to serve the current year:

President ...................... Mrs. Lawrence J. Vittrup
President Elect.................. Mrs. Ed. J. Smith, Jr.
1st Vice President............... Mrs. Vernal Clark
2nd Vice President.............. Mrs. William E. Greenman
3rd Vice President.............. Mrs. Dean Grafton
Secretary ...................... Mrs. Royce E. Oualline
Treasurer ....................... Mrs. Buford Miller
Historian ...................... Mrs. Robert E. Hackbarth

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Mrs. Wayne Bowman
Mrs. W. T. Gillingham
Mrs. Leon A. Kent

Mrs. Frank A. Nice
Mrs. Ralph Taylor
Mrs. James A. Wheeler

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Committee Chairmen

Courtesy........................................ Mrs. B. G. Martin
HGA Notification............................ Mrs. Everett Stratton
HGS Notification.............................. Mrs. William E. Lester
Publicity........................................ Mrs. R. R. Moore

Our known ill include Mrs. Orval L. Brace in St. Luke's Hospital. When you know of illness in our Auxiliary will you please notify Mrs. B. G. Martin or me so that we may remember them.

Have a pleasant summer and a wonderful vacation.

...Nan Vittrup

MEETINGS AND NEWS OF OTHER SOCIETIES

Geophysical Society of Houston

The last technical meeting of this Spring was held at noon Monday, May 18th, at the Rice Hotel. Dr. R. A. Geyer of Geophysical Service, Inc. spoke on "Magnetics in an Exploration Program with Particular Reference to Alaska." Approximately 150 members and guests were in attendance.

A stag barbecue will be given by the Society in June at which time the newly elected officers for the 1959-60 season will be announced.

All members of the Society are urged to give some thought to placement of loans from the Student Loan Fund to sons and daughters of Society members and of deceased members who may be in need of help in their college education. Mr. Hugh Broussard of Independent Exploration Company is Chairman of the Fund Committee.
As a preview of the program, the technical papers to be presented are listed tentatively below. Several of these are not finally cleared with management and a few more may materialize. In addition, the area to be covered on the Field Trip between Galveston and Lake Charles will be discussed in a 2 or 3 hour symposium. If any of these authors should ask for information or other assistance, please help, because they are working hard to give the latest and best thinking on their subjects.

Joseph D. M. Williamson, Houston  History of Gulf Coast Cenozoic

Leonard L. Limes & Occurrence in South Louisiana of
Jack C. Stipe, New Orleans Miocene Oil

Ramsey L. Oakes & The Grandison Complex, Lafourche
Jack Crosbie, New Orleans Parish, Louisiana

Frank R. Hardin, Houston Thornwell Field, Southwestern La.

Hunter Goheen, Lafayette Sedimentation and Structure of the
Planulina-Abbeville Trend, South
Louisiana

Jack W. Shirley, Lafayette Structure and Stratigraphy of Rayne
Field, Acadia Parish, Louisiana

L. Bruce Forney, Houston The Frio Formation of the Upper
Gulf Coast of Texas (HGS Study
Group Report)

Thomas Branham, Facies Study of the Frio Formation
John E. Grayshon & of the Upper Gulf Coast of Texas
Robert Johnson, Houston
James A. Mallory, Houston
An Environmental Study of the Nodosaria Sand of the Upper Gulf Coast of Texas

James S. Critz & John E. Walters, Houston
Pheasant-Palacios-North Francitas Area, Matagorda and Jackson Counties, Texas

J. O. (Jock) Reiter, Houston
Hitchcock Field, Galveston County, Texas

Richard P. Akkerman, Houston
Lost Lake - Trinity Bay Area, Chambers County, Texas

Ralph B. Cantrell,
J. C. Montgomery &
A. E. Woodard, Houston
Heterostegina Reef on Piercement Domes with Special Reference to Nash and Others in Northwestern Brazoria County, Texas

