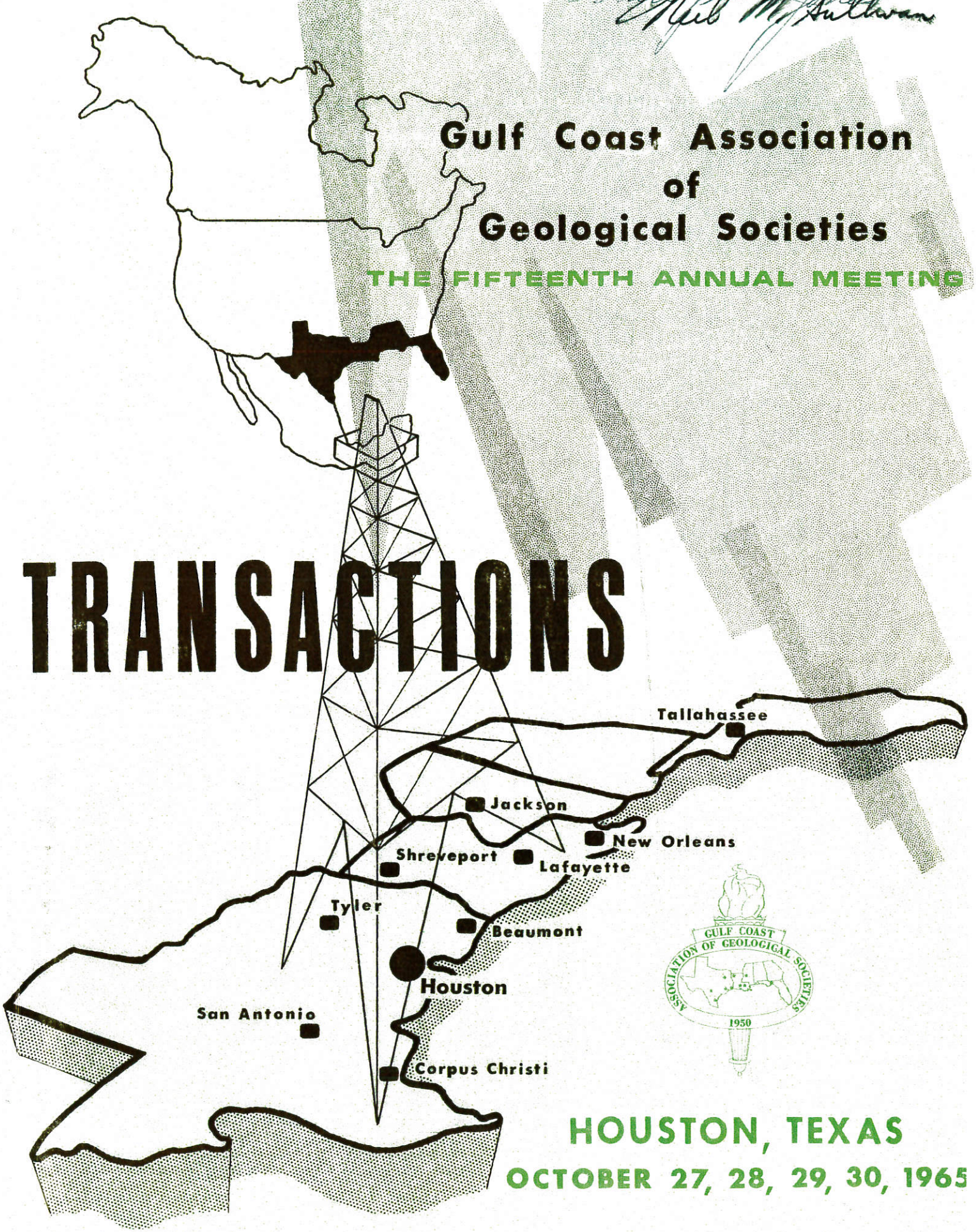
Gulf Coast Association of Geological Societies

THE FIFTEENTH ANNUAL MEETING

TRANSACTIONS



HOUSTON, TEXAS

OCTOBER 27, 28, 29, 30, 1965

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DEDICATION

DR. HENRYK BRONISLAW STENZEL

This volume is dedicated to Dr. Stenzel in honor of his contributions to the geology of the Gulf Coast. His numerous publications and the number of students who have been influenced by him are testimony to his abilities. It is fitting that this honor comes on the anniversary of his fortieth year of teaching and research in the Tertiary of Texas.