William V. Hoyt, Yoakum
Erosional Channel in the Middle Wilcox Near Yoakum, Texas

Gene B. Martin, New Orleans
A Preliminary Investigation of the Upper Ordovician Bryozoa of Northwestern Alabama

Gene Ross Kellough, Houston
Biostratigraphic and Paleoecologic Study of Midway Foraminifera Along a Section of Tehuacana Creek, Limestone County, Texas

Joseph W. Lang, Jackson, Miss.
Influence of the Jackson Dome, Miss. on the Sedimentary Facies in the Upper Claiborne

D. Hoye Eargle, Austin
Structure of the Karnes County Area, Texas, and Its Relation to Jackson Sedimentation
G.C.A.G.S. (Cont'd)

John J. W. Rogers & Cyrus Strong, Houston
Textural Differences Between Two Types of Shoestring Sands

Louis S. Kornicker, Austin
Analysis of Factors Affecting Quantitative Estimates of Organism Abundance

R. R. McLeod, New Orleans
A Theory for the Formation of Limestone Cap Rock of Salt Domes

Anyone else with a paper in mind is urged to contact promptly Charles W. Stuckey, Jr., Associate Editor for the HGS and representative of the Gulf Coast Section of SEPM.

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A.A.P.G. - Ballot on Junior Membership Amendment
Discussion as received from District Representatives

For the benefit of those who did not attend the meeting in Dallas, President Lewis Weeks has supplied the following summary of the various viewpoints:

For the passage of the amendment:

The feeling appeared to be rather general among those who expressed their views, both pro and con, that tightening up of membership requirements, particularly at the junior level, is desirable. In this respect, there appeared to be little, if any, disagreement with the views of the Executive Committee and those of the Membership Advisory Committee, both of which committees had given much study to the matter before recommending the amendment. Among the views ex-
pressed in favor of the amendment were:

1. That an increase in the qualifications was overdue; that the step taken was in the right direction.
2. That the temporary denying of junior membership to some students was not too serious since copies of the Bulletin are generally available to the few who might wish to consult them during the year or similar short period prior to attaining qualifications for junior membership.
3. That meanwhile the Membership Advisory Committee has been charged with the task of exploring the possibility of student membership, or of making the Bulletin available to students at junior membership rates, or of meeting the situation in some other way.

Against the passage of the amendment:

It was felt that the exclusion of students from any form of membership, even though the exclusion may be temporary, is unfortunate. Opinions were expressed that, even though increase in qualifications for junior membership is desirable, at the time that this is done, provision should be made also for some form of participation, such as a student class of membership, by those interested candidates who have not yet qualified for junior membership.

The opinion was expressed that the present limited opportunity for employment is a particularly unfortunate time to take any steps which might add to the discouragement of potential petroleum geologists now at the student level.

It was pointed out by some that the wording of the amendment proposed "having qualified and been accepted as a candidate for a master's or higher degree in geology..." is too vague, because in some schools "acceptance as a candidate" may not come until late in the graduate
course; whereas, in others, it means mere enrollment in the graduate school.

A third point of view, held by some, runs somewhat contrary to the arguments as given above for both sides. This view holds that, to add another class of membership, a student class, to last for only a year or two, would add an appreciable burden, of work and cost, to the Association. Rather, it may be better, it is argued, to leave the present Junior class of membership very much as it now is; and to make the desired upgrading of qualifications a requisite for attaining to full membership. Requirements for the latter, it is suggested, should include an appreciably higher number of college hours than the 30 hours required for Juniors. The number of hours might be more in line with that attained by the average Bachelor graduate today, which is much higher than 30. In addition, to become a full member, the candidate would have to have attained at least a Bachelor's degree or its equivalent, plus a certain number of years of creditable work and attainment as a graduate student and/or as a teacher or in the application of geology in industry, government, etc. Such a course, it is suggested, would satisfy those who would like to continue the advantages of the Association for geology student majors, and it would also meet the objectives of the large and growing number of the Association membership who see the need to have the main qualifications upgraded.

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Reports for Next Convention

Those who would like to present papers at the next A.A.P.G. Annual Convention, which will be held in Atlantic City, New Jersey, (April 25-28, 1960) should submit contributions to Professor F. J. Pettijohn, The Johns Hopkins University, Baltimore 18, Maryland. Papers should be "concerned with principles or concepts of exploration, with regional studies, and with geologic history and its bearing on known and possible petroliferous trends." The deadline for a place on the program is October 1, 1959.
From Paul Weaver

Geologists are under exposure to new logs. Have you read up on accelatron, cementon, and chlorinity? Bibliography available through advertising editors' offices.

W. L. Broadhurst, remembered by many of us for his Harris County water surveys, and presently Chief Hydrologist at Lubbock supervising 45,000 wells and issuing permits for about 325 new ones monthly, is in print with a full-color book: "Chief Running Water's Story of High Plains Water" to introduce some geology to 5th, 6th and 7th grade students. Good reading for any Cub Scout or Brownie in the country, if geologist daddy helps.

In a more sophisticated style, Trigg Twichell (U.S.G.S., Austin) is accepting applications for loan of a film on Texas water problems, suitable for service clubs, and with a message for all citizens, even geologists.

Another good friend of many of us and a native Texan, Parker D. Trask, is author of: "Effect of Grain Size on Strength of Mixtures of Clay, Sand, and Water" (G.S.A. Bull., Vol. 70, No. 5, May, 1959, p. 569-580). This article is one of several which report investigations on soils, and on recent sediments, by Trask and his associates. The article has a definite application to consolidation and to foundations or overlying sediment loads. Witness this sentence: "The affinity of sediments for water in a natural environment of deposition increases in the same order as does strength for given water content and as does base-exchange capacity." Test this on your Beaumont loam lawn or the new First City National Bank subsoil!
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Scientific Notes - From Paul Weaver (Cont'd)

A gas well in Alberta quit flowing soon after completion. The pay was a porous dolomite containing sulphur and production was almost entirely carbon dioxide, hydrogen sulphide, and methane, with sulphur in solution.

Denton Wieland, a graduate student at A&M, found that the literature has little about solubility of solids in nonaqueous solution (for example, the recent G.S.A. Memoir 73 by Fyfe, Turner, and Verhoogen considers only reaction during metamorphism with aqueous solutions). Wieland determined solubility of rhombic sulphur at different temperatures and pressures in the three gases and in mixtures of them. From the diagrams in his graduation thesis, it is obvious that to bring all the sulphur to the surface through the well, so it can be separated and sold, pressure around the well must be sustained at a certain value, otherwise sulphur precipitates in the reservoir, reducing permeability.

This pioneer research of Wieland shows there is significance in the solution of at least this mineral, sulphur, in these gases for efficient exploitation. Smackover operators take notice, also deep sour-gas exploiters in the new fields in France.

Probably the recent book which best combines beauty and utility is "Mineraux d' Uranium du Haut Katanga" by "Les Amis du Musée Royal du Congo Belge," Tervuren, Belgium - 240 Belgian francs. It contains 27 color plates of the principal uranium minerals, made by the Kodak dye transfer process. Up-to-date mineralogical descriptions of all species constitute the text.

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From E. H. Rainwater

The Mississippi Geological Survey

Recently the Mississippi Geological Survey was reorganized, and a new board of control, consisting of two geologists, an engineer, and two men representing business, was formed. One of the first acts of the board was to appoint a new State Geologist, Tracy W. Lusk, to succeed Dr. W. C. Morse who retired in 1958, after serving as Director of the Geological Survey for 25 years. Lusk has issued a paper-bound, up-to-date list of publications and has distributed a memorandum on a new policy in the distribution of reports. The heretofore free distribution ceased and a small charge, noted in the new List of Publications, will be made. Notices of new publications will be sent to those on the mailing list.