Henryk Bronislaw Stenzel was born on February 7, 1899, the second of three sons of Stanislaw Sztencel. His mother was Leah Kohn Sztencel. The place of his birth, Pabianice, Poland, is a textile town; his father and uncle were prominent members of the town and owners of a textile printing plant.

As a child of pre-school age, Stenzel collected Jurassic fossils in creek beds near his home; his first lessons in geology came from a distant relative, Benjo Dobrzynski, who had himself just been introduced to geology in courses at a French Lycée (high school). It was not until 1908, that he began formal schooling at the Gymnasium zu St. Elisabeth, Breslau, Silesia, then a part of Germany. At registration, the head master observed that a good German name as Sztencel warranted the proper German spelling and over his mother's objection he was registered as Stenzel. In 1915, because of the hostilities of World War I, he was considered an enemy alien and was forced to leave this school. He remained in Breslau attending a private prep school in preparation for the high school exams, which he subsequently passed. Upon returning home, he was taken by his father to a quarry located east of Czestochowa. The numerous fossils collected from the excellent Jurassic exposures were placed in a "tow-sack" which in turn was carried by a local workman especially hired for this chore. This rich-man approach to geology was to contrast sharply in later years with the sweat, dirt, insects, and brambles of the Tertiary of Texas.

In the fall of 1918 he returned to Breslau, and entered the Schlesiche Friedrich Wilhelms University; he majored in Geology and Paleontology and Mathematics and Physics as minors. His research problem in granite tectonics was under the supervision of Hans Cloos. During the final weeks of field work he was plagued with minor illness—such that he had less than a month's time to analyze the data and write his dissertation. He hastily prepared and submitted a preliminary copy of his dissertation on schedule and graduated magna cum laude in 1922 with the degree of Doctor of Philosophy. The preliminary copy of which he was less than proud was the basis for awarding him first prize for the best dissertation of the year. The high standards which he set for himself then have remained with him and are in part the reason for the excellence of his published material. He remained at Breslau for another year as an assistant in the Geology Department, and then spent a year in England with a brother. At this time he wrote to cousins in Texas, one of whom, Dan Kempner, had been a member of the board of regents of Texas A & M in 1908. An offer was soon forthcoming for the position of instructor at A & M and so in August 18, 1925, Stenzel arrived in College Station. He and two others, a Dr. Hance and a Mr. Edward Hall, comprised the then embryonic geology department. There can be no doubt that the development and growth of that department was in large part influenced by him.

The job of teaching geology could certainly not be confined to the classroom; there must be field work. The Tertiary around College Station offered no exposures comparable to the outcrops of his previous experience. The only granite exposures were in the relatively unaccessible Llano country and consequently he had to content himself with the soil covered "outcrop" of the Claiborne group. In order to teach, one must first know and so he dug into the Tertiary. In 1931 he first published with B. C. Renick the results of their study of the lower Claiborne on the Brazos River. Although he returned to granite tectonics in his work on the pre-Cambrian of the Llano uplift, published in 1932, it was the Tertiary that was destined to become his life's work.