Lusk is a native Mississippian and was educated in Mississippi. He is well aware of the need for an aggressive Geological Survey, but he also knows that he probably must operate on a small budget. There are many fields to be covered, such as:

1. Investigation of all types of mineral deposits
2. Determining the surface and ground water supplies of the state
3. Studying the stratigraphy and paleontology of the outcropping and subsurface formations
4. Cooperation with the Federal agencies in getting topographic map coverage of the state
5. Preservation of well samples
6. Publishing geologic reports on studies made by the Survey staff or by nonstaff geologists who offer manuscripts of value.

The Mississippi Geological Survey was first created in 1850, and John N. Millington, M.D., was appointed State Geologist. In 1857 the great scientist, Dr. Eugene W. Hilgard, became the State Geologist. He issued his outstanding report on the geology and agriculture of Mississippi in 1860. Soon after Hilgard left the state, in 1869, the
Survey died from lack of financial support. It was recreated in 1906, and A. F. Crider served as Director from 1906-1908. E. N. Lowe, M. D., was Director from 1908 until his death in 1933.

Eighty-five bulletins have been issued by the Mississippi Geological Survey. They deal mainly with the geology and mineral resources of the state, but some of them are on archaeology, plants, and soils. Many of the bulletins are of special interest to petroleum geologists, such as the ones on the geology of counties, on the Eocene sediments by Grim (1936), the Claiborne by E. P. Thomas (1942), the Lower Cretaceous by J. D. Nunnally and H. F. Flower of Gulf Oil Corp, (1954), and the Upper Cretaceous by Stephenson and Monroe (1940). The last bulletin, which has been out of print for several years, will be reprinted soon. Lusk advises that he has a manuscript on "Minerals of Mississippi" by F. F. Mellen ready for the press; also, field work on the Geology of Prentiss County has been completed.

Petroleum geologists generally agree that one important service a state geological survey can render is to preserve well samples and make them available for study by any interested person. The value of such a collection of samples was proved in 1944 and later when geologists from as many as 14 oil companies were simultaneously studying samples at the Florida Geological Survey in Tallahassee. Dr. Herman Gunter, who was Director of that survey for 38 years, had carefully collected and catalogued samples from hundreds of water wells and from each oil test. Similar sample libraries are at most other geological surveys in the Gulf Coast.

Mississippi has not had sufficient staff or facilities to build up a large collection of well samples, and the Mississippi Geological Society has been trying for several years to improve this situation. Already many valuable cores from most of the formations penetrated by the drill have been lost because no organization could afford to collect and store them. The new state geologist has plans for a sample library at Jackson, where most of the oil companies are headquartered.
The welfare of the state geological surveys should be of concern to all of us. With each state agency or bureau clamoring for a greater share of the state taxes, it behooves us to help the geological surveys by pointing out the valuable services which they have provided and can continue to do, without competing with company geologists or consulting geologists. We should become better acquainted with the staff, facilities, and material of the state geological surveys, especially those in the Gulf Coast. And we should be willing to help, encourage, and advise the state geologists whenever possible.

Techniques of Prediction with Application to the Petroleum Industry, by M. King Hubbert

By invitation of the Program Committee for the 44th Annual Meeting of the American Association of Petroleum Geologists in Dallas, M. King Hubbert reviewed some of the techniques of prediction and showed their application in estimating the future outlook for the petroleum industry in the United States. The present synopsis is based on the author's preprint which is subject to correction.

Techniques of prediction are divided into those with rational and those with nonrational bases. Of the latter, that which is most commonly employed is empirical extrapolation, either of trends or cycles. From the earliest times to the present, a favored technique of making predictions is by means of ambiguous statements.

The best predictive techniques, according to Dr. Hubbert, are those based upon a knowledge of the physical mechanism of the system, with the results stated as unambiguously as the data will allow. The oil-industry data were then examined using several different techniques. One of these was the curve of productive rate versus time. This curve must begin and end at zero, and the area under the curve is the cumulative production, which is limited by the oil initially present. Application of this technique to U.S. production data, assuming 150-billion
barrels ultimate reserve at present recovery efficiency, indicated that the productive peak should occur about 1965. For an ultimate reserve of 200-billion barrels, the peak would occur about 1970.

Another technique was based upon the relation between cumulative discoveries, cumulative production, and proved reserves. From API data it was shown that since 1925 discoveries have preceded production by about 10-11 years. The peak of the rate of discovery occurred about 1952, which suggests that the peak of the rate of production should occur about 1963. Reserves should reach their peak about midway between these dates, or about now. By the end of 1952, the amount of oil discovered was about 73.3-billion barrels, and if this is about half the ultimate, the latter would be about 147-billion barrels.

Separate consideration of fields greater than, and those less than, 100-million barrels gave an estimated ultimate of about 137-billion barrels. Hence, the estimate of 150-billion barrels for ultimate production at present recovery efficiency appears to be consistent with available information. If a one-third improvement in recovery efficiency is accomplished, this would yield another 50-billion barrels, or a total of 200-billion barrels. This still would imply a productive peak by about 1965, but with a decline at a lower rate than would otherwise be the case.

Dr. Hubbert informs the reviewer that soon after the Dallas meeting, a further study of the large fields showed his earlier estimate for these fields to be somewhat too small, and that a revised estimate for these fields is now being made.

The estimates by Hubbert are somewhat less optimistic than those of Morgan J. Davis* given at the same meeting.

*(Those interested in more than the brief reference to the address by Morgan Davis given in the May Bulletin can obtain complete copies by writing to Humble Oil & Refining Co., Public Relations Department, Room 1156, P. O. Box 2180, Houston. - Ed.)
Over 170 geologists and paleontologists in 47 vehicles attended the field trip in the vicinity of Hearne, Milam County, on May 2, 1959. Visitors from two states were led by Texas A&M Professor Fred E. Smith, who demonstrated his mastery of the Cretaceous and Tertiary of the Central Texas Brazos River Valley.

Charles Stuckey, E. H. Rainwater, and Mark Hanna joined Professor Smith in describing the geologic section and history at the localities visited. Cretaceous Taylor and Navarro, Paleocene Midway, and Eocene Wilcox, Carrizo and Reklaw outcrops were examined in a 90-odd mile tour.

An excellent guidebook with comprehensive discussions of geologic history, road log, locality descriptions, faunal assemblages, lithologic sections, an up-to-date stratigraphic section, a well section with electric log, and a complete annotated bibliography was compiled by Professor Smith. He was aided by the field trip committee, E. H. Rainwater, C. W. Stuckey, H. G. Schoenike, H. B. Stenzel, and L. J. Vittrup. With the guidebook in hand, one may easily run the trip and gain a first-hand understanding of the Cretaceous and Tertiary of the Brazos River Valley.

Under the auspices of the Houston Geological Society, and the Gulf Coast Section of the SEPM, this event was the second half of a two-part field study in the Brazos River area, including portions of Falls, Milam, Robertson, Burleson and Washington Counties, Texas. The first field trip covered the lower and middle Tertiary of the Brazos River Valley and was held December 6, 1958.
The recent International Geophysical Year found the United States Navy playing host to the American scientists in Antarctica. Task Force 43, under the command of Adm. George Dufek, USN, chose the sites, built the bases and supported them so that the scientists might have more time to devote to their observations. The men of the Navy, the scientists and the press have brought Antarctica before the world as it has never before been portrayed. Books have been written on this white continent, films of it flashed on the screen, pictures telecast into homes, and lectures presented with Kodachrome illustrations to various audiences. The cold curtains of Antarctica are being rolled back so that all may begin to understand it.