In 1934 he joined the Bureau of Economic Geology in Austin. Relieved of the time-consuming duties of teaching, he devoted full time to research. Months at a time were spent in the field and for the mapping of Leon County he brought his family with him; he had married Elsie Brodbeck of Austin in 1929. The field work, which took over a year, was hampered by poor roads (none were paved), an inaccurate base map (a county land survey map) and few good exposures. The results were excellent; the "Geology of Leon County" was published in 1939. He had recognized that the rocks of the Claiborne group were the result of cyclic deposition and had subdivided the group on that basis into formations and members. He had been impressed earlier by L. W. Stephenson's descriptions of Cretaceous disconformities; he had come to realize that similar disconformities were present in the Claiborne and were in fact the key to formation boundaries. In 1939, he also published the Yegua Problem in which he expanded on these ideas and first described the presence of conglomerates on the Tertiary disconformities. Throughout the years he has continued to document and describe the disconformities in numerous publications. Perhaps the best summation is to be found in "Boundary Problems" published in 1952.

Through the years, Stenzel added to his collection of Tertiary fossils and in 1944 he published on a Miocene invertebrate fauna from Burkeville, in Newton County. This was his first paleoecological study; it was short but extremely comprehensive. His explanations of variance in and synthesis of the environments of deposition of the Stone City beds, published in 1957, is another example of his ability as a paleoecologist.

The early years at the bureau were the years in which volumes of field notes and numerous fossils were collected, and many miles of terrain mapped. And the mapping never came easy. Those who have worked on the surface Tertiary of Texas know the frustration of mile after mile of soil with perhaps only a break in slope to mark a contact. The criteria for mapping include of necessity such things as soil or vegetation changes, or perhaps scattered but aligned rock float. The writer as assistant to Stenzel once followed behind as the Marquez shale-Queen City sand contact was mapped. On asking just what was the criterion for mapping, the Doctor jerked a leaf off of a low bush and pressed it beneath the assistant's nose—the smell was one of wax; the bush was wax myrtle; the contact between the shale and the overlying sand was gradational; ground water seeped out where the section became impervious; wax myrtle liked these zones of additional moisture—therefore trace the bushes and you have mapped the Marquez-Queen City contact. This example simply illustrates how his acute observations and logical conclusions made the solution of the problems of Tertiary geology possible. With years of such experience behind him, it was fitting that he resumed teaching in 1948 when he became professor of geology at the University of Texas. His concepts and principles of Tertiary geology were developed for the student in the same logical manner he used in his research. His ability as a geologist is perhaps only outdone by his teaching. He confined his teaching to the spring semester, and so that it did not interfere with his work at the bureau, he habitually scheduled his lectures during the noon hour; Saturdays were reserved for dawn to dark field trips.

Except for a short time in 1937 when he accepted a job as special problem geologist with the Shell Oil Company, but subsequently gave up because he felt "things were too good to last," he remained in Austin until 1954. At this time he joined the University of Houston as professor and chairman of the Geology Department, also becoming a consultant to Shell Development Company. In 1957, after suffering a major heart attack he resigned from the University of Houston and upon recovery he resumed his work at Shell Development. The work once more became primarily research except for occasional seminar lectures and field trips. In 1962, Stenzel got back to teaching when he became visiting lecturer in geology at Rice University.

The career of this man has run the geological gamut. He began in pre-Cambrian granite tectonics, by necessity switched to Tertiary stratigraphy. This necessitated becoming an expert in paleontology, which in turn required extensive knowledge in biology. His "Successional speciation in paleontology: the case of the oysters of the sellaeformis stock" is regarded as a classic and for many years has been required reading in advanced courses in evolution at the University of Texas and in many similar seminars throughout the country. When the authors were selected for the various parts of the treatise on Invertebrate Paleontology, he was chosen to prepare the write-

up on the living Nautilus. The editor, upon receiving the draft had pre-prints of his write-up sent to the other authors as an example to emulate. Among biologists, these pre-prints have received international notice, and requests have come from as far as New Zealand.

The recognition of the man is to be seen in the honors bestowed upon him. He was elected a fellow of the Geological Society of America, is one of the few people to have been president of both the Society of Economic Paleontologists and the Paleontological Society, and was chosen by the State Department to be an official Delegate of the United States of America to the 20th International Geological Congress in Mexico in 1956.

In 1953, C. I. Alexander chose to review "Geology of Henrys Chapel Quadrangle" by H. B. Stenzel in the bulletin of the American Association of Petroleum Geologists. He listed several distinguishing features of this publication, of which two are quoted:

"First, the meticulous attention to detail exemplified by the author in all phases of the field work and in the recording and presentation of his observations and conclusions might well serve as a model to all young geologists and to most of the older ones as well. A better illustration of how field observations should be made and recorded would be hard to find.

Second, the paper serves as a striking illustration of the amount of new and significant information which can be derived from a careful and detailed study of a geological section which has been the subject of numerous previous investigations, covering a period of nearly forty years."

While these remarks were written about the publication, they in effect describe the methods of the man—detail in observing, recording and presentation of the observations lead to well founded and logical conclusions. Of course, the application of this approach is only part of the reasons for the success of H. B. Stenzel—the other part is the man himself. The degree of success can be measured by the honors he has received, the positions he has held and now holds, the international reputation he has in both geology and biology, the worth of his publications and the influence he has had and has on the many that know him.

Wilfred Roux, Jr.
Senior Geologist
Shell Oil Company
Houston, Texas

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REPORT OF THE PRESIDENT OF G.C.A.G.S.

1965

Fifteen years ago a group of dedicated geologists formed an organization of societies to "provide for discussion and publication of papers on subjects and problems coming within the scope of the geological profession, and with particular emphasis on Gulf Coast geology." Over the years this organization has satisfied its purpose through its annual meetings and the publishing of its *Transactions*. You are all well aware of the success of these meetings and the broad acceptance of the *Transactions* as the principal source of Gulf Coast geological literature.

G.C.A.G.S. is now embarking upon a broader purpose through its Special Projects Committee. This committee was formed under the administration of Mr. Earl Knott of Corpus Christi in 1964. Its goal is to increase the contribution of G.C.A.G.S. to better geologists and geology. One project of particular interest has already been chosen for participation by G.C.A.G.S. This is an index to the geological literature of the Gulf Coast area. This index was compiled by the United States Geological Survey and will be published by G.C.A.G.S. and A.A.P.G. Several other projects are under consideration at this time and we are enthusiastic about the opportunities in this field.

Another of our functions during the past few years has been that of underwriting, through loans, the cost of special publications by member societies. Both the Lafayette Geological Society and the East Texas Geological Society have made use of such loans in publishing volumes dealing with typical oil and gas fields in their areas. We hope that loans such as these will encourage more publishing by member societies.

Our Association is strong, healthy and growing. Although we can all take pride in its accomplishments, we surely recognize that much more can and should be done.

Since the administration of G.C.A.G.S. travels about from host society to host society, there are practical limitations imposed upon each year's officers. While these limitations at times seem to be undue, I feel that they are more than offset by the obligation placed upon the host society and succeeding year's officers to become involved and devote a great deal of effort to the continuing success of the Association. This not only tends to prevent the growth of centralized autonomy, which can lose sight of the individual, but also creates a spirit of competition and requires rededication of successive host societies to the continued growth of the Association.

The administration of your Association during 1965 has been interesting to say the least. Discretion dictates that I not bother you by saying the most. Many people have done a lot, and I am particularly grateful for the contributions made by members of our Special Projects Committee and, of course, all who have worked so hard to organize this year's convention. I now look forward to the greater growth and success of G.C.A.G.S. and an occasional backward glance at the education and many good friends resulting from serving as your President during 1965.

Raymond E. Fairchild

REPORT OF THE GENERAL CHAIRMAN
FIFTEENTH ANNUAL MEETING
1965

The successful staging of G.C.A.G.S. annual meetings results almost entirely from the volunteer work of several score men and women who altruistically donate thousands of hours and immeasurable skills, energy, and ideas.

This year it is our privilege in Houston to provide manpower and facilities toward the continuing service, growth, and success of the G.C.A.G.S., the Gulf Coast Section of S.E.P.M., and, on a regional basis, the A.A.P.G. On behalf of all those who have worked on this meeting, I welcome each of you to Houston; and before all of you I thank each of those workers.