Antarctica is a continent larger than the United States and Europe combined. It extends over 5,000,000 square miles and rises in some places to over 15,000 feet above sea level. It is a continent of extremes. The coldest continent, with a temperature of -124 degrees F. recorded; the whitest continent, with 99% of its surface snow-covered; the most lifeless continent, with no human or animal life indigent to the land area and only three species of birds making it their native habitat. There are other superlatives that might be applied. Some oceanographers call its seas the richest in food; it is still the most unexplored region of the world.

Antarctic climate varies with the location of the observer’s base. The Weddell Sea area might measure hundreds of inches of snow a year, while only six inches may fall at the Pole; winds of barely a few knots may blow at Marble Point in the summer, while Mawson measured gusts of almost 200 knots along the Knox Coast; in one area bare earth may be seen, and in another it is covered with more than 10,000 feet of ice.
The only life one finds on land is bird life, and these find most of their sustenance from the sea. Some seventeen species of penguin may be found from the equator to the Antarctic, but only two species are found below the Antarctic Circle, the Adelie and the Emperor penguins. These differ in many traits and customs.

The Adelie, the smaller species, hatches its one or two eggs during the Antarctic spring and summer. Then the entire family migrates to the edge of the pack ice for the winter, returning the next spring.

The Emperor penguin brings forth its single chick during the winter time. Due to storms, ice pressure, and even the milling of the bird population, the infant mortality has been estimated as high as 70%. The species is preserved, however, by the long life span of the parents.

The one other bird native to this continent is the Skua Gull, so beautifully described by Poynting, photographer on the Scott's Second Expedition in 1910. This species resembles our own sea gull. Carl Edlund, however; places it in the eagle family. The Skua depends on the penguin for much of its food. Not only will it rob the penguin of a fish it has just brought up from deep waters, but will frequently snatch the egg or chick from a penguin mother to feed its own young.

Flora in Antarctica are next to non-existent. Lichens may be found on some exposed rocks, and occasionally a small piece of moss. These, plus a bit of grass found in some glacial streams, comprise the vegetation of the continent; and, compared to Arctic vegetation, it is as nothing.

The geology of Antarctica is not too well understood as yet. It is too difficult to extrapolate knowledge under the ice from the few exposures available. Flying up the Beardmore Glacier, one can see both crystalline and sedimentary exposures; some are metamorphosed, and others present a simple attitude. How far these conditions exist back from the valley walls is unknown.
Apparently McMurdo Sound is the result of a graben. The land east of the Admiralty Range dropped, carrying down both sediments and metamorphics. Volcanic activity began along the fracture, and Ross Island was born of this activity. The highest peak in this island, Mt. Erebus (13,800') is still emitting smoke and steam. In the material ejected from the craters can be found inclusions of sand stone, schist, and gneiss that have been carried up from the depths below, rock that was once the country rock of the area.

It is in such an area as this that the U.S. Navy and the scientists have been working since 1954, establishing bases and making scientific observations. The various Geophysical Disciplines, as Glaciology, Seismology, Terrestrial Magnetism, Oceanography, Cosmic Rays, Ionospherics, Meteorology and others were studied, and great advances have been made. It is planned to keep some of the bases operating for some years to come, if funds are available.

The conditions under which the scientists worked were as suitable as could be expected. Buildings were warm and the food well prepared. Where men were exposed to extreme temperatures, special clothes and breathing devices were provided. On the trail where various scientific experiments were operated, living conditions were sometimes hazardous, if not uncomfortable most of the time; but excellent results were produced, even under these conditions.

The scientists have solved some of the scientific secrets frozen in Antarctica, but many more remain. The Silent Continent will remain mysterious for some years to come. However, even now, the great expanse of ice, the flickering of the aurora across the heavens, the beauty of sunsets reflected on the ice, the relentless power of a moving iceberg, even the cheep of a penguin chick, teaches the explorer of the Power, Beauty, and Love of the Creator. Man feels very small in beholding His Works as they are portrayed in Antarctica.

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