I wish specifically to acknowledge the contribution and foresight of Mr. Albert C. Raasch, Jr., who, until his transfer to Corpus Christi, preceded me in the role of General Chairman and brought together most of the outstanding group of committee chairmen responsible for formulating and executing the meeting plans.

Our theme, SCIENCE IN EXPLORATION, was selected, as usual each year, to emphasize some fundamental of the science and industry we represent. This year that fundamental is *ourselves.*

As members of the petroleum industry we are rightfully concerned with economic and political matters of foreign imports, legislation, governmental controls, and future reserves; with geological matters of provinces, trends, discoveries, and technologies; with personal matters of higher salaries, better jobs, or keeping the ones we have.

As human beings we are unavoidably influenced by spiritual matters of achieving recognition, self-satisfaction with what we do, and security.

Many of us believe that a significant factor in each of these matters is the professional quality and effectiveness of the individual in performing his daily functions.

We believe that individual traits of proficiency, effectiveness, and quality of work are attained through rigorous applications of science and scientific method.

We believe the old adage "oil-finding is an art" is too often a license for sketching familiar old contours rather than searching creatively for better kinds of maps and new mental models of what to draw upon them.

When we individuals become sufficiently proficient in doing each day what we are paid to do, when we maintain our industry and our jobs by *finding* oil rather than just *looking for oil,* most of those day-to-day problems of industry, geology, and personal worth will be eliminated.

The time is overdue for us individual explorationists to look within ourselves for the answers to those problems of exploration and production that directly concern us. Most oil companies and most geologists are "running scared" in some degree and some direction. Some companies meet the problem by selling out to another company that is better able to buy reserves than to find them. Some companies cope with the problem by shuffling personnel, with little result other than changing the panorama of faces. But what oil company terminates itself or reshuffles management when its individuals or teams of explorationists systematically provide the successes necessary for profit and growth?

The objective of our theme is to stimulate our own fraternity of oil-seekers toward becoming more proficient and effective individuals for the benefit of themselves, their employers, and the industry.

The objective of our technical program is to provide a variety of increments of proficiency and effectiveness for personal integration into individual competency.

A successful exploration organization is similar to a professional football team. Each member must want so much to stay on the team and win that he voluntarily and continually conditions himself to the limits of his ability. The conditioning is never-ending in self-discipline, in the perfection of basic skills, in the search for new ideas and techniques, and in the willingness to work. The game is rough, but the rewards are high.

All teams have fairly similar scout data and repertoires of plays. The big winners have one thing additional: man for man they outplay their competitors often enough to win more games.

We hope that along with fun and fellowship this annual meeting can be remembered as the first day of training camp. Let's toughen up our national league of oil-finders through the unceasing practice of *science in exploration.*

ALAN LOHSE
General Chairman

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REPORT OF THE PROGRAM CHAIRMAN

1965

A need for relating scientific geology and geophysics to practical daily exploration procedures prompted our theme "Science In Exploration." Because many companies regard their practical application of scientific studies as secret information, it is difficult to provide a program which amplifies this theme.

Despite the limitations imposed by "policy," we have assembled a group of topics which should provide subjects of interest for all who attend. The 29 items which constitute the program cover a wide range of subjects. Beginning with the keynote address by M. King Hubbert, "The History of Petroleum Geology and its Bearing on Present and Future Exploration," we proceed with papers on the petroleum industry, petroleum geology, stratigraphy, paleoecology, new techniques from well evaluation instruments, geophysics, and conclude our program with a Symposium from the Delta Study Group of the Houston Geological Society.

Among those who provided immeasurable help in securing and evaluating papers were:

E. Alan Lohse, Monsanto Company, Houston, Texas
John J. W. Rogers, Professor, Rice University, Houston, Texas
Frank W. Harrison Jr., Consulting Geologist, Lafayette, Louisiana
Wm. W. Webber, Sun Oil Company, Jackson, Mississippi

Without the help of these people, many friends, and the cooperation of the authors, preparation of this program for your pleasure would have been impossible.

P. Barkley Souders

REPORT OF THE EDITOR

1965

I take the opportunity here to extend my thanks to all of those people who have contributed to these Transactions.

First, to the authors, whose contributions are (I hope accurately) transcribed here. It is to be hoped that, in the future, more local geologists will contribute to this journal and that their employers will recognize that such public presentations make the contributors more aware of their professional responsibilities and, thus, more effective in their day-to-day work.

Next, to Fred L. Smith, Jr., Editor of the Gulf Coast Section of S.E.P.M., who transmitted two papers to the Transactions.

And to Mrs. Gene Kellough, who not only contributed a major paper to the Transactions but also handled most of the editorial work connected with it.

And to Robert R. Lankford, who contributed greatly to the preparation of some of the papers dealing with micropaleontology.

Also, to Gulf Printing Co., who cooperated so effectively throughout the publication process.

And last, and most especially, to Miss Letitia Zumwalt, who did most of the real work.

John J. W. Rogers

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Report of The President, Gulf Coast Section, S.E.P.M.

1965

The Gulf Coast Section of the Society of Economic Paleontologists and Mineralogists continues in its long-range objectives for advancement of stratigraphy, with emphasis on paleontology and mineralogy. To further this program during the current year the Section has sponsored publications on paleo-stratigraphy in the G.C.A.G.S. *Transactions,* conducted a field trip, continued the Type Localities project, substantially increased G.C.S. membership and issued a current Membership Directory.

Mr. Julius B. Garrett was elected to Honorary Membership in the Gulf Coast Section of S.E.P.M. by the 1965 Executive Council. This is in recognition of valuable contributions to geological knowledge and resultant service to petroleum geology and paleontology.

Grateful acknowledgment for services contributed to G.C.S. by the other officers is made—namely, to Vice President Ben Petrusek, Secretary D. Jeter Smith, Treasurer Emmett Adams, Past President Lyman Toulmin and Editor Fred L. Smith, Jr. Business Representatives also assisted in conducting the Section's affairs during the year.

Louis Gimbrede continued to serve as editor of the important Type Localities endeavor during the present year. Robert Lankford, Field Trip Chairman, arranged and conducted the offshore trip which demonstrated methods of sampling for ecology data on the continental shelf. Norbert Cygan assisted by organizing the trip. Clarence Albers, et al., compiled, prepared and distributed an up-to-date Membership Directory. This Directory, the first that has been issued since 1960, was distributed free to G.C.S. members. Billy Toy, assisted by Edward Marks, served for G.C.S. on the G.C.A.G.S. Committee that organized the Annual Meeting. Finally, under the leadership of Vice President and Membership Chairman, Ben Petrusek, our membership increased to a total of 314, consisting of 149 Members, 158 Associate Members and 7 Honorary Members.

HOWARD L. TIPSWORD

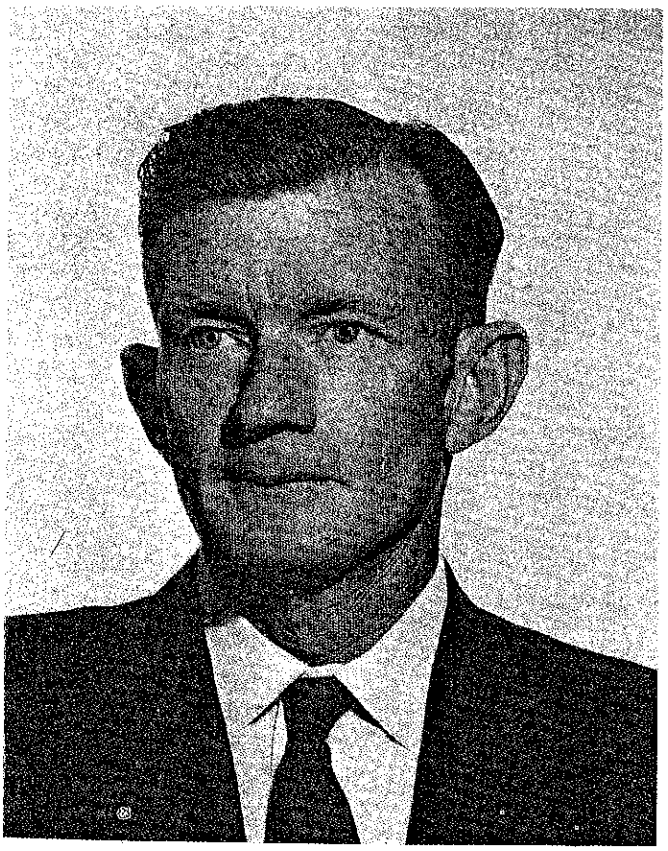
BEST PAPER AWARDS, 14TH ANNUAL MEETING
CORPUS CHRISTI

Awards were presented for three papers at the 14th Annual Meeting of the Gulf Coast Association of Geological Societies, held in Corpus Christi, Texas, October 28-30, 1964. The award-winning papers are:

1st. E. H. Rainwater, Regional Stratigraphy of the Gulf Coast Miocene

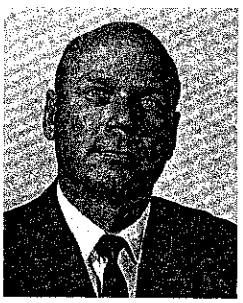
2nd. Don R. Boyd and Byron F. Dyer, Frio Barrier Bar System of South Texas

3rd. Jan L. Arps, An Introduction to Continuous Electric Logging while Drilling



E. H. RAINWATER is a consultant for Tenneco Oil Co., Houston, Texas. He has been active in work on the Gulf Coast for many years. He received the Bachelor's degree from Mississippi State College and the M.S. degree from Northwestern University.

DON R. BOYD is with Texas Eastern Transmission Corp., Corpus Christi. He received the Bachelor's degree from the Univ. of Texas and the M.S. degree from Louisiana State Univ.



BYRON F. DYER is district geologist for Southland Royalty Co., Corpus Christi. He received the Bachelor's degree from Lamar State College of Technology.

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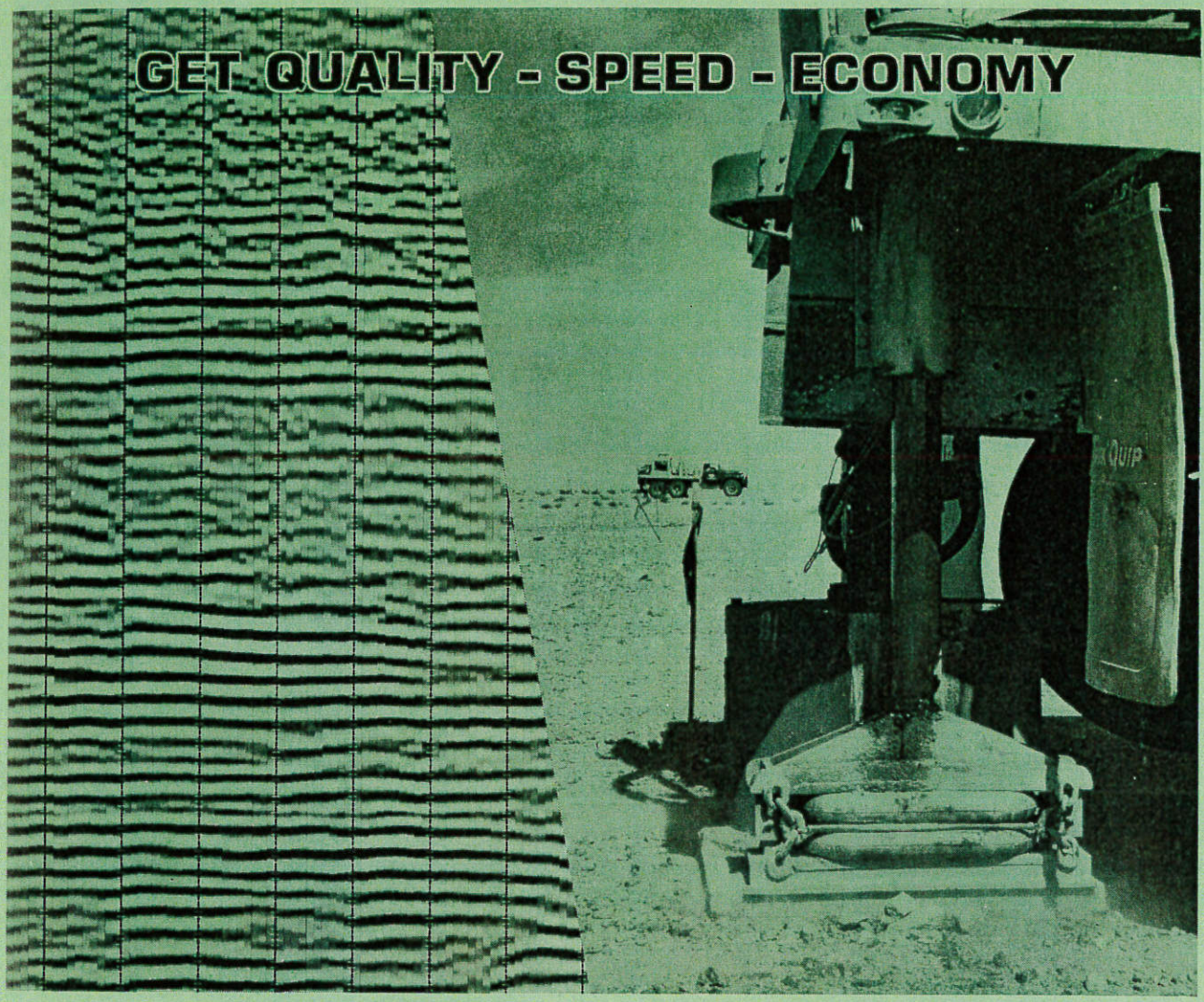

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EXPLORATION OPPORTUNITY—THE PRODUCT OF APPLIED TECHNOLOGY

J. E. FINLEY
Group Vice President, Exploration & Production
Continental Oil Company

Analysis of additions to reserves compared to cumulative exploratory well completions since the beginning of the U. S. petroleum industry clearly exhibits a close correlation between maximum exploratory effectiveness and applied technology. Surges of increased exploration results can be readily identified as those periods of optimum application of surface geology, reconnaissance subsurface and geophysical techniques, and prospect definition by intensive refraction and reflection seismic methods.

The domestic petroleum industry can be optimistic about the opportunities for future effective exploration. Current technology is well advanced. Continuous refinements have improved its definitive capabilities and broadened its opportunity for application. Additional technological development can be expected from the heavy expenditures on research and development currently being made by the petroleum industry, as well as associated industries and the Federal Government. There should be no concern about the opportunities to apply this technology when the volume of unexplored sedimentary section of the United States is considered. Tremendous opportunities for new reserves lie in the 350,000 square miles of potential and almost totally unexplored continental shelf surrounding the North American continent.

The exploration professions should place more emphasis on how to apply existing and future technology to generate a maximum of exploratory opportunity. This will require conceptual adjustments in exploration approach. Exploration staffs must have available full technical capability of all the skills and talents which can contribute to more effective exploration. Well-conceived programs must utilize each of these professional skills to the extent it can contribute, as opposed to the frequent practice of attempting to employ one technique beyond its capability and failing to utilize others which could make significant contributions. Organization must be compatible with optimum developments of technical capability and provide sufficient flexibility to bring the maximum of talents and judgment to bear in the development of concepts and formulation of programs.

Management must confidently support the application of technology in the discovery of new reserves. They must be knowledgable of the inherent risk in exploration and willing to include in their planning sufficient financial support to provide for adequate exposure to exploration opportunities to offset this inherent risk and take maximum advantage of applied technology.